

## **PROJECT BRIEF**

### **1. IDENTIFIERS**

**PROJECT NUMBER**

Project number not yet assigned (GF/8400-00-#)

**PROJECT NAME**

**Costa Rica and Nicaragua - Formulation of a Strategic Action Program for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin and its Coastal Zone**

**DURATION**

3 years

**IMPLEMENTING AGENCY**

UNEP

**EXECUTING AGENCY**

GS/OAS

MARENA - Ministerio de Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources)

MINAE - Ministerio de Ambiente y Energía (Ministry of Environment and Energy)

**REQUESTING COUNTRIES**

Costa Rica and Nicaragua

**ELIGIBILITY**

Eligible under paragraph 9(b) of the Instrument

**GEF FOCAL AREA**

International waters

**GEF PROGRAMMING FRAMEWORK**

Operational Program Number 8, Water Body-based

### **2. SUMMARY**

The San Juan River Basin and its coastal zone<sup>1</sup>, encompassing the subbasins of Lake Nicaragua and the San Juan River, extends through southeastern Nicaragua and northeastern Costa Rica to the Caribbean Sea linking ecosystems that are particularly valuable for their biodiversity and economic potential. The Strategic Action Programme formulated under this project will contribute to the conservation of natural ecosystems and to social and economic development in order to satisfy present and future demands minimizing water conflicts. The major components of the SAP formulation include: i) the strengthening of a basin-wide information system that provides the mechanisms for gathering and dissemination of data adequate to the needs of decision-making for the integrated management of the basin; ii) the creation of a well-coordinated bilateral planning process for the SJRB; iii) the implementation of a public participation process; iv) the strengthening of public institutions and private organizations; and v) the formulation and implementation of environmental education activities. Its execution is expected to bring both local and global benefits, such as conservation of the water cycle, the preservation of major water bodies and of the region's biodiversity, and the protection of extensive carbon sinks. This proposal is based on the conclusions and recommendations of the Transboundary Diagnostic Analysis (TDA) carried out under the PDF-B.

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<sup>1</sup> Hereinafter SJRB.

### **3. COSTS AND FINANCING (US \$)**

<b>GEF</b>	Project	3,233,220
	Administrative costs	413,600
	PDF Block B	283,000
	<b>Sub-Total GEF</b>	<b>3,929,820</b>

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<b>CO-FINANCING</b>	UNEP	175,000
	OAS	175,000
	CRRH	100,000
	Governments of Costa Rica and Nicaragua	984,990
	<b>Sub-Total GEF</b>	<b>1,434,990</b>

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<b>TOTAL COST OF THE PROJECT</b>	<b>5,364,810</b>
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### **4. ASSOCIATED FINANCING**

GEF/ UNDP (Mesoamerican Corridor)	320,000
DANIDA (Mesoamerican Corridor)	180,000
GTZ (Mesoamerican Corridor)	80,000
World Bank (Atlantic Biological Corridor)	350,000

### **5. FOCAL OPERATIONAL POINTS ENDORSEMENT**

**Costa Rica:** Ms. Guaria Vargas, Executive Director, FUNDECOOPERACIÓN,

Date: 07/02/00

**Nicaragua:** Mr. García A. Cantarero D, Adviser to the Minister and Project Coordinator for PROTIERRA, Ministry of Environment and Natural Resources (MARENA), Date: 25/10/99

### **6. IA Contact:**

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## **LIST OF ACRONYMS/ABBREVIATIONS**

AECI	Spanish International Cooperation Agency
AMURS	Asociación de Municipios del Río San Juan (Association of Municipalities of the San Juan River)
ASCOMAFOR	Asociación para la Conservación y Manejo de Areas Forestales (Association for the Conservation and Management of Forest Areas)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Research and Training Center for Tropical Agriculture)
CCAD	Comisión Centroamericana de Ambiente y Desarrollo (Central American Commission of Environment and Development)
CRRH	Comité Regional de Recursos Hídricos (Central American Committee on Water Resources)
DANIDA	Danish International Development Agency
EU	European Union
FINNIDA	Finnish International Development Agency
GEF	Global Environment Facility
GTZ	German Agency for Technical Cooperation
IDA	International Development Agency (World Bank)
IDB	Inter-American Development Bank
IDR	Instituto Nicaraguense de Desarrollo Rural (Nicaraguan Institute for Rural Development)
INETER	Instituto Nicaraguense de Estudios Territoriales (Nicaraguan Institute for Territorial Studies)
INIFOM	Instituto Nicaraguense de Fomento Municipal (Nicaraguan Institute of Municipal Promotion)
KFW	German Development Bank
MARENA	Ministerio de Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources)
MARENAP	Protected Areas and Natural Resources Management Project of MARENA
MINAE	Ministerio de Ambiente y Energía (Ministry of Environment and Energy)
NDF	Nordic Fund
NGO	Non Governmental Organizations
OAS	Organization of American States
PANIF	Nicaragua-Finland Environmental Program
PDF	Project Preparation and Development Facility
PROTIERRA	Reforma de Políticas de Recursos Naturales (Natural Resources Policy Reform)
SAP	Strategic Action Program
SDC	Swiss Agency for Development and Cooperation
SIAPAZ	Sistema Integrado de Areas Protegidas para la Paz (Protected Areas Integrated System for Peace)
SICA	Sistema de la Integración Centroamericana (Central American Integration System)
SIDA	Swedish International Development Agency
SINAC	Sistema Nacional de Areas de Conservación (Conservation Areas National System)
SJRB	San Juan River Basin and its Coastal Zone
TDA	Transboundary Diagnostic Analysis
UN	United Nations
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
USDE	Unit for Sustainable Development and Environment
WB	World Bank

## PROJECT BRIEF

### BACKGROUND

1. The San Juan River Basin project area covers some 38,500 km<sup>2</sup> in the basin itself, plus its associated coastal zone on the Caribbean Sea. Of the land area, 64% is in southern Nicaragua and 36% in northern Costa Rica. The planning area covers the subbasins of Lake Nicaragua and of the San Juan River, plus four smaller but nevertheless significant subbasins with natural links to this system--the Indio and Maiz river basins in Nicaragua and the Colorado and Tortuguero river basins in Costa Rica (see Annex F, Project Area Map).

2. The waters of the Lake Nicaragua-San Juan River watershed flow through at least eight distinct terrestrial ecosystems: i) dry tropical forest to the east, north, and west of Lake Nicaragua; ii) cloud forest in the high areas of the Central Volcanic Cordillera of Costa Rica; iii) moist tropical forest to the south and southwest of Lake Nicaragua and in the eastern foothills; iv) very moist tropical forest in the San Juan Valley and on the coastal plains; v) gallery forest along river banks; vi) wetlands to the south of Lake Nicaragua and at the confluences of the Colorado and Tortuguero rivers with the San Juan; vii) second-growth forest, meadows, and agricultural land in extensive areas of the basin; and viii) coastal forest and mangrove swamps on the Caribbean coast. The Indio and Maiz river basins are basically covered by moist and very moist tropical forest.

3. Because of this range of ecosystems and associated habitats, the SJRB has a wealth of biodiversity. Its location in the natural biological corridor running the length of Central America has made it a meeting ground for species from the subarctic areas of North America and others from the subtropics of South America. To a great extent, its natural history is unique. The low population density in many parts of the SJRB has kept it relatively pristine, although there is little information on the potential future impact of human migration trends and the spread of agriculture in the basin.

4. Regional studies now being carried out by the Central American Committee on Water Resources, with international cooperation, lead to the conclusion that the fresh water in the San Juan Basin is the only source capable of meeting the foreseeable development needs of the semiarid Pacific slope of Central America, the region's most populated area. Thus, there is every likelihood that this system will come under increasing pressure of human exploitation. In addition, because the SJRB is also a common westward passageway for anticyclones from the Atlantic to the Pacific, the threat of hurricanes and tropical storms, on top of the threats posed by volcanic activity and seismic pressures that already make this fresh water supply specially vulnerable, further exacerbates the human pressures likely to be experienced within this hydrologic system.

5. Although not included in the project area, Lake Managua at times has been temporarily connected with the SJRB and thus will be taken into consideration during the formulation of the SAP for the basin. For example, the torrential rainfall associated with Hurricane Mitch in October 1998 caused Lake Managua to overflow its banks, flooding the surrounding areas and sending water into Lake Nicaragua. To prevent such flooding in the future, the Government of Nicaragua now intends to regulate the waters of Lake Managua, which will make transfers to Lake Nicaragua more frequent. Various studies, in particular those undertaken by the Inter-American Development Bank (IDB) and the German Technical Cooperation Agency (GTZ), have shown that Lake Managua is extremely polluted. Thus Lake Nicaragua faces the threat of an influx of heavy metals, agrochemical waste associated with pesticides and fertilizers, and industrial and urban effluents, all of which would diminish the quality of its waters. With this in mind, the SJRB project will work in close coordination with any initiatives or plans to regulate the level of Lake Managua. Close co-operation with the

UNEP/GEF project “Reducing Pesticide Runoff to the Caribbean” executed by the office of the Regional Seas Programme for the Caribbean (CAR-RCU) is anticipated.

6. Currently, the two countries lack adequate technical and institutional capacity to collect comprehensive data on the SJRB and to implement the efficient policies for watershed planning and integrated management that are needed to protect and rehabilitate water resources and ecosystems. Paucity of resources, poor transportation infrastructure, the lack of attention to women in natural resource management, and weak local institutions are common on both sides of the border. Given this situation, the governments of Costa Rica and Nicaragua have proposed a joint approach to best manage this complex hydrologic system, within the constraints imposed by demography and geography.

## CONTEXT

7. **National and Regional Programming context.** Support for a regional approach in the management of the SJRB was forthcoming as early as the XIII Summit of Central American Presidents, held in Panama in December of 1992. The Central American Action Plan for the Development of Border Zones, in which the San Juan River Basin was named as a priority area led to the 1994 request, by the governments of Costa Rica and Nicaragua to UNEP and the OAS, to undertake a diagnostic study on the state of the SJRB environment. That study was carried out during 1995-1996 by MINAE and MARENA, and published in 1997 as the “Diagnostic Study of the San Juan River Basin and Guidelines for an Action Plan”. The proposed SAP formulation program reflects the prioritized view of the countries. Policy and programmatic limitation imposed by the GEF as well as community- and country-level priorities, govern the emphases placed on the various activities included in the SAP formulation program.

8. The execution of the SJRB project also contributed to the implementation of the priorities set under the Central American Alliance for Sustainable Development, agreed by the Central American Presidents in October 1994. These priorities include a variety of economic goals, such as development of border areas, conservation of natural resources, and protection of biodiversity; and specifically reference strengthening the Meso-American biological corridor, achieving sustainable use of water resources, and protecting the integrity of drainage basins. The Joint Declaration of the XXX Meeting of Central American Vice-Presidents, agreed in Managua on May 7, 1999, further noted the “desire to continue supporting the sustainable development of all border areas in the region.” The currently proposed project to develop a Strategic Action Program (SAP) for the SJRB will further contribute to this regional initiative, as well as to the development of an Action Plan for Integrated Water Resources Management on the Central American Isthmus, being prepared by the Central American Commission of Environment and Development (CCAD) and the Secretariat of the Central American Integration System (SICA) -- in response to the devastation caused by Hurricane Mitch. This latter plan aims to build national and regional capacities in the field of integrated water resources management on a foundation of watershed planning, a stronger legal framework, and better institutional and organizational capabilities. The present project would allow Nicaragua and Costa Rica to proceed with a vanguard action in the region and to gain experience and technical capabilities that could later be shared with the other countries of the isthmus in the framework of the Plan.

9. To this end, both countries have given great importance to assuring that local governments become aware of the need to work together on environmental problems and to use natural resources in a sustainable fashion. In Nicaragua, municipal associations have been created to promote the protection of the San Juan River and Lake Nicaragua. In Costa Rica, municipalities in the basin have come together to form an association. Recently a federation of border municipalities from both

countries was set up to pursue various goals, including environmental management. It should be said, however, that these organizations are still young and weak, and have not yet clearly delineated their work by basins and subbasins.

10. Finally, while the SJRB project calls for the identification of strategies for the resolution of environmental problems shared by the two countries, all jurisdictional aspects related to the management of the coastal zone and nearshore marine area are beyond the scope of this project and will be addressed in other ways by the basin governments.

