PROJECT BRIEF

1. Identifiers:

Project Number:	
Project Name:	Cuba: Priority Actions to Consolidate Biodiversity Protection in the Sabana-Camagüey Ecosystem
Duration:	5 years
Implementing Agency:	United Nations Development Programme
Executing Agency:	Ministry of Science, Technology and Environment (CITMA)
Requesting Country:	Cuba
Eligibility:	CBD Ratification: 09/03/94
GEF Focal Area:	Biodiversity
GEF Programming Framework:	Coastal, Marine and Freshwater Ecosystems

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2. Summary:

The northern archipelago of the Sabana-Camagüey Ecosystem (SCE) in central Cuba contains marine and terrestrial biodiversity of unquestionable global significance. This diversity is threatened principally by conventional tourism development, and, more locally and to a much lesser extent, from over-fishing and agroindustrial pollution. The successfully completed first stage of the project (1993-1997) established the scientific and institutional foundations for biodiversity conservation through integrated management of the entire SCE. The consolidation stage proposed here focuses on the northern archipelago of the SCE and couples the implementation of critical sustainable development activities -to be financed and implemented by the Government of Cuba (GoC)- with others designed specifically to protect globally significant biodiversity. Project activities will incorporate biodiversity into integrated coastal zone management through zoning, establishment of essential protected areas (a total of 127,547 ha) for demonstration and potential replication, a biodiversity monitoring program, institutional strengthening, and training, education and awareness raising of key sectors of the population, including decision makers**.** By the end of the project eight key protected areas will have been established, the entire northern archipelago will have been zoned for biodiversity conservation, technical and administrative staff of local and national institutions will have been trained in integrated coastal management, biodiversity valuation, biodiversity conservation and sustainable use, zoning, and biodiversity monitoring. In addition, biodiversity values and themes will have been incorporated into provincial and national curricula, and four case studies will have been carried out aimed at identifying and applying appropriate incentives and regulatory mechanisms, as well as economic instruments aimed at long-term financial sustainability of conservation efforts in the SCE.

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3. Costs and Financing (Million US$):

GEF: -Project: USD$ 3.776 m

	-GEF Project Support Costs:	USD$ 0.113 m
	-Subtotal GEF:	USD$ 3.889 m
Co-financing:	Government of Cuba:	USD$15.269 m
	UNDP Capacity 21	USD$ 0.45 m
	Canadian sources (various)	USD$ 0.300 m
	Subtotal co-financing:	USD$16.019 m
	Total project cost:	**USD$19.9 m**

4. Associated Financing (Million US$)**:** USD$96.97 m

5. Operational Focal Point Endorsement **(**Annex III)

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Date: 7 August, 1998

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LIST OF MAIN ACRONYMS AND ABBREVIATIONS

CITMA	Ministry of Science, Technology and Environment
SCE	Sabana-Camaguey Ecosystem
SCA	Sabana-Camaguey Archipelago
CIDEA	Environmental Information, Dissemination and Education Centre
CYTED	Science and Technology for Development
CARICOMP	Caribbean Coastal Marine Productivity Project (funded by UNESCO and UNDP)
GESAMP	Group of Experts on the Scientific Aspects of Maritime Environmental Protection
CICM	Council for Integrated Coastal Management
GoC	Government of Cuba
CEGIA	Environmental Management and Auditing Centre
CNAP	National Centre for Protected Areas
UMA	Environmental Units
TPR	Tripartite Review
PPER	Programme Performance Evaluation Report
CZM	Coastal Zone Management

1. BACKGROUND AND CONTEXT

Biodiversity context

1. The Sabana-Camagüey Ecosystem covers an area of 75,000-km^2, encompassing the northern Sabana-Camagüey *Archipelago* (SCA) along with its shallow sea shelf, the northern central watershed of the main island from Punta de Hicacos to Nuevitas Bay, and the Exclusive Economic Zone of the adjacent ocean (see map in Annex X). The archipelago or SCA stretches approximately 465 km along the north-central coast of Cuba and is comprised of some 2,517 keys that account for 60% and 93.8% of the total number and area, respectively, of all Cuban keys. The SCA contains extensive plant formations, such as Cuban wetlands and dry forests - of high global significance[1] - and mangroves are common on the keys and along the main island's coast. The biggest keys are populated with a variety of vegetation types, including mangroves, semi-deciduous forests, microphyllous evergreen forests, coastal xeromorphic plant complexes on sandy and rocky coasts, and halophytic communities.

2. The SCA also possesses coral reefs of great regional significance. The entire outer border of the marine shelf is fringed by a fore reef, while it is estimated that there are over 100-km of reef crests and over 500-km of fore reefs, with lush sea-grass beds. Kelleher et al. (1995)[2] recognize the need to strengthen protected areas in reefs of the SCA. At the same time, the Nature Conservancy (1998)[3] considers the marine shelf of the Sabana-Camaguey Archipelago as a high priority conservation zone. The SCA also forms an essential part of the Greater Antilles and Bahamian Marine Ecosystem, one of the Global 200 Ecoregions listed as global priorities for conservation of biodiversity by the World Wildlife Fund[4].

3. This rich mosaic of terrestrial and marine habitats contains a high diversity of plants and animals and high levels of endemism, ranking the zone among the richest in Cuba, itself the island with the greatest diversity in the West Indies[5]. Due to its enormous natural value and its vulnerability to marine pollution, this zone was declared a Particularly Sensitive Sea Area by the International Maritime Organisation (IMO) in September 1997. Such recognition has only previously been granted to the Australian Great Barrier Reef.

4. To date, 708 species of terrestrial flora have been recorded in the area, of which 126 are endemic and 12 are of localised distribution. The SCA also harbours a wide diversity of both species and subspecies of terrestrial fauna, representing large numbers of

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[1] Dinerstein, E., D. M. Olson, D.J. Graham, A.L. Webster, S.A. Primm, M. P. Bookbinder and G. Ledec. ***A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean.*** The International Bank for Reconstruction and Development / The World Bank. 1995.

[2] Kelleher, G., Bleakly, C. and Wells, A. *Global Representative System of Marine Protected Areas*, Volume II, 1995

[3] The Nature Conservancy 1998 *Coastal Systems of the Northwestern Atlantic* (Map with a table). Marine Conservation Science Center

[4] Olson, D.M. and E. Dinerstein. 1997. The Global 200: Conserving the World's Distinctive Ecoregions. Conservation Science Program. World Wildlife Fund-US. Washington, D.C. USA.

[5] Cuba also ranks unusually high relative to the US and Canada when compared on an area-by-area basis: 39 times as many bird species per hectare, 30 times as many amphibian and reptile species per hectare, and 27 times as many plant species per hectare.

endemic and migratory species: 958 species of terrestrial fauna have been recorded, 542 of them insects, (though a poorly studied group), and 209 species of birds. The highest endemism rates are found in molluscs and reptiles. Of birds, 48% migrate between Cuba, North America and South America. It is estimated that from 35% to 52% of the total number of birds found on the keys according to vegetation type are migratory. Eleven endemic genera have been recorded, along with 107 endemic species and 47 endemic subspecies of which 33 are exclusive to the SCA[6].

5. Due to its geographic location, the SCA serves as a destination and migratory corridor for many birds (see Annex VIII). As noted above, the SCE functions as an important flyway between the nearby continental masses (Annex X). Of migratory birds, four are endangered (*Charadrius melodus, Vermivona celata, Falco peregrinus* and *Falco columbarius*) while one is subject to lesser risk under managed conditions (*Phoenicopterus ruber*).

6. In the soft bottoms of the marine shelf, 88 macroalgae and seagrass species have been identified, with 155 species of algae found in reefs. To date, 447 benthic invertebrate species have been found on the soft bottoms of the marine shelf and 374 in the reef[7]. Diversity of fish species is also very high; of over 900 fish species currently present in Cuba, most are found in the SCA.

7. In several taxonomic groups it has been demonstrated that, as a result of increased sampling efforts both on the keys and the marine shelf, the number of species discovered has tended to rise, providing a clear demonstration of the SCA's enormous potential for discovery of new species. The SCA is home to species of great importance to conservation, both globally and regionally. Species such as the flamingo, the manatee (endangered), the queen conch, migratory birds, iguanas, snails belonging to the Cerion and Ligus genera, the Antilles crocodile, and dolphins, may be seriously threatened by expanding economic activities.

8. The Sabana-Camagüey Archipelago appears to be very important in the biogeographic processes related to biological diversity in the northern Greater Caribbean and therefore in conservation and sustainable use of regionally shared natural resources. Migratory marine species, (turtles, sharks, beak fish, tuna) and numerous metapopulations of reef and seagrass species are shared with both the United States, The Bahamas, and possibly Bermuda.

9. Evidence also points to the SCE as a propagule source for the Greater Caribbean region. From 1991 to 1997, drift cards launched from the north of the Sabana-Camagüey Archipelago (Bahamas Channel) reached eastern Florida (23% of the cards) and other coasts of eastern USA and Bahamas. Others were recovered in Bermuda with 0.8% in southern Jamaica[8]. At the same time, it has been demonstrated that the Florida Keys Marine Sanctuary imports larvae of species 1 to 2 months into their larval phase from a

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[6] Cuba, as an Endemic Bird Area, is listed among the top fifteen priorities world-wide for conservation by Birdlife International. Putting Biodiversity on the Map: Priority Areas for Global Conservation. 1992. International Council for Bird Preservation, Cambridge, U.K.

[7] For reefs, only information about sponges, gorgonians, scleractinia, milleporina and mollusks has been included.

[8] Institute of Oceanology, 1991-1997: *Album of Surface Currents.*

wide area of the Sabana-Camagüey Archipelago (from Cárdenas Bay to Cayo Coco) and from other areas of western Cuba.[9]

Policies, legislation and institutions

10. In 1994, as a result of increasing awareness of the crucial importance of the environmental dimensions of economic development and sustainability, Cuba created the Ministry of Science, Technology and Environment (CITMA) with its corresponding operational Environment Agency, the Environment Units in CITMA's Provincial Delegations, the National Centre for Protected Areas, the Environment Management and Auditing Centre, and the Environmental Information, Dissemination and Education Centre (CIDEA). Before that, the National Centre for Biodiversity had been established as part of the Institute of Ecology and Systematics.

