

# Un-edited

UNITED NATIONS ENVIRONMENT PROGRAMME

TERMINAL EVALUATION OF THE PROJECT:  
“FORMULATION OF A STRATEGIC ACTION PROGRAMME  
FOR THE INTEGRATED MANAGEMENT OF WATER  
RESOURCES AND THE SUSTAINABLE DEVELOPMENT OF  
THE SAN JUAN RIVER BASIN AND ITS COASTAL ZONE”  
(GF/1010-01-01)

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## LIST OF ACRONYMS

ACAHN - Área de Conservación Huetar Norte  
 ACG - Área de Conservación de Guanacaste  
 AGESOLCA - Asociación para la Gestión Sostenible de la Laguna de Las Camelias  
 AMURS - Asociación de Municipalidades del Río San Juan  
 APRODEGUA - Asociación de Productores del Cantón Guatuso  
 ASCOMAFOR - Asociación de Co-Manejo Forestal (Co-management Forestry Association)  
 BS – Basic studies  
 CRRH - Central American Committee for Water Resources  
 DP – Demonstration Project  
 FMAM - Fondo para el Medio Ambiente Mundial  
 GEF – Global Environment Facility  
 INETER – Instituto Nicaraguense de Estudios Territoriales (Nicaraguan Institute of Territorial Studies)  
 LAC – Latin American and the Caribbean countries.  
 MINAE - Ministry of Environment and Energy of Costa Rica  
 MARENA – Ministry of Environment and Natural Resources of Nicaragua  
 NGO – Non Governmental Organization  
 OAS - Organization of American States  
 PRODEUSA - Productores Unidos para el Desarrollo (United Producers for Development)  
 PRODOC – Project Document  
 SJRB - San Juan River Basin  
 SAP *Strategic Action Programme*  
 SINAC - National System of Conservation Areas  
 TDA – Transboundary Diagnostic Analyses  
 TU - Technical Unit  
 UDSMA - Unidad de Desarrollo Sostenible y Medio Ambiente de la Organización de Estados Americanos (Unit of Sustainable Development of the Organization of American States)  
 UNEP – United Nations Environment Program

## EXECUTIVE SUMMARY

This document presents the terminal evaluation of the GEF San Juan (GF/1010-01-01) project. The purpose of this project was the preparation of a Strategic Action Programme (SAP) for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin (SJRB) and its Coastal Zone.

The area of the San Juan River basin is approximately 38,500 km<sup>2</sup>. It comprises the territories that drain into Lake Nicaragua, also called Lake Cocibolca, (occupying 8,183 km<sup>2</sup> of the basin) and the San Juan River, plus the coastal areas of Tortuguero and Indio-Maiz. The river, whose southern bank is the political boundary between Costa Rica and Nicaragua, originates in the lake with an average discharge of 460m<sup>3</sup>/sec and flows in a west-east direction towards the Caribbean Sea, reaching about 1,300m<sup>3</sup>/sec at the outlet. Average rainfall in the area ranges from 1,500mm to 5,000mm in the direction northwest to southeast of the basin. About 85% of the water that drains into the lake and the river is contributed by Costa Rican watersheds. This area, which is prone to extreme tropical storm events causing flooding and damage in the lower lying lands, has been subjected to land deterioration and sedimentation caused by erosion as a result of overgrazing and poor agricultural and forestry practices in the medium and high slopes – from sea level to about 3,000m in elevation. The waters of the basin are being contaminated by fertilizers and pesticides, discharge from industries, urban solid waste and sewage discharge. This is affecting the ecological life and the flora and fauna associated with the lake, the river and the receiving maritime area and has become a matter of concern to both countries.

The time allotted for the execution of this project was three years starting in 2001. Subsequently, an extension of one year in project execution was granted to the end of 2004. At the time of this evaluation the SAP was not available in its final form. Hence, this evaluation is restricted to the processes of producing the information that was considered essential for the preparation of the SAP. This evaluation was based on a field visit at the end of October 2004, reports of component and sub-component activities, administrative records and documentation provided by the implementing and executing agencies, including reports of the Project Steering Committee.

The project was to be executed in seven components: one for the actual preparation on the SAP; one dedicated to *basic studies* for information gathering regarding physical, hydrological and eco-biological conditions; and five dedicated to strategically located and designed *demonstration projects*. Components 2 to 7 were to provide the knowledge base upon which the SAP was to be formulated.

With the exception of some activities that were expressly modified or eliminated by the Project Steering Committee, all components have been accomplished with varying degrees of success or effectiveness in the context of the original project objectives. In general, all *basic studies* were well executed and completed. Water quality variables were adequately measured indicating that contamination from agriculture, industry and urban solid waste and sewage are considerable and should be controlled and reduced to preserve the flora and fauna, fishing and tourist values of these ecosystems. Some reports contain measurements of current and previous water flows in the river, sedimentation in the lake and the plume at the maritime outlet, but additional information

on hydrology, soils and land use and the locations and degrees of land deterioration by erosion is still required. The performance of basic studies coordinated by scientific organizations in both countries was promising.

*Demonstration projects* were dedicated to the motivation of public and other stakeholder participation, the strengthening of institutions and institutional arrangements for the success of the project, and education for natural resources conservation. These were probably the most difficult activities and where most of the delays occurred. In general, and this is probably related to the focus of the project document, there was a tendency to dedicate the core of these activities to poor communities, rather than involving “all” stakeholders in these activities. This is an important observation that has to do with the economic sustainability of future actions in the area. With regard to public participation, the ProDoc might have been misinterpreted by the project coordinators as implying that the formation of basin councils should be *within the municipal councils*. Taking into account that “*integrated water resource management*” is an objective, it would have been necessary to design and execute projects focusing on whole watersheds, especially on the Costa Rican side. Nevertheless, there is clear evidence that both countries have shown, on numerous occasions, their will for the continuation of these activities, to sign bi-national agreements and to connect them to national policies and other efforts like the Mesoamerican Biological bi-National Corridor, National System of Conservation Areas and others.

The educational component was executed in a manner consistent with the ProDoc (Annex VIII of ProDoc). This aspect of the project was directed at education in the community rather than setting the grounds for a more specific problem-oriented education on natural resources conservation tied to research and technical assistance to implement solutions.

During 2001, when the project was initiated, there were delays regarding the functioning of the administrative mechanisms and the technical coordination of activities. This was natural considering the need to make arrangements for political and technical organizations of both countries and international donor and executing agencies to work together. By 2002, the project was well under way but this occurred after decisions that significantly changed its structure. This was a US\$5.4 million project, shared 72% by GEF, 17% by both countries, and 11% co-financing from UNEP, OAS and CRRH.

A satisfactory SAP is expected to be completed in the first quarter of 2005. It may well be able to take into account the conclusions and recommendations of this report. Among other things, the command structure, the nature of activities and the budget provisions for both countries should be different as much as there are substantial differences in the physical and socio-economic conditions of the two countries and the nature and practices in each of their sectors of the SJRB. The overall joint endeavour of the two countries is a long-term effort and should be differentiated from supporting projects financed by international donor agencies that are temporary and respond to specific objectives. While there is a bi-national board of authorities involved in each countries activities, project initiatives and on-going projects with international support should be subject to decisions of this board with regard to their political aspects.

## INTRODUCTION AND BACKGROUND

In accordance with UNEP/GEF policy, on completion of the execution of a project and before requesting any further GEF assistance, all GEF projects are subject to an evaluation by external evaluator(s) contracted by UNEP. Accordingly, the GEF San Juan (GF/1010-01-01) project has been subjected to a terminal evaluation that is documented in this report. *The purpose of this document is to report the evaluation of the San Juan project performed during October and November 2004.*

In 1994, the Governments of Costa Rica and Nicaragua requested UNEP and OAS assistance in undertaking a diagnostic study on the state of the San Juan River basin and its coastal zone as part of UNEP EMINWA programme. That study was carried out during 1995-1996 by MINAE (Ministry of Environment and Energy of Costa Rica) and MARENA (Ministry of Environment and Natural Resources of Nicaragua), and published in 1997 as the “*Diagnostic Study of the San Juan River Basin and Guidelines for an Action Plan*”. From October 1998 to September 1999, initial funds provided by GEF through a PDF Block B Grant (US\$ 283,000) helped prepare: (1) a TDA; and (2) a project proposal for improving water resources management of the San Juan River basin and its coastal zone. In December 2000 (FP submitted to May 2000 Council), the GEF approved grant funds to the value of US\$3,929,820 for enhancing and restoring the environmental functioning of the San Juan River basin system (project GF/1010-01-01). This project has been under execution since January 2001 and should terminate in December 2004. The Organization of American States (OAS) has been designated as the agency for the coordination of the execution of the project. MINAE and MARENA are the local executing agencies.

## SCOPE, OBJECTIVE AND METHODOLOGY OF EVALUATION

On the 4<sup>th</sup> and 5<sup>th</sup> of October, 2004, a meeting took place in Brasilia organized by UNEP and supported by the OAS office in Brasilia. The purpose was to establish the terms and schedule for the evaluations of five GEF supported international waters projects in the Latin American and Caribbean region. All these projects have the OAS as the executing agency. The principal evaluator, J.M. Bowers, specified the important aspects and procedures for these evaluations. He emphasized the need to understand the project design and objectives, as laid down in the Project Document (or ProDoc) as a guide to determining whether a project had achieved its objectives. He also stressed the importance of the scientific or technical perspectives on the projects and noted some of the aspects where the evaluators would probably not have to spend a great deal of time. The meeting was also attended by the UNEP LAC project officer from DGEF Nairobi, the OAS representative in Brazil and each of the consultant evaluators. As agreed at this meeting, a field visit was scheduled for the San Juan project between 18<sup>th</sup> - 27<sup>th</sup> of October 2004. The first draft of the evaluation was submitted via Internet by the 26<sup>th</sup> of November 2004. Subsequently, four two-day meetings were held in Brasilia for each project evaluator to review the draft with the principal evaluator. The meeting to discuss the San Juan project was held on the 6<sup>th</sup> and 7<sup>th</sup> of December 2004. The final report was due to be submitted on January 15<sup>th</sup> 2005.

The actual evaluation included a field visit to the area of the project as documented in Annex I, supplemented by the review of selected documents from this



project that are listed in the References section. Comparing this information with the ProDoc enabled the construction of Table I, to facilitate the analysis of activities.