11. **GEF Programming Context.** Both countries are eligible for GEF assistance under paragraph 9b of the Instrument for the Restructured GEF. This Project conforms with the GEF Operational Strategy and Operational Programs, in particular the Water-body based Operational Program #8. It will illustrate how freshwater basin and coastal management can be integrated to resolve transboundary issues and will also serve as a demonstration project for the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) in Latin America.

12. **GPA Programming Context.** The goal of the GPA (adopted by 109 governments at the Washington Conference in November 1995) is to prevent degradation of the marine environment from land-based activities by assisting States in preventing and reducing major threats to the health, productivity and biodiversity of the marine environment resulting from human activities on land and in coastal areas. Thus, the GPA is designed to be a source of conceptual and practical guidance to assist States in taking action, individually or jointly within their respective policies, priorities and resources, that will lead to the prevention, reduction, control and/or elimination of degradation of the marine environment, as well as to its recovery from the impacts of land-based activities.

13. **Implementing Agency Programming Context.** The proposed actions are consistent with the UNEP Environmentally Sound Management of Inland Waters (EMINWA) integrated watershed management planning process and related, regional seas programme. The proposed actions are also consistent with UNEP's role under the GPA/LBA.

## **PRESENT AND EMERGING ENVIRONMENTAL PROBLEMS**

14. The GEF Operational Strategy lists four major areas of concern relating to international waters: i) degradation of the quality of water resources; ii) physical habitat degradation of coastal and near-shore marine areas, lakes and watercourses; iii) the introduction of exotic species that disrupt aquatic and land ecosystems and iv) excessive and/or inappropriate exploitation of resources due to inadequate management and control measures. All these problems were identified in the SJRB during the Transboundary Diagnostic Analysis (TDA), which was carried out with PDF Block B funds. The analysis was carried out with the active participation of key stakeholders, and based upon an earlier study, carried out jointly by UNEP and the OAS, that pointed to a number of current and emerging problems that threaten the sustainability of development in the San Juan River Basin and ultimately the quality of life of the people who live there. These transboundary environmental problems often have common roots (see Annex D) and manifest themselves both individually and collectively. They are closely interrelated, but in the interest of seeking solutions they have been broken down as follows:

(a) **The accelerating degradation of transboundary ecosystems.** In the traditional uses of the main ecosystems of the area, human activities have exerted pressures on the environment and resulted in conflicts among the various groups involved, with negative consequences for the

quality of water resources. These consequences include inadequate urban, industrial, and agroindustrial wastewater treatment systems; migratory agriculture, extensive grazing and the consequent extension of the agricultural frontier; widespread cutting of trees for timber, unregulated ecotourism, non-conservationist farming practices, the introduction of aggressive exotic species such as *Tilapia mossambica*; and uncontrolled fires in the drier forests and of grassland. An emerging problem is the growing use of small and very small hydropower plants to tap the considerable hydroelectric potential of the region.

- (b) **Overexploitation of valuable natural resources.** The problems here are related to poor land use, especially the farming of hillside areas and wetlands, the construction of poorly designed roads, unregulated fishing, and excessive exploitation of valuable moist tropical forest species and the destruction of plant cover in fragile areas, causing erosion and land degradation. The result is a loss of potential income from agriculture, fishing and tourism, a threat to biodiversity and the natural productivity of the ecosystem, and a change in coastal and inland waterway dynamics. There are signs that three marine and freshwater species are being over exploited: *Carcharhinus leucas*, locally called “bull shark” or “freshwater shark” because of its unique behavior of migrating between the Caribbean Sea and Lake Nicaragua; *Macrobrachium carminus* or freshwater shrimp; and *Panalirus argus* or spiny lobster.
- (c) **Soil degradation and increasing sedimentation.** Part of the sedimentation of the San Juan River and its coastal zone is produced as a result of natural processes, according to historic documents.<sup>2</sup> Nevertheless, road construction, the advancing agricultural frontier, and hillside farming without adequate soil-conservation techniques exacerbate sedimentation problems, as well the emerging problems arising from open-pit mining and the extraction of construction materials.
- (d) **Pollution of water bodies.** The main causes of water pollution are the indiscriminate use of pesticides and fertilizers, especially where intensive farming practices are used, and urban, industrial, and agroindustrial waste discharges. The water bodies being affected in Nicaragua are Lake Nicaragua, the San Juan River and its coastal zone, the wetlands to the south of Lake Nicaragua. In Costa Rica the Caño Negro wetlands, the Colorado River, and the Tortuguero canals are suffering the consequences of degraded water quality. Sporadic die-offs of aquatic fauna and flora give evidence of such degradation, as do small-scale and occasional studies of water quality that have been carried out in some parts of the SJRB.
- (e) **High vulnerability to natural hazards.** This is apparent in the devastating impact of hurricanes and tropical storms on the region’s ill-housed populations, on its infrastructure, and on crops grown in areas where the forest has been cleared and the soil is fragile--areas exposed to landslides caused by hurricanes, tropical storms, and seismic or volcanic activity. Natural hazards can have a drastic -- and dramatic -- effect on the watercourses of the region.

15. The principal root causes of these major environmental problems are set forth in the Annex D and summarized below as follows:

- (a) **Inadequate Planning and Management.** Although MINAE and MARENA are both trying to promote integrated watershed management using the legal mechanisms provided within

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<sup>2</sup>. SQUIER (Ephraim George), Nicaragua, it's People, Scenery, Monuments and the Proposed Inter Oceanic Canal. New York, D. Appleton and Co., 1852, Vol. 2, p. 221.

Report to the Commission composed by captains and second officers of the vessels Diadem, Valorous and César to Captain Charles Frederick, chief of the Britain fleet in San Juan del Norte, dated on February 1 of 1859. Public Record Office, London. Microfilm FO-53, rollo 17, #43, p. 7.

each country through their own environmental legislation, there is no watershed planning and administration capacity in place. There have been no mechanisms for coordinating management and control across the international border and, thus, no ongoing institutional approach to water resources management in the SJRB. The lack of comprehensive up-to-date data on the SJRB—how it is structured, how it works, what its socioeconomic dynamics are, how information is managed at the local level—makes it impossible to proceed with the minimum certainty needed.

- (b) **Weak institutions.** Although both countries have quite comprehensive legislation on environmental management and the sustainable use of natural resources that could be implemented locally, a paucity of financial and human resources on the local level and the poverty in which most of the population lives makes compliance difficult.
- (c) **Insufficient human and institutional capacity.** Natural resource management is inefficient and it will not be possible to strengthen environmental command-and-control mechanisms without first creating local economic foundations and training people.
- (d) **Limited stakeholder participation.** There is currently limited participation by stakeholders in sustainable development due to centralization of decision-making, which the governments are currently trying to change. This situation, added to reductions in the size of government, has hampered local action. This project recognizes the need to promote and strengthen civil society organizations, increase the participation of women, and involve more people in decision-making on the sustainable development of the SJRB. The initial steps toward enhancing stakeholder participation have been already taken during the execution of the Block B program and through other actions of MINAE and MARENA. These steps now need to be reinforced and further developed through programs to educate people about sustainable development and adopting sustainable production practices and lifestyles within a comprehensive watershed management approach that does not yet exist.
- (e) **Extreme poverty.** Extreme poverty, combined with high population growth, low incomes and a subsistence economy, poor sanitation conditions, and a relative imbalance in employment and income-generating opportunities between the two countries, characterizes the current level of economic development in the SJRB. Uncontrolled migration exacerbates the situation, by exceeding the capacity of existing institutions to meet all the sanitation, health, and educational needs created. The economic conditions force the inhabitants to move to the mountainsides and practice slash-and-burn agriculture just to survive. These reactions contribute to the environmental degradation being experienced in the SJRB, but can be addressed, in part, through building institutional capacities and creating economic instruments, neither now existing, to address such problems.

## **RATIONALE AND OBJECTIVES**

16. The purpose of this request is to procure financing for the formulation of a **Strategic Action Program for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin and its Coastal Zone**. The ultimate objective of the SAP is to ensure the availability of the goods and services provided by water resources for conserving natural ecosystems and social and economic development in order to satisfy present and future demands as agreed by all parties involved. In this way conflicts related to the use of the goods and services generated by SJRB ecosystems will be minimized through a coordinated program of action conducted jointly by the two countries. The major components of the SAP formulation include: i) the strengthening of a basin-wide information system that provides the mechanisms for gathering and dissemination of data adequate to the needs of decision-making for the integrated management of the basin; ii) the creation of a well-coordinated bilateral planning process for the SJRB; iii) the implementation of a gender oriented public participation process; iv) the strengthening of public

institutions and private organizations; and v) the formulation and implementation of environmental education activities.

17. Coordination between the two countries is an important mechanism that can help to improve the quality of life of the inhabitants and protect the ecosystem. This cooperation will support the coordination of research and transboundary management. It will permit the interaction of government institutions and NGOs, strengthening both and making possible a more integrated – and thus more sustainable – development.

18. The SAP will create a framework for future action and a timetable of activities for the protection and use of the numerous goods and services offered by the water resources and ecosystems of the SJRB. It will thus promote the sustainable development of the region. The SAP will lay out a series of measures to reduce and/or eliminate current and emerging problems affecting the conservation and development of the SJRB. It will enhance the transboundary and global benefits obtained when development is both integrated and participatory, and when environmental education, technology transfer, and institutional strengthening are key elements of a program.

19. The SAP will address priority transboundary needs and focus on long-term solutions to the current and emerging problems facing the SJRB. Furthermore, it will propose a series of projects based on experience gathered from demonstrations of new technologies, taking into account their real costs and the capacity of the institutions and organizations involved to execute them.

#### **COMPONENTS AND EXPECTED RESULTS**

20. To achieve the foregoing objectives, the SAP will be developed on the basis of the seven components identified below—the specific activities comprising these components being set forth in the detailed work program appended hereto as Annex H.

21. **Component 1: Formulation of the SAP.** Development of the SAP is the core task to be completed by the Technical Units in close consultation with UNEP and the GS/OAS pursuant to the implementation arrangements set forth in paragraph 45 and following. The outcome of the SAP can not be determined a priori, however, strategic actions were anticipated based upon the findings of the information previously gathered during the PDF-B phase of the program and that derived from the TDA. Components 2 through 7 will provide the knowledge base upon which the SAP will be formulated. Thus, the Technical Units will (1) assemble the results of the work of components 2 through 7--the cost assessments and feasibility studies conducted at specific locations within the SJRB over the 36-month project period--; (2) collate and integrate these outputs with the information previously assembled during the PDF-B phase of the program using as well information deriving from the TDA, and (3) synthesize a strategic program of action to implement specific management measures within the San Juan River Basin following the completion of this project. Integrated management entails the coordinated management of land and water resources at the local or community level within the context of the cumulative impacts and effects of those actions on the basin as a whole, including the coastal zone.

22. Specific detailed Terms of Reference will be prepared by the Technical Units in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component element is anticipated to be initiated according to the timetable presented in Table 1 of Annex H. A detailed preliminary work programme is presented in Annex H of this document. The total cost of drafting the SAP will be US\$1,314,140 of which US\$702,000 is the cost to GEF, and US\$612,140 is the co-financing.