11. To incorporate the environmental dimension into the country's development, considerable supportive or enabling legislation has been formulated and approved: the *Law on the Environment* (July 1997*);* the *Resolution on Environmental Impact Assessment*, and Resolution 168/95 *"Rules for the Realization and Approval of Environmental Impact Assessments"* (October 1995); the *Law on the Tax System* (October 1994) introducing taxes to be levied on use or exploitation of natural resources, and for use in environmental protection; the *Resolution on Inspection by Government of the Environment and Toxic Chemical Products* (1995) and the creation of CITMA's Environmental State Inspection Body; the *Law on Foreign Investment* highlighting the principle of sustainable development and addressing environment protection in the process of foreign investment; the Decree-Law 164 *"Rules for Fisheries"*(May 1996) and the creation of the *Inspection Body of the Ministry of Fisheries*; and *Resolution 111/96: Regulations on Biological Diversity* (1996). Currently, the *Law on Soil Use, Territorial Ordering and Urbanisation*, the *Decree-Law on Protected Areas*, and the *Decree-Law on Management of the Coastal Zone* are under discussion and pending approval. Finally, Cuba is currently preparing a National Biodiversity Strategy and Action Plan (UNEP-GEF), in which the protection of the SCE and especially the SCA are emphasised.

12. Cuba participated in the United Nations Conference on the Environment held in Rio de Janeiro, signed Agenda 21 and has signed and ratified both Global Conventions (CBD, UNFCCC). Cuba also participated in the *World Conference on Sustainable Development of Small Island States*, and is a signatory and active member of an important number of international and regional agreements, conventions, and protocols relating to the environment, (*Montreal Protocol, Convention on International Trade in Endangered Species of Wild Fauna and Flora*-CITES, *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, MARPOL, CEPOL, SPAW, etc.). Cuba is currently taking steps toward ratification of the *Ramsar Convention on Wetlands of International Importance*, and the *Bonn Convention on Migratory Species* is under study. In 1994, Cuba developed a *National Program for Environment and Development* as a national Agenda 21, which became the *National Environmental Strategy* in 1996.

Environmental Management and Biodiversity Conservation

13. Current basic activities undertaken by the Cuban Government include hydrographic basin management plans in areas with ecosystems and species of global

[9] Roberts, Callum M. "Connectivity and Management of Caribbean Coral Reefs." *Science* 1997.

significance (e.g., Turquino Plan, Commission for Hydrographic Basin Management), and pollution reduction in key biodiversity areas of the SCE. At the same time, Cuba has developed a globally important National Manatee Program to be implemented within the framework of the protected area system identified under the initial, pilot project and to be implemented under the project proposed here.

14. In the mid-1980s, due to its natural, archaeological, cultural and scientific value, the Ministry of Science, Technology and Environment (CITMA) - the former Cuban Academy of Sciences - designated the SCA as a high priority area for biodiversity conservation. The Government has proposed much of the central part of this ecosystem as a Biosphere Reserve. In this context, a number of the protected areas considered here would be form part of the Biosphere Reserve's core areas.

15. In addition, in collaboration with the Institute of Ecology of Jalapa, Veracruz, Cuba is preparing a *Coastal Biodiversity Atlas* financed by *Science and Technology for Development* (CYTED); Cuba participates in the UNESCO project *"Mangrove Recovery in Selected Areas of the Cuban Archipelago"* and is also taking part in the regional *Caribbean Coastal Marine Productivity* project (CARICOMP) funded by UNESCO and UNDP.

16. Other relevant activities include the construction and operationalization of the Coastal Ecosystem Research Centre in Cayo Coco, and construction of infrastructure for mitigation of marine environmental degradation.

17. In 1992, the Global Environment Facility, during its Pilot Phase, authorized US$ 2.0 million in financing to assist Cuba in an initial pilot project entitled ***Protecting Biodiversity and Establishing Sustainable Development in the Sabana-Camagüey Ecosystem.*** This project formed the first part of an originally planned, three-phase process to ensure the conservation of biodiversity in the context of sustainable development in the SCE. The initial phase of the project ended in 1997 and was subject to an independent evaluation[10]. This evaluation assessed the highly satisfactory accomplishments of the project against the objectives of the Project Document, as well as against the defining features of coastal zone management initiatives as described by The Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)[11]. Given the progress made during the initial phase, government financial commitments and the design of the project proposed here, the original three phases of the project have been reduced to two – the initial pilot phase now completed and the phase proposed here.

18. According to the independent evaluation, as a result of the project, knowledge of biodiversity of global interest existing in the SCA was considerably enhanced through a process of information gathering, analysis and synthesis. The project identified ecologically sensitive areas, threats, opportunities and problems for conservation, as well as the causes of biodiversity loss. By means of interdisciplinary, inter-sectoral and inter-territorial participation and the adoption of a problem solving approach, a Strategic Plan was created to protect biodiversity in the context of sustainable tourism development and was formally adopted by government. Annex VI delineates the

[10] Available on request from UNDP-GEF, New York.

[11] Olsen, S., J. Ottenwalder, M. Smith, and A.M. Suarez. *Final Evaluation: Protection Biodiversity and Sustainable Development of the Sabana-Camaguey Ecosystem.* UNDP. 1997.

threats to biodiversity on several keys and in areas of globally significant biodiversity, as well as the solutions identified to eliminate these threats. On the whole, the initial phase of the project resulted in a strategy for achieving integrated coastal management, including a system of protected areas, and a network of small environment-monitoring stations. The strategy takes a regional landscape approach to planning and design of economic development. During the first phase, specifically targeted strategic plans for the conservation of biodiversity in the framework of tourism development were designed for the Santa María, Guillermo, Coco, and Sabinal keys. Project data and results have been incorporated into a Geographic Information System constituting a powerful tool for decision making, for resource management and economic development.

19. The independent evaluation of the pilot project concludes "the substantial progress made during the GEF project will produce significant benefits in biodiversity conservation and sustainable forms of tourism development if the effort continues into an initial phase of implementation."

2. BASELINE COURSE OF ACTION

Current and potential threats to biodiversity

20. The main current and potential threats to the SCA that have already been identified are described in Annex VI and summarized below. 31% of Cuba's sugar cane production takes place in the watersheds of the main island opposite the keys, accounting for localised pollution at river mouths. While locally more serious, this pollution has not constituted a serious threat to the keys to date due to the wide marine expanse separating them from the main island. Other potential sources of pollution include a number of rice plantations, and the tilapia culture ponds in Morón and near the Máximo River which discharge nutrients into the sea. All these threats to sustainable development and biodiversity are currently receiving specific attention from the Cuban Government through actions including institutional and legal strengthening, establishment of multisectoral councils for watershed management, implementation of inventories and audits of pollution sources, investments in waste treatment, etc.

21. The SCA is presently the focus of an expanding, large-scale tourism development program. The development of "sun and sand" tourism requires basic environmental measures such as preservation of water quality, adequate waste treatment, appropriate design measures regarding infrastructure and location, etc. Biodiversity protection has not yet been a significant factor in tourism development planning. Given the lack of human settlements, exploitation of the Sabana-Camaguey Archipelago to date has been very limited and is restricted mainly to more conventional tourism development on Coco and Guillermo keys. Currently planned tourism must be developed in an ecologically responsible manner, compatible with biodiversity conservation. Otherwise, planned infrastructure and activities will pose a serious threat to the flora, fauna, habitats and landscapes of the SCA.

22. Developing and implementing solutions to several of these issues is clearly in the national interest given the impact on the national economy and the environmental health of the population. The "realistic baseline" (i.e., that which can realistically be expected to occur in the near future) is typified by measures primarily targeted at better

environmental management in the SCA. These measures can broadly be categorized as follows:

23. *Development planning of coastal areas.* The government will be establishing a Council for Integrated Coastal Management (CICM) responsible for guiding developments in the coastal zone in an environmentally responsible manner. Master plans for tourism development on keys will be designed. Basic environmental monitoring, studies on environmental damage and on the assessment of land-based sources of pollution will also be undertaken. The government will also develop terrestrial and marine biological reference collections.

24. *Environmental Education and Awareness Raising.* Education and awareness programs will be developed at the provincial level. These programs will target decision-makers through raising their awareness of how the different economic sectors have an impact on the environment. They will also target schools, colleges, teaching centers and educators by introducing environmental awareness courses into curricula. Communications specialists and the mass media will also be involved in this program on general environmental education and awareness. These programs, however, do not focus on biodiversity conservation and management.

25. *Investments in Pollution Mitigation*. An essential component of targeted programs to address environmental problems and to improve environmental management is pollution prevention and mitigation. In the baseline the Government of Cuba will be undertaking substantial investments in controlling effluents from the sugar industry, tilapia culture, and the domestic sewage system, all of which are based on the mainland. Given the mounting pressures from rapid tourism development, the government will also commission engineering works specifically targeted at alleviating pollution pressures from the tourism sector. Other actions for environmental management that have a direct impact on the performance of the tourism and fisheries sectors include: the rehabilitation of Los Perros Bay that is suffering from excessive salinity, rehabilitation of quarries in the keys, reforestation efforts in the catchment, and the establishment of fishing reserves. In addition, Environment Canada will be exploring possibilities for technical cooperation related to waste from the sugar cane industry and a phyto remediation project with a direct bearing on the Sabana-Camagüey ecosystem.

26. *Coastal, marine and terrestrial Protected Areas Management.* Despite the vast extension of the Cuban marine shelf and the risks to its biota, there are no well-established and managed marine protected areas in Cuba. According to the independent evaluation, the project was successful in achieving initial designation of large areas of the SCA as protected areas; there is now the need to implement key protected areas in the SCA based on the preparatory work done during the initial phase of the project. In addition, there is a need to incorporate biodiversity conservation principles and practices into the overall sustainable development planning and management of the area. Under the baseline some expenditures will be allocated towards the legal establishment of coastal, marine and terrestrial protected areas, but not towards their management and operations.

