GLOBAL ENVIRONMENT FACILITY

Cuba

Protecting Biodiversity and Establishing Sustainable Development in the Sabana–Camaguey Ecosystem

Project Document

This Project Document has been edited to facilitate public dissemination.
The original is on file in the GEF Office at UNDP Headquarters in New York.

CONTENTS

ABBREVIATIONS AND ACRONYMS

ACC	(Academy of Sciences, Cuba)
CERC	Coastal Ecosystems Research Center
COMARNA	National Commission for Protection of the Environment and Natural Resources
EEZ	Exclusive Economic Zone
GIS	Geographic Information System
IUCN	World Conservation Union (formerly the International Union for the Conservation of Nature and Natural Resources)
SCA	Sabana-Camaguey Archipelago
SCE	Sabana-Camaguey Ecosystem

UNITED NATIONS DEVELOPMENT PROGRAMME

GLOBAL ENVIRONMENT FACILITY

Project of the Government of Cuba

Title:	Protecting Biodiversity and Establishing Sustainable Development in the Sabana-Camaguey Ecosystem
Number:	CUB/92/G31
Duration:	Two years
Project Site:	Sabana-Camaguey Region
UNDP Sector:	Environment
Subsector:	Biodiversity
Implementing Agency:	Academy of Sciences, Cuba
UNDP Approval:	July 1993
Estimated Starting Date:	July 1994
Government Inputs:	Phase 1: US$ 83,058,569 (in kind) Phase 2: US$ 4 million Phase 3: US$ 3 million
UNDP Inputs:	Phase 1: US$ 2 million Phase 2: US$ 4 million Phase 3: US$ 4 million

Brief Description:

This project, representing the first of a three-phase programme, will establish the scientific basis for the integrated, sustainable development and conservation of an environmentally important Cuban terrestrial and marine ecosystem complex. It will catalyze Cuban efforts in ecosystem monitoring and biodiversity research by equipping a recently completed coastal ecosystem research centre. It will strengthen the functional link that currently exists between the sciences and developmental interests. It will also result in a regional strategic plan to provide for the development of tourism and other activities within the context of environmentally sound management for the region's unique biodiversity.

A. CONTEXT

1. Description of subsector

Environment and biodiversity

The Sabana-Camaguey Archipelago (SCA) is located in the north central part of Cuba, lying between Hicacos Peninsula and Nuevitas Bay. Covering five provinces (Matanzas, Villa Clara, Sancti Spiritus, Ciego de Avila and Camaguey), it is the most extensive group of cays[1] in Cuba. The area of the Sabana-Camaguey Ecosystem (SCE) totals 75,000 square kilometres of land and sea, spread over 2,515 islands that represent 60 percent of all the cays in the country (see map on page 38). Cuban ecological surveys indicate that this region contains some of the country's most outstanding coastal and marine areas, in terms of biological and landscape diversity, as well as scientific, historical, archeological and cultural indicators.

In addition to the archipelago, the region of the study also includes the entire mainland watershed adjacent to the coastal waters of Sabana-Camaguey, and the ocean zone extending until the international maritime boundary in the Bahamas Strait. In all, the project area encompasses the entire ecosystem of terrestrial and marine resources that affect the SCA.

The narrow and elongated geography of Cuba dictates that many of the nation's economic activities affect the marine and terrestrial ecology of the insular shelf. In all likelihood, as pressure for national economic development increases, so will the threat to coastal resources, such as those found in the SCE. In fact, in the western part of the archipelago, oil petroleum exploration and development are already occurring, and the development of adjacent mainland areas for industrial and agricultural purposes is planned.

Uninhabited portions of the archipelago offer expansive beaches along the northern coast. The cays also present a wide diversity of marine and terrestrial ecosystems (including coral reefs, seagrass beds, muddy bottoms, mangroves, evergreen microfilous forests, and various shrub and herbaceous communities), and a wealth of flora and fauna, with high levels of endemism. Although there is much fishing activity, reef and estuarine fish are still present. This biophysical wealth, combined with the warm climate, holds promise for the development of several types of tourist facilities.

Although biological inventories in most of the Caribbean countries are incomplete, there is sufficient information on two of the more diverse groups—ants and vascular plants—to allow the preliminary generalization that Cuba has the highest levels of biodiversity in the West Indies. The conclusion is consistent with species-area curves which indicate that larger islands have lower extinction rates and therefore higher species numbers. Cuba also ranks unusually high in comparison with nearby continental countries, especially on an area-by-area basis. Relative to the United States and Canada, Cuba has 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.

---

[1] Low islands or reefs of sand or coral.

These proportions will increase greatly as the remaining 40 percent of the Cuban biota is discovered and catalogued. The figures above indicate that, with respect to biodiversity, an average hectare in Cuba is many times more important than an average hectare on the nearby continent. This in turn implies that biodiversity conservation in Cuba is of particular international and regional importance.

Tourism

Among the Caribbean countries, tourism is least developed in Cuba. Cuba's rate of tourism—3 visitors per 100 residents—is also one of the lowest. Only Haiti, with its rate of 2 visitors per 100 residents, has a lower visitor to resident ratio. On average, the Caribbean currently receives about 32 visitors for every 100 residents. Cuba will need to expand its receptive capacity by a factor of more than 10 in order to reach this average.

According to tourism figures obtained from the Caribbean Tourism Organization (CTO), the number of foreign visitors to Cuba went up from 293,351 in 1987 to 424,041 in 1991. This denotes a compound growth rate of 9.7 percent per annum over the four-year period. The corresponding rate of growth for the entire Caribbean was 9 percent per annum. To put these growth rates into perspective, it must be noted that the number of international tourist arrivals worldwide increased at an average annual rate of 6.2 percent during the three decades between 1960 and 1990, according to figures provided by the World Tourism Organization.

World GDP growth rates predicted for the 1990s suggest that the number of international tourist arrivals will continue to grow at between 3.5 and 5.4 percent per annum, that is, at rates somewhat slower than in the latter part of the 1980s.

The number of hotel rooms in Cuba almost doubled from 7,526 in 1988 to 14,697 in 1991. This represents an average annual increase of about 25 percent per annum in the supply of tourist accommodation. Compared to the average annual increase of 11.1 percent in foreign visitor arrivals during the same period, the figure probably connotes lower room occupancy levels, assuming all other factors remained unchanged. Information on these other factors, which could include changes in the average length of stay, number of tourists per room, and higher domestic patronage of tourist accommodation, is not currently available.

However, like the rest of the Caribbean, Cuba's tourism figures show a pronounced seasonality, with month-to-month variations in the levels of visitation. The high season lasts from December to April, when the temperate regions of North America and Europe are experiencing winter, followed by a low season during May and June and again during September, October and November. There is a slight upturn during the summer months of July and August, probably due to an increase in the number of people visiting Cuba to see friends and relatives (VFR traffic). This period coincides with the summer school vacations. This type of traffic does not usually translate into any significant increase in occupancy in tourist accommodation. However, there does seem an increase in the patronage of tourist accommodation during the summer vacation period from the domestic Cuban market, even though this is at reduced tariffs at the best hotels.

A more recent contribution to the upswing in summer travel to the Caribbean and to Cuba (bringing much needed foreign business for hotels) is provided by long-haul vacationers from Europe, especially from countries of the European Union such as Germany, Spain, Italy and the United Kingdom. Europeans get twice as many vacation days as their North American counterparts and usually stay longer in the Caribbean, often as part of a multi-country, multi-destination itinerary. European travelers are increasingly shunning the overcrowded and overdeveloped beach resorts of southern Spain and France. Increased traveler comfort and more affordable fares provided by the new generation of wide-bodied aircraft is also making long-haul air travel to exotic destinations more feasible.

The seasonality in tourism is endemic to the entire Caribbean basin. Cuba should aim to reduce its reliance on offering strictly a winter destination product. Cuba's relatively late start in developing its tourism industry could offer the advantage of learning from the mistakes of others.

2. Host country strategy

Environment and biodiversity

The Sabana-Camaguey has been designated a high priority area for the conservation of its biodiversity and productivity by the Academy of Sciences of Cuba (ACC) and the National Commission for Protection of the Environment and Natural Resources (COMARNA). The region is found to be of ecological importance at the national, regional and global levels. This priority is justified by the unique character of the prevailing ecosystems, the affinity with the West Indian vegetation, the fauna, and the relatively high degree of endemic species. Nearly every offshore cay that has been surveyed has yielded one or more species endemic to a single cay, resulting in thousands of narrow endemics within the study area.