23. **Component 2: SJRB information system.** The objective of this Component is to enhance the capabilities of existing infrastructure in the decision-making process at all levels of government, and to encourage technical cooperation at the national level, by contributing and disseminating information among stakeholders, while, in the first instance, specifically facilitate data acquisition and sharing through an improved system. The PDF-B activities identified specific and serious gaps in the availability of information needed to quantify, assess, and address priority transboundary problems and issues of concern (comprised both scientific data and institutional capacity including human capacity to collect, analyze and interpret such data) necessary to formulate an SAP. Acquisition of data is vital to the successful preparation of an effective SAP. Creation of the institutional and human capacities to obtain and use these data is also critical to the long-term success of the SAP. Thus, as part of the SAP formulation, studies will be conducted to measure the region's vulnerability to erosion, sedimentation and its effects on the dynamics of the river system and the coastal zone, and natural disasters. One key area is lack of comprehensive knowledge of physical information across the entire basin on rainfall and runoff, water quality, and erosion and sedimentation. Recognizing the difficulty in extrapolation from short time-series, the study will initially evaluate alternative strategies for data collection in order to optimize the amount and minimize the cost of useful and reliable data that are available for SAP formulation. An outcome will be a quantitative evaluation of the region's vulnerability to erosion, sedimentation and its effects on the dynamics of the river system and the coastal zone and linkage to natural disasters, and on water quality so that appropriate measures for point and non-point source mitigation can be identified in the SAP. Another major gap is information on the physical, chemical and biological characteristics of Lake Nicaragua and how these will respond to increases in human impacts. Because one aspect of the SAP will focus on future management of Lake Nicaragua, there will be a targeted set of activities focusing on physico-chemical data that will be essential for formulating those specific actions that will be recommended in the SAP that pertain to lake basin carrying capacity and eutrophication, contamination, and ecological functions. Critical areas within the SJRB will be identified and ecosystem deterioration will be described on the basis of agreed-upon objectives for water and land use and basic data on aquatic biodiversity, specially, but not exclusively, in the coastal zone. Other specific studies will include socioeconomic research, particularly on migration patterns, eco-tourism, and job creation, and also research into the natural history and the distribution, structure, and functions of the major ecosystems within the SJRB, in order to elucidate and compile the types of information required in these various sectoral activities. As part of these activities, attention will be given to cost-effective and sustainable methods for capturing, storing, analyzing and disseminating the data from these various activities within the framework of an environmental information system(s). This will include existing components such as GIS, plus other functionalities within a systems and communications architecture that will be sustainable beyond this project. The design of the information system will include mechanisms for institutionalizing it after the SAP is completed.

24. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, MINAE, SINAC, INETER, and academic institutions and research centers. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The total cost of this component will be US\$ 1,395,570 of which US\$ 1,083,000 is the cost to the GEF and US\$ 212,570 is co-funding.

25. Each of the following Component of the SAP formulation, relates to specific data or experiential needs necessary to identify, quantify and refine strategic actions necessary to sustainably manage the San Juan River Basin. The activities within the Components relate directly to recommendations contained within the Transboundary Diagnostic Analysis (TDA), supported by stakeholder initiatives. Together with existing information, gathered during the PDF-B phase, this information will allow formulation of an SAP consistent with current scientific and technical principals for integrated watershed management.

26. **Component 3: Strategic actions with stakeholder involvement.** Strategic planning and management will depend on integrating basic research with a series of activities and investment projects carried out within the identified geographic and subject areas to be targeted for development. Historically, such projects have lacked effective stakeholder involvement as a result of the institutional and human resource issues identified above. As an integral part of the process of formulating the SAP for the SJRB, a series of demonstration activities illustrative of ways and means for promoting sustainable agriculture production and the conservation restoration of land and water ecosystems will be conducted, providing both an assessment of cost and feasibility, and specific examples to local communities of alternative means of production and land and water resource management. Economic mechanisms contributing to the sustainable management of natural resources and to meeting the demand of the inhabitants for improved living conditions, and to solve the conflicts that can arise over plans and decisions affecting resource use will be specifically identified and developed. The cost to the GEF of conducting four demonstration projects in various economic sectors to establish effective mechanisms for the inclusion of stakeholders and sectoral concerns in the environmental management of the SJRB, and including specific public and stakeholder participation opportunities in defined areas within the SJRB (see Component 4, below), will be US \$ 337,000. This component will facilitate interaction between the GEF-funded activities and those of on-going development projects, totaling approximately US \$ 25 million of which approximately 75% are being funded by other agencies.

27. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, MINAE, SINAC, municipal organizations and NGOs such as Productores Unidos para el Desarrollo. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The total cost of this activity will be US\$ 401,070 of which US\$ 337,000 is the cost to the GEF and US \$ 64,070 represents the co-funding.

28. **Component 4: Public Participation.** This component will foster and support the participation of all stakeholders, including the general public, in the development and implementation of the activities carried out under the SJRB project, and complement the activities proposed under Component 3 (above). Success is dependent on identifying and motivating stakeholders and giving them an opportunity to participate, including, where necessary, through financial contributions. National and binational workshops will be organized to give stakeholders the opportunity to become involved, to engage their commitment and facilitate SAP implementation. The project team will strive to assure gender balance in these activities. To establish a broad base of participation and learn the capacity of organizations to carry out actions, the four demonstration projects in various natural areas within the SJRB are envisioned. These activities are to be more broadly based and inclusive of the general public and public-at-large than those to be conducted under Component 3 (above), and will contribute to inclusion of public inputs beyond those considered from an economic perspective.

29. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, and MINAE, municipal organizations such as ASCOMAFOR and NGOs such as Fundación del Rio. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The total cost of this component is US \$ 594,070 of which US \$ 484,500 is the cost to the GEF and US \$ 109,570 is co-funding.

30. **Component 5: Local, national and bi-national level institutional arrangements.** This component is designed to correct problems identified in the TDA regarding the shortcomings in institutions working at the local and national levels, and to encourage enhancement of binational coordination between institutions within the SJRB as well as to ensure that the prescribed actions of the SAP are incorporated into national policies. Technical meetings bringing together MINAE and MARENA personnel and cooperative research efforts between universities and other institutions of both countries will be promoted. Current institutional arrangements and the role they play in the management of the San Juan River Basin will be reviewed. This component is complementary to component 6.

31. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, and MINAE, and academic institutions and research centers. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The cost total cost of developing an enhanced level of coordination among institutions at all levels within the SJRB will be US \$ 174,080 of which the cost to the GEF is US\$158,720 and US \$ 15,360 represents the co-funding.

32. **Component 6: Capacity building and institutional strengthening.** This component will foster the formation of basin councils in critical subbasins and encourage the participation of such councils within the municipal sustainable development councils existing within the SJRB. The Federation of Local Border Governments will be strengthened through specific activities with clearly defined goals in order to promote the strengthening and further development of coordination mechanisms at the local level. A proposal to strengthen institutions will be drafted with measures for: i) building sustainable development planning and management capacities; ii) improving infrastructure; iii) equipping institutions; and iv) designing mechanisms to increase the incomes of local and regional institutions. These activities will be supported by two demonstration projects establishing costs and feasibility of achieving integrated management as well as assessment of specific paradigms to be developed at specific sites within the SJRB.

33. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, and MINAE, and municipal organizations such as AMURS. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The total cost of this

component will be US \$ 253,710 of which US \$ 214,000 is the cost to the GEF, and US \$ 39,710 represents co-funding.

34. **Component 7: Education and training in conservation and the sustainable use of natural resources.** This component has been designed to provide the building blocks of an education and training Program that will make the inhabitants of the SJRB more aware of the important role that water resources play in society, in the economy, and in nature. It will be especially geared to students and young people, who generally are more willing to change their habits and production practices, and who have been shown to be effective conduits by which such habits and practices can be transferred into individual households to the benefit of entire communities. Best sustainable production practices will be identified. The information will be disseminated in both countries and knowledge will be furthered through training for various kinds of local organizations working in the fields of development and environmental conservation. Workshops, seminars, and technical meetings will be held in conjunction with the preparation of the SAP. Materials for environmental education will be collected, designed, and implemented in three demonstration projects, which will be evaluated to aid in the design of the implementation Program. These programs will be used to define costs and feasibility of specific educational measures in the management of the SJRB. The cost to the GEF of this component will be US \$ 254,000.

35. The execution of these activities will be undertaken by the relevant national institutions and organizations such as MARENA, and MINAE, municipal organizations and NGOs. The coordination and supervision will be ensured by the Technical Units at MINAE and MARENA. Specific detailed Terms of Reference will be prepared by the Technical Coordinators in close consultation with UNEP and GS/OAS, during the first quarter of the project period. This component is anticipated to be initiated according to the timetable presented in Table 1 of section H. A preliminary detailed workprogram is presented in Annex H of this document. The total cost of this component is US \$ 320,570 of which the cost to the GEF will be US \$ 254,000 and US \$ 66,570 represents co-funding.

36. The result of these actions will be the formulation of a SAP that will set forth strategic actions for the sustainable development of the SJRB, including domestic and transboundary investment projects, and result in a request for GEF financing to implement activities important to the global environment, and other investment needed to be covered by funds from other agencies or from domestic sources. The actions will be organized according to the basins and subbasins of the SJRB. A public participation program developed during the PDF-B process will enable stakeholders to take part in activities and decisions regarding the planning and implementation of an active and continuous policy, programs, and projects for the integrated management of the SJRB, with emphasis on the involvement of women and young people. Mechanisms for coordinated participatory action at the basin and subbasin level will be incorporated by means of basin councils or similar organizations.

## **RISKS AND SUSTAINABILITY**

37. In order to formulate a SAP for the sustainable development of the SJRB by bringing the people of Costa Rica and Nicaragua together in a participatory and coordinated fashion, several assumptions with certain inherent risks have been made. They are described below.

38. Since there is no bilateral legal and institutional framework for the well-ordered management of the SJRB or for common administrative actions to be taken on its behalf, the governments of Costa Rica and Nicaragua have each studied this request for financing in accordance with their internal procedures and will each submit it to UNEP/GEF for consideration. This is the same procedure they followed previously in applying for and receiving PDF Block B funds.

39. The governments have decided to use this project as an instrument of cooperation and mutual understanding for the benefit of their natural ecosystems, the environment and sustainable development of both countries, of Central America, and of the international community as a whole. The just completed phase is testimony to this desire. Thus, while all issues related to jurisdictional concerns remain to be resolved outside of the context of this project, a satisfactory resolution is presupposed.

40. Further, it is assumed that work already done in the SJRB has led to the correct identification of problems. In this regard, the TDA is and will continue to be of great significance, and will have to be continually updated.

41. It has also been assumed that the governments, local organizations, and universities want to cooperate and coordinate activities in the SJRB. Since these proposals were formulated with the widespread participation of all interested groups, including both national governments, it would seem that this assumption is grounded in reality. Nevertheless, a constant effort by the Technical Units will be necessary to assure coordination on the part of the institutions and organizations of both countries.

42. Another major assumption is that financing and other resources are available. If the previous assumptions regarding the attitude of the stakeholders, including both governments, are valid, the assumptions regarding the real availability of financing and other resources become all the more well founded.

43. To a large extent, the success of the SJRB project will depend on the timetable, or more precisely, on the performance of each component at the right time. To assure that this is the case, each country will name a technical coordinator to work directly under the executing agency. Moreover, the SAP will be given great flexibility, as occurred in the preparatory stage.

44. The national governments have pledged their support to actions proposed to be implemented with the incremental financial assistance of the GEF by allocating to this project important state and national financial resources. Further, it is believed that local level initiatives can form a model upon which country level initiatives can be built over time hence the adoption of a “bottom-up” approach in most of the project activities. It is anticipated that these “bottom-up” approach with the active participation of key stakeholders will enhance the likelihood of SAP findings inclusion into national policies. The risk however that these local level initiatives are not adopted at the country level is the principal risk facing this project and has been identified as such hereabove. Finally, the SJRB project is being used as a pilot project for the formulation and implementation of a Strategic Action Plan for the Central American Isthmus. This regional SAP seeks the implementation of regional policies for the integrated management of water resources in the Central American Isthmus. It will therefore, endorse SJRB SAP findings at a regional level, increasing further the probability of incorporating them into national policies.

## **IMPLEMENTATION ARRANGEMENTS AND STAKEHOLDER PARTICIPATION**

45. This phase of the project, whose purpose is to prepare a SAP for the sustainable development of the SJRB, will continue to be executed by the governments of Costa Rica and Nicaragua, through MINAE and MARENA respectively. A series of well-defined activities will have to be implemented in each country and throughout the SJRB. The coordination of these activities will be carried out by the two technical units in the national executing ministries. UNEP and OAS will support Project Execution. OAS, due to its historic involvement in the basin, its partnership with UNEP in similar projects within the region, and its role in implementing activities under related projects, will act as Executing Agency and manager of the funds provided to the project by UNEP on behalf of GEF, consistent with UNEP financial reporting requirements.

46. The technical units charged with drafting the SAP will each have a national director, appointed by the executing ministry, and a technical coordinator to be contracted by the USDE/OAS in consultation with the governments and UNEP for the full 36 months of the project. The posts of technical coordinators have been budgeted at US \$ 3,500/month each, for a total of US \$ 252,000. The costs of communications, travel, copying, operations, and clerical services have been budgeted at US \$ 450,000 putting the total cost to the GEF of drafting the SAP at US \$ 702,000.