27. Despite the actions that Cuba undertakes towards the protection of the environment, the country cannot be expected to fund its sustainable development and also the protection of globally significant biodiversity. In the absence of this final consolidation phase of the project - to be financed by GEF and non-GEF resources - the actions of the Cuban Government would be insufficient, at least in the short-term, to protect the globally significant biodiversity of the SCA and consequently there would be damage to ecosystems and species of global significance. Conservation and sustainable use efforts would be restricted to legal establishment and only very basic-level implementation of the protected area system in the SCE; establishment but not full operationalization of the Integrated Coastal Management Council of the SCE; detailed environmental - but exclusive of biodiversity - assessments for planning; general zoning for sustainable development in the area but without ensuring the conservation of globally significant biodiversity; general environmental monitoring without specific monitoring of the status and trends affecting biodiversity thus favouring an inability to carry out proper adaptive biodiversity management; construction of some engineering works in order to alleviate environmental impacts; introduction of educational activities to raise environmental awareness, but lacking adequate materials and information on biodiversity; pilot schemes for waste treatment; and formulation of a proposal for a system of fishing reserves, though lacking any synergy with biodiversity conservation measures.

28. The project proposed here aims at eliminating current and long-term threats to biodiversity such as the construction of inappropriate infrastructure, technical and institutional inadequacies in planning and zoning, quarrying in the keys, unsuitable methods of oil extraction and exploration, introduction of exotic species, poaching, and tourism development tending to harm or destroy globally important biodiversity. The project will be financed on an incremental cost basis by the Government of Cuba, UNDP-Capacity 21, the GEF and other donors. The proposed project will consolidate strategic planning and management of biodiversity conservation and sustainable use and implement key conservation activities in the Sabana-Camagüey Archipelago (SCA). Activities in the interest of national sustainable development will be financed by the GoC and other donors; incremental activities to protect biodiversity will be financed by the GEF, as well as other interested parties.

3. RATIONALE AND OBJECTIVES (ALTERNATIVE STRATEGY)

29. Protection of the SCE's regionally and globally important biodiversity will be achieved by ensuring the incorporation of biodiversity conservation principles and practices into ongoing and planned sustainable development programmes and projects, through the coordinated implementation of both sustainable development and incremental activities in the area of highest globally significant biodiversity – the SCA. The alternative course of action builds on the products and experience gained from the pilot phase and the recommendations and findings of the independent evaluation, and is guided by the priorities and concerns of the Strategic Plan.

Objectives and accomplishments of the pilot phase project

30. The aim of the pilot phase project was to "provide a scientific basis for integrated sustainable development and environmental conservation" of the Sabana-Camaguey

Ecosystem. This would be realized by integrating biodiversity conservation; EEZ, small island and watershed planning and management; innovative approaches to infrastructural development, and the development of appropriate models of tourism and ecotourism. The six immediate objectives of the project included: the strengthening of the technical, institutional and planning and management capacities of the Ministry of Science, Technology and the Environment; improvement of the region's base of information as well as institutional information management capabilities, increase of public awareness; and development of a regional, strategic plan aimed at integrating biodiversity conservation into the region's economic development, principally tourism.

31. Equally important, project participants – both individual and institutional - gained considerable experience in cross-sectoral planning and formulation of a resource management strategy incorporating biodiversity values. Participants acknowledged the importance of coastal zone management "informed, but not driven by science," and that multi-sectoral cooperation should be reflected in and enhanced by the corresponding institutional framework to support implementation.

Main findings of the final evaluation

32. The independent evaluation carried out at the end of the pilot phase project found that it had met or exceeded its objectives, outputs and activities specified in the Project Document. While the project increased the capacities of key institutions to plan and manage the region's resources and ecosystems for biodiversity conservation and significantly built awareness around the importance of the region for global biodiversity, it also produced a Strategic Plan recommending a series of actions, the most significant of which included: application of environmental analysis and planning methodology to all future development of the archipelago, with emphasis on biodiversity values; restoration of degraded areas and depleted fisheries; designation of large areas as national parks and preserves; and expansion of the ongoing environmental monitoring system and use of the information gained from the project to enrich impact assessment and inspection processes. As a result of the pilot phase project and subsequent evaluation and follow-up missions, the Government adopted this Strategic Plan earlier this year. This Plan will guide priority actions to be undertaken in the SCE as part of the Alternative strategy for sustainable development in general and biodiversity conservation in particular.

33. The Evaluation made eight recommendations for further strengthening the achievements thus far: increased research on the biodiversity resources of the SCE, including intensified surveys; prioritization of pollution mitigation activities on the mainland according to degree of stress on the archipelago; continued improvement in information systems; increased outreach and awareness raising both within the project area, nationally and regionally; and implementation of the major resource management policies and tools recommended by the Strategic Plan. The main findings of the final evaluation and the role this has played in design and formulation of the final consolidation phase in presented in Annex IX.

4. PROJECT COMPONENTS AND EXPECTED RESULTS

34. As a result of project experience and lessons learned, the recommendations of the independent evaluation, and the priorities of the strategic plan (see Annex IX), the four

principal objectives of the project proposed are described below. The sequencing of each component's activities over time (the lack of which was identified as a weakness of the pilot phase) will be detailed in the project document.

A. ***Establishment of eight key priority protected areas for conservation, demonstration and replication (GEF will share costs of this objective with the GoC and Canadian sources; for details on description and benefits of proposed protected areas see Annex VII).*** The following key protected areas will be established or consolidated:

All these areas have been chosen as a result of studies carried out during the first phase of the project and management of these areas reflects implementation of conservation priorities identified in the Strategic Plan for the SCE. Annex VII provides an overview of the biodiversity contained in the selected areas and a summary is provided below. The protected areas will be legally established, their management plans designed and implemented, visitor centres created, information printed for distribution, interpretative trails set up, park personnel trained in biodiversity planning and management, and minimal scientific and logistical equipment provided to ensure monitoring and feedback to planning and management functions. It should be noted that the SCA is and has been largely uninhabited, with very minor resource use by individuals from communities on the main island.

Protected Area	**Area (in hectares)**	**Main features**
Caguanes National Park	25,547 ha	This park houses one of 8 populations of the endemic Cuban sandhill crane, and also houses other conservation-concern species such as manatees, dolphin and the American crocodile, all 3 of which are threatened and of regional concern. In terms of flora the area has 186 taxa inventoried (24 of which are endemic). This park ranks second in biodiversity end endemism within the SCA after Cayo Coco that is 10 times larger.
Santa María-Guillermo National Park	25,700 ha	Includes the most diverse and well-preserved coral ecosystems in the SCA, with good development and extension. 192 faunal species have been inventoried, of which 38 are endemic. In terms of flora, 186 species are known, 23 of which are endemic.
Central and Western Cayo Coco Ecological Reserve	29,200 ha	This reserve has the highest figures for biodiversity and endemism in the Cuban keys. It houses 619 fauna taxa, 98 of which are endemic, and 385 flora taxa, 28 of which are endemic. The reserve also has some very well preserved reefs and different mangrove types.
Máximo River Fauna Refuge	19,800 ha	This refuge has the largest nesting colony of the Rose Flamingo in the world and also houses significant populations of other aquatic birds, manatees and American crocodiles.
Lanzanillo-Pajonal Fauna Refuge	11,200 ha	Houses the second largest manatee population in the country, an endangered species.
Maternillo-Tortuguilla Ecological Reserve	5,500 ha	This reserve includes developed and well-preserved front coral reefs and mangroves. It has an important breeding site for the queen conch. It houses 286 flora taxa, of which 25 are endemic, and 239 fauna taxa, of which 69 are endemic.

Central Cayo Fragoso Fauna Refuge	3,600 ha	Central Cayo houses the only population of rat hutia, an endangered Cuban vertebrate locally endemic to this key. It has abundant bird fauna, including migratory species, well-preserved wetlands and coral reefs.
Cayo Cruz del Padre Fauna Refuge	6,300 ha	Rich in mangroves and coral reefs which are in an excellent state of conservation.

While Component A is focussed geographically on the Sabana-Camaguey Archipelago, activities of Components B, C and D will focus on the SCA and/or broader Sabana-Camaguey Ecosystem, as appropriate, to ensure achievement of the global biodiversity benefits associated with the former. Specific activities described below may be implemented outside the strict boundaries of the SCA with the aim of facilitating or enhancing the conservation of its biodiversity by addressing actual or potential threats, building constituencies and capacities for biodiversity conservation and sustainable use, or generally working to produce a strong enabling environment for conservation and sustainable use. In this sense, the areas of the SCE around the Archipelago can be more conventionally considered as buffer or transition zones to the eight proposed protected areas. As noted, financing of these activities will be split among a variety of sources depending on incremental costs analysis and the specific interests of cofinancing agencies.

A. ***Consolidation of co-ordinated institutional capacities for sustained, long-term integrated coastal management (UNDP-Capacity 21, GoC and Canadian sources will support sustainable development and environmental training, technical advice and networking between sectors and institutions for integrated coastal management; GEF will contribute by funding only incremental costs related to biodiversity conservation).***

Activities:

- **Establishment of a Council for Integrated Coastal Management (CICM) for the SCE.** This will include formal institutional and inter-institutional structuring, staff training, and the acquisition of minimum required equipment for integrated coastal management. On completion of the project, the Council for Integrated Coastal Management for the SCE will have been legally established and will be in operation. As a result, the prevailing sectoral approach to biodiversity management and the lack of co-ordination and integration in decision making will have been eliminated, and a single legal authority will be responsible for coastal management. During the pilot phase, the project was very successful in achieving inter-sectoral, inter-institutional co-ordination to resolve specific issues or problems as they were identified, though as such, it could be characterised as more or less ad hoc; the purpose of this activity is to build on this experience to formalise and structure successful co-ordination arrangements between the sectoral institutions a) with clear lines of authority, b) guided by the strategic plan, c) and with well-defined decisionmaking procedures and channels of communication.

- **Inventories and rapid environmental assessments will be carried out in areas of globally significant biodiversity,** prioritised on the basis of special protection needs or existing or potential threats. Specialised inventories, training and minimum necessary equipment for these actions will be provided. Biodiversity management based on relevant scientific information will ensure that decision making takes into account globally significant biodiversity.

- **Detailed zoning and planning in prioritised areas will be carried out incorporating biodiversity conservation and environmental protection criteria.** Taking into consideration the emphasis given to physical planning in the first phase of the project as the only way to reach the conservation of biodiversity in the archipelago, follow-up actions in this context will include staff training and the provision of minimum necessary equipment. As opposed to the ecosystem-wide zoning carried out in the pilot phase, this project will effect zoning at a reduced scale in order to provide more precise information for local level planning in areas of high biodiversity.