The terms of reference for the evaluation state: “The scope of this evaluation will cover all key activities undertaken in the framework of the project. *The evaluator will compare planned outputs of the project to actual outputs and assess the actual results to determine their contribution to the attainment of the project objectives.* The Evaluation will *diagnose problems if any and suggest necessary corrections and adjustments.* It will evaluate the *efficiency of the project management, including delivery of outputs and activities in terms of quality, quantity, timeliness and cost efficiency.* The evaluation will also determine the likely impact of the projects. The Evaluation will highlight lessons learned and best practices thus far from the implementation of the project that would improve the future work in the basin and assess the appropriateness of these projects in meeting the long-term objectives of the GEF. In this regard, the Evaluation should assess the extent to which (1) sources of environmental stress in the basin have been adequately addressed through project activities, (2) mechanisms for joint management of the basin have been put in place or strengthened through execution of the project, and (3) there has been a change in environmental state as a consequence of the projects intervention.”

## CHARACTERISTICS OF THE SAN JUAN BASIN<sup>1</sup>

The project area includes all the component watersheds of the San Juan River. These watersheds comprise: Lake Nicaragua (also called Lake Cocibolca) and its tributaries; the basin of the San Juan River that flows from the outlet of Lake Nicaragua; and the watersheds of all the downstream tributaries. Although they are independent freshwater catchments of the Caribbean Sea, the watersheds of the Indio and Maíz rivers in Nicaragua and that of the River Tortuguero in Costa Rica are also considered part of the San Juan basin. The total area of this basin is approximately 38,500 km<sup>2</sup> of which 24,500 km<sup>2</sup> (64%), including the 8,183 km<sup>2</sup> area of Lake Nicaragua, lies in Nicaragua and 14,000 km<sup>2</sup> (36%) lies in Costa Rica. By itself, Lake Nicaragua and its tributaries have an area of 23,731 km<sup>2</sup>, of which 11,385 km<sup>2</sup> lies in Nicaragua and 4,163 km<sup>2</sup> in Costa Rica. Discounting the area of the lake, the area of Costa Rica that contributes to the lake is the larger. The San Juan River Basin (SJR) delivers an average 1,300 m<sup>3</sup>/sec of water to the Caribbean Sea of which 85% is derived from Costa Rican watersheds. The catchment is an area subject to tectonic activity and both seasonal and extreme hydrologic events. Accordingly, the lower catchment is subject to frequent flooding. In the Tortuguero and Indio Maiz reserves and in the medium and higher lands of Costa Rica to the east, average annual rainfall increases to about 5,000 mm. With the exception of the northern part of the Lake, average annual rainfall in Nicaragua is not less than 1,500 mm. Temperature and evaporation rates are typical of the tropics with variations largely due to elevation.

## DESCRIPTION OF THE PROJECT

### General Aspects

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<sup>1</sup> Information for this paragraph was obtained from references 2 and 7.a.

This is a project about the planning of another project. It is a project to improve the information needed for the next phase of planning and to develop pilot experiences with selected groups of people – communities and government - to provide practical guidelines to perfect the planning of a longer-term project. The outcome of this project is a *Strategic Action Programme (SAP)*. As such, the project is divided in seven components: *Component 1*, the preparation of the next phase of the project and the completion of the *Strategic Action Programme* that would be prepared based on the results of the other components. *Component 2, the information system*, was referred to “*Basic Studies*”<sup>2</sup> and was subdivided in eight subcomponents: (a) hydrometeorology and water quality; (b) hydrographic survey of Lake Nicaragua; (c) determination of the plume of sedimentation of the coastal area, Nicaragua/Costa Rica; (d) information for sustainable management of critical aquatic habitats; (e) study of the Tortuguero and Indio/Maiz conservation areas; (f) zoning to reduce vulnerability to natural hazards; (g) study of trans-border migration and new settlements; and (h) the creation of an information system. Components 3 to 7 are called “*Demonstration Projects*”. These include: (3a, b, c, d) strategic actions with stakeholder involvement; (4a, b, c, d) public participation; (5) local national and bi-national institutional arrangements; (6a, b) capacity building and institutional strengthening; and (7a, b, c) education and training in conservation and the sustainable use of natural resources.

## Organization for the Formulation and Execution of the Strategic Action Programme

The diagram below shows the organizational arrangements for the planning and execution of the Project. Starting February 2003 (see the minutes of the IV Steering Committee Meeting, ref. 27) the Board of Directors (also called the *Steering Committee*)<sup>3</sup> is chaired by the Vice Ministers of Environment and composed of representatives of the Ministries of Foreign Relations, FMMA, OAS-UDSMA, a representative of each association of mayors and the coordinators of the technical units of each country<sup>4</sup>. After this date a new institutional structure was approved. The National Directors (paid by the governments of Costa Rica and Nicaragua) and Project Coordinators, *national professionals paid with international funds*, are eliminated. An Executive Binational Secretariat was created and integrated by two National Technical Units. They are responsible for the execution of the directives of the Board. The Secretariat was directed and supervised by a Binational Executive Secretary –appointed by the Board. Each unit having a coordinator appointed by the authorities of MARENA and MINAE, for Nicaragua and Costa Rica, respectively. The Binational Executive Council coordinated the directives of the Board within the respective institutions and facilitated direct communications with the Executive Secretariat and the governmental institutions

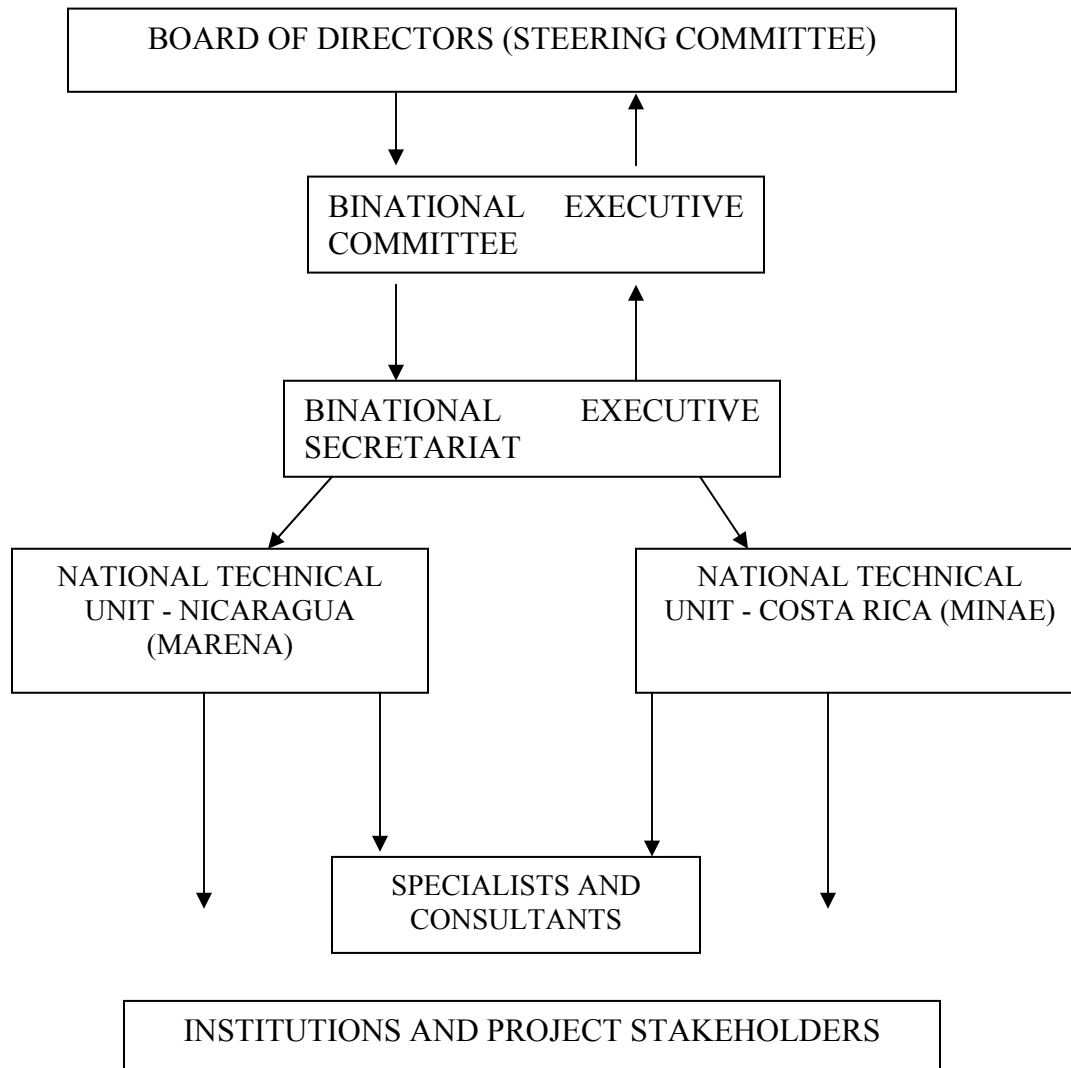
<sup>2</sup> A printed report of the Basic Studies was prepared and published in July 2004 (see Ref. 6)

<sup>3</sup> Before this date the chair-representatives were the ministers themselves. It is the understanding of the author of this document that the Consejo Director, as written in Spanish and translated to English as Board of Directors, in fact is the Steering Committee as it is indicated in the PRODOC –the top decision maker of this project.

<sup>4</sup> As indicated in the ProDoc, up to the time when this evaluation was made, a total of six Steering Committee meetings had taken place.

involved with the SAP. It was composed of the same members of the Board, with exception of FMMA and OAS.