47. A Steering Committee will be established for the project, composed of the ministers of MINAE and MARENA, a representative of each country's Foreign Ministry, representatives of associations of municipalities, the Director of USDE/OAS, the Director of the Division of Environmental Information Assessment and Early Warning of UNEP, and the project's two national directors. Observers will include the other two GEF implementing agencies (World Bank and UNDP), the technical coordinators, and other cooperation agencies willing to be part of the SAP. This board will be the highest organ of the project and will meet at least twice a year. It is charged with approving the work plans of the technical units, the terms of reference of the demonstration projects, and any advisory opinions that OAS/USDE may present in concert with the national directors and the technical coordinators. Also, any significant change to programs and budgets must be approved at this level.

48. A Consultative Committee will be set up in each country. It will include national institutions involved in the management of the SJRB, private organizations taking part in the project and academic institutions. Its role will be to promote the active participation of the institutions and to advise on the orientations of the project. It will be co-chaired by the national directors and will also serve as a mechanism for the coordination of national actions.

49. Binational coordination will be promoted at various levels and through the exchange of information of the demonstration projects. To make progress on the studies and the preparation of the SAP, six binational workshops (two each a year) are being planned. At US \$ 17,250, the total cost will be US \$ 103,500. Twelve national workshops will also be organized, two a year in each country. At US \$ 5,000 each, the total cost will be US \$ 60,000. For all this it will be necessary to contract 27 months of international consulting services at US \$ 10,000/month, for a total of US \$ 270,000, and 159 months of national consulting services at US \$ 2,000/month for a total of US \$ 318,000.

50. Seven meetings of the Steering Committee are being planned for the three-year period. Six will be in Costa Rica and Nicaragua at a cost of US \$ 44,720. The final meeting at the end of the period will take place in Washington, D.C., and travel costs have been calculated at US \$ 10,000. It

is anticipated that the last couple of Steering Committee meetings will be preceded by donor roundtables to ensure donors buy-in and financial support for the SAP.

51. Successful implementation of the project will depend on the active participation of stakeholders in the Basin. To assure this, the proposal has specific elements for participation. Thus, the programs on public participation and education and training are of fundamental importance.

52. More than 100 institutions, government agencies, and civil society organizations took part in preparing this proposal, contributing their experience and hands-on knowledge to identify the elements needed to formulate, validate and identify the strategy for the formulation of the a SAP. In addition, more than 40 technical proposals, pilot project proposals, and recommendations for action were received. Studies carried out by consultants and technical reports and other government documentation from both countries were also important sources. Information was thus gleaned to complement the Diagnostic Study of the San Juan River Basin and Guidelines for a Plan of Action and to discover any gaps in knowledge and understanding of current and emerging transboundary environmental problems.

53. In addition to the public participation, fourteen consultants worked on this proposal: four from Costa Rica, five from Nicaragua, and five from other countries. The proposal is consistent with the environmental policies of Costa Rica and Nicaragua, and both MINAE and MARENA were regularly consulted. Two meetings with the cooperating agencies were organized, to open the doors of the project even wider and to make it a catalyst for generating other sources of financing for activities identified as priorities for the sustainable development of the SJRB. They proved very useful in learning about current and planned activities and in seeking mechanisms for coordination.

#### **INCREMENTAL COST AND PROJECT FINANCING**

54. The total baseline of the project is estimated at US\$ 24.43 million and the alternative scenario is estimated at US \$ 29.86 million. The incremental cost is estimated at US \$ 5.43 million of which 18%, or US \$ 0.98 million is the estimated financial and in-kind contribution of local and national stakeholders. In addition to the US \$ 283,000 grant from the PDF Block B, already disbursed, GEF is requested to finance US \$ 3.72 million.

**PROJECT FINANCING**  
(in thousand of US dollars)

Component/ Other Costs	Base Line <sup>3</sup>	Alternative Scenario <sup>4</sup>	Incremental Cost <sup>5</sup>	Co-financing				GEF	Associated Financing
				Gov.	UNEP	OAS	CRRH		
Component #1	900.00	2,214.14	1,314.14	312.14	150.00	150.00	0.00	702.00	0.00
Component #2	2,363.68	3,759.25	1,395.57	212.57	0.00	0.00	100.00	1,083.00	228.07
Component #3	4,754.44	5,155.51	401.07	64.07	0.00	0.00	0.00	337.00	73.12
Component #4	8,629.32	9,223.39	594.07	109.57	0.00	0.00	0.00	484.50	127.51
Component #5	1,331.23	1,505.31	174.08	15.36	0.00	0.00	0.00	158.72	183.60
Component #6	4,022.28	4,275.99	253.71	39.71	0.00	0.00	0.00	214.00	155.93
Component #7	2,424.17	2,744.74	320.57	66.57	0.00	0.00	0.00	254.00	160.79
Administrative Costs	0.00	413.60	413.60	0.00	0.00	0.00	0.00	413.60	0.00
PDF Block B	0.00	498.00	498.00	165.00	25.00	25.00	0.00	283.00	0.00
<b>Totals</b>	<b>24,425.12</b>	<b>29,789.93</b> <b>93</b>	<b>5,364.81</b> <b>364.81</b>	<b>984.99</b>	<b>175.00</b>	<b>175.00</b>	<b>100.00</b>	<b>3,929.82</b>	<b>929.02</b>

**MONITORING, EVALUATION AND DISSEMINATION**

55. The administrative, technical and financial reporting framework will be provided by the Implementing Agency through the Executing Agency and Steering Committee using standard UNEP reporting protocols. Utilizing key process and status indicators will be an intrinsic part of the project. These indicators will be implemented through the establishment and integration of monitoring tools into project components, as agreed by the Steering Committee. A monitoring and evaluation plan, consistent with GEF criteria, will be prepared by the Executing Agency and, MINAE and MARENA, and approved by the Steering Committee and UNEP. The objective of this monitoring is to contribute to improving, and, if needed, adapting management of work program activities as well as creating the basis for project evaluation. Implementing Agency supervision will be exercised through the Executing Agency and by participation in the regular meetings of the Steering Committee, the first and second meetings of the Steering Committee wherein the work plan and terms of reference for project staff and consultants will be discussed and agreed. A project implementation review would be undertaken jointly by the Government and UNEP two years after the end of the project.

56. STAP Review. (Annex C) This project proposal was reviewed by Dr Ed Ongley, Emeritus Scientist, National Water Research Institute, Environment Canada, an International Waters Expert included in the STAP Roster of Experts. Comments made by Dr. Ed Ongley have been addressed in details in Annex C. The Information System and the SAP formulation components (Para 20 through 25) as well as paragraph 7 of the detailed

<sup>3</sup> For this analysis, the “Business-as-Usual” scenario has been used as Baseline. Past expenditure for project preparation is not considered baseline.

<sup>4</sup> The Alternative Scenario is equal to the Baseline plus the Incremental Cost.

<sup>5</sup> The total Incremental Cost includes the costs to the GEF and Co-financing.

workprogramme (Annex H) have also been altered to address specific concerns of Dr. Ed Ongley.

57. **Dissemination** Incorporated into the SAP formulation are specific work program components (see Components 4&7) which explicitly aim to promote and disseminate the experiences obtained through the SAP formulation process to the SJRB Stakeholders, and to communities within the SJRB through a program of public information and education. Work program activities encourage and facilitate technology transfer and information dissemination through programs of public participation, stakeholder involvement, and professional and community-based education and information dissemination. States and municipal governmental organizations, NGOs and citizen involvement in project execution will also contribute to the dissemination of information on specific technologies and techniques that contribute to the sustainable environmental management and economic development of the watershed. Finally, the publication of the SAP for the SJRB will communicate to all concerned organizations, agencies and citizens, the comprehensive strategic approach for the management of this critical drainage basin. Copies of this management program will be widely disseminated within the planning project area.

## **LIST OF ANNEXES**

### **Required Annexes**

- Annex A. Incremental Cost**
- Annex B. Logical Framework Matrix**
- Annex C. STAP Roster Technical Review**

### **Optional Annexes**

- Annex D. Transboundary Diagnostic Analysis, including Root Cause Analysis**
- Annex E. Public Involvement Plan Summary**
- Annex F. Map of the SJRB and Surrounding Area**
- Annex G. Definition of Terms**
- Annex H. Proposed Work Program and Descriptions of Specific Studies and Demonstration Projects**

## ANNEX A

### INCREMENTAL COST ANALYSIS

1. **Broad Development Goals.** The goal of this project is to formulate a program of strategic actions that will ultimately promote environmentally sustainable development within the San Juan River Basin and its coastal zone (collectively the SJRB). This program of sustainable development will take into account the investment programs of the governments of Costa Rica and Nicaragua, as well as of their constituent municipalities, other local authorities and nongovernmental organizations.

2. **Baseline Situation.** The baseline situation consists of existing long-term development programs for the SJRB as stated in country-level economic development plans, and environmentally-related activities. In addition, the relatively uncoordinated activities being planned or conducted by many governmental agencies and private parties within the Basin form elements of the baseline situation. The total baseline of the project is estimated at US \$ 24.43 million, according to the budget shown in Table 1.

3. Associated financing includes the GEF/ UNDP Mesoamerican Biological Corridor project in Costa Rica and Nicaragua. The total cost of the project amounts US \$ 19.20 million of which US \$ 8.60 are DANIDA (Danish International Development Agency) and GTZ (German Agency for Technical Cooperation) co-financing. It is estimated that US\$ 0.32 million from GEF, US \$ 0.18 million from DANIDA and US \$ 0.08 million from GTZ are allocated to support the SJRB project activities. In addition, the GEF/ WB (World Bank) Nicaraguan Atlantic Biological Corridor project has assigned about US \$ 0.35 million to the SJRB project. Total associated financing is US \$ 0.93 million. Other agencies have shown interest in providing additional financing pending the approval of this proposed Project Brief.

4. **GEF Alternative Scenario.** The alternative scenario consists of the implementation of those actions needed to introduce sustainable development into the development projects being conducted in the SJRB. Such actions would result in sustainable global benefits embodied into the mitigation of the transboundary environmental problems identified in Annex D. The costs of these actions are over and above those incurred by the countries in their required environmental impact assessments under existing environmental laws and regulations. The cost of the project under this scenario is estimated at US \$ 29.86 million. The incremental cost, by which the alternative scenario exceeds the costs of the baseline situation, is estimated at US \$ 5.43 million. About 18 % of this cost, or US\$ 0.98 million, is the estimated financial and in-kind contribution of local and national stakeholders. In addition to the US \$ 283,000 grant from the PDF Block B, already disbursed, GEF is requested to finance US \$ 3.72 million.

5. **Global Benefits.** Global benefits likely to arise from the execution of this project include decreased transboundary transport of contaminants and sediments, increased wildlife diversity, decreased soil degradation, increased knowledge of river system behavior (especially at the freshwater-ocean interface), improved coordination of river basin management and planning, and increased dissemination of knowledge of the river system and its coastal zone within the basin. These benefits are reflected in the project activities as presented in Table 2. (See also Table 3). These benefits are:

6. **Component 1: Formulation of the SAP.** The main objective of the SAP is to assist in maintaining and recuperate valuable ecosystems of forests, wetlands and coasts, to reduce the

level of water pollution, to diminish the levels of vulnerability to natural hazards, and to promote research and other forms of binational cooperation. The SAP is an enabling activity for the sustainable use of the global resources of the San Juan River watershed and its coastal area, based on key criteria such as natural resource integrated planning, and participation and institutional strengthening. The baseline scenario in both countries does not include funds for the formulation of a SAP for the integrated management of the SJRB. The alternative, sustainable development scenario includes the time of stakeholders and public officials, studies and workshops. The total cost of the alternative scenario is US \$ 2.21 million, of which governments in-kind contribution is estimated at US \$ 312,140. GEF would be requested to finance 32%, or US \$ 702,000.

7. **Component 2: SJRB Information System.** Physical characteristics, pollution, vulnerability to natural hazards, and human migration patterns were identified in the Transboundary Diagnostic Analysis (TDA) as key input areas for an information system in the region. The baseline for water quality and vulnerability, which includes the use of existing facilities in the Universities and Water Management Laboratories in both countries, is estimated in US \$ 38,000. Co-financing includes a hydro-meteorological network to be implemented by the regional institution for water resources, CRRH, which is to be financed by USAID. Of the total amount of that project, US \$ 100,000 would be allocated in the San Juan River watershed. The monitoring system would complement the satellite information currently being collected and analyzed by the Mesoamerican Corridor Initiative, which is estimated at US \$ 63,020 for this component.