The region is a critical winter habitat for hundreds of migratory species. It also harbors certain threatened species listed under international conventions and treaties for species protection such as the Convention on International Trade in Endangered Species (CITES) and SPAW. These species include sea turtles, crocodiles, a stable population of manatees, black coral, and numerous species of birds, amphibians, reptiles, invertebrates and vascular plants. Although Cuban institutions are involved in biodiversity survey work, they are severely constrained by a lack of funds.

Tourism

The Government of Cuba has identified tourism as a priority sector for economic development. However, no precise information is available about the future development of the tourist sector in Cuba, or about the country's strategy, or the resources allocated to tourism in current economic plans. But government representatives have made it clear that the visitor service industry is slated for extremely high growth during the current five-year plan. The Sabana-Camaguey region will be a major focal point of tourism development, given its endowment of natural attractions. Several hundred rooms have already been built and current plans dictate the construction of several thousand hotel rooms, many of which are intended for the cays. A strategic tourism plan is needed to ensure the protection of biodiversity and the promotion of an innovative tourism programme (see Box 1).

Box 1: Ecotourism

The current focus on ecotourism—also called nature or adventure tourism—is the result of a convergence of several complementary movements. On the demand side, the increased interest in the environment—on enjoying and preserving it—is coupled with an enhanced awareness of the health and cultural benefits to be obtained from a more active vacation. A recent Gallup Poll found, for instance, that 75 percent of those interviewed considered themselves environmentalists. According to operators who specialize in this business, the market for ecotourism is growing to about 25 to 35 percent a year, at least in the Caribbean and Latin America.

On the supply side, the scientific community and conservationists have accepted the need to invite responsible numbers of people in a well managed way to enjoy the floristic and faunistic resources—whether they be rainforests in the tropics, national parks and reserves, or the terrestrial and aquatic life of an offshore cay—to provide badly needed revenues for local and regional economies.

The convergence of these two factors is opening up a large, and as yet largely untapped, industry, especially in the Third World and the Caribbean. Environmental concerns here carried little weight before simply because they were not part of the development equation. These attitudes are changing, as exemplified by the statement of a game warden in East Africa, "Wildlife pays, so wildlife stays."

However, any future developments in ecotourism will have to follow an entirely new set of rules than those that have guided, or misguided, tourism planning in the past. No longer will these areas depend on the mass movement of tourists, requiring the massive development of infrastructure and superstructure in virgin areas, usually called "greenfield development." On many occasions, such an approach has proved counterproductive by damaging the very resource base on which the industry was founded, and by being insensitive to local culture, both past and present. In addition, this type of development had minimal economic impact on the local economy because foreign exchange earnings from tourism "leaked" out almost immediately to pay for imported goods for the consumption of tourists.

(continued)

Box 1: Ecotourism (continued)
Investment opportunities submitted by international investors in ecotourism must be screened carefully to avoid repeating such mistakes. But a more proactive approach would be needed to generate a sufficient number of projects for the Sabana-Camaguey project area. Such an approach would require the following:

- Preparation of an inventory of significant natural resources in SCA which could sustain a certain level of nature-based tourism
- Determination of the carrying capacity of individual resources in terms of "sustainable development" and the imposition of a maximum visitation ceiling at full-scale operation
- Identification of the local constituency to be served by the project and the regulatory requirements to properly manage this type of tourism
- Structuring of the investment in a manner most responsive to local needs and management capability.

The Steering Committee of this project may therefore need to be innovative in its dealings with not only individual entrepreneurs, but also with such entities as regional governments and village cooperatives.

By definition, access to relatively remote areas will be involved and special attention may therefore be needed for investment in *transport modes* and their linkages with global carriers. Special skills, knowledge of resources, and appropriate marketing networks must be developed by tour companies and *travel intermediaries* to distribute the product—all of which may need substantial initial investment. The construction of appropriate *accommodation facilities* and other tourist amenities will also enter into the investment decision, bearing in mind their location in relation to the primary resources (such as rainforests, game reserves, coral reefs, and archeological, cultural and historical sites) and their scale, style, and degree of permanence (for example, tent sites rather than a steel and concrete hotel structure may be more appropriate in some instances).

In all cases, the issues of project size, the pioneering spirit of the enterprise, the track record of local organizations, and the potential emergence of a true scientific/commercial partnership are essential components of successful ecotourism projects.

3. Prior and ongoing assistance

The Country Programme of the United Nations Development Programme (UNDP) in Cuba (1992-1996) includes twelve projects. These projects have been designed taking into consideration the development strategies of the government, such as:

- Food production for internal consumption
- Increase in industrial production
- Increase in traditional and non-traditional exports through the development of new products in biotechnology and the pharmaceutical industry.

UNDP assistance complements these areas of priority. Eleven of the twelve projects included in the programme are being executed by the government. This is due to the high quality of human resources available in the country, as well as the national experience in project execution gained over the past years. There is a strong emphasis on production in the Country Programme. The UNDP projects include the following:

(i) Antibiotics Pilot Plant (Fermenters)
(US$ 1 million—Ministry of Public Health);

(ii) Polycristalline Silicon Production
(US$ 800,000—Ministry of Higher Education);

(iii) Pilot Plant for Minerals
(US$ 900,000—Ministry for Heavy Industry);

(iv) Nickel from Laterites: Acid Lixiviation at High Pressure
(US$ 900,000—Ministry for Heavy Industry);

(v) Intensive Cultivation of Shrimps (II)
(US$ 850,000—Ministry of Fisheries);

(vi) Transfer of Embryos for Cattle (II)
(US$ 500,000—Ministry of Agriculture);

(vii) Industrial Enzymes Production (Biotechnology)
(US$ 800,000—Ministry of Public Health);

(viii) High Quality Paper from Sugar Cane
(US$ 550,000—Ministry of Sugar Industry);

(ix) Pilot Plant for Pharmaceutical Products
(US$ 1 million—Ministry of Public Health);

(x) Production of Monoclonal Antibodies (US$ 800,000—MINSAP);

(xi) Use of Wastes to Feed Pigs (US$ 1 million—Ministry of Agriculture); and

(xii) Weed Killers and Fertilizers for Sugar Cane (US$ 200,000—Ministry of Sugar Industry).

4. Institutional framework for subsector

Environment and biodiversity

In 1975 the new constitution for Cuba recognized the necessity of protecting the environment, and in 1977 the National Commission for Protection of the Environment and Natural Resources (COMARNA) was established. All central institutions of the government are members of this commission. The President of the Academy of Sciences of Cuba (ACC) is also President of COMARNA. Within COMARNA, technical specialists coordinate and integrate the work of the various sectors in an environmentally responsible manner.

All provinces and municipalities are represented on the ACC and COMARNA, usually by members of local government bodies or by local offices of the national organizations responsible for the rational use of natural resources, environmental management, environmental education and impact assessment of different programs.

COMARNA is also the national focal point dealing with several international scientific and conservation programmes. It works with all the UN institutions and with the World Conservation Union (IUCN). COMARNA is currently involved with the Caribbean Environment Programme of the United Nations Environment Programme (UNEP). In cooperation with the ACC, the Economic Commission, the Commission on Foreign Affairs, and many other Cuban institutions, COMARNA prepared a contribution for the United Nations Conference on Environment and Development (UNCED) in 1992.

Other international organizations and initiatives in which the ACC and COMARNA are involved include: the Intergovernmental Oceanographic Commission (IOC), the Caribbean Environmental Protection Forum on Pollution (CEPOL) and CARIPOL, the International Maritime Organization (IMO), the Maritime Shipping and Protection of Sensitive Sea Areas Programme, and the Caribbean Debris Project that is jointly sponsored by IOC, IMO and UNEP.

The ACC has four main groups: the Institute of Oceanology, the Institute of Ecology and Systematics, the Institute of Geography, and the Institute of Meteorology. These have been working together for three years using an interdisciplinary, integrated approach on various initiatives, notably in the area of this project.

The ACC has created and built the Coastal Ecosystems Research Center (CERC) on Cayo Coco in the SCA. CERC serves as the focus for collecting and managing scientific and environmental information.

Cuba has the human resources required to carry out the proposed research and management programme of this project, and to expand upon it. Historically, Cuban biologists have been among Latin America's leading scientists in the study of biodiversity. The institutions and scholarly traditions founded by them place Cuba in a position that is fundamentally different from that of most Caribbean countries. Cuba has herbaria, botanical gardens, natural history museums, and scientific libraries that were initiated more than 150 years ago. The community of scientists now working in the field of biodiversity includes internationally known specialists in sponges, corals, molluscs, crustaceans, arachnids, myriapods, fishes, amphibians, reptiles, birds, and many groups of plants.