- **A network of small environmental monitoring stations will be established. W**orkshops will be held to train staff and then to periodically analyse results of monitoring status and trends affecting globally significant biodiversity and its responses to management actions and environmental stress factors. Minimal scientific and logistical equipment will be provided. This approach will permit adaptive management, by incorporating feedback from analysis of monitoring of the effects of actions and stressors on biodiversity.

- **Principles of resource economics will be applied to biodiversity conservation and management.** Staff will be trained, four case studies, with the corresponding workshops, will be carried out, and minimal equipment will be provided. This will allow the costs of environmental variables and biodiversity conservation to be internalised in development plans and programmes and will prevent the misuse of benefits resulting from particular mechanisms and economic incentives. While some training in resource economics was successfully effected in the pilot phase, this project will apply resource economics principles/practices in four specific case studies to learn by doing with the aim of improving technical capacity and informing policy aimed at optimising income to the individual protected areas and the system as a whole.

A. ***Education and awareness-raising for environmental management, sustainable development and biodiversity conservation and sustainable use (Capacity 21 will support environmental awareness and education activities. The GEF will finance only the biodiversity-related components)***. The biodiversity component includes the design and introduction of provincial biodiversity education policies; workshops and seminars to raise awareness among decision makers and different community and economic sectors that affect biodiversity; production of didactic materials, dissemination of biodiversity values through the mass media; collaboration with the different teaching professions; workshops, lectures, talks, seminars and events promoting the protection of globally significant biodiversity; events and activities

for popular participation; and systematic assessment of the population's perception of matters concerning biodiversity, the environment and sustainable development. This project will thus incorporate biodiversity principles and values into environmental education and sustainable development-oriented curricula and activities in planning or under implementation by the Government of Cuba. Whereas general awareness and education activities were successfully implemented during the pilot phase, this project will take a more systematic approach based on that experience to incorporate biodiversity elements into standard educational objectives, programmes and activities.

B. ***Actions and infrastructure to relieve environmentally negative impacts (to be financed by sources other than GEF).*** The Cuban Government and other donors will finance this last component, which will include actions to mitigate pollution (reforestation of river margins, progressive inventory and control of priority sources), bay hyper-salinity due to both excessive fresh-water damming and berm-roads across shallow marine water bodies, over-fishing and fishing practices harmful to habitats and biodiversity. The Cuban Government and other donors will also finance reforestation of quarries and road shoulders in the keys, regulation and monitoring of tourism development, and analysis of potential for establishing and implementing a fishery reserve system. These actions by the Cuban Government will not only prevent ecological degradation in key areas of the SCE from increasing, but also promote their gradual recovery and allow for new environmentally sustainable approaches to be introduced in the development programmes of different sectors.

35. This project is within the scope of the Coastal, Marine and Freshwater Operational Program of the GEF. It is also within the priorities set by the CBD under Article 8, and particularly under its Annex 1. The project uses the incremental costs approach to obtain added global biodiversity benefits to those of existing and planned national efforts. The project also leverages additional resources from the GoC, Capacity 21 and other donors. Cuba is aware of the globally important biodiversity under its management, but cannot fully fund such protection out of its own limited resources. Therefore, to maximise the biodiversity benefits of such a significant biodiversity conservation initiative in Cuba, the support of GEF is needed. The full project planning matrix is shown in Annex II.

5. RISKS AND SUSTAINABILITY

36. Institutional and financial sustainability of activities beyond the life of the project is guaranteed by the Government's recognition of the vital importance of protecting biodiversity as part of the country's natural capital on which its national sustainable development depends. The Government will guarantee the functioning of the Protected Area System and the Council for Integrated Coastal Management upon completion of the project, including the long-term monitoring programme. Despite the huge economic difficulties the country is facing, the Government continues to invest considerable resources in scientific research, institution building and environmental legislation and policymaking, among other elements.

37. Cuba is currently creating the National Fund for the Environment, supported by the recently approved *Law on the Environment.* This fund will permit continued financing of activities aimed at protecting biodiversity in fundamental ecosystems, including those of the SCE. The Fund will be capitalized from a variety of sources, including entrance and users fees in protected areas, as well as charges for ecosystem services. By current law, forty percent of income generated from entrance and users fees is expected to remain within protected area administrations and will be managed and redistributed according to the possibilities of each protected area to cover its needs with profits it has generated. Design and legal establishment of the fund is expected to become final later this year. Activities under Component B of the project proposed here will support the identification and design of economic instruments aimed at generating adequate revenue for the protected area system and progressively capitalizing the Environment Fund.

38. The existing institutional and legal system, together with the ever-increasing participatory character of decision making, will increasingly contribute to sustaining biodiversity conservation activities. Sustainability will be enhanced over time with an increasingly comprehensive legal framework; the *Resolution on Environmental Impact Assessment,* the *Decree-Law on Fishing Regulations,* and the *Law on the Environment,* as well as the *Decree-Law on Coastal Zone Management*, currently being approved, and other new laws, will contribute to the sustainability of project objectives.

39. The risk of failing to achieve the targeted basic or incremental investment is minimal, and it is unlikely that the Government should give conscious priority to a non-sustainable development plan with short-term goals. It is highly improbable that there be a shortage of suitable staff for the actions proposed given the wide availability of highly trained people from different educational levels. Participation of the provinces and sectors involved has been secured since the implementation of the GEF pilot project and because of their participation in project design.

40. This project intends to impart the experience acquired in the protection of biodiversity in the SCE to other areas of the country and, where possible, to other countries of the region, thus favoring a more systematic implementation of integrated management in the zone.

6. STAKEHOLDER PARTICIPATION AND IMPLEMENTATION ARRANGEMENTS

41. The strategy for biodiversity conservation and sustainable development of the SCE, developed in the initial pilot phase of the project, will be implemented with the broad participation of a wide variety of stakeholders. These include the sectors, disciplines, institutions and territories found in or belonging to the SCE. Among the main stakeholders involved in designing the current proposal are the institutions of several ministries, local and provincial administrations and non-governmental organizations, including fishermen, construction workers, tourism, hotels, etc. The strategy for the SCE was formulated in numerous workshops and meetings using participatory, consensus building methods for problem analysis and identification of solutions and priorities.

42. The Cuban Government has conferred the responsibility of directing and coordinating all aspects related to coastal zone management in the SCE on the Ministry of Science, Technology and the Environment (**CITMA**), which acts as governing and executive body in scientific, technical and environmental policy fields. CITMA's operative function is effected through its **Environment Agency**, composed of the Environmental Management and Auditing Centre (CEGIA), the National Centre for Protected Areas (CNAP), the Environmental Information, Dissemination and Education Centre (CIDEA), and several scientific institutes (previously belonging to the former Cuban Academy of Sciences) such as the Institute of Ecology and Systematics, the Institute of Oceanology, the Institute of Tropical Geography, the Meteorology Institute, and the Coastal Ecosystem Research Centre in Cayo Coco. The National Zoo, the National Aquarium, and the National Museum of Natural History also form part of this agency. This Ministry is represented at the provincial level by Provincial Delegations, whose work on the environment is carried out by individual Environment Units (UMA).

43. The aforementioned institutions, along with scientific and technical dependencies of the Ministry of the Revolutionary Armed Forces, the Fisheries Industry Ministry, the Ministry of Basic Industry, the Ministry of Economics and Planning, the Ministry of Education, the Ministry of Higher Education, the Ministry of Construction, etc., have collaborated on integrated studies and projects in the SCE, the latest being the recently concluded initial pilot project. These and other institutions and ministries (the Ministry of Agriculture, the Ministry of Sugar, the National Institute of Hydraulic Resources, etc.) have been consulted as part of the design process and will participate in the implementation of the current project.

44. Cuba is maintaining a sustained trend towards refining the decision making process regarding land use and physical planning as well as environmental issues in development at policy level. This can be seen in the expeditious strengthening of the institutional framework and legal system, and the increased awareness, experience and know-how of Government. The Institute of Physical Planning (of the Ministry of Economics and Planning) is the governing agency for physical planning and regulation of land use and its work is closely co-ordinated with CITMA concerning environmental issues. As it has the necessary logistical, technical and human resources, the Fisheries Ministry also plays an important role in environmental management and is supported by the new *Decree-Law 164 Rules for Fisheries* and its body of fishery inspectors. Major, final decisions are made by the Council of Ministers.

45. *The project proposed here will initiate implementation of the strategic plan for biodiversity protection and sustainable development of the Sabana-Camagüey Ecosystem, as drafted in the initial pilot project.* As previously stated, this strategy will be implemented with the aim of achieving integrated management of coastal ecosystems with interdisciplinary, multisectoral, and transterritorial participation as well as local community participation. Cuba currently possesses a variety of mechanisms for consultation and popular participation (Account Rendering Assemblies of Local Government), mass organizations (Technical Brigades of Working Youths, Cuban Pioneers' Union, Junior-School Students' Federation, Committees for the Defence of the Revolution, Cuban Women's Federation, University Students' Federation, Communist Youth Union, etc.) and non-governmental organizations (National Union of Cuban Architects and

Engineers, Pro Naturaleza, Cuban Botanical Organisation, Cuban Zoological Society) that make it possible to guarantee broad community participation regarding environmental issues.

46. The **Steering Committee** – comprised of representatives of the different sectors and disciplines relevant to the project's goals in the SCA - will be incorporated into the **Council for Integrated Coastal Management** of the SCE, which will be officially established and made operational during the implementation of the present project. This authority will be charged with co-ordination, integration and planning of all development and conservation activities in the SCE, with the aim of adequately empowering decisionmaking under the responsibility of the local or central Governments, as appropriate. Furthermore, the Council will serve to enable the corresponding ministries and governmental entities to gather adequate information for decision making through surveys, research, compilations and monitoring. The **Steering Committee** will play an important role within the CICM in the SCE, as the operational entity charged with ensuring that appropriate environmental regulations are established and formulated so that initiatives on economic development may be adequately evaluated by CICM, as provided for by both existing and soon-to-be-approved legislation. Based on pilot project experience, an effective institutional strategy, structure and infrastructure have been created (CICM) for the project proposed here; the Steering Committee will carry out its operational roles and responsibilities based on its experience in the pilot phase with the aim of effective and efficient implementation of project activities. This committee will meet periodically and promote intersectoral integration and co-ordination. Specific, detailed Terms of Reference will be drafted and incorporated into the Project Document for each institution or organization involved in project implementation.