8. In addition, although lacking an integrated and comprehensive approach, studies conducted in Nicaragua with the financial assistance of FINNIDA have concluded that Biodiversity in the region is high and with significant potential for endemism. Nevertheless, the aquatic life of the transboundary water bodies is virtually unknown. Academic institutions, and regional and local institutions will support the collection of information on aquatic biodiversity, including the institutions in charge of the Tortuguero Conservation Area (in Costa Rica) and the Indio Maiz Reserve (in Nicaragua). Their support is estimated in US \$ 20,000.

9. Lastly, during project preparation, human migration was identified as an important cause of resource depletion. No studies have been conducted to determine the extent of this problem or to determine the solution. The incremental cost of this study is estimated at US \$ 75,000. The information to be generated from these studies would serve as indicators of the environmental benefits of GEF investment, and would assist in prioritizing future investments in the region. The potential benefits of having access to such monitoring and information systems for environment and socioeconomic aspects at the border region cannot be estimated now. GEF is requested to finance 78% of the incremental cost, or US \$ 1.08 million.

10. **Component 3: Strategic Actions with Stakeholder Involvement.** Some donors have targeted their resources in strategic investments in the SJRB. Amongst them are the GTZ, with a natural resources management project in Huetar Norte in Costa Rica and Indio Maiz in Nicaragua; and DANIDA, with a long-term project in El Castillo, Nicaragua. Nevertheless no investments were identified for conflict management and integrated strategic planning for global and binational resources in the San Juan River Basin. Current and projected future demands for hydroelectricity, tourism and other activities; and the potential benefits of designing and providing instruments for stakeholders and decision-makers to reach informed agreements on such activities can result in incalculable potential benefits. A series of demonstration projects for this component will provide assessments of cost and feasibility and specific examples of

sustainable alternative means of production and land and water resource management. The incremental cost of this component is estimated at US \$ 401,070. The GEF is requested to finance the 84% of the incremental cost, or US \$ 337,000.

11. **Component 4: Public Participation.** The participation of civil society is key to successfully formulating and implementing the SAP. This component will provide the space for stakeholders to identify, implement and take ownership of the project activities. It is a priority for the project to ensure a gender balanced participation in all of its activities. The pilot projects identified by stakeholders are community-based initiatives to address issues that are common to the region, such as forest fires and rehabilitation of a lagoon. The project would document these initiatives and promote exchange across the border. Conservation Areas, local governments and NGOs currently allocate an estimated US \$ 8.67 million for consulting and promoting civil society participation in natural resources management on a regional basis. The incremental cost of addressing global and transboundary environmental issues during the SAP preparation is estimated at US \$ 594,070 of which 25% is the cost of participation of stakeholder representatives. GEF is requested to finance 81%, or US \$ 484,500.

12. **Component 5: Local, national and bi-national level institutional arrangements.** The activities to be financed under this output include meetings and technical support costs needed to achieve local, national and transboundary agreements on resource protection and use. This component would support promoting technical exchanges amongst local institutions and MINAE and MARENA staff. This component would also finance the periodic meetings of the Consultative Committees and those of the Steering Committee, which gather key representatives from stakeholders in the region. Strengthening dialogue on environmental issues across Central America is a key concept of the Mesoamerican Corridor and framework of the Central American Commission for Environment and Development (CCAD). This project would coordinate closely with these initiatives to provide feedback to similar initiatives in the isthmus. The baseline situation is comprised of a modest allocation of time from Foreign Affairs and Environment and Natural Resource Ministries officials to dialogue on transboundary and global issues derived from the resource use of the San Juan River watershed and its Coastal Area. The alternative scenario provides funding for time and resources to focus the attention of local and national officials on these important issues, and the support for the design of key institutional instruments, space and information for constructive dialogue and policy making. The baseline for this component is estimated at US \$ 1.33 million, and the incremental cost at US \$ 174,080, of which 9% is in-kind contribution of local governments. GEF is requested to finance 91% of the incremental cost, or US \$ 158,720.

13. **Component 6: Capacity Building and Institutional Strengthening.** The activities to be financed under this output include capacity building and transaction costs needed to promote the formation of basin councils in critical subbasins and encourage the participation of such councils within the municipal sustainable development councils already in place in the SJRB. This component will also support the strengthening of the Federation of Local Border Governments which is a priority for both countries. Various donors, including FunPaDem6/Ford Foundation and Protierra/Inifom7, have strong presence and interesting results in promoting dialogue and strengthening the municipalities in the region. This component would document successful experiences and facilitate dialogue, cooperation, and extension of the concept throughout the region. This component would also finance workshops and seminars for officials

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0 6 Fundacion de Servicio Exterior para la Paz y la Democracia.

1 7 Instituto de Fomento Municipal, Nicaragua

appointed as members of local and binational sustainable development councils. The baseline for this component is estimated at US \$ 4.02 million, and the incremental cost at US \$ 253,710, of which 16% is in-kind contribution of local governments. GEF is requested to finance 84% of the incremental cost, or US \$ 214,000.

14. **Component 7: Education and Training in Conservation and the Sustainable Use of Natural Resources.** Although both countries have dedicated resources to national or regional environmental education programs, an environmental education program focused on the global and binational environmental aspects of the San Juan River Basin and its Coastal Zone has not been financed. The National Strategy for Environmental Education in Costa Rica, targeting Conservation Areas, and the scattered environmental education programs financed by various donors inside the protected areas of Nicaragua, lack a coordinated transboundary approach. This project would finance the design and implementation of environmental education programs in an urban (*Ciudad Quesada*, Costa Rica) and a rural (*San Carlos*, Nicaragua) area. All materials and lessons learned during the implementation of these three projects would be applicable in the whole region. The estimated alternative scenario of the whole component is US \$ 2,744,740 of which the GEF is requested to finance the 9% or US \$ 254,000.

**Table 1. Country-level programs included in the Baseline Situation (US \$ million)**

<b>Program</b>	<b>Description</b>	<b>Amount</b>
IDA (International Development Agency)/ MARENA/ PROTIERRA (Natural Resources Policy Reform)	Environmental policy, legislation and regulations project	0.06
IDA/INIFOM (Nicaraguan Institute of Municipal Promotion)/ PROTIERRA	Rural poverty and natural resources management project	0.28
IDB/ KFW (German Development Bank)/ NDF (Nordic Fund)	Lake Managua Restoration Project	1.70
IDB/ IDR (Nicaraguan Institute for Rural Development)	Agricultural restoration project	8.32
SIAPAZ (Protected Areas Integrated System for Peace)/ GTZ/ MARENA	Humid Tropical Forests Conservation and Sustainable Use Project	1.45
SIAPAZ/ DANIDA/ MARENA	Humid Tropical Forests Conservation and Sustainable Use Project	5.06
SIAPAZ/ EU (European Union)	Humid Tropical Forests Conservation and Sustainable Use Project	0.16
SIAPAZ/ AECI (Spanish International Cooperation Agency)	Humid Tropical Forests Conservation and Sustainable Use Project	0.07
USAID (United States Agency for International Development)/ MARENA	Protected Areas and Natural Resources Management Project (MARENAP)	0.82
FINNIDA (Finnish International Development Agency)/ MARENA	Nicaragua-Finland Environmental Program (PANIF)	0.30
EU/ MARENA	Agricultural Frontier Project	0.08
SDC (Swiss Agency for Development and Cooperation)/ CATIE (Research and Training Center for Tropical Agriculture)/ MARENA	Technology Transfer & Training for Natural Forest Management Project	0.13
SINAC (Costa Rican Conservation Areas National System)	Conservation Areas	6.00
<b>TOTAL</b>		<b>24.43</b>

**Table 2. Incremental Cost Matrix (US \$ million)**

<b>Component/ Other Costs</b>	<b>Category</b>	<b>Amount</b>	<b>Domestic Benefits</b>	<b>Global Benefits</b>
Formulation of the SAP	Baseline	0.90	No known direct benefits	
	Alternative	2.21	Enabling activity	Strengthened capacities for negotiating and reaching agreements on shared waters; protection of marine and freshwater fish resources
	<b>Increment</b>	<b>1.31</b>		
Information System	Baseline	2.36	Improved hydro-meteorological monitoring capability, reduced flow of contaminants, mitigation of natural hazards	
	Alternative	3.76	Same as above	Improved access to information, improved knowledge of shared biological resources, enhanced understanding of human migrations
	<b>Increment</b>	<b>1.40</b>		
Strategic Actions with Stakeholder Involvement	Baseline	4.75	No known direct benefits	
	Alternative	5.15	Enabling activity	Coordinated use of donor funds, improved conflict resolution procedures, workable stakeholder participation program, strengthened regional cooperation
	<b>Increment</b>	<b>0.40</b>		
Public Participation	Baseline	8.62	Increased public awareness, support for national cooperation with NGO stakeholders and regional partners	

	Alternative	9.22	Same as above	Better coordination between organizations, enhanced public participation in resource management, potential replicability
	<b>Increment</b>	<b>0.60</b>		
Local, National and Binational Level Institutional Arrangements	Baseline	1.33	Capacity building for increased cooperation between institutions; improved knowledge of the natural resource base	
	Alternative	1.50	Same as above	Better coordination between SJRB institutions, improved decision-making capacity, enhanced integration
	<b>Increment</b>	<b>0.18</b>		
Capacity Building and Institutional Strengthening	Baseline	4.02	More broadly based environmental management capacity, improved communication between basin organizations	
	Alternative	4.27	Same as above	Improved management of water and living resources in the SJRB, coordinated management of environment and development, implementation of sustainable development philosophies
	<b>Increment</b>	<b>0.25</b>		
Education and Training in Conservation and the Sustainable Use of Natural Resources	Baseline	2.42	Improved level of knowledge at the grassroots level, better informed communities	
	Alternative	2.74	Same as above	Transferable curricula, improved environmental management affecting biological, soil and water resources in the SJRB
	<b>Increment</b>	<b>0.32</b>		

<b>Total Components</b>	<b>4.46</b>	
<b>Administrative Costs</b>	<b>0.41</b>	
<b>Project Preparation</b>	<b>0.49</b>	
GEF PDF Block B	[0.28]	
Governments	[0.17]	
UNEP	[0.02]	
OAS	[0.02]	
<b>TOTAL INCREMENT</b>	<b>5.36</b>	

**TABLE 3. BREAKDOWN OF PROJECT FINANCING  
(in thousand of US dollars)**

Component/ Other Costs	Base Line <sup>8</sup>	Alternative Scenario <sup>9</sup>	In cremental Cost <sup>10</sup>	Co-financing				GEF	Associated Financing
				Gov.	UNEP	OAS	CRRH		
Component #1	900.00	2,214.14	1,314.14	312.14	150.00	150.00	0.00	702.00	0.00
Component #2	2,363.68	3,759.25	1,395.57	212.57	0.00	0.00	100.00	1,083.00	228.07
Component #3	4,754.44	5,155.51	401.07	64.07	0.00	0.00	0.00	337.00	73.12
Component #4	8,629.32	9,223.39	594.07	109.57	0.00	0.00	0.00	484.50	127.51
Component #5	1,331.23	1,505.31	174.08	15.36	0.00	0.00	0.00	158.72	183.60
Component #6	4,022.28	4,275.99	253.71	39.71	0.00	0.00	0.00	214.00	155.93
Component #7	2,424.17	2,744.74	320.57	66.57	0.00	0.00	0.00	254.00	160.79
Administrative Costs	0.00	413.60	413.60	0.00	0.00	0.00	0.00	413.60	0.00
PDF Block B	0.00	498.00	498.00	165.00	25.00	25.00	0.00	283.00	0.00
<b>Totals</b>	<b>24,425.12</b>	<b>29,789.93</b>	<b>5,364.81</b>	<b>984.99</b>	<b>175.00</b>	<b>175.00</b>	<b>100.00</b>	<b>3,929.82</b>	<b>929.02</b>

- 2 8 For this analysis, the “Business-as-Usual” scenario has been used as Baseline. Past expenditure for project preparation is not considered baseline.
- 3 9 The Alternative Scenario is equal to the Baseline plus the Incremental Cost.
- 4 10 The total Incremental Cost includes the costs to the GEF and Co-financing.