This Global Environment Facility (GEF) project differs from others in the Caribbean region which usually incorporate a large element of technical assistance. This is because the country already has several biodiversity specialists whose activities are fully supported by the government. There is little need for technical assistance in the project, other than the usual need for collaboration with outside peers, specialized consultants, and collection/study visits abroad.

Museums in Cuba have traditionally played an integrated role in public life, with several of them well placed to play a major role in public education on biodiversity and conservation issues. Many museums house important collections that have been on public display for many years.

Tourism development

Cuba has a well developed process for making decisions about land use and physical planning, and for incorporating environmental issues into development projects at the policy level. The Institute of Physical Planning is the lead agency for physical planning and land-use regulation, working closely with COMARNA in the environmental review process.

Tourism planning falls under the general responsibility of the Vice President of the Executive Committee of the Council of Ministers. The National Tourism Institute prepares national and regional tourism plans, which are developed in collaboration with the Institute of Physical Planning, the Central Planning Group, and the Joint Venture Tourism Companies. Relevant government agencies including COMARNA and ACC are consulted in the planning process.

The review process for specific tourism investment proposals places the Institute for Physical Planning in the main coordinating role, working with COMARNA, and with national, regional, and local government agencies.

B. PROJECT JUSTIFICATION

1. Problem to be addressed and the present situation

Cuba recognizes the biological value of the SCE, and has made a commitment to preserve the unique biological heritage of this region. At the same time, however, the government has identified the region as a prime location for economic development, principally in the form of tourism. The problems that arise are threefold:

- Cuba's capacity to carry out the requisite scientific surveys to support environmental management, biodiversity conservation, and economic development is severely constrained by a lack of equipment.

- Present plans for tourism in the SCA promise stereotypical development that may threaten important biological resources, without even meeting the evolving market for tourism in the Caribbean. For example, the present Cayo Coco masterplan has been conceived using models that could endanger the environment. On the other hand, the characteristics of the cay could suggest its exploitation for a market different from mass tourism purposes.

- In theory, environmental issues are integrated into Cuban development planning. In practice, however, there is no effective means of incorporating scientific information and environmental concerns into the development planning cycle for the SCA.

Biodiversity protection

The following factors currently hinder the protection of Cuba's biodiversity:

- Biodiversity inventories are not well developed

- Distributional data are not yet available for the majority of species, especially for marine fauna

- Existing programmes emphasize charismatic species

- The majority of endemics are not yet subject to study or management

- Conservation of migratory species is not yet fully integrated into international management programmes

- The existing information base is inadequate to delimit environmentally sensitive areas.

By Neotropical standards, the Cuban biota is well studied. Nonetheless, Cuban scientists involved in biological surveys estimate that 40 percent of the island's species of macrofauna remain to be discovered for the first time, based on the rate of encounter of new species during recent inventories. Caves and offshore cays, both of which are prominent features of the Sabana-Camaguey region, are among the habitats that continue to yield previously unknown species at the highest rate. For example, half of Cuba's known species of land mammals were discovered during recent explorations of offshore cays. Exploration of Cayo Coco, site of the new coastal research station, resulted in the discovery of four new vertebrate taxa, all of them endemic to the cay.

Given that the basic elements of biodiversity remain poorly known, it is difficult to assure their protection or sustainable management. The development of a more comprehensive biodiversity information base will be a long-term endeavor (on the order of five to ten years). In the meantime, economic constraints dictate that development must proceed on the basis of the best available

information. The presence of a high proportion of known species must therefore be treated, in itself, as an important consideration in the planning of projects that are likely to result in any significant environmental impacts. In the short term, the apparent conflict can best be resolved by dedicated inventories associated with each development venture and by rapid ecological inventories of important habitats based on preliminary data.

Initial data indicates that the offshore cays of Cuba, 60 percent of which are located in the project area, are among the most important tracts for the preservation of Cuban terrestrial biodiversity. Recent inventories have resulted in the discovery of 46 vertebrate taxa and hundreds of invertebrates that are endemic to isolated islands or cays along the Cuban coast. The reason that so many species are restricted to the cays may be that these islands represent the last remnants of several habitat types that have been eliminated on the main island. Agricultural development and the consequent loss of natural habitat began very early in Cuba—more than 400 years ago in many regions. Because of Cuba's extensive low-lying terrain, much of the country was suitable for sugar production and therefore converted to monoculture for sugar cane. Habitat modification has therefore been both extensive and of long duration (the new atlas of Cuba indicates that the category "highly modified landscape" has grown). As a result, many plant formations and habitat types have been eliminated on the main island.

By contrast, most offshore cays in the Sabana-Camaguey have remained virtually uninhabited until recently, so that they retain extensive pristine habitat. They harbor unique elements of the Cuban natural heritage that cannot be found elsewhere. The small size of many of the habitat remnants is itself a concern for conservationists. On the basis of the limited knowledge currently available, the cays should be regarded as a priority area for biodiversity protection. Adequate management of offshore cays can be expected to result in protection of the largest number of species that could otherwise face extinction in the near future. For biodiversity protection on a longer term, it will be necessary to develop a comprehensive biological inventory and database network.

Tourism

Current plans for tourism in the study area could have the following problems:

- They may not reflect changing trends in the tourism market in the Caribbean region
- They may not address the problem of seasonality
- They may not capitalize on the natural resources of the target area, for example, by encouraging ecotourism development strategies
- They may inadvertently damage the ecosystem and biodiversity because the existing scientific information has not been incorporated into tourism development plans
- They may not be cost-effective due to all the above factors.

The seasonality problem in the Caribbean is becoming even more pronounced due to certain fundamental changes in the nature of market demand for the Caribbean tourism product. Recent medical warnings regarding exposure to the sun in tropical areas like the Caribbean have moderated the demand for beach-oriented tourism. While North Americans and Europeans still go to beachside resorts, and winter temperature differences between the Caribbean and the frigid north are very welcome, they are spending less and less time on the beach itself and are increasingly looking for more varied pastimes. This applies to activities during daylight hours as well as to evening and night-time activities.

The traditional pattern of resort development in the Caribbean severely constrains the ability of hotels and resorts to cater to these non-beach-oriented activities. Traditionally, developers and hotel companies involved with the typical resort hotel in the Caribbean have sought their own stretch of beach, the more secluded the better, to locate their resort. This has resulted in a pattern of linear development such as that in Cancun in Mexico, with hotels situated at regular intervals along a stretch of coastline. The proliferation of hotels on every available natural beach area and the destruction of mangroves, coral reefs, and other marine habitats to create beaches where nature did not provide them, is a matter of some concern to environmentalists, scientists, and local fishermen alike.

In many instances, buildings located too close to the water have contributed to beach erosion and also suffered from a weakening of their own structures. Examples of such construction have been investigated by the Institute of Oceanology of the ACC in areas such as Varadero. Evidence of this approach can also be seen in the current development of Cayo Coco.

Another issue of concern in the development of resorts for the SCA is the typical drive to achieve total segregation and complete self-sufficiency for each hotel complex. Typically, a series of hotels are built along the same beach without allowing for the possibility of any interaction between them to provide guests with access to a wider variety of facilities and amenities. This approach often requires each resort to build a series of recreational and commercial facilities on its premises. In fact, income from these ancillary facilities does not generally generate sufficient revenue to cover capital and operating costs, even when the hotel is filled to capacity during the high season. In the low season, when tourists on a budget and other lower-paying groups are catered to, the operating costs of these facilities invariably exceed the income derived from them by a huge margin. The lesson from this approach to developing tourist facilities is to pay greater attention to changes in the pattern of demand from the principal tourist generating areas and to provide facilities that will promote year-round visitation. Present plans for Cayo Coco do not fully reflect this new approach to resort planning and design.

Environmental planning

Cuba faces the following constraints in the area of environmental planning:

- Zoning and detailed physical plans in the SCE do not adequately incorporate environmental factors and biodiversity concerns
- Implementation and enforcement of approved physical plans is poor

- Technical linkages and information flows between science and natural resource agencies to planning and development agencies are inadequate.

The country has a well developed process for making decisions about land use and physical planning, and for incorporating environmental issues into development projects at the policy level. The Institute of Physical Planning and COMARNA work together in the environmental review process. However, in the SCA, actual development has not lived up to the promise of the planning process. Zoning does not adequately reflect environmental sensitivity, and construction does not adequately respond to site constraints and opportunities.