#### ORGANIZATION FOR THE FORMULATION AND EXECUTION OF THE STRATEGIC ACTION PROGRAM



#### PROJECT PERFORMANCE EVALUATION

Motivation for protecting the environment

*The boundary limit between the two countries is the southern bank of the San Juan River. Consequently, all of the surface area and the water of the San Juan River proper lies within Nicaraguan jurisdiction.* Since the beginning of the 19th century, the River San Juan together with Lake Nicaragua has been an important inter-oceanic passage for commerce and human migration. In the northwestern part of Nicaragua, in the provinces of Leon and Chinandega, it has been estimated that there is a potential for irrigating 750,000 ha of land using water from Lake Nicaragua. Important Nicaraguan cities like Managua, Masaya, Leon and Granada are close to the lake and others lie in the surrounding area. The Mayor of Juigalpa<sup>5</sup> expressed interest in using the water of the lake for increased irrigation and for water supplies of cities. Thus, the lake and the river are *vitally important* to Nicaragua and, ultimately, to the population and stakeholders, such as those who run industry and commerce and provide employment for many people. If the development of the basin is conducted in an equitable and sustainable manner, there will be increased interest in financial and resource investment for its protection and management. *This is obviously important and presents considerable opportunity for a country that, for many reasons, such as a previous civil war and natural (hurricane and earthquake) disasters, has a large proportion of its population below the extreme poverty line. Because a major portion of the water inflow to the lake and to the river is derived from Costa Rica, effective management of land use and water resources in Costa Rican watersheds is very important to Nicaragua.*

Costa Rica, on the other hand, is one of the most successful countries of Central America. Average yearly per capita income is around US\$5,000 in contrast to that in Nicaragua of US\$700. The SJRB in Costa Rica is being used extensively for the production of wood, sugarcane and pineapple and as pasture for milk and meat production. Tourism is also a growing industry in the area. There is considerable damage in the form of land erosion due to deforestation and intensive agriculture. However, the need to improve these practices would be motivated more by the need to protect the health and productivity of the land rather than to prevent adverse effects on water resources. The wealth in the SJRB lies predominantly in the higher and medium slopes of the Costa Rican part of the watershed while the poorest communities, comprising small landholders, are in the lower parts of the watershed.

This contrasts with the more common situation where the lowlands or valleys in the lower reaches of a watershed have the most productive agriculture and the major cities and industries (other than mining) and, therefore, the wealth. Invariably, however, the lower-lying areas are the beneficiaries of both water flow and the protection of the upper watersheds. In the case of the San Juan, the population with the least income occupies these lower reaches. It would therefore normally be logical that a financing mechanism for the development and protection of the contributing watersheds would demand a greater contribution from lowland areas. This is not the case in the watersheds of Costa Rica. Nevertheless, protection of the land *per se* should be a good enough reason for the landowners and citizens of the upper watershed to be interested in resource sustainability and therefore effective water resource management. *They should therefore share, via equitable financial contributions, the responsibility for conserving and using best land practices on their own lands and in correcting the deterioration of the low-lying*

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<sup>5</sup> Erwing de Castilla, Mayor of Juigalpa and President of the Association of Municipalities of the San Juan watershed.

*environment. The conservation of the low-lying areas, of small farming and the health of the Lake and River for the purposes of maintaining biodiversity, fishing and tourism is more a matter of concern at both national and international levels. Thus, there exists adequate justification for international initiatives, specifically GEF interventions, in this case.*

## Comparison of planned to actual results

Table I presents the detailed comparative analyses of planned against actual results. It has been prepared having read the documentation listed in the Reference section and, for some of the activities listed and noted in column one, enriched by the experience of having interviewed those responsible for, or directly associated with, project execution, as described in Annex I. *What follows are some highlights of this experience trying to focus on some of the important issues in this planning process.*

In general, it was found that the documentation was abundant. In most instances, poverty was one of the causes of the problems and its reduction one of the solutions. Most cases reported contamination of bodies of water by agrochemicals, sewage from cities and industries and sediment from erosion caused by deforestation and agricultural practices. Most proposed solutions to these problems were basically similar.

### *The Strategic Action Programme*

The draft SAP document presented in September 2004 (Ref. 20) is very extensive and descriptive. It defines most of what needs to be done in the area for the conservation of natural resources and for the reduction of the primary problems in the San Juan River Basin (SJRB). While this lacks the specifications of a project that can be directly implemented, this is not altogether inappropriate because such specifications are intended to be contained in the finalized SAP, due to be completed in early 2005. A Medium Sized GEF Project is to be proposed for activities in 2005-2007 (see Refs. 17 and 18) as an intermediate bridge to the next full GEF project phase. There are results and impacts of the current project, both within the information component and within the so-called “*demonstration projects*”, that have demonstrated, through experience, the possibilities of the two countries<sup>6</sup> working together towards a common purpose. This is a very important and major indirect benefit stemming from several of the project activities as distinct from their direct results and outputs.

*An analysis of the TDA was completed as part of this evaluation with the conclusion that the TDA provides an excellent basis for the development of the strategic Action Programme. Previous work by the OAS played an important role in the development of the TDA. However, there were some limitations related to the information system used in Costa Rica and Nicaragua. Data collection was fraught with difficulties to the point where the process was abandoned and then restarted. As a result, the most important analysis related to hydrology, and water resources and both countries suffered due to limited availability of data.*

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<sup>6</sup> Considering the transboundary problems they are due to differences of wealth that promotes migration from one country to the other and originating conflict.

### *The Basic Studies*

The *information component* was relatively successful in the areas of water quality, biodiversity, fishing conditions and social conditions of communities associated with protected natural environments like the Tortuguero, Barra del Colorado, San Juan del Norte, and Indio Maiz, irrespective of the country involved. They do serve to justify support from both countries for a bilateral effort and from international organizations in respect to the protection of these environments. The reports provide quantitative information on climate, precipitation, water quantity inflows and outflows from the lake and the River San Juan and contributions from tributary watersheds. However, this information is gathered from previous records at stations that have now been discontinued and measurements at two stations that were rehabilitated in the San Juan River. Accordingly, this information only gives an approximate idea of water flows and sediment loads. *Many conclusions could be derived from a system of information that continuously reports the water balances in these bodies of water.* Also, there is lack of integrated information on the watersheds in relation to soils, land use, water use and tenure. There has been inadequate attention to the entire *stakeholder* community and its participation in the analysis of problems within the basin. Such participation is vitally important for the comprehensive analysis and resolution of problems, including the resolution of conflicts among the sectors, and for ensuring the financial resources necessary for sustainable use. Such information would be very useful. In fact, it is indispensable when making plans for integrated management of water bodies and related land resources and for the sustainable development of the area – the objective of this project. It is also very important, in the first instance, to have a sound understanding of the conditions of the basin as a whole for the two countries. The diagnosis made by MINAE-MARENA/OAS in 1997 (Ref. 3) has a technical approach and presents this type of information. It should however be recognized that even though the hydrological data are old and some measurements have now been discontinued, this report attempted to present the available information in the form of graphs, such as precipitation isohyets, water flows, evaporation rates and water temperatures.

### *Stakeholders Involvement*

When considering the so-called “*demonstration project*” activities, those related to actions with *stakeholder* involvement (especially components 3 and 4), have less relevance to the project objectives. These demonstration activities have had a tendency to concentrate on poor community involvement rather than ensuring the involvement of stakeholder representatives from all relevant sectors. The purpose of stakeholder involvement is to “*develop economic mechanisms contributing to the sustainable management of natural resources*”. Self-sustainability is the intention of these components. It is a logical way of eventually finding a path to sustainable management. Stakeholders, including substantial landholders of the largest economic means and potential investors in forest/timber exploitation and modern mining industries, must be convinced that it is in their best interests to participate equitably in the sustainable development of their territory. In order to be motivated, they would have to perceive that

it would be in their own interests. Together with the state, the attainment of those country and bi-national objectives that have to do with the environment, tourism and the maintenance of healthy water bodies, is an achievable possibility. Activity 3.c should also be part of the last component on “*education for natural resources conservation*” because it is part of an educational effort; at the same time it can be an option for many small peasants (the president of the association indicated up to 5,000 peasants) to take advantage of offering their natural and well-conserved environments for special types of tourism. This reflects recognition that such small landholders have little chance of producing enough income for their families from agricultural activities. The experience regarding the protection of the banks of Sarapiquí River (Activity 3.d) is of benefit to landowners but it could have been better designed if it had been part of an integrated approach to the whole watershed, which is probably the largest water-contributing tributary to the San Juan River.

### *Institutional Arrangements*

*Component 5* is understood as all the actions taken to promote the formation of national and bi-national bodies in the political arena, such as the technical and administrative organizations to carry on the SJRB projects in a coordinated manner. In nine years of activities, 19 international, 14 community and 14 private organizations have participated in project activities. It is also understood that there has been considerable progress in these aspects with the participation of both Ministries of Foreign Affairs and with MARENA and MINAE coordinating more than 221 institutions and organizations directly involved in the execution of these activities. These included representation of 97 federal government organizations, 29 NGOs, 22 private companies, 20 local governments and municipalities and 8 press and media organizations. This process required the signature of 24 memorandum and 12 letters of understanding and 4 agreements (Ref. 17, p. 6). Such large numbers of organizations involved raises the question: “*How is the Project supervised and monitored?*”

### *The formation of Basin Councils*

*Component 6* had the purpose of forming basin councils. No basin councils have been formed. Instead, the project has directed efforts towards strengthening municipal coordination. It appears that there were no clear proposals of what to expect and how to design and create basin councils. As in other countries, there are frequently conflicts in the creation of bodies for the management of areas having natural boundaries that are based on cooperation among organizations created in a politically-defined context.

### *Education and Training*

*Component 7* comprises education and training for the conservation of natural resources. This is a very relevant component to the objectives of the project. The results are useful but limited. If integrated water management is the objective, one of the basic problems is improper land use (also referred to as conflict of use) with respect to the land use potential, and also, lack of correct land use practices. This problem is addressed in most activities. Part of the solution is the formulation and implementation of

conservation programs. Land use planning is applied by the allocation (proposed) of uses compatible with the natural conditions of the land (considering soils, topography and climate) and market possibilities in case of productive uses. Technically proposed plans based on specific studies should be suggested to landowners and promoted via credit or subsidies depending on conservation policies for particular individual conditions. Conservation programs require legislation and strong central government support coordinated with local government. This needs to cover the conduct of basic natural resource studies, research into alternative uses, measures of productivity and the definition of conservation practices. It also needs to ensure adequate technical assistance to those willing to participate in such programs. By participating in such programmes, land users and citizens in general become more sensitive to the beauty of the environment and the need to protect it while using land resources to the best of their abilities. It is then, also, an educational program with greater possibility of success.

### Problems Experienced During Project Execution

The project intended to start in January 2001 but suffered difficulties at the beginning. These difficulties resulted in delays in the initiation of some sub-project activities from six to twelve months<sup>7</sup> and a few to late 2004. The project was originally intended to be completed in December 2003 but was subsequently extended by one year (Ref. 24, item 5). Some of the reasons offered included OAS regulations about disbursements and the lack of experience of national and bi-national institutions in working together. Some blamed the complicated structure for the administration and coordination of the project. It was not until mid 2003, after significant changes in the local and bi-national administrative organization of the project, that these problems were resolved (October 17, 2003, Ref. 24).