47. The task of gradually implementing the Protected Area System within the SCA (Special Region for Sustainable Development that includes protected areas of different gradations of use and protection), will belong to the National Centre of Protected Areas of CITMA and the National Enterprise for Flora and Fauna Protection of the Ministry of Agriculture, with support from CITMA's Provincial Delegations and the Popular Power bodies (local government) in the provinces and municipalities involved. CITMA's Environment Units will play an important and direct role in each of the provinces.

48. The Institute of Physical Planning, of the Ministry of Economics and Planning, and its Provincial Directorates of Physical Planning will participate with other relevant institutions of the project to establish a clear delineation between the areas to be protected and the areas prioritised for development. It will also continue strategic environmental planning for other important keys where biodiversity may be seriously damaged by tourism development, should adequate territorial ordering be overlooked. These keys are mainly Paredón Grande, Las Brujas, Ensenachos, Cruz and Esquivel.

49. Environment monitoring of the broader SCE will be carried out through a network of small Environment Monitoring Stations to be created in the provinces to implement this project. CITMA will be responsible for the implementation of this network through its Provincial Delegations and with the support of the Popular Power bodies (local government) in the relevant provinces and municipalities. CITMA's Environment Units will play an important and direct role in this.

50. CITMA's Environment Units together with the National Center for Protected Areas, the National Biodiversity Centre and the National Enterprise for Flora and Fauna Protection, of the Ministry of Agriculture, and with the participation of other relevant institutions, (Fisheries Ministry, National Institute of Hydraulic Resources, Ministry of Sugar, Ministry of Construction, Ministry of Tourism, etc.), will lead the operational planning for environmental rehabilitation and recovery actions (affected species, habitats and landscapes identified by the pilot project). This will involve measures to control organic loading and pollution, regulate dams and reservoirs, construct culverts and bridges in marine roads (bermroads), reintroduce species, monitor and protect threatened species populations, as well as carry out environmental education, research, monitoring, etc.

7. INCREMENTAL COSTS AND PROJECT FINANCING

51. The project separates a realistic baseline from a sustainable development baseline. The latter is leveraged by the project. The realistic baseline is $ 96.97M and the sustainable development baseline $ 100.05M. The leveraged baseline is therefore $3.08M. The incremental costs to cover biodiversity protection have a GEF component of 3.8M, a Cuban component of 12.9M and a Canadian component of .27M. The full incremental costs analysis and matrix are shown in Annex I.

52. The following matrix shows the project components and their costs split by GEF and non-GEF contributions (millions of USD). Increment 1 reflects the non-GEF co-financing that has been leveraged for implementing activities that are in the national sustainable development interest. Sustainable development baseline activities will be financed by GoC, UNDP/Capacity 21, Canadian Department of Environment, Canadian Nature Federation, Ducks Unlimited, WWF Canada, and Environment Canada. Increment 2 represents the costs of activities beyond national sustainable development interest that primarily generate global benefits. Some non-GEF co-financing has been secured for Increment 2 as well (from GoC and Parks Canada and the Canadian Wildlife service).

Components	**Increment 1** *(Non-GEF financing leveraged for Sustainable Development Baseline)*	**Increment 2**		**GEF Total**	**Non-GEF Total**	**TOTAL**
		GEF	**Non-GEF**			
Protected Areas and Management	0.000	2.400	12.940 Of which, GoC: 12.913 Canadian sources: 0.027	**2.400**	**12.940**	**15.340**
Consolidated capacity for long-term coastal zone management	2.588 Of which, GoC: 2.001 Capacity 21: 0.314 Canadian sources: 0.273	1.083	0.000	**1.083**	**2.588**	**3.671**

Components	**Increment 1** *(Non-GEF financing leveraged for Sustainable Development Baseline)*	**Increment 2**		**GEF Total**	**Non-GEF Total**	**TOTAL**
Education and awareness-raising	0.491 Of which, GoC: 0.355 Cap.21: 0.136	0.293	0.000	**0.293**	**0.491**	**0.784**
Subtotal	**3.079** **Of which,** **GoC: 2.356** **Cap. 21: 0.450** **Canadian sources: 0.273**	**3.776**	**12.940** **Of which,** **GoC: 12.913** **Canadian sources: 0.027**	**3.776**	**16.019**	**19.795**
Project support costs		*0.113*		*0.113*		*0.113*
TOTAL	**3.079**	**3.889**	**12.940**	**3.889**	**16.019**	**19.908**

8. MONITORING, EVALUATION AND LESSONS LEARNED

53. The project's Monitoring and Evaluation arrangements encompass the collection, analysis, and dissemination of data and information on issues related to implementation progress and impact assessment. Monitoring the progress of project implementation will be carried out internally and permanently by CITMA, and evaluation of implementation and impact of the project will take place in the middle, at the end and after completion of the project, as commissioned by the Steering Committee.

54. Based on its monitoring and evaluation activities, the project will be able to capture and share "lessons learned". This will assist project management to systematically assess the timely and qualitative fulfilment of workplan objectives and, if necessary, to take corrective measures. M&E findings will be fed back directly into decision making and enhancement of project quality, as well as to ongoing and forthcoming GEF initiatives; lessons learned will be compiled, published and disseminated to raise public awareness of the project's activities and substantiate its credibility both nationally and internationally.

55. Baseline data and permanently updated data are crucial in order to measure progress of project implementation and to assess impact. The project will identify objectively verifiable implementation and impact indicators, including the means and sources of verification. Emphasis will be placed on collecting and systematising data already available from various sources in order to avoid the costly collection of primary data.

56. Current UNDP project monitoring and reporting strategies (Tripartite Project Review [TPR], Program Performance Evaluation Reports [PPER], Mid Term- and Final Review) will be applied and complemented by GEF M&E procedures such as the annual Project Implementation Review (PIR) and independent project and portfolio evaluations.

57. Finally, UNDP will invite the SCA project to participate in a monitoring and backstopping initiative for GEF-financed biodiversity conservation projects dealing with Coastal Zone Management. This initiative will provide high-level technical expertise to each project on an annual and ad hoc basis, as required, as part of standard UNDP monitoring (TPR) and evaluation procedures forming part of project support activities. The experts responsible for backstopping CZM projects will also ensure the systematic exchange of information among projects, as well as the identification of training opportunities and other activities in which project similarities and economies of scale make joint action by the different projects attractive.

58. In the course of the independent evaluation of the initial pilot project, a number of themes came up repeatedly as those involved reflected on the impacts of the project and what had been learned individually and collectively. The great majority of those who participated through the 11 working groups involved in the pilot project are educated as natural scientists; lessons learned tend to reflect or refer to the role of the sciences in a public policy process.

59. Lessons learned from the pilot phase project include the following:

- Integrated coastal management is informed but is not driven by science. This fundamental realisation came as a surprise to some participants for whom this project was an initial exposure to the process of formulating a resource management strategy.

- For many participants this project offered the first opportunity to participate in a cross-sectoral planning process and to experience a methodology for proceeding from information synthesis to problem definition and selection of a management strategy.

- As the project matured, it became clear that new institutional frameworks with supporting policies and regulations would be required to successfully implement the SCE management strategy. This makes the project proposed here a first opportunity to apply the policy reforms being designed as a national response to UNCED's Agenda 21 to a specific geographic site and a specific set of management issues.
- Several participants reflected that the pilot project strongly reinforced the idea that public education and public engagement must be at the core of the implementation phase of the strategic plan.

- Finally, the participants in the pilot project became very aware that the issues posed by biodiversity conservation and sustainable development in the S-C ecosystem will be successfully met only through a sustained effort extending out over many years.

Annex I

INCREMENTAL COST ASSESSMENT

1. BROAD DEVELOPMENT GOALS

The Government of Cuba has acknowledged the importance of conserving its rich biodiversity heritage by ratifying the *Convention on Biological Diversity* in March 1994. Cuba has also developed a *National Environment Strategy* (1996) as part of its national Agenda 21 exercise. This strategy identifies several environmental management issues that are a prerequisite for the protection of biodiversity in Cuba, such as marine pollution control and planning in the fragile insular area of the keys. A variety of regulations and decrees support the environmental strategy. Cuba is also preparing a National Biodiversity Strategy and Action Plan, with the support of UNEP, wherein the Sabana-Camagüey Ecosystem (SCE) in general, and the Sabana-Camagüey Archipelago (SCA) in particular have been identified as conservation priorities.

2. GLOBAL ENVIRONMENTAL OBJECTIVE

The global environmental objective of the project is to ensure conservation of the valuable marine and terrestrial biodiversity existing in the SCE, and more specifically that of the SCA in northern Cuba. To date, 708 species of terrestrial flora have been recorded in the area, of which 126 are endemic and 12 are of localized distribution. The SCA also harbors a wide diversity of both species and subspecies of terrestrial fauna, that includes a large numbers of endemic and migratory species: 958 species of terrestrial fauna have been recorded, 542 of them insects, (though a poorly studied group), and 209 species of birds. Of these, 48% migrate between Cuba, North America and South America. It is estimated that from 35% to 52% of the total number of birds found according to vegetation type on the keys are migratory. Eleven endemic genera have been recorded, along with 107 endemic species and 47 endemic subspecies of which 33 are exclusive to the SCA. The highest endemism rates are found in mollusks and reptiles[12].

3. BASELINE

Biodiversity in the SCA is coming under increasing threat principally from development of "sun and sand" tourism, construction of infrastructure (roads and bridges for tourism), quarries for extraction of construction material, poor control of public use, local pollution in the main island across from the SCA (solid waste, agricultural pollution) and over-fishing. Developing and implementing solutions to several of these issues is clearly in the national interest given the impact on the national economy and the environmental health of the population. The "realistic baseline" (i.e., that which can realistically be expected to occur in the near future) is typified by measures primarily targeted at better environmental management in the SCA. These measures can broadly be categorized as follows:

Development planning of coastal areas. The government will be establishing a Council for Integrated Coastal Management (CICM) responsible for guiding developments in the

[12] Details on the globally significant biodiversity found in the SCA are provided in the main text.

coastal zone in an environmentally responsible manner. Master plans for tourism development on keys will be designed. Basic environmental monitoring, studies on environmental damage and on the assessment of land-based sources of pollution will also be undertaken. The government will also develop terrestrial and marine biological reference collections.