Detailed physical plans have been drawn up for Cayo Coco, the largest offshore island in the area. Similar plans are being drafted for nearby cays such as Cayo Gulliermo, Cayo Cruz, Cayo Esquierl and Cayo Sabinal, among others. Plans for other offshore cays in the study area are not yet as well developed, but are based on the traditional approach to beach tourism—parceling every suitable stretch of coastal area into discrete hotel sites. Present plans also call for a series of elevated roadways to be built either on earth berms or bridges built on piles to connect these cays to the mainland and to each other to enable unimpeded vehicular access to all these offshore islands. These structures will have significant direct impacts on marine and terrestrial ecosystems; they may also have serious negative long-term implications for the maintenance of biological diversity in the SCA.

2. Expected end-of-project situation

The proposed assistance of US$ 2 million is conceived as the first phase of a three-part continuous assistance programme totalling US$ 10 million. At the end of the first phase (two years), the following will have been achieved:

Institutional strengthening

(i) The ACC will have organized and convened a special Steering Committee consisting of at least the following agencies: ACC, COMARNA, National Tourism Institute, Institute for Physical Planning, Central Planning Group, and the Ministry of Construction (see page 18 for a complete list);

(ii) ACC will have a project management unit in place to deal with accounting, procurement, disbursements, scheduling and coordination;

(iii) CERC/ACC will have received and installed equipment and set up laboratories to carry out physical, biogeographic and ecological surveys of the SCA;

(iv) Information management systems (such as a Geographic Information System (GIS) and DBMS) will be in place to manage data resulting from equipment and laboratory survey outputs;

(v) ACC will have established communications and technical cooperation linkages with counterpart institutions internationally;

(vi) National and regional planning staff and scientists will have received additional training in contemporary environmental planning methods;

(vii) Local construction and public works officials will have been briefed on the new strategic plan and development regulations and guidelines; and

(viii) Local ACC and National Tourism Institute staff will have received briefing/training on the preliminary results of physical and biogeographic surveys sufficient to serve as interpreters or guides for tourists.

Environment and biodiversity conservation

(i) ACC will have completed preliminary physical and biological surveys of marine and terrestrial ecosystems of the SCA;

(ii) ACC will have established biological reference collections at CERC in Cayo Coco and in appropriate regional and national institutions;

(iii) ACC will have established a biodiversity database for the SCA;

(iv) Database installations will have been connected to biodiversity networks nationally and internationally;

(v) Existing information on Cuban biodiversity will have been recovered from foreign databases, literature sources, and reference collections;

(vi) Existing maps and biophysical data will have been consolidated in a GIS;

(vii) The Steering Committee will have established a coordinated programme of continuous environmental monitoring;

(viii) ACC will have established a comprehensive classification of known Cuban coastal species according to their conservation status (for example, threatened, endangered, restricted distribution, and so on);

(ix) The Steering Committee will have completed a preliminary assessment of ecologically sensitive areas. Additional sections of the coastal zone will have been identified for inclusion in the protected areas system;

(x) Management plans will be in place for existing and proposed protected areas; and

(xi) Species recovery plans or management plans will have been developed for species identified to be of special concern.

Environmental planning

(i) The Steering Committee will have prepared a specific development strategy for the SCA, based on ecological dictates, a review of contemporary tourism market data, and an analysis of new tourism concepts;

(ii) The Steering Committee will have created a GIS database on the SCA that is specifically designed for assisting in working decisions on protecting environmentally sensitive areas and developing the region in an environmentally sound manner;

(iii) Environmentally sound strategies and guidelines for the SCA will have been adopted; and

(iv) Known environmentally sensitive areas (ESAs) will have been designated as protected areas, or special management areas, to be incorporated into the Cuban system of protected areas.

Public information

(i) Public information programmes and materials will have been generated and disseminated to Cubans, explaining the significance of SCA;

(ii) Exhibits on biodiversity will have been created and installed in museums and interpretive facilities; and

(iii) Natural history tours of the SCA will have been organized.

3. Target beneficiaries

Direct beneficiaries

The staff of ACC will have improved their ability to carry out scientific research through the acquisition and use of proper equipment. This will include improved compilation, analysis, and communication of relevant environmental scientific information. Developmental decision-making will be improved through the use of innovative strategic planning techniques, including the application of GIS technology.

Staff of the National Tourism Institute and the Institute of Physical Planning will improve their ability to carry out tourism marketing studies and develop regional tourism plans based on relevant scientific information. Staff of the Institute of Physical Planning, the National Tourism Institute, the Ministry for Industrial Fisheries, and other national and provincial agencies will improve their ability to implement integrated environmental management and development strategies.

Indirect beneficiaries

People of SCA employed in sectors such as tourism and fisheries should benefit from the enhanced and sustainable economic activities in these sectors created by an extended season. The general population of the SCE should ultimately benefit from the increased and sustainable economic activity in the region.

The strategic planning process and the approaches used to achieve sustainable economic development for the SCA will be applied to other regions in Cuba, thereby enhancing both conservation and development efforts throughout the country. Nations of the Caribbean region should benefit from the lessons learned and information shared regarding strategic environmental and tourism planning, environmental management, biodiversity protection strategies, and tourism development.

International agencies involved with biodiversity conservation, climate, and international waters should benefit from a greater knowledge base and more accurate, better organized, and more accessible environmental information on the region.

4. Project strategy and institutional arrangements

The Cuban government has charged the ACC with responsibility for the management of the marine and terrestrial environment of the SCE. New integrated planning initiatives for the area will be developed within the project. These initiatives will be entrusted to the Steering Committee and should be conducted as a formal exercise in strategic planning based on scientific information and the country's societal objectives. The strategic plans will focus on: the development of a series of tourism products, such as ecotourism, that can be marketed internationally; the protection of the region's biodiversity; and guidelines and strategies for sustainable development of the SCE.

The ACC has established the CERC to act as a focal point for scientific research and ecosystem management activities in the project region. CERC is located at Cayo Coco in the middle of the SCA. This modern facility was completed in 1991 and is staffed by ACC scientists. The CERC will be the centre for the interdisciplinary study of ecology in the SCA. Scientific data will be used to address environmental planning and management, and the practical application of science to address major development issues in the SCA. Equipping the CERC with proper scientific, logistical, and communication facilities will substantially improve the site as an operational scientific base for the project.

Recommendations resulting from the project will influence the economic development of the region, particularly in the sector of tourism, but also in the areas of industry and petroleum. The adoption of regulations for protection of the marine and terrestrial environment resulting from the project should guarantee a clean and healthy environment for present and future generations, as well as opportunities for environmentally sound development.

5. Reasons for assistance from UNDP

The Cuban government will require sizeable resources for the conservation of biodiversity and the sustainable development of the SCE. While it has allocated scientific and management staff for the project, it faces serious limitations in convertible currency for the acquisition of essential

equipment and training. It will therefore require the assistance of the GEF. The benefits of such assistance will be felt throughout Cuba as the strategic planning process is applied to the SCE.

This GEF project involves many innovative aspects of natural resources planning and sustainable economic development. The project will incorporate an integrated, multidisciplinary, interagency approach facilitating the use of scientific information and analysis to support sustainable economic development decisions and policy-making. The project involves the integration of the following programme elements that will be developed for the SCE and then applied to the rest of Cuba as appropriate:

- Strategic regional planning methods and procedures
- Watershed management planning techniques
- Protection of biodiversity
- Integrated marine protected area planning
- Coastal zone planning and management
- GIS technology for database development, environmental analysis, and preparation of environmental planning guidelines for economic development
- Innovative strategic tourism planning techniques
- Assessment of ecotourism development opportunities
- New concepts for beach resort tourism involving the "village concept"
- Ocean planning and management for the Exclusive Economic Zone (EEZ)
- Oil-spill response planning and management
- Climate change and international waters
- Integration of biodiversity protection and sustainable economic development
- Ecological planning techniques
- International standards for biodiversity cataloguing and the linking of Cuban biodiversity databases with regional databases.

6. Special considerations

The project focuses on the protection of the notably high levels of biodiversity found in Cuba within the context of expanding tourism development. Tourism will be developed in a manner that

is sensitive to the natural resource base of the region to provide substantial economic benefits and biodiversity protection advantages. The strategic planning processes established during this project could become a model for establishing sustainable development throughout Cuba and the Caribbean.

7. Coordination arrangements

The ACC will direct research activities at the national level and be responsible for the coordination of research centres and entities of the national economy (such as private enterprises, ministries and universities). Often the results of the ACC research will be applied to the practical implementation of projects according to the needs and functions of all the entities involved.