### Efficiency of Project Management

The line authority for the project derived from the headquarters of the international executing agency (OAS) in Washington, D.C. In Costa Rica and Nicaragua, there were originally Project Coordinators, paid for by OAS, and National Directors, each paid by their own organization, MARENA in Nicaragua and MINAE in Costa Rica. For every expenditure, especially when hiring personnel (considering that numerous consultants have been engaged), the administrative process was cumbersome because it required ultimate approval in Washington, D.C. Occasionally, OAS headquarters required additional information and this resulted in individual cases of requests for approval and/or allocation of funds having to be repeated. This was solved by eliminating the Project Coordinators in each country paid by OAS and hiring a single bi-national coordinator. The bi-national coordinator was in place in an office in San Jose, Costa Rica, by late 2003. The stringency of the line authority procedures for the execution of the project were subsequently relaxed.

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<sup>7</sup> During 2002, the majority of Basic Studies and Demonstrative Projects initiated activities, and many of them started to produce preliminary results which permit the orientation for the preparation of the SAP (IV Steering Committee meeting, Feb 13, 2003, Ref. 23)



It is difficult to judge these situations with regard to the outcomes of the project. It is understandable that in a project such as this, involving several organizations in two countries that have conflicts of national interest in transboundary basin management would have difficulties in getting adjusted to working together. It is true that the project has contributed to having many organizations working together. Nevertheless, the heavy reliance on consultants could have resulted in the project coordinators losing intimate familiarity with the variety of activities in the project and becoming simple non-technical facilitators. Establishing the PROCUENCA offices in San Jose, Costa Rica, may have been a mistake because San Jose is well outside the San Juan River watershed. This was less of an issue in Nicaragua because Managua is close to the watershed. It sends the wrong message that central government is the key to all action. In addition, it involved the inconvenience of requiring a three-hour trip to the area of the SJRB. Also, it was a mistake to have management and administrative decisions subject to approval at such a remote location as Washington, D.C. On the other hand, the idea of appointing OAS paid project coordinators in the two countries could have been sensible if these would have been given delegated authority. However, they could not have been nationals of each of the countries participating in the project. The present arrangement seems to work but it may be that, without the project coordinators in each country and the reduced liaison with Washington, the *technical units* are weaker than before.

The working conditions of the personnel involved also merit consideration. In both countries, the technical units had personnel dependent on their respective organizations, MARENA in Nicaragua and MINAE in Costa Rica. This could have worked well in practice if independence of the project facilitated the fluent functioning of the command structure of the project itself. On the other hand, in this same structure, there were personnel dependent on external resources with no administrative links to their mother national institutions. For the effective functioning of the project, it is important that the contract conditions of these personnel give them the required motivation to acquire ownership of the project not only in terms of salary but of continuity.

In each country, there are different social-economic and physical conditions that require a special and integrated approach. If one examines the different reports of each activity, among them one can find many coincidences, descriptions and recommendations that are similar, denoting some unnecessary duplication of effort. It seems that a more technically dedicated central command for the activities in each country was needed for greater efficiency.

The physical facilities of the project's Technical Unit in both countries were found to be poor. It seems that little attention was given to comfort, office characteristics and proper modern equipment to facilitate communications, technical and administrative work. The spread of responsibilities for the activities of the project gave the feeling that the Technical Unit did not have control of the entire project. Yet, all of this was overcome by the excellent disposition and willingness to cooperate of its personnel.

## Finances and Expenditures

The budgeted contribution of GEF is US\$3,929,820 (73%), countries US\$984,990 (18.5%), OAS US\$175,000 (3.5%) and the cost to CRRH<sup>8</sup> US\$100,000 (1.5%) (Ref. 1). During the 2001-2003 periods, Tables 2 and 3 of this report indicate national counterpart expenditures of US\$588,000 from Nicaragua and US\$545,000 from Costa Rica. In year 2001, in Costa Rica there were no expenses indicated for either BS or DP activities, only the expenses for personnel and administration are indicated for a total of US\$17,000. In Nicaragua, a total of US\$101,000 was spent of which about half corresponds to expenses of the Technical Unit (TU). For years 2002 and 2003, expenditures of both countries have similar trends as regards national counterpart funding indicating that the core of the activities started in 2002. In total, in the three years, 28% was spent for the TU of Nicaragua. Table 3 shows expenses for 2004 for the TU of US\$48,000. Thus, the total contribution of Costa Rica for the three years is US\$497,253. Of this, 12% was spent for personnel and administration of the TU.

For the period 2001-October 2004, Table 4 reports actual expenses allocated from the GEF contribution. The total expenditure is US\$3,304,021. Examining this Table, one can observe for each component a significant variation of the amounts spent relative to those budgeted, indicating that it was difficult to predict actual requirements. Nevertheless, the total did not exceed the amount budgeted. From the standpoint of what was planned, without consideration of timeliness, the international and national counterpart contributions were duly received. One thing that probably deserves noting is the fact that conditions in both countries are different and consequently the budgets appropriate to each would be significantly different. One could speculate that these are causes of the variations in the relationship between budgeted and actual expenditures. Just as an example, Nicaragua has lower salaries so that Nicaragua's national contribution to its TU reflects greater involvement of personnel dedicated to the project. These tables also show that the initiation of activities was delayed by about one year – many activities show no disbursements during 2001.

## CONCLUSIONS

1. The project under evaluation had not yet been concluded at the time of Terminal Evaluation. The SAP was under preparation and expected to be finalized during the first quarter of 2005. Hence, this report, and its conclusions and recommendations, relate to the components and subcomponents that were executed during the period 2001-2004 for the purposes of providing the knowledge base upon which the SAP is being formulated.
2. The SJRB is a bi-national long-term project provided with additional temporary externally funded support in activities and projects, from organizations like GEF, UNEP, UNDP and OAS, with specific objectives such as this GEF project.
3. The project document does not adequately itemize the results and benefits to *both* countries of integrated water resources management. The territories within the SJRB can be differentiated by physical, economic and social conditions. These are different for Costa Rica and Nicaragua. Motivation for the project in each country is different, but common interests can be found in improving the bodies of water and soils and in water and biodiversity conservation, in the SJRB.

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<sup>8</sup> Funds not administered by UNEP corresponding to the contribution of the Central American Committee for Water Resources.

4. The conservation of the low-lying areas, of small farming and the health of the Lake and River for the purposes of maintaining biodiversity, fishing and tourism is more a matter of concern at national and international levels. Thus, there exists adequate justification for international initiatives, specifically GEF interventions, in this case.
5. There are results and impacts of the current project, both within the information component and within the so-called “*demonstration projects*” that have demonstrated, through experience, the possibilities for the two countries to work together towards a common purpose. This is especially true with the scientific community represented by several institutions in both countries. One can also say that this project benefited from other past and ongoing experience in the same field such as the Mesoamerican Biological Corridor, the Marshes and Fire Programs and the SINAC (National System of Conservation Areas). In Steering Committee meetings (six were held up to the time of the evaluation), both countries have indicated a favorable disposition towards the signature of bi-national agreements and the inclusion of the results of this project into national policies.
6. The *information component* was relatively successful in the areas of water quality, biodiversity, fishing and social conditions of communities associated with protected natural environments like the Tortuguero, Barra del Colorado, San Juan del Norte, and Indio Maiz, irrespective of the country involved. They do serve to justify support from both countries for a bilateral effort and from international organizations in respect to the protection of these environments.
7. In general, it was found that documentation was abundant. However, sometimes, different activities reported general descriptions of the context, or problems affecting them, as being the same. In most instances, poverty was one of the fundamental causes of the problems and its reduction one of the solutions. Most cases reported contamination of bodies of water by agrochemicals, sewage from cities and industries and sediments from erosion caused by deforestation and agricultural practices. Most proposed solutions to these problems were basically similar.
8. The reports provide quantitative information on climate, precipitation, water quantity inflows and outflows from Lake Nicaragua and the San Juan River and contributions from tributary watersheds. This information was gathered from previous records from stations that have now been discontinued and two stations in the San Juan River that have been rehabilitated. This information still only gives an approximate idea of water flows and sediment loads. Many conclusions could be derived from a system of information that continuously reports the water balances in these bodies of water.
9. There is lack of integrated information on the watersheds in relation to soils, land use, water use and tenure, and even less on the organizational arrangements needed to improve and update this information. However, previously gathered information, although still subject to the same lack of continuity, has proved very useful and complements the information provided by this project (Refs. 3 and 4).
10. If appropriately supported, the rehabilitated stations and the information gathered in the San Juan River, the lake, the coastal areas of Tortuguero and Indio-Maiz, and tributary watersheds, could motivate the installation of a sustainable information system.
11. There has been inadequate attention to the entire stakeholder community and its participation in the analysis of problems within the basin. Such participation is vitally

important for the comprehensive analysis and resolution of problems, including the resolution of conflicts among the sectors, and for ensuring the financial resources necessary for sustainable use.

12. The experience regarding the protection of the banks of the Sarapiquí River, the largest water-contributing tributary to the San Juan River (Activity 3.d), is of benefit to landowners but it could have been better designed by being part of an integrated approach to the entire watershed.
13. Tourism is one of the important options that could be an incentive for many activities of common interest to both countries. While not neglected, it deserves more intensive treatment.
14. Solely on the Costa Rican side of the basin, there are about 5,000 small peasants in low-lying areas that could benefit from conservation programs that provide technical assistance. This is an activity that seems to be relatively weak for that part of the country. Also, it is an option for many small peasants to take advantage of offering their natural and well-conserved environments for special types of tourism. This reflects recognition that such small landholders have little chance to produce enough income for their families from agricultural activities and, at the same time, it provides an incentive for sustainable and ecologically sound management of their land holdings.
15. In nine years of activities, 19 international, 14 community and 14 private organizations have participated in project activities in the San Juan River basin. Considerable progress has been made in these activities with the participation of both Ministries of Foreign Affairs and with MARENA and MINAE coordinating more than 221 institutions and organizations. The motivation of national authorities to engage in bi-national agreements has been present in all instances and expressed in all Steering Committee meetings (Refs. 24 to 29). The number of organizations that contributed to this project and participated in the public meetings held to motivate the community are a good indicator of commitment that shows promise for the success of future initiatives.
16. No basin councils have been formed. Instead, effort has been directed towards strengthening municipal coordination.
17. Education and training for the conservation of natural resources has been concentrated in poor community sectors and has not been related to conservation programmes and technical assistance for all land users and for urban development.
18. The physical facilities of the project's Technical Unit in both countries were found to be poor. It is true that the project has contributed to having many organizations working together. Nevertheless, the heavy reliance on consultants or other organizations could have resulted in the project coordinators losing intimate familiarity with the variety of activities in the project and becoming simple non-technical facilitators.
19. If we examine the different reports of each activity, among them one can find many coincidences, descriptions and recommendations that are similar denoting unnecessary duplication of effort. It seems that a more technically-dedicated central command for the activities in each country is required for improved efficiency.