Environmental Education and Awareness Raising. Education and awareness programs will be developed at the provincial level. These programs will target decision-makers through raising their awareness of how the different economic sectors have an impact on the environment. They will also target schools, colleges, teaching centers and educators by introducing environmental awareness courses into curricula. Communications specialists and the mass media will also be involved in this program on general environmental education and awareness. These programs, however, do not focus on biodiversity conservation and management.

Investments in Pollution Mitigation. An essential component of targeted programs to address environmental problems and to improve environmental management is pollution prevention and mitigation. In the baseline the Government of Cuba will be undertaking substantial investments in controlling effluents from the sugar industry, tilapia culture, and the domestic sewage system, all of which are based on the mainland. Given the mounting pressures from rapid tourism development, the government will also commission engineering works specifically targeted at alleviating pollution pressures from the tourism sector. Other actions for environmental management that have a direct impact on the performance of the tourism and fisheries sectors include: the rehabilitation of Los Perros Bay that is suffering from excessive salinity, rehabilitation of quarries in the keys, reforestation efforts in the catchment, and the establishment of fishing reserves. In addition, Environment Canada will be exploring possibilities for technical cooperation related to waste from the sugar cane industry and a phyto remediation project with a direct bearing on the Sabana-Camagüey ecosystem.

Coastal, marine and terrestrial Protected Areas Management. Under the baseline some expenditures will also be allocated towards the legal establishment of coastal, marine and terrestrial protected areas, but not towards their management.

4. GEF ALTERNATIVE

While these baseline measures (realistic baseline) are important in ensuring better environmental management, there is considerable scope to strengthen and therefore maximize the impact through additional actions. UNDP's Capacity 21 program and the Cuban government will finance these additional measures aimed at capacity building for sustainable development. These additional measures must be in place for securing biodiversity conservation efforts and constitute the "sustainable development baseline" (i.e., that which ought to occur in the country's own national sustainable development interest). The Alternative strategy is therefore a two-staged process: the first is the realization of the sustainable development baseline and the second stage is the implementation of specific biodiversity conservation measures. Activities to be implemented as part of the sustainable development baseline primarily fall under the rubric of development planning of coastal areas and are described below.

Development planning of coastal areas. Targeted training of CICM members is needed in the specific fields of inter-sectoral and inter-territorial coordination, environmental monitoring, zoning and planning, alternative strategies to control poaching, waste treatment options, and environmental economics to enhance their decision-making capacities. Database management, GIS capacities, and monitoring networks need to be strengthened to improve the analysis of data and the detection of trends as an input into zoning and planning frameworks. In particular, the key development plans need to explicitly take into account environmental criteria, and one way of ensuring this is by making available training and equipment for rapid environmental assessments.

In order to ensure better protection of biodiversity within protected areas as well as in the rest of the SCA, additional biodiversity conservation measures need to be implemented under the Alternative strategy. The GEF will therefore complement the leveraged sustainable development baseline with activities aimed at biodiversity conservation. These include the following (a more detailed explanation is provided in the main text/ logical framework matrix of the brief): (i) the establishment and full operation of key marine and terrestrial protected areas as demonstrations, (ii) integration of biodiversity conservation into development planning in the SCA through rapid biodiversity assessments, monitoring, and sensitization of CICM staff to biodiversity conservation principles; and (iii) biodiversity conservation education and awareness raising.

5. SYSTEM BOUNDARY

The system boundary for the incremental cost analysis includes the SCA, its adjacent waters and the coastal watersheds on the main island alone, and not the entire country. The analysis is done for the five-year period of the proposed project.

There are likely to be some incidental domestic benefits from the intervention such as the increased potential for ecotourism in the SCA and improvements in the long-term sustainability of the fisheries sector. These benefits, however, are uncertain and difficult to quantify at present.

INCREMENTAL COST MATRIX *(all figures in thousands of US dollars)*

	Baseline (B) *(environmental management)*	**SD Baseline (SDB)** *(improved environmental management)*	**Alternative (A)** *(additional biodiversity conservation measures)*	**Increment 1 (SDB-B)** *(leveraged for sustainable development baseline)*	**Increment 2 (A-SDB)**
Global benefits	Conservation of biodiversity in the Sabana-Camagüey ecosystem and archipelago under threat.	Conservation of biodiversity in the Sabana-Camagüey ecosystem and archipelago under threat.	Improved capacities & targeted measures for integrating biodiversity conservation measures into sustainable development plans.		Conservation of critical habitat and improvements in survival probabilities of endemic & threatened flora and fauna.
Domestic benefits	Poor local environmental quality due to non-inclusion of environmental criteria in planning and decision-making.	Improved capacity to include environmental criteria in planning.		Improvement in the performance of economic sectors dependent on natural resources.	
Costs / Activities	Protected areas USD 1,855 Legal establishment of marine and terrestrial protected areas.	Protected areas USD 1,855	Protected areas USD 17,194.8 Baseline programs plus: Design & implementation of management plans in eight marine and terrestrial protected areas; interpretive trails; promotional brochures for dissemination; signaling system & buoys for protection of reefs from divers & ships; species recovery plans for endemic & endangered species; solar cells as energy source for PAs; terrestrial & marine transportation equipment & upkeep; equipment & materials for visitor center; study tours for dissemination of success & challenges in park management; basic infrastructure and administration and management of parks.		Increment: USD 15,339.8 Of which, GEF: 2,400.0 GoC***: 12,913.0 Canadian sources****: 26.8

	Baseline (B) *(environmental management)*	**SD Baseline (SDB)** *(improved environmental management)*	**Alternative (A)** *(additional biodiversity conservation measures)*	**Increment 1 (SDB-B)** *(leveraged for sustainable development baseline)*	**Increment 2 (A-SDB)**
	Consolidated capacity for long-term coastal zone management USD 6,440 Establishment of a CICM as a management structure for coastal developments. (USD 650) Master plans for tourism development on the keys. (USD 1,030) Study & inventory of environmental damages; assessment of land-based sources of pollution & a plan for control. (USD 2,040) Marine & terrestrial biological reference collections. (USD 55) Basic environmental monitoring. (USD 2,665) Education and awareness	Consolidated capacity for long-term coastal zone management USD 9,028.1 Baseline programs plus: Training of CICM staff in inter-sectoral & inter-territorial coordination, zoning & planning; waste treatment options; env. auditing. (USD 309.3) Training of CICM in env. economics through 4 case studies on design & application of economic instruments for env. mgmt., & policy; economic appraisal of natural resource use; valuation of env. impacts. (USD 750) Equipment for env. management. (USD 260) Inclusion of env. criteria into key dvpt. plans. (USD 270) Training & equipment for rapid environmental assessments. (USD 502.5) Improve database mgmt. & GIS support. (USD 190) Strengthen existing monitoring network. (USD 51.3) Establishment of 4 new biological stations associated with the PA network. (USD 255)	Consolidated capacity for long-term coastal zone management USD 10,111.1 Baseline & SDB programs plus: Technical assistance & equipment to CICM for integrated biodiversity management & recovery of habitats & threatened species. (USD 350) Training in economic assessment & valuation of biodiversity through implementation of case studies. (USD 70) Inclusion of biodiversity criteria into key development plans. (USD 60) Rapid biodiversity assessments. (USD 153) Inventories of focal taxa (indicators). (USD 400) Workshops on methodologies for biodiversity monitoring. (USD 5) Equipment specific to assessing and monitoring ecosystem & species populations. (USD 45) Education and awareness	Leverage for SDB activities: USD 2,588.1 Of which, GoC: 2,001.0 Capacity 21: 314.0 Canadian sources**: 273.1	Increment: USD 1,083 Of which, GEF: 1,083

	Baseline (B) *(environmental management)*	**SD Baseline (SDB)** *(improved environmental management)*	**Alternative (A)** *(additional biodiversity conservation measures)*	**Increment 1 (SDB-B)** *(leveraged for sustainable development baseline)*	**Increment 2 (A-SDB)**
	USD 1,575 Design & implementation of provincial strategies for environmental education; & awareness raising among decision-makers of the environmental impact of different economic sectors. Pollution mitigation USD 87,100* Mitigation of pollution from sugar industry, tilapia culture, domestic waste from mainland; control of pollution from tourism development; rehabilitation of Los Perros Bay; reforestation in catchment; rehabilitation of quarries on keys; designation & mgmt. of fishing reserves.	Education and awareness USD 2,066 Baseline programs plus: Improve citizen participation in general environmental awareness; and transfer experiences and lessons learned. Pollution mitigation USD 87,100*	USD 2,359 Baseline & SDB programs plus: Awareness-raising at all levels about biodiversity conservation. Pollution mitigation USD 87,100*	Leverage for SDB activities: USD 491 Of which, GoC: 355 Capacity 21: 136 Leverage for SDB activities: USD 0	Increment: USD 293 Of which, GEF: 293 Increment: USD 0
Total costs	Realistic baseline: 96,970.0	SD baseline: 100,049.1	Alternative strategy: 116,764.9 *Plus* project support: 113.0 Total for Alternative: 116,877.9	Non-GEF financing for SDB activities: 3,079.1 Of which, GoC: 2,356 Capacity 21: 450 Canadian sources: 273.1	Increment: 16,715.8 Project support: 113.0 Total Increment: 16,828.8 Of which, GEF financing: 3,776 Project support(GEF):113 Subtotal GEF: 3,889 Canadian sources: 26.8 GoC: 12,913 Subtotal non-GEF:12,939.8

* This is a conservative estimate, as it does not include potential outlays by Environment Canada on technical cooperation for wastes from the sugarcane industry and phyto remediation. ** Canadian Department of Environment (Regina and LaSalle): 173.0; Canadian Nature Federation / Ducks Unlimited / WWF (Canada): 16.6; Environment Canada: 83.5. *** These resources from the government of Cuba will go towards the basic infrastructure and administration and management of the 8 protected areas. **** Parks Canada and Canadian Wildlife Service.