The activities of the GEF project will be executed by a group of institutions under the direction of the ACC, coordinated by a Cuban Steering Committee for the project. Collaborating institutions include:

- Institute of Oceanology, ACC
- Institute of Ecology and Systematics, ACC
- Institute of Meteorology, ACC
- Institute of Geography, ACC
- Cuban Institute of Hydrography (ICH)
- Institute of Forest Research (IIF)
- Institute of Tropical Medicine "Pedro Kouri" (IPK)
- Centre for Fisheries Research (CIP)
- National Institute of Tourism (INTUR)
- Cuban Institute of Geodesy and Cartography (ICGC)
- National Commission for Protection of the Environment and Natural Resources (COMARNA)
- Institute of Physical Planning (IPP)
- Centre of Marine Research of the University of Havana
- Ministry of Agriculture (MINAG)
- Anthropology Centre, ACC.

Other Cuban institutions will participate in the project as required. The project also involves provincial government agencies for Matanzas, Villa Clara, Sancti Spiritus, Ciego de Avila and Camaguey.

8. Counterpart support capacity

The level of training and the technical proficiency of staff in relevant national agencies is generally high. Cuban scientists are well trained and familiar with the latest theories and methodologies in their respective disciplines. Given the necessary technical support, they could conduct research programmes that would undoubtedly meet the standards of their international peers. However, there would be a need for consultation in certain specialized areas.

The CERC installation at Cayo Coco is an excellent facility which, when properly equipped, will facilitate the professional activities of any scientific research institution in the country related to ecosystem research and environmental management.

Although Cuban physical planners possess professional planning qualifications, they are not fully conversant with contemporary approaches in strategic environmental planning, ecological planning, and landscape architecture. They require further training to develop strategic plans for the SCA region that will ensure protection of the region's significant natural resources while allowing environmentally sound development.

Cuban tourism development planners and marketing specialists require exposure to contemporary methods of strategic tourism planning and tourism market analysis, as well as to emerging trends in tourism products in the Caribbean region and around the world.

C. DEVELOPMENT OBJECTIVE

This project will further GEF objectives in the areas of biological diversity and international waters by strengthening scientific research, strategic planning, and sustainable development activities. Environmental planning strategies and management will ensure the integration of all project activities and outputs. The project involves the integration of biodiversity conservation, EEZ planning and management, watershed planning and management, small island planning and management, tourism and ecotourism, and innovative approaches to resort development. Scientific information will be compiled, organized, and analyzed through a comprehensive strategic planning process to achieve sustainable development of the Sabana-Camaguey region.

D. IMMEDIATE OBJECTIVES, OUTPUTS AND ACTIVITIES

IMMEDIATE OBJECTIVE 1

To strengthen the technical capabilities of the ACC and other agencies to survey and assess coastal and marine ecosystems in support of biodiversity conservation and sustainable development.

Output 1.1

A fully equipped laboratory at Cayo Coco.

Activities for Output 1.1

1.1.1 Procurement of necessary equipment.

1.1.2 Installation and testing of equipment.

Output 1.2

Staff trained in the use of field and laboratory equipment.

Activities for Output 1.2

1.2.1 In-country training for experts in the use of equipment.

1.2.2 Training of additional Cuban staff by Cuban technical cadres.

IMMEDIATE OBJECTIVE 2

To strengthen the scientific and environmental planning and management capabilities of Cuban agencies at the national, regional and local levels.

Output 2.1

Staff trained in current environmental planning techniques at the national, regional and local levels.

Activities for Output 2.1

2.1.1 Graduate study for professionals in environmental planning/landscape architecture.

2.1.2 Fellowships for scientific staff to study specialized topics abroad for a limited duration.

2.1.3 Short in-country courses on environmental planning for national/regional level planners.

2.1.4 In-country training for local officials in on-site environmental management, site planning and design, and enforcement of zoning and building regulations.

Output 2.2

Operational GIS for the Sabana-Camaguey Archipelago.

Activities for Output 2.2

2.2.1 Technical needs assessment for hardware and software.

2.2.2 Procurement of GIS hardware and software.

2.2.3 In-country training for supervisory and technical staff in GIS.

2.2.4 Input and processing by GIS of spatial data compiled by others.

2.2.5 Creation of maps of biophysical resources of the SCA for planning purposes. Preparation of spatial environmental analyses using GIS to define environmentally sensitive areas, development zones, and a strategic plan for the SCE.

IMMEDIATE OBJECTIVE 3

To develop a basic knowledge of the flora and fauna, habitat distribution, and the physical/chemical characteristics of the marine and terrestrial ecosystems adequate for planning, management, conservation, and sustainable development. This will serve as a baseline for permanent

monitoring. This information will be compiled and organized using the project GIS mentioned above for preparing the strategic plans.

Output 3.1

Preliminary physical survey and mapping of coastal waters of the SCA.

Activities for Output 3.1

3.1.1 Documentation of basic physical oceanographic characteristics such as temperature, salinity, currents, waves and tides.

3.1.2 Determination of basic chemical oceanographic characteristics such as nutrients, pH, oxygen, hydrocarbon contamination and pollution.

3.1.3 Characterization of the geology, sediments, and geomorphology of the area.

3.1.4 Coastal classification and mapping according to coastal type and state of conservation (for example, rocky, sandy, mangrove, eroded and non-eroded) and the identification of problems.

3.1.5 Preliminary reporting of pertinent data.

Output 3.2

Preliminary coastal marine biological survey and mapping.

Activities for Output 3.2

3.2.1 Inventory of coastal and marine biotopes.

3.2.2 Inventory of benthic marine macroflora.

3.2.3 Inventory of pelagic and benthic marine macrofauna.

3.2.4 Establishment of a regional benchmark for the long-term monitoring of coral reef vitality.

3.2.5 Establishment of the regional benchmark for the long-term monitoring of seagrass bed productivity.

3.2.6 Preliminary reporting of pertinent data.

Output 3.3

Preliminary terrestrial survey and mapping of archipelago.

Activities for Output 3.3

3.3.1 Inventory of biotopes with emphasis on endemism.

3.3.2 Inventory of flora with emphasis on endemism.

3.3.3 Inventory of fauna with emphasis on endemism.

3.3.4 Determination of migratory routes of birds.

3.3.5 Inventory of pests, disease vectors and useful organisms.

3.3.6 Preliminary soil studies.

3.3.7 Establishment of a regional benchmark for the long-term monitoring of mangrove productivity.

3.3.8 Preliminary reporting of pertinent data.

Output 3.4

Survey and mapping of historic and current human activities in the SCE, including the watershed, archipelago and ocean zone.

Activities for Output 3.4

3.4.1 Archaeological inventory of SCE.

3.4.2 Study of current use of SCE.

3.4.3 Preliminary reporting of pertinent data.

IMMEDIATE OBJECTIVE 4

To develop a strategic plan for the SCE that fully integrates tourism and other economic development activities with biodiversity protection to achieve sustainable development.

Output 4.1

A biodiversity protection strategy to integrate species protection plans, habitat preservation, and management of environmentally sensitive areas (see Box 2 on page 24).

Activities for Output 4.1

4.1.1 Establishment of a system for classifying marine and coastal species according to their conservation status (for example, threatened, endangered, rare, and so on).

4.1.2 Regular review of information from surveys and monitoring activity relevant to species and habitats that warrant special management consideration.

4.1.3 Development of species recovery plans as necessary.

4.1.4 Identification of habitat critical to survival of rare and endangered species, on a species-by-species basis.

4.1.5 Identification of the effects of extractive industries (such as fisheries) on species in decline or of special concern.

4.1.6 Participation in regional planning and the management of migratory species, in collaboration with participants in Specially Protected of Areas and Wildlife Convention (SPAW) and other international conservation conventions to which Cuba is a signatory.

4.1.7 From the above, identification and mapping of areas of high biodiversity, environmental sensitivity, high endemism, and so on.

4.1.8 Development of criteria for the selection of environmentally sensitive areas (ESAs) for the purpose of establishing an integrated system of terrestrial, coastal, and marine protected areas.

4.1.9 Based on the above criteria, selection of the areas most important for biodiversity protection.

4.1.10 Based on the areas selected in Activity 4.1.9, development of a biodiversity protection strategy and action plan.

4.1.11 Development of detailed management plans for the identified terrestrial, coastal, and marine protected areas.

4.1.12 Integration of the findings of these activities into ongoing tourism processes and regional SCE strategic planning activities.