## ANNEX B

### LOGICAL FRAMEWORK FOR DEVELOPMENT OF A STRATEGIC ACTION PROGRAMME (SAP) FOR THE INTEGRATED MANAGEMENT OF THE SAN JUAN RIVER BASIN AND ITS COASTAL ZONE (SJRIB)

Intervention Logic	Indicators of Performance	Means of Verification	Risks and Assumptions
<p><b>Development Objective:</b> Water resources of the San Juan River Basin and its coastal zone are available to satisfy present and future demands as agreed to by those who use or have an influence over these resources.</p>	<p>Human populations in the SJRB have improved life quality as measured by health and income parameters.</p> <p>Reduced biotic, chemical, and physical contamination of Lake Nicaragua, the San Juan River, and its coastal zone.</p> <p>Fewer conflicts over the use of services provided by ecosystems in the San Juan River basin including those of Lake Nicaragua and the coastal zone.</p>	<p>San Juan River Basin Project (SJRBP) documents that show that mechanisms and instruments for integrated planning and implementation are in place.</p> <p>Reports of the SJRBP monitoring and evaluation system.</p> <p>Reports of other local, national, and international investigations.</p>	<p>Governments of Costa Rica &amp; Nicaragua agree on the mechanisms and instruments of planning, implementation, and monitoring the SIRBP.</p> <p>Other stakeholders agree on the mechanisms and instruments of planning, implementation, and monitoring the SIRBP.</p> <p>Programs and financial strategies of the SIRBP are in place.</p>
<p><b>Project Purpose:</b> To formulate a Strategic Action Programme (SAP) for the Integrated Management and Sustainable Development of the San Juan River Basin and its coastal zone (SJRIB).</p>	<p>Public participation and consultation methods were used in the development of the SAP.</p> <p>Formulation of the SAP has been completed.</p> <p>SAP priorities have been set and its institutional framework has been prepared.</p>	<p>Governments endorsement of the SAP Program Document.</p>	<p>Governments of Costa Rica and Nicaragua agree on and approve the SAP.</p> <p>Stakeholders are willing to actively and responsibly participate in and collaborate with the SIRBP.</p>
<p><b>Result/ Component 1:</b> Formulation of the SAP.</p>	<p>Proposals to address root causes are available.</p> <p>SAP priorities have been set and its institutional framework has been prepared.</p>	<p>Governments endorsement of the SAP Program Document.</p>	<p>Governments of Costa Rica and Nicaragua agree on the results of the studies.</p> <p>Stakeholders actively and responsibly participate in the development of the SAP.</p>

Intervention Logic	Indicators of Performance	Means of Verification	Risks and Assumptions
	Formulation of the SAP has been completed.		participate in the development of the SAP.
<b>Result/ Component 2:</b> SIRB Information System.	Information system workshops have been held.  Studies have been completed.  Surveys regarding information system needs have been completed.  Databases have been designed.	Information system workshop reports.  Documents (including maps) reporting on the SIRBP studies.  Reports of SIRBP surveys and databases.	Stakeholders are willing to share information and will collaborate in the design and maintenance of the information system.  Information needs are clearly identified.  Stakeholders will continue to allocate funds and other resources to support the information system.  Information is balanced and accurate.
<b>Result/ Component 3:</b> Strategic Actions with Stakeholder Involvement.	Social and economic investigations have been conducted and the information is used in the integrated development planning for the basin.  Conflict management needs have been identified and projects are designed.  Strategic planning and management demonstration projects are completed.	Reports of SIRBP studies.  Progress reports on demonstration projects.	Stakeholders provide accurate information on their demands.  The governments of Costa Rica and Nicaragua will accept the use of Strategic Planning and Management (SPM).  The policies and priorities of the governments of Costa Rica and Nicaragua with regard to SPM will be positive and sustained.
<b>Result/ Component 4:</b> Public Participation.	STAKEHOLDERS ACTIVELY PARTICIPATED IN THE DEVELOPMENT AND IMPLEMENTATION OF SIRBP ACTIVITIES.  Workshops were held to develop SIRBP activities and policies.  SAP Demonstration Projects are completed.	PROGRAM WORKSHOP REPORTS.  Progress reports of the SAP demonstration projects.  SAP PROGRAM DOCUMENT.	A clear and balanced identification of stakeholders is possible.  Financial resources are made available for stakeholder participation in the SIRBP workshops.  There is an interest on behalf of civil society and

Intervention Logic	Indicators of Performance	Means of Verification	Risks and Assumptions
			other stakeholders to positively participate on a long-term basis with the SIRBP.
<p><b>Result/ Component 5:</b> Local, national and bi-national level institutional arrangements</p>	<p>Governments of Costa Rica and Nicaragua have allocated funds for the SIRBP National Technical Units.</p> <p>National and BI-national technical level workshops and seminars have been held with participation of personnel of MINAE and MARENA.</p> <p>Joint Research Studies have been identified and designed.</p>	<p>MINAE and MARENA budgets.</p> <p>Reports of meetings.</p> <p>BI-national Co-operation agreements between universities and research institutes.</p> <p>national Co-operation instruments between MINAE and MARENA.</p>	<p>Local governments, technical personnel and scientists are interested in developing and sustaining institutional arrangements.</p> <p>Governments of Costa Rica and Nicaragua are willing to work with the institutional arrangement developed by the stakeholders.</p> <p>Governmental institutions of Costa Rica and Nicaragua are willing to work together to develop institutional arrangements to support SAP implementation.</p>
<p><b>Result/ Component 6:</b> Capacity Building and Institutional Strengthening.</p>	<p>Basin Councils and Associations for work in the basin are formed.</p> <p>Capacity building and institutional strengthening demonstration projects are completed.</p>	<p>Proposal to strengthen institutions.</p> <p>Progress reports on demonstration projects.</p>	<p>Local governments, technical personnel and representatives of civil society are interested in building management capacities.</p> <p>Governments of Costa Rica and Nicaragua are willing to work with local governments and local stakeholders to strengthen local institutional capacities.</p>
<p><b>Result/ Component 7:</b> Education and Training in the Conservation and Sustainable Use of Natural Resources.</p>	<p>Environmental Education workshops have been held.</p> <p>Review studies of existing environmental education programmes and materials have been completed.</p>	<p>Environmental education workshop reports.</p> <p>Progress reports of SIRBP demonstration projects.</p>	<p>A clear identification of stakeholders (beneficiaries and providers) is possible.</p> <p>A clear understanding of the levels of intervention exists.</p>

<b>Intervention Logic</b>	<b>Indicators of Performance</b>	<b>Means of Verification</b>	<b>Risks and Assumptions</b>
	<p>Surveys regarding environmental education needs have been designed and conducted.</p> <p>Successful experiences in the use of sustainable technologies have been identified and innovative technologies tested.</p> <p>SIRBP environmental education demonstration projects are underway.</p>	<p>SAP Program Document.</p> <p>SIRBP environmental education survey reports.</p>	

Activities	Assumptions
<p><b>Project Purpose:</b> <i>To formulate a Strategic Action Programme (SAP) for the Integrated Management and Sustainable Development of the San Juan River Basin and its Coastal Zone.</i></p> <p><b>01</b> The OAS/USDE provides technical co-ordination and follow-up for the administration of funds, supervision of personal, and preparation of the activity reports submitted to UNEP, GEF and to the Governments of Costa Rica and Nicaragua.</p> <p><b>02</b> Provide technical co-ordination to the technical units (Costa Rica and Nicaragua) to a) prepare and follow-up on the work-plan, b) administer funds assigned to the SJRBP by international agencies, and c) supervise the activities of the technical unit.</p> <p><b>03</b> Prepare the SAP document.</p>	<p>MINAE and MARENA provide counterpart contributions in terms of finances and staff.</p>
<p><b>Result/ Component 1:</b> <i>Formulation of the SAP.</i></p> <p><b>1.1</b> Prepare, organise and present workshops.</p> <p><b>1.2</b> Promote, prepare and organise bi-national meetings which includes the participation of the government authorities of Costa Rica and Nicaragua.</p> <p><b>1.3</b> Collect data, undertake studies and surveys, etc.</p> <p><b>1.4</b> Complete studies needed to formulate the SAP.</p>	<p>Stakeholders are willing to participate and authorities are receptive to participatory findings.</p>
<p><b>Result/ Component 2:</b> <i>SJRB Information System.</i></p> <p><b>2.1</b> Identify specific critical areas and level of degradation of the water resources based upon agreed use plans.</p> <p><b>2.2</b> Design and undertake studies of the basin ecosystems (natural history, structure and function, distribution, uses, etc.</p> <p><b>2.3</b> Design basin-wide sedimentation and contamination studies.</p> <p><b>2.4</b> Design a basin-level Monitoring System covering both natural history and socio-economic concerns.</p> <p><b>2.5</b> Design and perform studies of human migration in the basin.</p> <p><b>2.6</b> Design mechanisms to monitor natural hazard vulnerability.</p> <p><b>2.7</b> Analyse progress and results of selected demonstration projects related to the design of an information system for the SJRB and its coastal zone.</p>	<p>Communities are receptive to the SJRBP and are willing to collaborate with the technical staff of the project.</p> <p>Stakeholders are willing to provide information and data.</p> <p>Participants of studies allocate the financial resources to execute the project.</p> <p>Participants of demonstration projects undertake their assigned activities.</p>

Activities	Assumptions
<p><b>Result/ Component 3:</b> <i>Strategic Actions with Stakeholder Involvement.</i></p> <p><b>3.1</b> Identify geographic and thematic areas for intervention.  <b>3.2</b> Identify present and future demands for the ecosystem services available in the basin and develop and test mechanisms to satisfy these demands.  <b>3.3</b> Design a programme for “environmental” conflict resolution at local (municipal) levels.  <b>3.4</b> Analyse the progress and results of selected projects for specific areas, such as the Lake Nicaragua basin, San Juan River basin, coastal zone, sub-basins and critical areas.  <b>3.5</b> Design training programs to improve strategic planning and management and to enhance awareness of its value for long-term, conflict free development of natural resources.</p>	<p>Financial resources are allocated to execute the demonstration projects.</p> <p>Demonstration projects are well managed and completed.</p>
<p><b>Result/ Component 4:</b> <i>Public Participation.</i></p> <p><b>4.1</b> Identify stakeholders.  <b>4.2</b> Motivate stakeholders to participate in the SJRBP and in other programmes in the region.  <b>4.3</b> Prepare, organise and present workshops on public participation.  <b>4.4</b> Analyse the progress and results of the participatory mechanisms and methods used in selected demonstration projects.  <b>4.5</b> Promote project partnerships (consortia, associations , etc.).  <b>4.6</b> Prepare the Public Participation Program document.</p>	<p>Stakeholders participate responsibly and authorities are receptive to participatory decisions.</p> <p>Participants in the demonstration projects allocate financial resources for project execution.</p> <p>Participants in the demonstration projects undertake the activities assigned to them under the project.</p>
<p><b>Result/ Component 5:</b> <i>Local, national and bi-national level institutional arrangements.</i></p> <p><b>5.1</b> Promote meetings, workshops and seminars between technical and administrative personnel of MINAE and MARENA, research institutions, educational institutions, etc.  <b>5.2</b> Promote joint research studies between universities and other research institutions.  <b>5.3</b> Collect, review and analyse information on current institutional arrangements and their roles in the management of the San Juan River Basin and its allied coastal zone.  <b>5.4</b> Design local, national and bi-national institutional arrangements including inter-institutional co-ordination based on common elements of the resource use and conservation policies in both countries.</p>	<p>Local governments, technical personnel and scientist are interested in developing and sustaining institutional arrangements.</p> <p>Common elements exist in the resource use and conservation policies of both countries.</p>

Activities	Assumptions
<p><b>Result/ Component 6:</b> <i>Capacity building and institutional strengthening.</i></p> <p><b>6.1</b> Within the basin, promote the creation and strengthening of basin-based Sustainable Development Councils and Associations of Councils.</p> <p><b>6.2</b> Analyse the progress and results of selected demonstration projects on capacity building and institutional strengthening.</p> <p><b>6.3</b> Formulate a program for institutional strengthening including these components: a) programme for capacity building, b) programme for infrastructure, c) programme to equip the institutions, and d) programme to increase revenues for these institutions.</p>	<p>Participants of demonstration projects allocate the financial resources to execute the project.</p> <p>Participants of demonstration projects undertake their assigned activities under the SAP.</p>
<p><b>Result/ Component 7:</b> <i>Education and Training for the Conservation and Sustainable Use of Natural Resources.</i></p> <p><b>7.1</b> Identify stakeholders (beneficiaries and providers of the programme).</p> <p><b>7.2</b> Review of existing programmes and materials .</p> <p><b>7.3</b> Prepare, organise and present workshop, seminar and technical meeting.</p> <p><b>7.4</b> Survey of beneficiaries (level of education, cultural behaviours, etc.).</p> <p><b>7.5</b> Analyse the progress and results of selected demonstration projects on environmental education.</p> <p><b>7.6</b> Formulate a Programme for Environmental Education and Training for the Conservation and Sustainable Use of Natural Resources.</p>	<p>Stakeholders are willing to participate and authorities are receptive to participatory decisions.</p> <p>Participants of demonstration projects allocate the financial resources to execute the project.</p> <p>Participants of demonstration projects undertake their assigned activities under the project.</p>

## ANNEX C

### TECHNICAL REVIEW

#### **"Formulation of a Strategic Action for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin and its Coastal Zone"**

Review carried out by:

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February 25, 2000.