Annex II

Project Planning Matrix

Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions/Risks
Development goal: Secure biodiversity protection in the SCE	• Decline of populations of protected species is reversed	• Results of managed-population monitoring • Results of assessments of the ecosystem status	• Species are able to recover from past actions • Protected areas provide an efficient means for species protection and recovery
Project purpose Immediate biodiversity management is established in the SCE through adaptive, integrated coastal management based on institutional strengthening and coordination, the progressive establishment and implementation of a protected area system and a network of monitoring stations with unified criteria, and an effective program on biodiversity education and awareness	• Governmental approval of the institutional framework of integrated coastal management and the protected area system together with their management plans and regulations • Evidence of achievement of these plans and regulations • Evidence of the application of management plans and regulations for protected areas • Governmental financing of the infrastructure and functioning of the network of monitoring stations in the SCE • Evidence of the application of laws and regulations on planning and zoning, and the project proposals in favor of biological diversity	• Legal probatory documents of the corresponding formal adoptions • Documents of the management plans and regulations for protected areas • Reports on incidences and management actions for protected areas • Inspection of the infrastructures of monitoring stations and their functioning • Review of the reports on the results of monitoring and quick ecological assessments for planning and zoning, as well as inventories and assessments for management purposes	• There is a political will strongly rooted in the Cuban Government regarding biodiversity conservation, protection and sustainable use as reflected in the *Law on the Environment* and the *National Environmental Strategy* • There is an appropriate legal and institutional framework to implement the proposed priority actions • There is adequate balance between institutional-executive centralization and institutional-executive decentralization of the Government's environmental activity • There is capable and available staff to undertake the project actions both at central and local levels • The project complements the country's actions on sustainable development in the SCE
Output 1: Protected Areas	• Existence of a legal and institutional framework appropriate to implement the proposed protected areas • Existence of an up-to-date national system of protected	• Management plans and regulations for the eight protected areas • Specific and general regulations for protected areas	• The Government is aware of the need to establish protected areas as instruments to protect biodiversity and the environment • Protected areas are an alternative tourist product besides that of sun and beach. In

	area classification that is both compatible with that of the UICN and adapted to country conditions • Eight protected areas of the system are in full operation with their management plans and regulations • Protected areas are mostly self-financed	• Documents of the finances of public and tourist use as a source for self-financing • Register books on the incidence of problems and management answers in protected areas • Inspection of Visitor Centers and Interpretative Trails in full operation, among other options	turn, these may be self-financed through ecotourism • Protected areas will be a source of employment for the nearest communities • The absence of permanent human settlements in the keys will facilitate management and efficacy of protected areas • There should be effective control and penalties for actions against biodiversity. There is legal back up to do it
Output 2: Integrated Environmental Management: • Council for Integrated Coastal Management • Inventory of biodiversity and quick ecological assessments for zoning • Zoning and planning • Monitoring and assessments for biodiversity management • Economic measures for biodiversity conservation	• Existence of Integrated Coastal Management supported by a Council for Integrated Management in the SCE • Inventory of focal groups of terrestrial and marine flora and fauna in priority areas • Results of quick ecological assessments included within development plans and zoning • Development plans and zoning carried out on environmental bases • Network of monitoring stations implemented with trained staff and minimal equipment • Knowledge about the general health status of ecosystems and populations of global-concern species • Environmental economic aspects included in projects and development plans	• Official probatory documents of governmental formalization of the Council for Integrated Coastal Management in the SCE and the Protected Area System in full operation • Review of the self-financing mechanisms set up in protected areas and their effectiveness • Reports on the results of monitoring and their consequences • Reports on the inventories and quick ecological assessments and their consequences • Reports on the assessments of the status of ecosystems and species populations and their implications in management • Reports and documents related to the advances and achievements made by using economic instruments for biodiversity protection	• By completion of the project, the protected area system and that of economic instruments should allow for an important share of financing required for the activities concerning global-concern biodiversity management and protection • The Institute of Physical Planning includes biodiversity dimension within development master plans • Provincial and local governments are institutionally and legally entitled to have active participation in management and decision making in their territories • The Faculty of Economics of Havana University is capable to move towards full application of environmental economics in the country investment plans. The aforementioned Faculty will participate in the Project
Output 3: Environmental	• More participation of the	• Inspection of the existence and	• There is an ambitious National Program

Education and Awareness	population in biodiversity protection • Relevant trained staff related to biodiversity protection • Decision-making based on minimal knowledge of relevant disciplines • Different products for environmental education and awareness	quality of different information products related to education and awareness concerning biodiversity • Inquiries to different population sectors and economic sectors • Review of guideline- documents at the different teaching levels	of Environmental Education and a Government's decisive political will for its implementation • There is adequate institutional structure for the development of the actions regarding environmental education and awareness in an integrated and decentralized way
Component 4: Mitigation Actions and Infrastructures	• Diminution of the pollution levels in the areas treated • Diminution of salinity levels in the areas treated • Existence of regulations and actions that prevent tourism from affecting biodiversity • Quarries under rehabilitation process • Forest plantations on the banks of selected rivers • Fishery reserve plan to be proposed	• Diminution of P and N concentrations in the water • Diminution of sea salinity • Increase in vegetation biomass and coverage in reforested zones • Inspection of the tourist activity in sensitive zones and its consequences • Existence of a fishery reserve plan for the SCE	• There are Government's policies aimed at solving problems concerning pollution and deterioration of the environmental quality of the sea • There are institutions that can periodically evaluate the evolution of sea pollution and salinity • Support from the Ministry of Agriculture should be obtained concerning reforestation actions • The Fisheries Ministry should be concerned with promoting fishery reserves as an effective tool for fishery improvement

List of activities of each component

Component 1 (*Costs to be assigned to GEF and GoC based on incremental activities/costs)*

- Implement management plans for the eight priority provinces
- Build the administration rooms in the parks and action bases
- Create administration and carry out basic protection, as well as creating or increasing the staff for marine and terrestrial patrolling as convenient
- Creation of the Visitor Center, interpretative trails and posts for bird observation
- Promote settlers' visits to protected areas and provide demonstrative services in protected areas
- Increase professional staff
- Undertake actions to diminish or eliminate exotic species
- Initiate action plan to rescue local endemic species that are endangered or of global concern, and reforestation for conservation purposes as convenient
- Keep the flamingo nursery in Máximo River Fauna Refuge
- Initiate plan for ecosystem and degraded-site reconstruction. Practically eliminate logging, hunting and fishing and start substituting or completely substitute logging actions through alternative reforestation with local population
- Set up signaling systems and buoys for diving and snorkeling as convenient
- Use systems of solar cells for energy, communications, equipment and work means for post for protection and park guards
- Acquire marine and terrestrial transportation for the activities regarding area protection and monitoring
- Equipment and materials for the Visitor Center and trails, as well as protected area administrations
- Periodically develop workshops
- Train the staff of protected areas

Component 2 (*Costs to be assigned to GEF and GoC based on incremental activities/costs)*

- Establishment of the Council for Integrated Coastal Management
- Staff training and technical assistance concerning biodiversity management and integrated management
- Network for databases and Geographic Information System on biodiversity for the SCE management (bases financed by sources other than GEF)
- Minimal equipment for biodiversity management
- Training in methods of inventories and quick ecological assessments and their results
- Inventories of focal groups (indicators) and quick ecological assessments for planning and zoning of responsible development towards biodiversity
- Intensive inventories of flora and fauna in special-concern areas (bases co-financed by sources other than GEF)
- Marine and terrestrial biological reference collections (bases co-financed by sources other than GEF)
- Minimal equipment for inventory of biodiversity and quick ecological assessments for planning
- Formally include criteria on biodiversity within development plans for the area
- Training in environmentally sustainable planning and zoning
- Minimal equipment for zoning and planning
- Establishment of the network for four biological stations for environmental monitoring (infrastructure and staff)
- Implementation of the biodiversity monitoring program
- Training in monitoring and assessments of the status of ecosystems and populations for biodiversity management
- Methodological workshops where results are discussed
- Minimal equipment (scientific and logistic) and materials to support monitoring and assessments of the status of ecosystems and populations of global-concern species
- Basic training in environmental economics
- Specific studies on the design of economic instruments for biodiversity, protected areas and focal politics
- Specific research on economic assessment of natural resources, costs, and environmental benefits
- Design of software for specific actions in the SCE
- Economic management of impacts caused by pollution
- Specialized training in economic assessment of biodiversity given by Cuban and foreign specialists
- Implementation of case studies on application of environmental economics
- Workshops on environmental economics to discuss case studies
- Equipment and materials to support basic and specialized training, and design of software and case studies

Component 3 (*Costs to be assigned to GEF and GoC based on incremental activities/costs)*

- Design and implementation of the Provincial Strategies of Environmental Education
- Workshop to elaborate the Environmental Education Program aimed at the conservation and sustainable use of biodiversity in the SCA
- Design, edition, reproduction and delivery of the program in the territories and economic sectors
- Carry out courses and workshops for experience exchange and training of stakeholders linked to the program implementation (at least two per year)
- Meetings, talks, lectures with officials, entrepreneurs and other decision-makers in the provinces and the capital on biodiversity in the SCE. Development of educational projects, with emphasis on biological diversity, for each of these sectors
- Design, edition and reproduction of bulletins, serials, videos, photos, games, exercise books, posters related to the subject of biological diversity existing in the SCE
- Development of workshops, seminars, as well as meetings between communicators and specialists
- Press conferences of the project with national and international character
- Design, edition and reproduction of dissemination materials related to biodiversity in the SCE for the use of the mass media