Box 2: Strategic Planning for Tourism Development

While the following discussion focuses on the strategic planning process for developing tourism, exactly the same methodology, approach, and procedures will be undertaken to prepare an overall strategic plan for the SCE. The overall plan will integrate biodiversity protection strategies and economic development activities (including tourism, agriculture, forestry, fisheries, urbanization, and so on) within an environmentally sustainable framework.

The context

Experience with tourism development in the Caribbean shows that success depends to a large degree on an effective public/private partnership. The paucity of locally available investment capital, the high cost of development, the need to import certain essentials (such as building materials, equipment and furnishings), and the technical knowledge and access to resources of the markets in Europe and the Americas, have all made it necessary to invite foreign private investment to participate in the development of the industry.

This public/private partnership is, however, not generally based on an equal bargaining position. While foreign private enterprise is fully aware of its self-interest when it invests in tourism, the same cannot be said for the public sector. In most cases, government officials have to respond on an ad hoc basis to requests for specific sites from foreign investors, or when dealing with individual requirements for special assistance through financial and fiscal concessions. This is usually done without the benefit of an overall strategy based on consensus in the host country to address issues of long-term national interest.

Private enterprise is in general unaware of issues pertaining to the long-term national interest in preserving the environment and maintaining ecological biodiversity. Many projects promoted by the private sector have in fact destroyed the very tourism endowments on which they were based. The aim of strategic planning in the tourism sector for this project is therefore to institute a framework for joint decision-making between the various entities involved in the industry, and to develop an ongoing system for harmonious interaction between scientific and commercial activities. This will be achieved through:

Plan formulation

Since strategic planning is too important to be left to strategists, local or foreign, the focus of decision-making must be shifted to those who will have to live with the results. In the case of Cuba, this body is envisaged as the Steering Committee consisting of representatives of the scientific community as well as those interested in planning, design, and implementation of tourism projects and their functional management. Such an approach will provide:

- More relevant strategy formulation, based on a synthesis of the insights of various segments of the industry as well as officials of the Ministry of Planning, the Ministry of Tourism, and joint venture entities in tourism as well as the Cuban Academy of Sciences
- A better understanding of the strategic implications of everyday decisions

(continued)

Box 2: Strategic Planning for Tourism Development (continued)

- A stronger commitment to objectives, strategies, and plans at all levels within and outside the government

- A better interdisciplinary dialogue within various segments of the tourist industry as well as with other ministries within the government

- A better understanding by those entrusted with programme management or implementation of the rationale for country goals and strategies in the tourism sector.

Plan implementation
This process does not, however, stop at the development of a strategic plan for tourism development activities in Cuba. It includes detailed implementation programmes focused on priority development areas and action plans. The number of areas selected will depend on priority needs, and the complexity of each area plan in relation to the time and resources available. The overall plan for the SCA is expected to be a fairly detailed one.

The next step is to see that these implementation plans, that form an integral part of the strategic plan, are actually put into action. The planning process will have assigned responsibility for particular programmes and activities to specific agencies of the government, determined the resources needed for each activity, and prepared an implementation schedule which is realistic but timely. Part of the approval process for the plan will require ensuring that the required resources will be available, locally or through the UNDP/GEF and other aid agencies, but the key will be to ensure that the individual agencies are committed to performing their parts of the implementation programme. The consultants will work with Cuban counterparts to establish reporting and monitoring mechanisms.

Continual improvement
Strategy is a process, not a static product. Actual experience provides a basis for improving any plan, as some activities need review and modification, while others need expansion, having proved more successful than anticipated. Market trends and new competition must be accommodated. Once involved with the Steering Committee, the ability of participants to think strategically will improve, and new and better ideas are likely to supplant old ones.

This project provides for ongoing attention to strategizing, analyzing and adapting, to ensure the relevance and efficiency of project strategy.

(continued)

Box 2: Strategic Planning for Tourism Development (continued)

The role of consultants, the role of insiders
The role of consultants in this project is intended to be that of the outside objective voice that can coach and assist. The strategic analysis formulation and implementation itself would be conducted by the Steering Committee, with the direct assistance and guidance of the consultants. The consultants can, if so desired, help in the initial orientation of the members of the Steering Committee, coach the Steering Committee in the steps it needs to take, assist in collation, analysis, and interpretation of facts and statistics, and evaluate external forces and competitive moves. They can also be helpful in the preparation of position papers and other documentation when internal resources are either not available or are considered inadequate. The consultants will continue to give their own objective opinions on both the content of the plans and the management processes created, and help to implement them.

Output 4.2

A strategic plan for tourism development activities (See Box 2).

Activities for Output 4.2

4.2.1 Integration of scientific information into the development of ecotourism and other touristic products, taking into account current markets, future evolution of demand, and competition from other destinations.

4.2.2 Evaluation of options available, taking into consideration societal objectives as well as market related information. The questions to be addressed would be:

- What—priority for development
- Where—optimum location within SCA
- When—timing (phasing/staging)
- How much—maximum capacity for sustainable development.

4.2.3 Preparation of a specific strategy for: development of new products/tour circuits; marketing initiatives; training programmes; and coordination with overall SCA strategic plans, biodiversity protection plan, and national development plan.

Output 4.3

A strategic plan for the Sabana-Camaguey Ecosystem (see Box 2).

Activities for Output 4.3

4.3.1 Organization of information on a series of integrated strategic planning workshops and interagency working sessions incorporating natural resources, biodiversity, tourism, and other relevant areas. Preparation of spatial environmental analyses using GIS to define environmentally sensitive areas (such as areas of high biodiversity or critical habitats for endangered species), development zones, and preparation of an overall strategic plan for both the SCE (watersheds, SCA, and the ocean zone) and the SCA itself.[2]

4.3.2 Preparation and publication of a comprehensive strategic plan for the SCE and SCA to protect biodiversity and enhance tourism and other development opportunities.

4.3.3 Preparation of environmental planning and development guidelines for SCE and SCA.

4.3.4 Definition of priorities for implementing the strategic plan.

IMMEDIATE OBJECTIVE 5

To establish a framework to enhance public awareness of the flora and fauna of the SCA, and to initiate public understanding of sustainable development approaches.

Output 5.1

Public information programme on natural resources.

Activities for Output 5.1

5.1.1 Creation of radio, film, newspaper articles, and video programmes.

5.1.2 Creation of exhibits for museums and interpretative centres.

IMMEDIATE OBJECTIVE 6

To compile, organize and analyze existing climatic data, and acquire information on issues pertinent to long-term management, such as global warming, climate change, international waters and oil-spill responses.

Output 6.1

Climatic data.

Activities for output 6.1

6.1.1 Measurement of basic climatic factors.

---

[2] In Phase 1, the strategic plan will focus on the SCA, although a preliminary strategic plan for the SCE will also be prepared. In Phases 2 and 3, greater emphasis will be placed on the SCE.

6.1.2 Collection, organization, and analysis of existing climatic information.

E. INPUTS

1. Government of Cuba

The expenditures listed here relate only to this project which represents Phase 1 of a three-phase programme.

Total previous investment by government in SCA research: Cuban pesos 79,401,780 (US$ 106.76 million)[3]

	US$
Full-time scientific/technical staff (187 persons x 2 years)	1,313,272
Support staff	29,580
Facilities (including CERC laboratory at Cayo Coco)	1,955,550
Equipment	58,973
Miscellaneous	120,000
Total project investment (2 years):	3,477,375

2. Global Environment Facility

	US$
Consultant fees and expenses	500,000
Scientific equipment	1,220,000
Travel	60,000
Mission costs	70,000
Fellowships	70,000
Study tours	50,000
In-country training courses	30,000
Total project investment (2 years)	2,000,000

F. RISKS

1. Internal risk

Cuba has strong centralized institutions for science, environmental management and economic development, but the economy is now under extreme stress. The country is badly in need of foreign exchange earnings. Tourism, earmarked as a major avenue of development activity, offers promise of compatibility with environmental conservation in the Sabana-Camaguey region.

However, given the current situation, other potential economic activities may be equally or more compelling, but far less environmentally compatible than tourism. The government may be

[3] US$ 1 = 0.74 Cuban pesos, according to the United Nations exchange rate for January 1994. Prior to commencement of this GEF project, the Cuban government invested over 79 million Cuban pesos for research and development of the archipelago. This is included in the government's total budget for Phase 1. Not included in these budgets are the significant sums that will go towards tourism and protected area development and management during project implementation.

required to adopt economic development projects for Sabana-Camaguey that run counter to environmental management plans.