#### **General Comments and Overview**

1. The proposal is well organized, seems well reasoned, and provides a logical basis for the steps that are proposed. The proposal tends to be highly narrative and offers a normative rather than quantitative analysis and suffers from a lack of data and detail on a variety of issues. This, however, probably reflects the absence of data rather than the omission of pertinent data in which case the proposal should not be faulted for lack of detailed analysis. The TDA and associated root cause assessment is well organized and, while one can find fault in some details, provides compelling reasons for the main components recommended in the proposal. There are some problems with certain technical issues that are outlined below and which can be dealt with during the implementation phase.

2. The most critical issues that are currently deficient in the proposal are:

2a. Although the development of the SAP (Component #1) is a major activity and second largest budget item, there are no details provided about how this will be carried out. As noted below (2b), there are also no details on the linkage between this component and the other components of the proposed workplan.

2b. The proposal contains two different types of activities -- one is the development of the SAP, and the second is a number of pilot/demonstration projects and activities. Although the Project Brief states (Paragraph 13) that the SAP formulation includes all the other project components, the linkages are not clear, especially as much of the information required from the other components will not be available until near the close of the project. In particular:

- (i) What is the linkage between the development of the SAP and the data that will be gathered under the "information system" component which, presumably, will not be complete until the SAP has been formulated? One might well ask why the information system component should not wait until the SAP is completed and the data needs are more critically appraised as part of the SAP development process;
- (ii) What is the explanation for the choice of actions contained within project components relative to the development of the SAP?

2c. Of the many problems identified in the TDA and summarized in the Project Brief and Workplan, there is no indication of how the particular activities that are proposed, were selected and other obviously important activities (noted in the TDA and/or derived from the Root Cause analysis) were excluded (see paragraphs 8, 9 & 10 for example). One cannot argue with the 5+3 general categories of problems, however the rationale for particular choices within many of these categories is not clear. Paragraph 40 of the Project Brief is not instructive in this regard. In the absence of a clear selection strategy, one has the impression that the proposal contains something for everyone as a way of accommodating the large number of stakeholder concerns. This raises certain concerns with respect to the distribution of budget and whether the amounts allocated are sufficient to deal credibly with each issue.

2d. A critical issue in the Root Cause analysis appears to be policy and institutional failure. There seems to be little assurance, however, that the two governments intend to deal with this beyond some specific local/regional initiatives that are contemplated in the proposal. This goes to the heart of sustainability concerns and it is the experience of this reviewer that unless this is addressed at a senior level, many of the initiatives contemplated in the proposal will die at the end of the project. Possibly this problem is addressed in the covering letters of the two Governments. Certainly it is not dealt with in Components 5 or 6 of the Workplan.

2e. Given that one focus is on the coastal component of the project area, there is very little analysis or comment on the problems that are very specific to this area (e.g. Workplan Item 2e). It is also difficult to see the justification for Workplan item 7c when the TDA mainly comments on a fisheries problem. There is nothing else in the TDA or proposal that would seem to justify 7c.

2f. The priority that is given to the development of an information system should be re-expressed to indicate, from the outset, that the main expenditures are for the collection of critical data and information, and not on the technical development of an information system. It is troubling that the "Rational and Objectives" of the Project Brief refers (paragraph 13) to the "basin-wide information system". This raises several immediate problems:

2f.1 The reader infers from the wording of the text that technical development is a major thrust. There are many Environmental Information Systems (EIS) that are easily adaptable for the purposes described, and there is no need to "build" a new system. There is a need for technical adaptation of such systems. Certain technical aspects of this initiative are commented upon below.

2f.2 It is not clear at all how the seven components of the information system initiative are compatible within a single basin-wide system. This can likely be clarified during project inception however the problem needs to be clearly flagged at the review stage.

2f.3 There is no indication of how such a system will be accessible to stakeholders. There is no recognition of the technical issues such as data exchange and communications, distributed systems, etc. that will have to be resolved to make such a system(s) work well.

2f.4 The budget for the SRJB Information System (Table 1, Annex H) contains no amount for technical modification, data exchange/transfer/communication, software/hardware acquisition, capacity building in systems development and support, etc. that will be essential if such a system is to become useful. It is noted (Workplan, Table 1) that it is proposed to hold ten GIS workshops, however, this seems both excessive and misdirected in terms of modern EIS systems

configurations and applications.

2f.5 Given the comments above (2f.2), it is not clear how the system will be developed. Clearly, a GIS-based system is not useful for several of the components, and indeed, is not especially useful at all if the system will be required to form the basis of a DSS (decision-support) system for, for example, the analysis of policy options for basin development.

It should be noted that "information systems" have been failures in many development assistance projects with which this reviewer is familiar because of unreasonable expectations, are science/data/technology-driven and not purpose-driven, use of unsustainable EIS (environmental information system) technologies, and an unreasonable focus on GIS as the principal technology for the system.

2g. Developing countries are typically characterized as "data-poor" environments; no amount of data collection will resolve this to the level of being able to develop western-style data-driven management plans. Therefore, the proposal needs to acknowledge this problem and address how the SAP will be developed and, by extension, how future management decisions will be made, in the absence of comprehensive databases. There a number of ways of dealing with this, and depending on the issue, ranging from best management practices to use of domain knowledge-base decision-support systems. This is also critical in the development of the SAP so that the stated objectives are realistic, achievable, and technically defensible.

### **Scientific and Technical Issues**

3. The principal scientific part of the proposal deals with the development of the information system. Insofar as the system itself is concerned, there are many (including public domain) EIS (Environmental Information Systems) systems available. One infers (as noted above) that the technical construction of such a system is one focus of the proposal (using GIS). The proposal should make it clear that technical construction (in contrast to implementation) is not an issue. The criteria for such a system should be low cost, short learning curve, non-proprietary and open-architecture, object-oriented, PC platform, and using public domain software. GIS should be considered only as one tool for such a system and, generally, should not be considered as the principal tool, for a variety of technical and practical reasons. In fact, and given the comments in paragraph 4, there is probably a need for several different types of information systems.

4. Of the seven items noted in the Workplan as comprising the SJRB Information System, it is unclear, technically, how a number of these can be easily incorporated into a single information system.

5. The proposal for water and sediment monitoring requires technical clarification during the inception of the GEF project. There is not enough information in the current proposal to justify, for example, the number of monitoring stations that are proposed, which seems excessive for practical management purposes and decision-making. Scientific and management needs for information are quite different and need to be recognized at the inception stage.

6. Also in the context of monitoring, there is no information on methodologies to be used, quality assurance protocols that will be followed, or of the technical and institutional capabilities of the organizations to be involved in this component. There is no recognition of alternative and more cost-effective ways of collecting information on, for example, erosion and sedimentation. This is critical in view of the high variability in time and space of erosion and sedimentation that cannot be captured in the

three year period assigned to this activity using standard monitoring protocols. For the purpose of the SAP and, indeed, for longer programs of monitoring, there are a variety of alternative and more cost-effective approaches than the type of monitoring (especially for sediments and water quality) that is referred to in the proposal. Again, these can be assessed during the inception phase.

7. The absence of management information for Lake Nicaragua seems critical, yet the proponents do not make clear how this will be remedied except by a large (probably excessive) number of sampling stations and a line item in the budget. Important issues such as carrying capacity of the lake, determination of internal loadings (especially of phosphorus), and development of point and non-point source loadings scenarios would seem to be essential but are not acknowledged in the proposal nor would such aspects be included in the activities identified in the line items in the Workplan budget.

### **Other Issues**

8. An apparent omission in the context of public health and environment that would seem to be very important in the context of this proposal is the problem of supplying data on drinking water quality to small communities. The monitoring component does not deal with this, yet it is well known that developing countries generally can not operate effective public health monitoring programs from centralized agencies. There are a number of interesting initiatives in community- based monitoring that might be considered.

9. Given the central importance within the TDA of land and environmental degradation from agricultural practices (and as derived from the Root Cause analysis), the omission of a demonstration educational component that focuses on agricultural best practices is most curious.

10. In view of the statements in the TDA, the absence of a component that incorporates plans for groundwater protection is notable.

11. Certain actions such as promoting legal and economic reforms, micro-lending and other similar actions that will lead to improved institutional performance, to economic gains with the basin, and to long-term sustainability of the project may not be possible within this project, but should be acknowledged so that the reader is assured that such activities have been purposely omitted.

12. Sustainability of the program is difficult to define *a priori*. Factors that will ensure sustainability will have to be developed over the life of this GEF project. In particular, steps will be required to safeguard against continued policy and institutional failure as noted above.

13. The proposal does not identify global benefits. The regional benefits of such a project are, however, quite clear and there can be no doubt of the need for such a project in Central America. Global benefits, in addition to environmental considerations, also include peace and security issues and alleviation of poverty. I see no drawbacks to the proposal.

14. A benefit that is linked to replicability that has not been considered is that, apart from benefits within the San Juan basin, there seems to be no mechanism for transferring the experience gained in this project to other parts of Latin America which have similar problems. The GEF should consider some amount, incremental the requested budget, to use this project as a hemispheric demonstration project in that it contains most (but not all!) of the rural development issues and associated environmental impacts that are experienced in large parts of Latin America.

15. The project is intimately linked to other core activities of the GEF, especially biodiversity. These linkages are quite explicit and are re-enforced through many of the co-financing mechanisms.

16. The proposal has taken great advantage of the many local and ODA initiatives in the San Juan basin area.

17. Stakeholder involvement in the preparation of the proposal seems to have been very substantial. One downside to this will be the management of expectations of stakeholders once the program is underway.

18. An aspect that is not included in the proposal is a communication component so that the public is kept informed of the program as it unfolds.

19. The proposal asserts that appropriate performance indicators are built into the plan although no details are provided.

## **RESPONSE TO THE STAP REVIEWER'S COMMENTS.**

This review is fairly composed and reflects some of the issues facing each GEF International Waters Project that seeks to prepare and present a Strategic Action Program (SAP). Foremost amongst these issues is the issue of balance: the extent to which the program include practical, “hands-on”-type demonstration projects versus the extent to which the program should seek to identify and refine strategic issues. As Dr. Ongley points out, this results in a project comprised of two different types of activities.

The first of these activities is the preparation of the SAP, which is not only the ultimate outcome of this project, but the document that will subsequently guide implementation of a watershed management program. While the need for, and emphasis of, the SAP is to a large extent determined by the research that was undertaken during the program development phase of the project (the PDF-B activities), the content and final thrust of the SAP can only be determined as the end result of this phase of the project. That is to say, the outcome of the SAP cannot be predetermined at this time. That said, however, the program development activities did highlight certain areas where strategic actions can be presupposed and in response to which certain types of actions can be anticipated. For this reason, demonstration projects, the second type of activity that is designed to explore the feasibility and costs of these anticipated actions, have been included in the SAP formulation project. Previous experience in this area suggests that these projects can provide adequate information for use in formulating the SAP even if their full value is only realized subsequent to the completion of the SAP document.

The following comments address specific points raised by Dr. Ongley.