- Arousing awareness in decision makers of the different sectors of economy that impact the environment
- Electronic dissemination of project informative materials related to biodiversity (Internet, WEB pages, national networks, etc.)
- Promotion and realization through the Project of events with national and international character in the country in relation to biodiversity conservation and sustainable use in the SCE
- Make didactic materials supporting environmental education
- Increase the environmental education activities that are carried out in teaching centers linked to the project in relation to biodiversity. Train professors and provide support through teaching materials
- Make visits and exchanges to natural and developing areas in the SCA possible for children and young people
- Allow dissemination regarding environmental and sustainable use subjects. Train communicators and introduce the environmental dimension in the mass media
- Increase the introduction of the environmental dimension in schools, colleges, other teaching centers as well as cultural and didactic-recreational institutions
- Make itinerant exhibitions and increase the use of local museums so as to reveal the values of biodiversity of the SCE
- Promote greater participation of provincial and national creators so as to integrate the arts to the problems biological diversity is facing in the Project area
- Promote activities and citizen participation
- Develop environmental campaigns aimed at biodiversity conservation and sustainable use in the SCE
- Workshops with local communities and NGOs related to biodiversity protection in the SCA
- Elaborate and implement small community projects linked to biodiversity protection in the SCA
- Systematic assessment of the people's state of environmental awareness
- Design and application of evaluative instruments for environmental perception regarding the subject of biodiversity in the Project area. Periodic and final assessment

Component 4 *(to be financed in its entirety by GoC and non-GEF sources*)

- Gradual control of pollution due to the sugar industry (Máximo River mouth and Cayo Caguanes), tilapia cultures (Máximo River mouth), and domestic wastes (Cayo Caguanes)
- Control of poaching (Keys, Máximo River mouth and Cayo Caguanes)
- Tourism (Keys and Máximo River mouth)
- Rehabilitation of Los Perros and Jigüey Bays (excessive salinity)
- Riparian reforestation in selected rivers
- Rehabilitation of some quarries in the keys
- First proposal for fishing reserves
- Training in recovery of habitats and populations of global-concern species (bases co-financed by other sources)

Annex III

STAP Review

A- There is no doubt that this project, which follows a first stage where the entire Sabana-Camaguey Ecosystem has been considered, is scientifically and technically correct within the limits of its focus on the establishment of several protected areas in the relatively pristine archipelago and on consolidation of the institutional and educational capacities which are necessary to achieve success in biodiversity conservation.

B- The global environmental benefits which should result from the project are equally clear, since the proper establishment and management of the eight identified protected areas will clearly contribute to conserving a most important ecosystem of the Caribbean, very rich in both terrestrial and marine flora and fauna, with a high level of endemism, in a region where most comparable ecosystems have already been seriously damaged by excessive human impacts, particularly tourism and overfishing. The very size of the archipelago, and the fact that it has so far been relatively protected, offers an almost unique opportunity for large scale conservation measures of global significance (Another important area in the region being the coast of Belize). It is assumed of course that the identified areas to be protected are of sufficient size (data not given in the document).

C- The project fits very clearly within the biodiversity focal area of GEF objectives and strategy in view of its unquestionable global value in a type of ecosystems, namely tropical coastal ecosystems consisting of coral, mangrove and limestone formations, which are among the most diverse, the most endangered and the less protected ecosystems of the world.

D- The full significance of the project for terrestrial and marine coastal biodiversity conservation must be viewed in terms of scientific, economical, ecological and cultural values both for the country as a whole and for the rest of the world. This significance will however only be reached through a long term effort within an appropriate physical planning strategy and not through the mere establishment of several conventional protected areas which might remain isolated and threatened in a context of non-sustainable development, including uncontrolled international and national tourism.

E- Very few coastal area conservation projects in the world have so far been entirely successful, due either to historical reasons, to demographic pressure, to absence of planning and regulations, and more and more so to massive and anarchic tourism development accompanied by construction of heavy infrastructures for road and air transport and ancillary services. It appears that the present project, focused on an archipelago which has not yet suffered much from such pressures, could provide a good example to many other islands in the world, as well as to other coastal regions. For this reason alone, the proposed project should be already viewed in a broad perspective as suggested below.

F- The sustainability of the project, and therefore its true success, will depend primarily on institutional and conceptual factors which should be kept in mind from its inception. From this point of view, the project document, while providing a considerable amount of somewhat redundant administrative and financial details - which may be necessary for GEF - does not

present a sufficiently clear strategy for its proper insertion into a systemic coastal management policy for the region. Yet, it is now broadly recognised that conventional protected areas, particularly on coveted coasts, cannot be truly successful without such a policy, endorsed by all concerned stakeholders, including local population.

The Cuban government appears to be quite conscious of this, since the document refers to the many authorities which will have to be involved in the project for its success. It indicates also its intention to utilise for this region the concept of « biosphere reserve », for which Cuba has demonstrated a good record in spite of its economic difficulties. The Cuban MAB National Committee has a solid experience in this respect in other coastal areas of the country. Contrary however, to what the document seems to state, such a biosphere reserve for the Northern Archipelago would not be « integrated into the system of protected areas », but it is rather these protected areas, as established by the project, which would constitute core areas within the biosphere reserve, in accordance with the very basis of this bioregional concept.

Admittedly, the archipelago is very large - some 300 miles long - but it is perfectly possible to consider and manage it, together with the surrounding shallow waters (and to the extent possible with some appropriate parts of the mainland) as one single biosphere reserve, designed in accordance with the usual zoning, which consists of core areas (strictly protected), buffer zones (with restrictions on certain uses) and transition areas (with tourism, fishing and other compatible development). Other archipelagos in the world have been designated as biosphere reserves (Archipelago Sea in Finland, Boloma-Bijagos archipelago in Guinea-Bissau, West archipelago in Estonia) as well of course as have been many islands, even where considerable tourism development is taking place (Lanzarote and Minorca in Spain, Mer d'Iroise in France, Rügen in Germany, etc). The coastal biosphere reserve of Sian Ka'an in Mexico encounters some of the same problems as those mentioned in the project.

Concerning the size, it could be recalled that the entire island of Palawan, in the Philippines, is a biosphere reserve and that the Mata Atlantica Biosphere Reserve in Brazil is indeed much longer and consists of a number of « land islands » of protected forest linked as far as possible by corridors within a variety of other areas ; this complex region is managed by a Coordinating Council, whose powers are however too limited for this huge, populated and highly degraded ecosystem. In the case of the present project, the accent placed upon the « Council for Integrated Coastal Management for the SCE » is most welcome. As a matter of fact, the success of the project - although it is a rather limited project - will certainly depend on the proper functioning and on the authority given to this Council, including how it links with the National Centre for Protected Areas which will apparently have direct responsibility for the management of the eight parks. The document is not fully clear on this crucial matter but, assuming that a long term sustainable development strategy is to be followed where the eight protected areas of the project would become core areas of an SCA Biosphere Reserve, it is imperative that the Council be constituted from the onset with the proper composition, mandate and powers. Such bodies as the Ministry of Agriculture, the Fisheries Ministry, the Institute of Physical Planning, etc. should clearly have a strong position in the Council, together with CITMA , the provincial authorities concerned, the MAB National Committee and whoever is really in charge of tourism development in the country.

While it must be assumed that the present project, with its protected areas and the Council, could succeed in the short run to maintain the biodiversity of the Archipelago, it appears clearly that the integrity of the ecosystem will, in the long run, depend upon broader and more difficult

measures to be taken on the non protected areas of the Archipelago (massive or destructive tourism, overfishing, aquaculture, quarrying of reefs, etc.) as well as on the mainland (sugar industry, fertilisers and pesticides, watershed management). It is interesting to note that, in parallel with this small scale project, the government is expected to spend some 90 million dollars for these sustainable development measures which are rather artificially separated from other actions required in the project. No indication is given on how and when the government will be able to finance such measures, which may be somewhat overestimated, but the very value of biodiversity in the area forces one to think already of the long term, and to include in the project the physical planning and regional development strategy which can sustain it, namely a systemic (integrated) management strategy for the entire archipelago, for which the biosphere reserve approach appears to be the most suitable.

G- If conceived in the light of what precedes, the Northern Cuba Archipelago project could constitute a breakthrough in the implementation of GEF's strategy for coastal areas, which are undoubtedly those areas presenting the greatest difficulty and challenge for adequate conservation of biodiversity, not only in the Caribbean but world-wide. (The Mediterranean is a clear example of this problem). The subject of integrated coastal management - a prerequisite for biodiversity protection - is discussed in many of national and international seminars and workshops, yet it is rarely applied. The COP of the CBD has recognised it as a priority issue and recommended the use of the biosphere reserve concept as an appropriate tool for implementation. At this point in time the proper development of the Cuban project leading to a well planned biosphere reserve could constitute an excellent example of success in this much debated field over an area of world significance.

K-The current and potential stake holders are not necessarily nationals of the country. If, as can be assumed, the main immediate threats to the archipelago are overfishing and massive tourism (with accompanying infrastructures, nautical sports, shipping, etc.) the decision-making is likely to depend largely from foreign interested groups to which the government of most developing countries has great difficulty to resist. Hence the importance of fixing the rules of the game from the beginning, including appropriate zoning with extensive buffer zones around the protected cores.

L-The capacity building elements of the project (as well as the research and monitoring aspects) appear suitable. In this respect, it is important to stress that awareness-raising is essential not only for the local decision-makers and communities but equally for the foreign tourists whom, if properly informed, could become active supporters of the project. Since Cayo Coco appears to be a central place for tourism, research, administration and conservation, the area management of the Archipelago Ecosystem might advantageously be located there and play its full role in capacity building.

Conclusion Partly as a result of the Country's isolation and partly for other historical reasons, the Sabana-Camaguey Archipelago constitutes the largest relatively pristine coastal area in the Caribbean and presents an immense value for the conservation of tropical biodiversity in coral reefs, mangroves and limestone terrestrial formations. In view of the probable rapid opening of the country to massive tourism and other forms of coastal resources development, there remain a narrow window of opportunity to make sure that this area will be managed in a systemic, integrated way for the benefit and enjoyment of future generations and for the long term conservation of its rich biodiversity. The establishment of a number of well managed conventional protected areas, as foreseen in the project, is a necessary element of such a strategy. Equally

important is the institutional mechanism which will have authority in the country and in the area to develop this strategy, hence the attention which should be given to the adequate setting up of the proposed Council. The application of the concept of biosphere reserve to the entire archipelago (with adjacent waters including the outer reefs), together with the capacity building, research, monitoring and information exchange which form part of this concept, appears to present the best approach for ensuring long term success. The present project should therefore be clearly inserted into such a strategy and, although it could have been formulated to move immediately much further in this direction, it should be approved without delay for earliest possible implementation.