20. Establishing the PROCUENCA offices in San Jose, Costa Rica, may have been a mistake because San Jose is well outside the San Juan River watershed. This was less of an issue for Nicaragua because Managua is close to the watershed.
21. In both countries, the technical units had personnel dependent on their respective organizations, MARENA in Nicaragua and MINAE in Costa Rica. This could work well in practice if independence of the project facilitates the fluent functioning of the command structure of the project itself. On the other hand, in this same structure, there were personnel dependent on external resources with no administrative links to their mother national institutions.

## LESSONS LEARNED

These are “lessons learned” as expressed in the draft SAP presented in September 2004 (Ref. 20, item 1.2.2 p.28). The draft SAP was prepared by a team of nine professionals of different complementary disciplines.

1. The complicated bureaucracy regarding the administrative aspects between OAS and the Technical Units was responsible for the long delays in preparing the TDA.
2. In general, the TDA-99 is based on estimates and theory due to the lack of basic studies. It was expensive and does not reflect the specific problems of the watersheds with regard to contaminants;
3. Too much effort was put into trying to formulate the SAP and this was in part due to the lack of knowledge of the FMMA requirements and administrative problems concerning the hiring of consultants without the approval of the responsible institutions of both governments.
4. Ninety percent of the demonstration projects did not provide the expected elements of transference due to a lack of follow up by the executing agencies.
5. Local governments were not involved sufficiently in “demonstration projects” and this limited the necessary follow up.
6. There were long periods of ‘vacuum time’ (up to one year) for each change of government after presidential elections in both countries. This caused a slow process of involvement of new staff members responsible of the institutions in each country.
7. It would be advisable to strengthen the existing environmental organizations, such as the “municipal environmental committees” (CAM), and to include the criteria of watershed management for the sustainable management of natural resources.
8. To design and get consensus with stakeholders, the mechanisms of coordination, planning, monitoring and follow up of all activities so they are performed efficiently and effectively in the area of integrated management of hydraulic resources.
9. To consolidate the existing consulting spaces such as the units of environmental management, municipal environmental committees, watershed committees, local councils for sustainable development, designing operational instruments, with gender consideration, for decision making in the execution activities and conflict resolution.
10. To recognize the municipal development plans as a base to prepare the SAP and in agreement with the national plans.
11. Training of the stakeholders in areas such as legislation, administration and financing, and technical aspects, to insure adequate water resources management.

12. Enlarge the Bi-national Executive Committee with new stakeholders including producers, natives, fishermen, universities, research centers and non governmental organizations.

## RECOMMENDATIONS

1. The objectives of the GEF project should be distinct and separate from the individual national objectives. The range of objectives of GEF interventions should be both limited to major transboundary issues of direct interest to both countries irrespective of whether they are individual priorities in each set of national objectives.
2. *Sustainable integrated water resources management in the San Juan basin should be the overall objective of GEF-supported interventions.* The two countries involved should decide whether this is accomplished as one programme for both countries, or two separate ones for each. The view has been expressed that the international approach funded by the GEF should be the focus of a single program. Clearly, predominantly at the outlet of San Juan River, there are direct mutual interests in the benefits that can be obtained from sound integrated management of the river basin.
3. Taking into account basic differences in the physical, political, institutional and socio-economic conditions, the following immediate actions are recommended:

### I. Information

- a. The establishment or strengthening of the information system for hydro meteorological data, land use, water use and natural resources;
- b. Creation of inventories and classifications of soils and land-uses,
- c. Improvements in land tenure registration and making such information available for a wide range of management applications;
- d. Improved record keeping of residential housing and industrial activities, including mining, agriculture, animal husbandry and forest enterprises and of the stakeholders that have an interest in basin management and the potential for further development;
- e. The preparation of these inventories should be a responsibility of a service such as that indicated in recommendation II.b below in cooperation with universities and other institutions, as has been the practice in the present project. This should constitute a contribution of the central governments and project funds should be devoted to designing them and training personnel in their creation, maintenance and application.

### II. Organization.

- a. The formation of basin councils, having no more than 8 members, is a good concept for representing all basin residents and land and water users, to facilitate decision-making about what actions should be taken in the watersheds and how they are to be financed. Watersheds should be strategically defined in the context of political boundaries and financial capabilities. There would need to be a legislative framework for their establishment and the definition of their functions and authority. They would also have to operate within government constraints regarding water

policy and environmental law and any other similar conditions in the process of executing their authority under central government supervision.

- b. The creation and/or strengthening of technical assistance services to improve support in the areas of hydrology, engineering, environmental management and conservation practices.

As soon as possible there should be a permanent organization of this type (in each country) that will be strengthened by this GEF-UNEP project (and others). These organizations should be the implementing agencies of government support to the watershed organization (s), and in charge of technical assistance, lead in the preparation of inventories of natural resources.

Lack of a permanent organization like these could eventually make a project like GEF-UNEP fade into nothing, as soon as the money is finished. It can be done because the Vice Minister of Environment of Costa Rica said that he could imagine a "permanent" Procuencia office in each country. The Technical Units are adequate for the coordination and management of international support. They are just temporary. When the project has ended they disappear and if there is no permanent office to accumulate the experience (like it is now) it will be like many other projects.

The Watershed organizations are those of the stakeholders (as yet inexistent). Hopefully these organizations, resulting from many others created for specific purposes, like water and sanitation for municipalities, irrigation districts, conservation districts, multipurpose districts and so on, without losing their individual identity and purpose, could join as members in a bi-national organization to work on common problems.

These should raise the funds for investments that are necessary to carry out the plans, and also, manage their respective resources and be subject of the work and support that could be done by those "implementing agencies".

- c. A master plan should be prepared to define the required investment to resolve existing water problems in the basin taking due account of preparations for extreme events. Tourism opportunities should be fully taken into account in such a master plan.
- d. The technical assistance services, among other functions, should promote the organization of conservation districts to allow the design of small watershed conservation areas and to provide a planning framework for farming, conservation and other activities that involve land use. These plans would be used with cooperating landowners to guide technical assistance demands.

### III. Financing.

- a. For the purposes of executing the master plan, there have to be powers for the basin council to create financing mechanisms that will require the payment of equitable yearly contributions by stakeholders. Depending on

the degree to which national objectives are potentially satisfied, the central government should contribute a share of the costs.

- b. There should be a program established by the central government to subsidize, to a certain extent, the execution of conservation plans in district conservation areas.

#### IV. Project Administration and Technical Supervision

For the continuation of GEF supported activities, it is advisable to strengthen the technical units with professional personnel and technical coordinators in each country who represent the international executing agency. These individuals should be experienced professionals from other countries. Particular consideration should be given to streamlining project administrative procedures. The physical facilities of the technical coordination units in the two countries should be considerably improved. In the case of Costa Rica, a component of the coordination unit should be located within the drainage basin.



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1. GEF PROJECT PAPER GF/1010-01-01. *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*. 28 P. In addition, there are 16 Annexes. Only Annex VIII is included in this list.
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4. ADT-1999. *Análisis de Diagnóstico Transfronterizo – CRJ*. Document received from J Bonilla y JJ Castro former UT-CR coordinators. 84p MP. Entiendo que éste es el documento base para la elaboración del PAE. Me parece un buen y detallado análisis. Lo encuentro cualitativo, como Uds. indican, positivamente, por falta de información. Así, se podría mejorar el análisis con base a localización de los problemas en la fisiografía del lugar interactivos con datos de lluvias, caudales, temperaturas, uso de la tierra. No se indican las fechas y datos precisos sobre quienes participaron en la elaboración del documento. He puesto mis observaciones en el Cuadro. Las explicaciones sobre las razones del problema son características de regiones similares. Los principales problemas están en las cuencas. No se indica serios problemas en el río San Juan excepto que es buena fuente de pesca, transporte y turismo. Según mapa hídrico las áreas de Tortuguero, Río Colorado, Indio y Maíz están desconectadas del río San Juan y por tanto de su cuenca. El problema principal está en los aportes al lago Cocibolca por contaminantes, pesticidas y fertilizantes. Encuentro cuestionable el potencial de irrigación en Nicaragua, 760,000ha. Costa Rica aporta al río aproximadamente 2/3 del caudal medio de 1,300m<sup>3</sup>-seg, estimado en la boca del Sarapiquí. No se dimensiona los usos de la tierra aunque dice que el 92% son agricultores de subsistencia y que ocupan sólo con el 6.5% de la superficie, y que el uso de agroquímicos es el principal problema de contaminación –y los pequeños no usan agroquímicos porque no tienen dinero. El problema institucional, políticas e implementación del gobierno, asistencia y educación son claves. No hay datos de caudales ni precipitación. La recolección de basura en la cuenca es del 32%. Se indica que es aporte de sedimentos es de 2 a 8 ton/ha/año lo que no es muy significativo, salvo que provenga de áreas muy reducidas. No se dice cómo se midió.
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     Anexo 7.a. Balance Hídrico del Lago Cocibolca. INETER, 36p.  
     Anexo 7.b. Análisis de sedimentos en suspensión. INETER, 12p.  
     Anexo 7.c. Estudio Básico de Levantamiento Batimétrico de Río Frio, INETER, 3p
8. Basic Study. *Hydro meteorological and Water Quality Monitoring*. Final Report. MINAE-MARENA. 14p.
9. Jaime Valverde Rojas. *Síntesis final de proyectos demostrativos*. Procuenca. Setiembre 2004. 87p. MP. Has a thorough analysis with observations of each activity. Among other observations, questions the limited possibilities of the technical units for follow up.
10. Proyecto Demostrativo. *Restauración de la subcuenca del Río Oyate, Nicaragua. Informe Final*. Carlos Pineda. Presidente de la Asociación de Municipios del Río San Juan. 37p
11. Proyecto Demostrativo. *Ara ambigua and Dipterix panamensis habitat recovery. Final Report, Nicaragua*. Antonio Ruiz Meléndez. FUNDACION DEL RIO. 21p.
12. Proyecto demostrativo. *Educación ambiental en el municipio de San Carlos con énfasis en el manejo de los desechos sólidos*. Sergio Romero Guido.
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16. Proyecto Demostrativo de Participación Pública. Comité de Comanejo. *Conservación y Manejo del Refugio Nacional de Vida Silvestre de Las Camelias*. Informe Final. Sin Fecha. Comment: tiene actividades pendientes en un 20%. No se indica quien supervisó la ejecución de este proyecto. No entregaron informes de supervisión.
17. PNUMA. Fondo para el Medio Ambiente Mundial (FMAM-GEF). *Bases Conceptuales Para Un Proyecto de Porte Medio (PPM), Relativo a Aguas Internacionales*. 28p. MP. En su fundamentación lo encuentro bien escrito. Salvo la importancia de las relaciones entre los países, no está clara la necesidad

de las acciones en conjunto en toda la cuenca. Parece que los principales beneficios están en las cuencas y no necesariamente en el río San Juan. Por tanto, las actividades se justificarían independiente de los acuerdos binacionales - faltando dimensionar adecuadamente los beneficios en el turismo debidos a un buen manejo de las cuencas que redunden en pantanos y estuarios protegidos en su biodiversidad y actividades artesanales productivas. Las actividades indicadas aquí y en la Tabla anterior son genéricas. No se indica quién haría los planes para cada una. Cómo se aprobarían? Cómo sería la supervisión para la ejecución de cada una de las actividades propuestas?