### **General Comments and Overview**

2a. Component 1, Formulation of the SAP is the activity which articulates all the other components. The two Technical Units, located in MINAE and MARENA, under the technical coordination of the two technical coordinators contracted by the SG/OAS, the direction of the two national directors, and the supervision of the GS/OAS and UNEP, will be responsible for assembling the results of the activities to be carried out under components 2 through 7, and prepare a strategic action program (SAP) to implement specific management measures within the San Juan River Basin following the completion of this project. Dr. Ongley's concern has been addressed specifically in paragraphs 21 in the text of the Project Brief.

2b.(i) The linkage between the formulation of the SAP (Component 1) and the information to be gathered under Component 2 is created in two ways; namely, (1) the collection (and sharing between basin countries) of information necessary to quantify, assess, and address priority transboundary problems and issues of concern, and (2) GEF programming requirements that limit GEF participation in operating monitoring systems. In respect to the former, the PDF-B activities identified specific and serious gaps in the availability of information (comprised both scientific data and institutional capacity including human capacity to collect, analyze and interpret such data) necessary to formulate a SAP. Acquisition of these data is vital to the successful preparation of an effective SAP. Creation of the institutional and human capacities to obtain and use these data, as Dr. Ongley has noted, is critical to the long-term success of the GEF-funded program. However, equally important is the fact that the GEF intends to be catalytic, ultimately weaning international funding from problems best addressed at the regional level. Thus, to satisfy the former need, the GEF can support the creation and initiation of a data gathering system, it cannot support the ongoing operation of such a system beyond the point necessary to provide the necessary data for SAP formulation. In this regard, it is perfectly proper for the initiation of such a data or information system to parallel the SAP formulation to the extent that it provides knowledge necessary to formulate the SAP; thereafter, the ongoing operation of this system can legitimately be a recommendation within the SAP. Paragraph 23 of the project Brief has been altered accordingly.

2b.(ii) The choice of actions is designed to provide the necessary information for SAP formulation and to complement existing information assembled and analyzed during the PDF-B phase. For this reason, because of the uneven treatment of information gathered and analyzed during the PDF-B phase, some suggestion of uneven treatment during the SAP formulation program might be anticipated.

2c. As explained in section 2 of the TDA, the perceived present and emerging problems were grouped into 8 categories. These 8 categories, therefore, attempt to simplify a very complex causal chain by which various physical and biotic elements, institutional and policy issues, and social and economic factors interact with each other. As a result of the analysis, it was observed that the first five categories can explain the main perceived problems and their root causes. Thus the reason to present first the 8 categories is to preserve, during the analysis, the perception that stakeholders who participated in the PDF have of the environmental issues in the SJRB. Section 2 of the TDA provides additional explanation of how the categories were defined and later on selected.

The inputs of the organizations and individuals referred to in paragraph 52 were evaluated by the PDF-B project team to create a short list of proposals that were consistent with GEF criteria. This short-list was further refined after reviewing proposals relative to the informational needs identified during the PDF-B program. The remaining proposals were then reviewed to eliminate duplications of effort, and synthesized into a program of work that addressed informational needs identified in the PDF-B project reports, taking into account the abilities of proposed project participants to adequately meet budgetary, personnel and institutional commitments. In the view of the project team, based upon local conditions and specific knowledge of the proposed project participants, the budget and work program reflects an achievable and balanced approach to providing information for the formulation of an SAP for the San Juan River Basin. Issues apparently neglected during this process reflect issues that are of purely local or country-level concern, issues that are better addressed as part of other environmental management programs, or issues that can best be addressed in subsequent interventions that will follow publication of the SAP.

Paragraph 7 of the project brief has been altered in an attempt to address Dr Ongley's concern.

2d. Dr. Ongley sagely identifies a critical issue facing the San Juan River Basin, namely the issue of conflict of access and use of resources in the basin. It is the experience of the PDF-B project team that local level initiatives can form a model upon which country level initiatives can be built over time hence the adoption of a "bottom-up" approach in many of the project activities. The risk that these local level initiatives are not adopted at the country level is the principal risk facing this project, and has been identified as such in the risks and sustainability discussion as well as in the Logical Framework Annex B.

2e. At the time the SAP formulation project was being prepared, two issues relating to the coastal zone became apparent; namely, (1) that there was a paucity of information on the coastal zone, with the available knowledge being primarily on coastal marine fisheries, and (2) that at least some of the known impacts were the function of human activities well upstream of the coastal zone within the San Juan River Basin that impacted the fishery. Chief amongst these latter was the issue of sedimentation that not only diminished the usability of river but also degraded coastal habitat and was likely to contribute to the reported fisheries problems. In this instance, resolving the coastal zone problems is best achieved by addressing sediment losses in the upstream watershed.

2f.1 The basin countries have operating geographic information systems (GIS) that currently provide subwatershed-level topographic information to decision-makers at the local government level. These systems have the capacity to facilitate the dissemination of additional knowledge concerning the San Juan

River and its resources, and to service a user community that transcends national boundaries. The objective of this Component is to build on existing inadequate infrastructure, and to encourage technical cooperation at the national level, by contributing and disseminating information among stakeholders. Transboundary cooperation will be enhanced by shared data acquisition and exchange through linkage of existing national activities. In accord with GEF program requirements, it is intended that this system address informational deficiencies identified in the TDA and form the nucleus for a more comprehensive system of exchanging information between agencies and organizations in the basin. As it was never the intent to “build” a new information system, paragraph 23 of the Project Brief has been altered accordingly.

2f.2 Given that the nature of the information varies in scale from site specific data on, *inter alia*, water flows and coastal sediment discharges, to regional environmental hazard risk assessments and sub-regional management of environmental protected areas, incorporating all of these elements into a single emphasis on information may appear ambitious. As noted by Dr. Ongley, a critical pre-requisite for determining priority remedial actions and evaluating the effectiveness of interventions is an adequate data and information system. It should be noted that the information needs have been identified during the PDF-B phase. Likewise, it should be noted that all of the seven elements of this Component have a geographic context that lends itself to being incorporated into an information system as a discrete information layer. Beyond providing a context for the acquisition of specific information needed in formulating the SAP, the future elaboration of an information system is to be determined as part of the SAP process.

2f.3 Because the proposed system of exchanging technical information between basin countries is based upon established systems that are mutually compatible, technical issues are not anticipated to result in problems during the SAP formulation period. It is anticipated that the future development of this system to include additional user groups will occur during implementation of the SAP. Nevertheless, the total number of workshops has been reduced and funds re-allocated to strengthen the infrastructure per se.

2f.4 As noted above, the proposed information system is based upon existing infrastructure. The potential for local units of government and other groups of stakeholders to access data and information through a network currently exists. The focus of the proposed workshops will be to enhance the abilities of these and other user groups to access and share information on a watershed basis. Part of this ability is a function of demonstrating to local officials and other users the ability of a GIS-based system to provide relevant information in a timely fashion; hence, the workshop approach. Annex H with the detailed workprogramme has been altered accordingly. (See activity h) in component 2 – figure 1 and table 1)

2f.5 While not all information can be presented graphically or located geographically so that it can be mapped within the context of a GIS system, the ability of such a system to contain tags or linkages to other types of data, including numeric data and/or textual materials (meta-data) is well known. GIS-based systems, such as the U.S. Environmental Protection Agency’s BASINS system, are increasingly being used as points of entry to decision support programs. For this reason, the GIS-based approach was determined to be a reasonable point of departure for developing a binational, watershed-based view of the San Juan River system and its resources. Not only does the GIS format provide a flexible tool for capturing and sharing information, but it also has an element of familiarity to agency-based users in the San Juan River Basin that makes it an acceptable mechanism to encourage basin-scale river management.

2g. The Transboundary Diagnostic Analysis (TDA) recognizes that although a considerable amount of information and data are currently available in both countries, this is a little “patchy” and of uneven quality. The land information system in place within Costa Rica and Nicaragua is an efficient and

effective management tool that is currently being used in decision-making at various levels. For example, in Nicaragua, GIS-based maps and related land use information has been provided in atlas form to local governments and international agencies working in the country. The proposed actions to be undertaken as part of the SAP formulation project will add to this current capability and seeks to enhance the capacity of the users to make better use of this system. By building real-time data acquisition capabilities into this existing technology, as can be achieved through the addition of hydrometeorological data layers, an existing system can become more effective in basin management. This is not an attempt to “reinvent the wheel” but rather a considered means of enhancing existing capacities and capabilities within the river basin context.

### **Scientific and Technical Issues**

3. See the above response to comments 2f. 1 to 5. The ultimate vision of the basin information system remains to be articulated as a consequence of the SAP. The proposed SAP formulation project is designed to enhance existing capacities and capabilities within the river basin context, as noted above. It is fully intended that this system mature into a network as a result of implementing what is presently a conceptual strategy that needs be fleshed out during the process of SAP formulation.

4. See response to comment 2b.

5&6. In the context of monitoring, the activities to be conducted during the period of SAP formulation are directed to addressing specific data needs identified in the TDA. Each of the proposed activities included in the SAP formulation project proposal are individually documented in more detail separate from the GEF project document and proposed work program, and were determined by the project team to be technically and financial feasible activities. This assessment was made not only based upon the immediate needs of a SAP formulation project but also upon the ability of the activities to contribute to the long-term management of the basin. Therefore, one consequence will be the placement within the San Juan River Basin of a network of data collection stations is that this network can form the nucleus of a long-term data acquisition system to be operated by the basin countries. One feature of such a system is its ability to accommodate changes in agency mission and societal needs by being flexible in terms of data collected and decisions supported over time.

The limited time frame within which the SAP for the San Juan River Basin is an external constraint imposed by the funding mechanism. Therefore, while a longer-term approach to environmental assessment is often desirable, shorter-term data acquisition and assessment programs are generally the norm. Operation of such programs over at least a three-year period is common practice worldwide and rests upon the theory that a three-year data collection period is likely to encompass at least one “normal” year. Given that the data to be acquired are likely to form the basis for future management actions identified in the SAP, it is essential that “real world” data form a part of the planning process. These data can be supplemented using other techniques, as alluded to by Dr. Ongley, but use of indirect measurement and assessment techniques alone would be inappropriate, especially in light of the extreme variability that is characteristic of inter-tropical hydrologic systems.

To take into account Dr Ongley’s remarks the detailed work programme presented in Annex H of the project Brief has been altered (see para 7 (a)). See also response 2e. above.

7. With regard to the specific situation of Lake Nicaragua, data collection and analysis are provided for in Component 2 and elaborated in the work program to include the acquisition of limnological as well as hydrographical and hydrological data that will form the basis for assessing contaminant loading regimes, etc...

### **Other Issues (Paragraphs 8 to 19)**

Many of the minor issues mentioned by Dr. Ongley have been addressed elsewhere in the response.

Issues such as environmental and public health, agricultural best management practices, and fiscal measures impacting environmental management, while relevant to the strategies to be developed during the course of this program, are areas where the country governments and other international and bilateral programs have specific expertise, or areas where adequate data on potential practices exist, or areas that are outside of the scope of GEF programming. For these reasons, while the project team acknowledges the veracity of Dr. Ongley's comments, specific inclusion of some elements of import to the sustainable management of the resources of the San Juan River Basin are contained within co-financed programs and programs being conducted with associated financing as set forth on the project cover sheet. These linkages are also alluded to, where relevant, in the project descriptions.

The assertion of Dr. Ongley that agricultural best practices have been omitted appears to be an oversight. For example, in component 3, three demonstration projects are included in that area (projects (b), (c) and (d)). Under component 4, project (c) also addresses that concern.

Groundwater contamination has not been identified as a major problem during the Diagnostic Study or the PDF, and is not given a major relevance in the TDA.

**SUPPLEMENTARY REVIEW**

**"Formulation of a Strategic Action for the Integrated Management  
of Water Resources and the Sustainable Development of the  
San Juan River Basin and its Coastal Zone"**

Supplementary Review  
March 07, 2000.

I have reviewed the changes made in the project document, project workplan and related budget, and other relevant annexes, that respond to my technical review of this project. I am able to state that my main concerns have been addressed either by changes in the documents, or have been addressed in the "RESPONSE TO THE STAP REVIEWER'S COMMENTS" of Annex C. I should note that many of my concerns were not based upon a faulty project document, but rather reflect the inevitable page limitations of the document and Annexes which places limitations on the amount of history and explanation that can be brought to the reviewer's attention.

From a technical perspective I believe this project is ready for submission to the GEF.

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