The likelihood of the government shelving these tourism plans for less environmentally friendly development plans is not high. Once the project is complete, its demonstration of financial success and the compatibility of tourism with environmental conservation will pave the way for further environmentally sensitive development activities. The risk of failure to do so can be mitigated to a degree by creating an environmental strategy and management plan which addresses development issues beyond tourism, such as agriculture, fisheries, and minerals and petroleum, within the watersheds that directly affect the SCA.

2. External risk

Opposition to the Government of Cuba by the United States could hamper project implementation. US activities could potentially result in difficulties in the following areas: travel to and from Cuba; contact between Cuban scientists and researchers and outside counterparts; and import by Cuba of various goods and services.

Although the likelihood of these problems occurring during the period of the project is low, the risks can be mitigated further by the broad sourcing of equipment, and by ensuring that the pool of Cuban scientific contacts extends well beyond North America.

G. PRIOR OBLIGATIONS AND PREREQUISITES

1. Prior obligations

None.

2. Prerequisites

The Government of Cuba will allocate staff and funds as indicated in Section E on inputs. The government will establish a Steering Committee to guide the project, and designate counterpart teams from appropriate agencies.

The government will either hold in abeyance future construction and development activities for Sabana-Camaguey based on the outcome of surveys, analysis, and strategic planning activities associated with the project, or agree to prepare detailed site-specific ecological studies and enforceable guidelines for development projects which proceed. Mechanisms will be established to enforce guidelines and performance standards that comply with the overall objectives for the region, as stated in this document.

The Project Document will be signed by UNDP, and assistance to the project will be provided only if the prerequisites stipulated above have been fulfilled or are likely to be fulfilled. When anticipated fulfillment of one or more prerequisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

H. PROJECT REVIEW, REPORTING AND EVALUATION

The project will be subject to joint review by representatives of the Government of Cuba and UNDP at least once every twelve months. The first such meeting will be held within the first twelve months of the start of full implementation. The national project coordinator shall prepare and submit to each review meeting a Project Performance Evaluation Report (PPER). Additional PPERs may be requested, if necessary, during the project.

The project terminal report will be prepared for consideration at the terminal review meeting. It shall be prepared in draft sufficiently in advance to allow review by the government and UNDP at least four months prior to the terminal review.

The project shall be evaluated halfway through its implementation. The organization, terms of reference, and precise timing will be decided after consultation between the parties to the Project Document.

I. LEGAL CONTEXT

The original Project Document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Cuba and UNDP. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government cooperating agency described in that agreement.

The following types of revisions may be made to the Project Document with the signature of the UNDP Resident Representative only, provided he or she is assured that the other signatories have no objections to the proposed changes:

- Revisions in, or additions to, any of the annexes of the original Project Document
- Revisions which do not involve significant changes in the immediate objectives, outputs, or activities of a project, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation
- Mandatory annual revisions which rephase the delivery of agreed project inputs or increased expert or other costs due to inflation, or take into account agency expenditure flexibility.

J. BUDGETS

The budgets showing government and UNDP contributions are attached.

1. PROJECT BUDGET COVERING GOVERNMENT CONTRIBUTION

Project Title: Protecting Biodiversity and Establishing Sustainable Development in the Sabana-Camaguey Ecosystem

Project Number: CUB/92/G31

Code	Description		Total		1993		1994
		mm	$	mm	$		$
10.00	Project personnel						
11.01	Scientific/technical	4488	1,313,27	2244	656,636	2244	656,636
11.02	Support staff	87	29,580	42	14,280	45	15,300
11.99	Component total	4575	1,342,852	2286	670,916	2289	671,936
40.00	Equipment		58,973		43,973		15,000
49.00	Component total		58,973		43,973		15,000
50.00	Miscellaneous						
51.00	Sundry		120,000		95,000		25,000
52.00	Facilities		1,955,550		1,255,550		700,000
59.00	Component total		2,075,550		1,350,550		725,000
99.00	GRAND TOTAL		3,477,375		2,065,439		1,411,936

Code 11.01
Scientific and technical staff budget salaries

	Total		1993		1994
	$	mm	$	mm	$
National project director	9,600	12	4,800	12	4,800
Benthic zoologist	8,800		4,400		4,400
Benthic zoologist	7,440		3,720		3,720
Benthic zoologist	7,440		3,720		3,720
Benthic zoologist	7,440		3,720		3,720
Benthic zoologist	8,160		4,080		4,080
Benthic zoologist	7,440		3,720		3,720
Benthic zoologist	7,440		3,720		3,720
Benthic botanist	7,440		3,720		3,720
Benthic botanist	7,440		3,720		3,720
Benthic botanist	4,752		2,376		2,376
Fisheries biologist	7,440		3,720		3,720
Tourism specialist	6,720		3,360		3,360
Ichthyologist	8,160		4,080		4,080
Ichthyologist	4,752		2,376		2,376
Ichthyologist	8,160		4,080		4,080
Ichthyologist	10,560		5,280		5,280
Ichthyologist	8,160		4,080		4,080
Planner	7,440		3,720		3,720
Planner	8,160		4,080		4,080
Marine biologist	8,160		4,080		4,080
Specialist in botanical systematics	8,160		4,080		4,080
Specialist in invertebrates	8,800		4,400		4,400
Specialist in invertebrates	7,200		3,600		3,600
Specialist in invertebrates	7,200		3,600		3,600
Ornithologist	8,160		4,080		4,080
Vertebrate specialist	7,440		3,720		3,720
Herpetologist	7,440		3,720		3,720
Specialist in mastozoology	8,800		4,400		4,400
Specialist in plant conservation & mgt.	8,800		4,400		4,400
Environmental impact specialist	7,440		3,720		3,720
Cartographer and biogeographer	8,800		4,400		4,400
Plant physiologist	8,800		4,400		4,400
Terrestrial ecologist	7,440		3,720		3,720
Remote sensing specialist	8,800		4,400		4,400
Specialist in primary productivity	8,800		4,400		4,400
Ecologist	8,160		4,080		4,080
Ecologist	8,160		4,080		4,080
Plant physiologist	8,160		4,080		4,080
Soils ecologist	8,800		4,400		4,400
Forestry specialist	8,280		4,140		4,140
Forestry specialist	8,808		4,404		4,404
Specialist in diseases and vectors	7,440		3,720		3,720
Economist	7,440		3,720		3,720
Cybernetics/mathematics specialist	7,080		3,540		3,540
GIS specialist	6,720		3,360		3,360
Software analyst	6,720		3,360		3,360
Architect	7,080		3,540		3,540

Specialist in atmospheric contamination	8,160	4,080	4,080
Hydrometeorologist	8,520	4,260	4,260
Hydrometeorologist	8,160	4,080	4,080
Hydrometeorologist	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Hydrographer/oceanographer	7,080	3,540	3,540
Physical oceanographer	7,080	3,540	3,540
Physical oceanographer	7,080	3,540	3,540
Physical oceanographer	8,160	4,080	4,080
Chemical analyst	6,720	3,360	3,360
Chemical oceanographer	7,440	3,720	3,720
Chemical oceanographer	8,160	4,080	4,080
Specialist in marine contaminants	7,440	3,720	3,720
Specialist in marine contaminants	8,880	4,440	4,440
Specialist in marine contaminants	7,440	3,720	3,720
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Data processing specialist	7,080	3,540	3,540
Geographer	8,160	4,080	4,080
Specialist in coastal processes	7,440	3,720	3,720
Marine geologist	7,440	3,720	3,720
Marine geologist	7,440	3,720	3,720
Marine geologist	8,160	4,080	4,080
Marine geologist	8,160	4,080	4,080
Marine geologist	8,160	4,080	4,080
Specialist in coastal processes	7,440	3,720	3,720
Specialist in coastal processes	7,080	3,540	3,540
Specialist in coastal processes	7,080	3,540	3,540
Sonographer	7,080	3,540	3,540
Sonographer	7,080	3,540	3,540
Mathematician	7,080	3,540	3,540
Physical geographer	7,440	3,720	3,720
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Radio positioning specialist	7,080	3,540	3,540
Scientific/technical librarian	7,080	3,540	3,540

Ecotourism specialist	7,480	3,740	3,740
Tourism development specialist	7,800	3,900	3,900
Provincial tourism representative	7,200	3,600	3,600
Environmental specialist	6,720	3,360	3,360
Environmental specialist	6,720	3,360	3,360
Environmental specialist	6,720	3,360	3,360
Environmental specialist	6,720	3,360	3,360
Environmental specialist	6,720	3,360	3,360
Environmental specialist	6,720	3,360	3,360
Environmental education specialist	6,720	3,360	3,360
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Hydrographic/oceanographic tech	6,360	3,180	3,180
Sonographic technician	6,360	3,180	3,180
Sonographic technician	6,360	3,180	3,180
Sonographic technician	6,360	3,180	3,180
Sonographic technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180

Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Radio positioning technician	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Meteorological observer	6,360	3,180	3,180
Draftsman	4,752	2,376	2,376
Draftsman	4,752	2,376	2,376
Forestry technician	6,480	3,240	3,240
Hydrometeorological technician	5,544	2,772	2,772
Hydrometeorological technician	5,544	2,772	2,772
Hydrometeorological technician	5,544	2,772	2,772
Hydrometeorological technician	5,544	2,772	2,772
Meteorological technician	6,000	3,000	3,000
TOTAL	1,313,272	656,636	656,636

2. PROJECT BUDGET COVERING UNDP CONTRIBUTION

Project Title: Protecting Biodiversity and Establishing Sustainable Development in the Sabana-Camaguey Ecosystem
Project Number: CUB/92/G31

Code	Description	Total $	1993 $	1994 $
10.00	Project personnel			
11.01	Consultants	500,000	350,000	150,000
11.99	Component total	500,000	350,000	150,000
15.00	Travel	60,000	35,000	25,000
16.00	Mission costs	70,000	45,000	25,000
19.00	Component total	130,000	80,000	50,000
30.00	Fellowships	70,000	35,000	35,000
31.00	Study tours	50,000	25,000	25,000
32.00	In-service training	30,000	20,000	10,000
39.00	Component total	150,000	80,000	70,000
40.00	Equipment			
41.00	Non-expendable equip.	1,220,000	1,220,000	
49.00	Component total	1,220,000	1,220,000	
50.00	Miscellaneous			
53.00	Operations & maint.			
54.00	Sundry			
59.00	Component total	0	0	0
99.00	GRAND TOTAL	2,000,000	1,730,000	270,000

Code 11.01
Consultant budget

Environmental planning/management	370,000	220,000	$150,000
Geographic information systems	35,000	35,000	
Tourism marketing and finance	50,000	50,000	
Marine physical & biological science	25,000	25,000	
Terres. physical & biological science	20,000	20,000	
Component total	500,000	350,000	$150,000

Annex

TRAINING PROGRAMME

Fellowships, study tours, and in-country seminars and workshops are planned to support the scientific, environmental management, and tourism development activities of this project. Topics for study and training, from which specific training programmes will be developed, are listed below.

Environmental management, planning and design

Contemporary methods in environmental planning
Regional planning methods, ecological planning methods, landscape architecture
Ecotourism development and environmental conservation
Protected areas management and planning
Geographic Information Systems for environmental planning and management
Control of disease and vectors in tourism areas on small islands
Use of remote sensing for environmental planning and management
Modern techniques for diagnosing forest disease
Silviculture and reforestation techniques
Integrated watershed management
Ecological accounting for management of marine ecosystems

Physical and biological science

Methods of radio-isotopic measurement of mineral activity in micro-organisms
Diagnostic modelling of marine waters
Mathematical modelling of hydrophysical behavior
Oceanography of tropical coasts
Modelling transport and diffusion of marine contaminants
Analysis and interpretation of data on marine contamination by heavy metals
Improving the quality of analysis in detection of heavy metals in the ocean
Hydrocarbons and marine organisms
Mathematical modelling of chemical processes in marine waters
Zooplankton in the coastal environment
Ecology of phytoplankton in the coastal environment
Electrophoretic methods for study of population genetics of marine species
Metabolic balance of tropical marine ecosystems
Methods employing Carbon 13 to study tropic structures of organic material
Ecology and primary productivity of benthic microphyto-organisms
Functional ecology of terrestrial coastal ecosystems
Management of forest dwelling animals
Mangrove studies
Service of meteorological equipment
Calibration of spectrometre
Operation of solar radiation sensors
Chemistry of rain
Gas chromatography

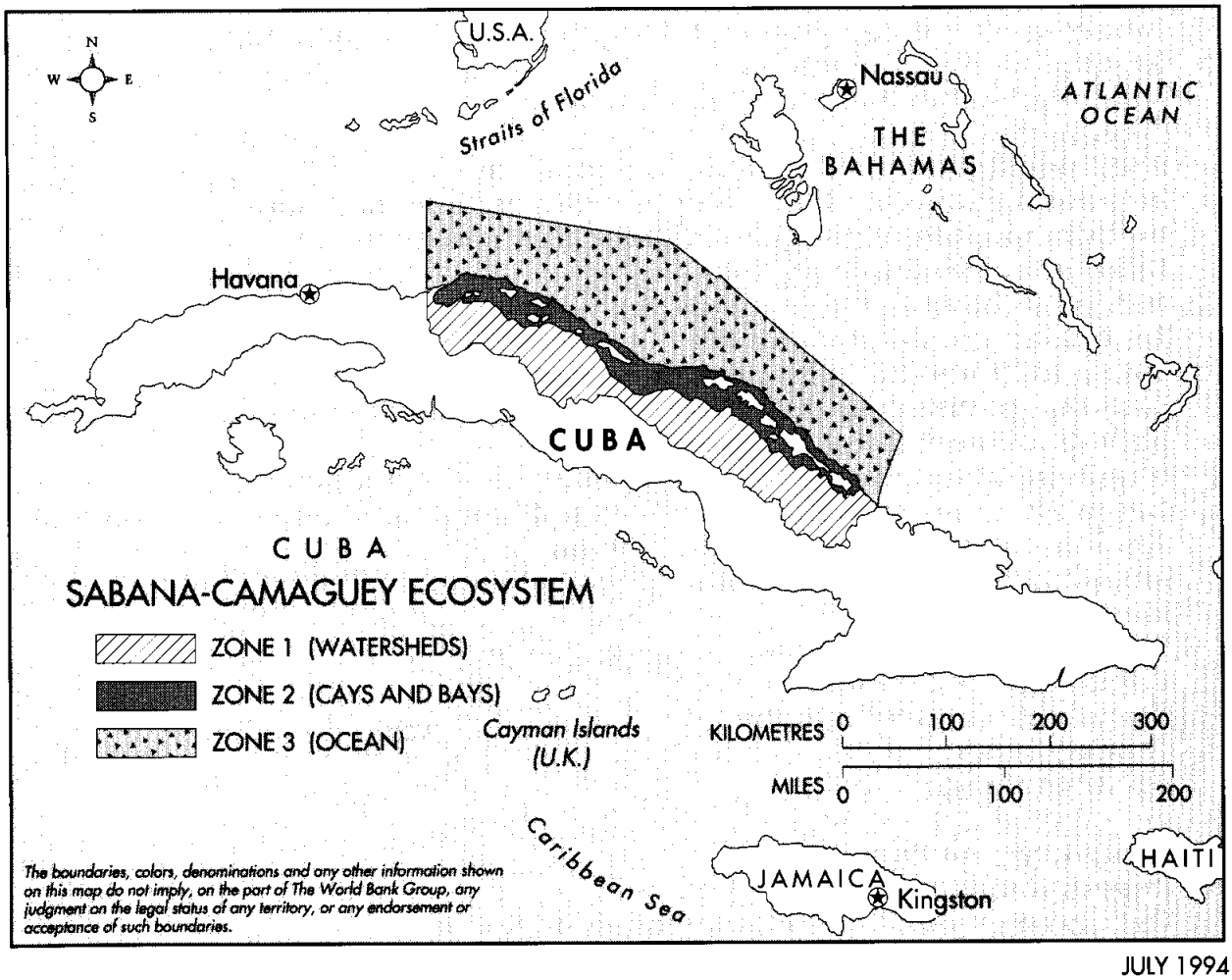
Tourism marketing and finance

Preparing national strategic tourism plans
Contemporary studies in tourism market analysis and finance
Case studies in tourism development emphasizing ecotourism
Tourism marketing and advertising.

Sabana-Camaguey Ecosystem

This map represents the region included in this Sabana-Camaguey Ecosystem (SCE) project. The study area encompasses a total of 75,000 square kilometres which include the watershed, the archipelago, adjacent waters, and the ocean zone extending to the Exclusive Economic Zone (EEZ) maritime boundary. The archipelago and adjacent waters–the Sabana-Camaguey Archipelago (SCA)–provide the focus for Phase 1 of this research, planning, and development programme. This map is based on 1 of 26 maps prepared for this project using a Geographic Information System (GIS). All the maps were prepared by the Academy of Sciences of Cuba and the UNDP consultant for the SCE region, Dobbin Milus International.

IBRD 26083



JULY 1994