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29. Acta. *Sexta Reunión del Consejo Director*. Edificio de Servicios Generales. Secretaría General de la O.E.A. Washington, D.C. 16 y 17 de Septiembre del 2004

## ANNEX II

### CO-FINANCING

Co financing (Type/Source)	IA own Financing (US\$)		Government (US\$)		EA (US\$)		Other* (CRRH) (US\$)		Total (X) (US\$)		Total Disbursement (y) (US\$)		FINAL TOTAL	
													TOTAL + TOTAL DISBURSEMENT (x+y)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants											3,929,820	3,929,820		
Loans/Concessional (compared to market rate)														
Credits														
Equity investments														
In-kind support	175,000	220,000	984,990	641,890	175,000	275,000	100,000	100,000	1,434,990	1,236,890				
Other (*)														
<b>Totals</b>	<b>175,000</b>	<b>220,000</b>	<b>984,990</b>	<b>641,890</b>	<b>175,000</b>	<b>275,000</b>	<b>100,000</b>	<b>100,000</b>	<b>1,434,990</b>	<b>1,236,890</b>	<b>3,929,820</b>	<b>3,929,820</b>	<b>5,364,810</b>	<b>5,166,710</b>

\* Other is referring to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

\* Missing figures re actual co-financing from Costa Rica - USD641,890 correspond to the actual level of co-financing from Nicaragua alone.

\* Missing OAS actual level of co-financing

## ANNEX II

### FIELD VISIT - ACTIVITIES IN CHRONOLOGICAL ORDER

Monday, October 18<sup>th</sup>.

*Travel from Lima to Costa Rica.* TACA 032 - Arrival in the afternoon. Holyday in Costa Rica. Hotel Parque del Lago, 3star (*Address:* del Museo del Arte Costarricense, 50m al Este [info@parquedellago.com](mailto:info@parquedellago.com) T. (506) 257 8787; F. (506) 223 1617; US\$60/day). *Comment:* The hotel was recommended by Procuenca. It is used by OAS representatives and other visitors to the Project. The hotel is satisfactory for the category.

Tuesday, October 19<sup>th</sup>

*Office of Procuenca, Costa Rica. Address:* Del Yamuni –Sabana-, 100m Sur, Edificio de CNP, Piso 3, San José, Costa Rica. T. (506) 2571839.  
[procuenca\\_sanjuan@racsa.co.cr](mailto:procuenca_sanjuan@racsa.co.cr)

9:00 hours, Zadia Trejos, Head of Technical Unit;

12:00 hours, Magaly Castro T.830 8022, [magcastro@costarricense.cr](mailto:magcastro@costarricense.cr) Tropical Biologist. MINAE, about the basic study: *Study of the coastal and marine resources of the Tortuguero Conservation Area and the Indio-Maíz Reserve.*

16:00 hours, Sandra León. T. 3791227. Information Systems Engineer [Sandra.sb@gmail.com](mailto:Sandra.sb@gmail.com) Administers the WEB page of the project for Costa Rica. [www.procuenca-sanjuan.org](http://www.procuenca-sanjuan.org) Works in compiling documents and maps about the San Juan watershed.

Wednesday, October 20<sup>th</sup>

9:00 hours, Allan Flores, Vice minister of Environment. Together with Ramakrishna, Zayda Trejos and Jorge Rucks. *In the Office of Procuenca, Costa Rica.*

14:00 hours, With Jorge Bonilla, [Jorginho@costarricense.cr](mailto:Jorginho@costarricense.cr), (506) 2224798, Nacional Director up to February, 2003, 5 years; together with Juan José Castro, Agricultural Economist and MSc in Natural Resources, 7 years with the project, Technical Coordinator up to February 2003. [jjcastro@racsa.co.cr](mailto:jjcastro@racsa.co.cr) (506) 2533267, C. 385 2604.

16:00 hours, Luis Sierra, [lsierra@una.ac.cr](mailto:lsierra@una.ac.cr), T. 506 373 4126, 277 3426, Marine Biology Professor, Dean of Faculty, Science, Universidad Nacional de CR, about the basic study: *Information for the sustainable management of critical aquatic habitats.*

19:00 hours, meeting at the hotel with Jorge Rucks, OAS, who was in mission to CR with regard to details about future medium term implementation project.

Thursday, October 21<sup>st</sup>

Travel to Sarapiquí watershed, tributary of San Juan river, to meet personnel of demonstration project: *Restoration and management of the banks of the Sarapiquí and Sucio rivers*.

Friday, October 22<sup>nd</sup>

9:00 hours, visit with Wilberth Rojas, Vice Major of San Carlos Municipality.

10:00 - Travel to Cantón Guatuso to visit with farmer members of *Productores Unidos* Demonstrative Project: *Integrated Project of Peasant Landholdings*. Visit with farmer Julia Gutierrez Gonzalez and Juliana Espinoza, President of APRODEGUA (Asociación de Productores de Guatuso). T. (506) 464 1130, [mayi23@costarricense.cr](mailto:mayi23@costarricense.cr)

Return to San José

Saturday, October 23<sup>rd</sup>

8:00 hours, meeting with Mr Mike Bowers, GEF principal evaluator.

10:00 hours, meeting with Ramakrishna, bi-national director of Procuencia.

Sunday, October 24<sup>th</sup>

11:00 Travel to Managua, Nicaragua. Copa Airlines. Arrival to Hotel Las Mercedes (Best Western) Km11, C. Norte, RD46, Managua, Nicaragua – in front of the airport. T. (505) 263 1011; F. (505) 263 1083; [www.lasmercedes.com.ni](http://www.lasmercedes.com.ni) *Comment: rustic bungalows in a tropical environment, US\$65. Comfortable and good food.*

Monday, October 25<sup>th</sup>

Office of Technical Unit, in the Ministry of Natural Resources (MARENA). Martha Gaithan, Secretary.

8:00 hours, meeting at MARENA with Juan José Romero, Head of Technical Unit in Nicaragua. T. (505) 263 2598; 233 1110. [jjromero@marena.gob.ni](mailto:jjromero@marena.gob.ni)

9:00 hours, meeting with Marvin Valdivia, Proyecto San Jorge. Left for field trip in the afternoon.

10:00 hours, meeting with Sergio Cordero, Recursos Hidricos de INETER, (505) 249 2756 [sergio.cordero@rh.ineter.gob.ni](mailto:sergio.cordero@rh.ineter.gob.ni) about, *Bathymetric Study of Lake Cocibolca (Nicaragua)*.

11:00 hours, meeting with Leonardo Somarriba, Vice Minister of MARENA, T. (505) 263 1343; 263 1968 [nayo@ibw.com.ni](mailto:nayo@ibw.com.ni) ; [lsomarriba@marena.gob.ni](mailto:lsomarriba@marena.gob.ni) *Comment: the meeting was cancelled.*

12:00 hours, travel to San Jorge and Rivas municipalities, watershed of River Oro, about 90km south border of Lake Nicaragua. Together with Juan Jose Romero, and Marvin Valdivia.

14:00 to 17:00 hours, in the Municipality of San Jorge with the Major Lic. Luis Arlen Lopez Alvarez. (505) 453 4611 [alc\\_sanjorge@hotmail.com](mailto:alc_sanjorge@hotmail.com) about the activity: *Students for a clean Oro River*. Field visit to garbage disposal facilities constructed in San Jorge and, to garbage disposal site in Rivas.

Tuesday, October 26<sup>th</sup>

9:00 hours, visit with Ambassador Mauricio Diaz Davila, General Director of Organisms and International Conferences, Ministry of Foreign Relations. Managua, Nicaragua. T. (505) 244 8051, [Mauricio.diaz@cancilleria.gob.ni](mailto:Mauricio.diaz@cancilleria.gob.ni) and with Rosaura Garcia Nuñez, Officer Multilateral Cooperation, T. (505) 244 8032; [rosaura.garcia@cancilleria.gob.ni](mailto:rosaura.garcia@cancilleria.gob.ni)

11:00 hours, in MARENA, visit with Erwing de Castilla, Major of Juigalpa and president of the Association of Municipalities of the San Juan watershed. T. (505) 812 2788; T/F 812 2254. [aljuich@ameri-cable.com.ni](mailto:aljuich@ameri-cable.com.ni)

Table I. WORK PROGRAM COMPARATIVE RESULTS

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
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## ANNEX III

## WORK PROGRAM COMPARATIVE RESULTS

PRODOC: 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	PRODOC: The SAP will create a <i>framework for future action</i> and a <i>timetable of activities</i> 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.	PRODOC: 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.	The SAP is in the process of revision and its final version is expected for the first quarter of 2005.	
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Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
implementation of environmental education activities.				
<b>Project Objective (Ref. 1):</b> 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.	While this evaluation took place, the project staff were working on the final version of the SAP which should be ready by the first quarter of 2005.	The objective is wide. Integrated management of water resources is contained in sustainable development. There is a 1997 Diagnostic Study of the San Juan Watershed and Guidelines for an Action Plan, Ref 3; see Tables 6.1 and 6.2 pp.238-251.	Limit the overall objective of the project to Integrated Management of the Water Resources as a key to the sustainable development of the SJRB. Selected specific objectives could be supported by GEF.
<b>Component1: Formulation of the SAP</b> As stated in the Project Document, Components 2 through 7 will provide the knowledge base upon which the SAP will be formulated.		There is a draft-SAP published in September of 2004 (Ref. 20). The document has 283 pages. See also Ref. 17.	The draft-SAP presented is very comprehensive and may be ambitious for a GEF project but good as guidelines for actions to be taken in both countries including GEF support.	The project could concentrate on water resources: means to administer them for best use and to provide and manage the investments required to control them, in terms of infrastructure, land management, technical assistance, and other activities.
<b>Component 2:</b>	This is a fundamental	The results show that a	In PRODOC: An	Pursue what is stated in

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
<p><b><i>SJRB information system</i></b></p> <p>IN PRODOC (Ref. 1, item 26): Enhance the capabilities of existing infrastructure in the decision-making process at all levels of government, and 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.</p>	<p>component to be able to pursue other objectives, specially considering that this program has to deal with the sustainable use of natural resources where water is the cause and solution of over 70% of the problems.</p>	<p>good coordination has been accomplished within institutions in and between countries. Activities related to quality and biology of water bodies, lake and San Juan river were successful. There is also progress shown in furthering knowledge about natural resources, especially in the Nicaraguan side. Creating and or strengthening a coordinated organization for providing continuous information for the whole watershed is needed.</p>	<p>outcome should have been 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.</p>	<p><b>PRODOC:</b> Cost-effective and sustainable methods for capturing, storing, analyzing and disseminating data from these various activities within the framework of an environmental information system(s). This will include hydrology, soils, land use, erosion and sedimentation of the basin and 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 should include mechanisms for institutionalization after the SAP is completed.</p>
<p>2.a Hydro-meteorological and Water Quality Monitoring.</p> <p>In Annex VIII of PRODOC, (Ref 2, item 7a): To create a reliable body of data on water</p>	<p>Very relevant. For example, knowledge of how much water is delivered to Cocibolca from the different sources and how much is lost by evaporation would lead to knowledge of how much</p>	<p>In written report (Ref 7). Two stations were reestablished. Loma de Gallo at the outlet of the lake, and El Castillo 8km down the river. Sediment sampling showed 190 to 700</p>	<p>Little information on climate trends and the interactions with temperature, Relative Humidity and water demands. Although INETER did make the required studies to</p>	<p>There is plenty of water in the whole watershed. Yet, continuous time series of complete water balances is necessary for the purposes of further understanding and considering proposals about future uses and development</p>

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
<p>quality, flow volumes and rainfall patterns in the SJRB. Includes the lake, river SJ and tributaries. Institutions, training and monitoring. For the formulation of the SAP it is necessary to define basic patterns of water discharge, sediment transport and water quality at key points in Lake Nicaragua and the San Juan River and at other set points on tributaries of the San Juan.</p>	<p>is it attributable to Costa Rica and Nicaragua contributing watersheds. Also, how much of this water flows out and is available for different uses. If an amount of 400m<sup>3</sup>-sec flows out of the lake, in theory about 400,000ha of land could be incorporated to total irrigation, or more, if irrigation is partial. This would not affect the river too much, since more water inflow comes from tributaries below, mostly from Costa Rican watersheds. For this information to be valuable it would have to be continuous in time to show lows and highs.</p>	<p>metric tons-day in Loma de Gallo, and 425 to 1700 in El Castillo. Sampling was not sufficient for yearly estimates of sediment loads. Hydrologic balances of 1970, 1980 and 1990 were used. Flow at same stations varied from 200 to 700 m<sup>3</sup>-sec. In written report, (Ref 6): Information on water quality is there, but no system to get data and to monitor. Most contaminators are industries and large agricultural enterprises: banana, sugar, coffee, milk and citric fruits. Only 32% of population has solid waste treatment. Erosion is reported in previous studies. Lake is contaminated with municipal sewage at unacceptable levels</p>	<p>define water balances for the watershed of the lake (see Ref. 7), there is not enough information to make continuous estimates of hydrologic balances. In previous report of 1997, published by the OAS –Ref. 3, there is more information about these variables. Although it is data about 10 years old or more, water balances could be estimated and some conclusions could be derived. Yet, information is average. Time series are needed. Erosion and sedimentation also needs to be localized and measured on a consistent and continuous basis so good management of urban, agricultural and forest lands get the proper interventions.</p>	<p>of the system – see “relevance”. There is the knowledge in both countries to produce this type of information and continuously monitor hydrometeorology and water quality about the lake and the surrounding watersheds. It seems that the need of doing this in a permanent basis should be emphasized so the organization (s) to do this could be strengthened.</p>

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
		(levels that exceed applicable standards) and agrochemicals from the Costa Rican side.		
2.b Hydrographic survey of Lake Nicaragua and the San Juan River In Annex VIII of PRODOC (Ref 2, item 7b): Bathymetric survey of Lake Nicaragua and the San Juan River and the setting up of four limnological stations on the former and five on the latter. Twenty-one hydrographic charts will be produced and depths readings will be taken in both the lake and the river.	Same as two previous activities. In this case, it was important to know the nature and relative quantities of the sediments coming from the different sources. In this way, the largest sediment contributing watersheds would be identifiable and it would help to justify priority assignments to future actions.	Is available in the published report (Item 6). The bathymetric study around the shore of lake Nicaragua was made. Sediment is deeper close to the outlet -about 3m. An evaluation of sediment deposits at the outlet of Frio river was also made although not included in the plan. No reports found about the installation of limnological stations or the production of hydrographic charts.	The lake is 8,260 km <sup>2</sup> in surface area. There are no studies of contributing watersheds and rivers. No studies are reported of San Juan River.	The SAP should include studies about where, and how much sediment is deposited. Also, the sediment sources and degree of risk or susceptibility to erosion should be identified in order to design and implement practices for effective interventions.
2.c Determination of the plume of sedimentation in the coastal area. CR-NI. In Annex VIII of PRODOC (Ref 2, item 7c): To establish the extent and rate of	This and the next two activities are similar in that they also describe the conditions of the San Juan River, its fauna and the associated communities that live there. This study was specifically dedicated	In printed report (Ref 6). A qualitative report of people, activities of fishermen and communities in Barra del Colorado, CR, and Rio San Juan, NI was presented. It was	This investigation was limited due to turbidity of the water. Some equipment was useless due to this problem. It was mentioned that there are ships that capture lobsters and	A more institutionalized presence is needed in these areas to cooperate and train small fishermen, do research and design and enact regulations to protect the environment.

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
sedimentation from the San Juan Basin in the coastal receiving area and to describe the behavior of coastal currents.	to the sub-task of the sediment plume. <b>It is justified because the plume affects the normal transit of people and fauna.</b>	appreciated that sediment was not the reason affecting reduced capture as it was over-fishing.	fish with larger capacity gear. No investigations of this are reported.	
2.d Information for the sustainable management of critical aquatic habitats. In Annex VIII of PRODOC (Ref 2, item 7d): This project will use research and theses of university students who will study the structure, function, and distribution of critical aquatic habitats and the ways to best manage them and their populations.	These three (c,d,e) activities are complementary and successful in terms of bi-national cooperation among scientific and other institutions. They help in dealing with the transboundary issues of the countries. <b>This activity is justified because it promotes cooperation and research among educational and scientific institutions of both countries.</b>	<b>In printed report (Ref 6).</b> Performed in cooperation UCA-NI. Planned for two years, <b>it had to be completed in one year due to delayed disbursement of funds.</b> It worked: coordinated one report, one method, and sample sites identified together. Trained personnel in both stationary net and trawl fishing. Found that smaller fish in the estuary contribute to yield of larger ones in NI. Sedimentation in lower reaches reduces section of river preventing fish migration. Money was sufficient.	Gained better scientific knowledge for the management of threatened or overexploited species, including <i>Atractosteus tropicus</i> , <i>Joturus pichardi</i> , <i>Centropomus Parallelus</i> , <i>Tarpon Atlanticus</i> and <i>Carcharinus leucas</i> .	The proposal is a plan of research to improve fishing methods and to protect the biodiversity of Tortuguero and Indio-Maiz reserves.

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
2.e Study of the coastal and marine resources of the Tortuguero Conservation Area and the Indio-Maíz Reserve. Bilateral study to be executed by the Tortuguero Conservation Area of SINAC/MINAE of Costa Rica and MARENA of Nicaragua. In Annex VIII of PRODOC, (Ref 2, item 2e): To gauge current conditions and monitor coastal marine species that are being commercially exploited and species being over exploited: Lobsters and Robalo, of most interest.	These three (c,d,e) activities are complementary and successful in terms of bi-national cooperation of institution of scientific nature. They help address the transboundary issues of the countries.	<b>In printed report (Ref 6), Delayed disbursement of funds, required the study to be completed in 8 rather than 18 months as planned.</b> A description of flora and fauna and main threats was made. Results are valuable to improve fishing and means for community. Executors conceded that nothing will succeed without integrated management.	In NI, they worked only in the area of Refugio del Rio San Juan Community of San Juan del Norte where 989 inhabitants add to the pollution of river. There is concern about not being able to continue this activity that, so far, has been an example of successful cooperation.	An important reason for institutionalizing the protection of these areas. Wildlife and biodiversity of marshes and sea.
2.f Zoning to reduce vulnerability to natural hazards.			It was considered that there is sufficient information on this subject prepared by other countries.	
2.g A study of	One of main reasons for	<b>In printed report (Ref. 6)</b>	Based on existent data	

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<b>Component/Activity Objective</b>	<b>Relevance to Project Objectives</b>	<b>Results Impacts</b>	<b>Observations Problems</b>	<b>Recommendations</b>
transborder migration and new settlements. CR-NI, In Annex VIII of PRODOC (Ref 2, Item 7 g): Determine the causes, forms, and extent of current migration between Costa Rica and Nicaragua and toward new settlement outposts and how this influences the use of natural resources in the SJRB.	the interest of both countries in this project.	Data on internal changes in land use and external migration. Land concentration for animal production and migration to cities and services – about 5% of landholders have 40% of the land.	and interviews of selected personnel.	
2.h Information System. In Annex VIII of PRODOC (Ref 2, Item 7h): Strengthen the existing information system to: a) provide comprehensive information for the basin, that is, go from an Information System based on discrete data to a basin-wide information system; and b) develop the mechanisms for	This is part of the system of information which includes other aspects already mentioned and organized to be sustainable.	Recompilation of documentation about the area of the project. Established a WEB page: <a href="http://www.procuencia-sanjuan.org">www.procuencia-sanjuan.org</a>	There is one person dedicated to this activity in the Technical Unit of Costa Rica and one in Nicaragua. They are making progress. Goals are yet to be developed for next phase of the project.	This is a fundamental activity. The objective of this activity would not be accomplished unless the other activities attain a degree of sustainability. This activity could lead the coordination among different institutions so an integrated basin wide sustainable information system is obtained.

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
information sharing and exchange to support decision-making at all levels: local, national and bi-national.				
<p><b>Component 3. Strategic actions with stakeholder involvement.</b></p> <p>IN PRODOC (Ref 1, Item 29): Economic mechanisms contributing to the sustainable management of natural resources and to meeting the demands of the inhabitants for improved living conditions. Also, solutions for the conflicts that can arise over plans and decisions affecting resource use will be specifically identified and developed. The coordination and supervision will be ensured by the Technical Units at MINAE and</p>	<p>One of the most important components. Contributions from the private sector and all sectors are needed for sustainable development of these territories. Ref 4, p.31: 95% of properties have 6.5% of land; about 5% of landowners have 40% of the land (Ref.6).</p>	<p>Ref.9 Most activities were performed as planned with some exceptions which are indicated in final reports.</p>	<p>Just concentrated in poor sectors which mismanage soils and forest and have no economic conditions for sustainability. From consultant (Ref 9): it is essential to dialogue with the private sector of the region (there are large agricultural plantations) which are also responsible for soil and environmental deterioration and the contamination of water sources. We have not seen any structured information of land use, tenure, and investment by sectors to identify stakeholders other than the poor.</p>	<p>Should include strategic actions with representatives of all and major productive sectors. Important to find out the real financial capabilities of the area. After that, design the mechanisms for sustainable (financially) development of the area by which all residents contribute equitably. Pilot activities to be developed should have demonstrative effects for all stake holders.</p>



Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
MARENA.				
3.a Conflict management for the La Virgen hydroelectric project			Not executed, by decision of Steering Committee Meeting No. 3, (Ref 26, June, 2002).	
3.b Fund for the development of agro-forestry activities in Cárdenas Municipality In Annex VIII of PRODOC (Ref.2, Item 8b): Create and test community financing of agro-forestry activities. A revolving fund will be formed for small-scale producers who want to raise indigenous commercial species of trees in deforested areas. An economically viable strategy for the sustainable use of local natural resources will be formulated, with the	It is relevant to the component objective, although it is dedicated to the small producers. To be successful, productive activities must be sustainable. Each group of land users should contribute its corresponding share.	Ref.9 and 13. Started 07.2001- finished 12.2003. 96% of resources were executed. Few credit requests from poor farmers because of concerns about their ability to repay. Established 56 mzs systems “taungya” <sup>9</sup> with participation of 35 producers: banana-fruit trees-forest in five communities. - Banana-fruit trees with live barriers. - Banana-fruit trees with wind breaks. -Crops in corridors. - Fruit trees associated	(Ref 9) Consultant who wrote the analyses says: Lack of experience ofexecuting agency. A better understanding of the purpose of this component was needed. This subcomponent was amended by decision of Steering Committee Meeting No. 3, (Ref 26, June, 2002).	The comparative dimensioning of private sector and their possibilities in participating in the sustainable development of the area should be investigated. This does not exclude the participation of the public sector.

<sup>9</sup> The taungya involves the planting of cash or food crops between newly planted forest seedlings in a reforestation project. Farmers raise crops while the forest trees are still young. After 2-3 years, depending on the tree spacing and tree species, the canopy closes, and light-demanding annual crops can no longer be planted. The culminating vegetation is a pure tree plantation. Farmers then transfer to other open areas to repeat the process. This can be applied by using different reforestation species.

Table I. WORK PROGRAM COMPARATIVE RESULTS

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
purpose of halting the migration of small farmers toward as yet uncultivated lands or into Costa Rica.		with corn. Training and technical assistance activities.		
<p>3.c Sustainable use and rehabilitation of the Río Frío sub-basin. Executed by Asociación de Productores Unidos para el Desarrollo (PRODEUSA) .</p> <p>(a) In Annex VIII of PRODOC (Ref.2, Item 8c): Support the actions to conserve and rehabilitate the basin of the Rio Frio; help reduce poverty. Plans for the management of second-growth forest and the creation of model farms will be drawn up. Also, ways to make these efforts financially sustainable, such as through the payment for environmental services will be identified and three nurseries for native</p>	<p>Ref. 9 It is a watershed of bi national and strategic importance as it delivers its water right in the nascence of river San Juan (Lake Nicaragua). It has a serious problem of deforestation, erosion and sediment transport in the mid sector and upper lands affecting ecosystems of the lower reaches. Besides the population and institutions in general lack environmental education and an integral vision of the problems causing deterioration of quality of life of inhabitants, accelerated loss of scenic beauty and deterioration of water quality for human and animal consumption.</p>	<p>Ref.9 Started 14.3.2002- Finished 11.2003. 100% of resources executed. Reforestation of river banks, success in community education and participation. Reduction of sediments in streams, less contamination by solid waste, public participation including groups of children, adolescents, teachers, and actors of private sector</p>	<p>Ref 9: Support small producers associations. Bad relationship between executor and PROCUECA Technical Unit. Area of the Project is very large. Payment of environmental services is not mentioned.</p>	<p>The private sector must perceive the benefits of private sector financing for better management of the environment. The purpose of reducing deforestation and mismanagement of the land in medium and upper sectors of the watersheds, to reduce erosion and sediment loads, should be emphasized. This task, however, requires a strategy of education tied to financing and technical assistance.</p>

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
species will be created. Indigenous groups and women will take part in this project.				
Small farms Integrated Management. APRODEGUA (Asociación de Productores del Cantón Guatuso). Cantón Guatuso. Creation of model farms, same objectives as above.	Most tourism is for the benefit of agencies outside the area. There are also ecotourism opportunities for small farmers and peasants.	Ref.9 Started 11.3.2002- Finished 15.11.2003 100% of resources executed. Productive appropriate activities of little sample small farmers. Fish ponds, biogas, crops, and fruits. In general it is considered a success.	Association could enlarge to 5,000 farmers. Vision is subsistence looking forward for tourism. Unclear about technical assistance with Ministry of Agriculture.	This is the kind of activity which could be extended for small and subsistence landholdings, but it has to be accompanied by technical and financial assistance.
3.d Restoration and management of the banks of the Sarapiquí and Sucio rivers. In Annex VIII of PRODOC (Ref 2, Item 8d): Appropriate economic mechanisms and incentives will be designed for the payment of an environmental services fee by landowners benefiting from the project.	Ref. 9. It benefits landowners of the river banks which have problems: deforestation, loss of environmental value associated to forest (scenic beauty), soil deterioration, erosion and sedimentation, and flooding. The protection of river margins was considered justified.	Ref.9. Started 8.03.2002- Finished 15.11.2003. 95% of resources were spent; success of coordination with many organizations; project located in lower reaches of low energy river; vision that a plan of integrated management of the watershed is needed. The project was excluded of the area where government would pay	Met in Pueblo Viejo, Centro Agrícola Cantonal. It showed that the activities had little relation with upper area producing sediments. S Juan river floods and water back up has had serious consequences in flooding and transportation by boats. Watershed is 1,923 km <sup>2</sup> , mostly cattle for meat and milk, pasture,	Have to check whether dynamic translation of banks is due to sediment from above. If so, bank stabilization will cause destabilization somewhere else. It would be better if programmed as part of a comprehensive watershed plan.

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
		environmental services. This was recognized as a mistake of design. This among others, originated little motivation of landowners towards the project.	and wood extraction. It is highest water producing watershed.	
<b>Component 4: Public Participation</b> PRODOC (Ref 1, Item 31): 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 complements the activities proposed under Component 3	Probably the most important component – together with component 3. Success is dependent on identifying and motivating stakeholders and giving them an opportunity to participate, including, where necessary, financial contributions. Activities 4.a to 4.d are most relevant if considered to increase public awareness of its responsibility towards water and watershed management.	We have not seen any structured information of land use, tenure, and investment by sectors to identify stakeholders other than the poor. Important to find out the real financial capabilities of the area.	IN PRODOC Ref 1, Item 31: Success is dependent on identifying and motivating stakeholders and giving them an opportunity to participate, including, where necessary, financial contributions. Ref.9 Design does not show consideration of physical variables of the territories object of the activities to be performed.	The best projects are those which articulate soil, forestry and biodiversity conservation with productive and better possibilities of income for the populations. Community management of forest, linked to small farmers associations, leading rural tourism, should also be considered for SAP.
4.a Conservation of Las	The idea was to generate	Ref 9 and 16. Started	Ref 9. Excessive	Second phase of this project

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
<p>Camelias Wildlife Refuge. Coordination of Upala Canton / MINAE, Upala, and the Asociación para la Gestión Sostenible de la Laguna de Las Camelias (AGESOLCA). In Annex VIII of PRODOC (Ref 2, Item 9a): Study a co-management scheme between MINAE/ Arenal-Huetar Norte Conservation Area and the community of Las Camelias Wetlands Wildlife Refuge. An effort will be made to reclaim the basins of the Gaucaliti and Pizotillo rivers by formulating a plan to reduce sedimentation and multiply the economic opportunities and technical skills of the local people in the</p>	<p>experience about sharing the management of this Refuge with the participation of key stakeholders at the local level (MINAE; municipality, and community). Most relevant if considered to increase public awareness of its responsibility towards water and watershed management.</p>	<p>23.03.2002- Finished 15.11.2003 The research and education components were best with universities. Better knowledge of swamp areas. Limited participation component. Progress was accomplished in aspects like a place for the nursing of “tepezcuintles<sup>10</sup>” of 30 units, a study of fish, biophysical diagnosis, delimitation of a pond - 1600has, counting of forestry species, working committee rules, and activities like: solid waste, sewage management, organic crops, fire fighting.</p>	<p>weight of MINAE. “Cultura de hacienda” in members of Association (passive attitude of individuals). The objectives of this activity were not accomplished completely. The organization of the community was weak and also the limited municipal participation failed to produce the expected joint management of the refuge. The excessive weight of MINAE with its own limitations also counteracted possibilities of success.</p>	<p>should enlarge the participation base with other actors, and also provide greater coverage. Upala is one of the poorest areas.</p>

<sup>10</sup> See description in Spanish: [http://www.iucn.org/places/orma/publica\\_gnl/Tras%20la%20huella%20y%20el%20trillo%20del%20tepezcuintle.pdf](http://www.iucn.org/places/orma/publica_gnl/Tras%20la%20huella%20y%20el%20trillo%20del%20tepezcuintle.pdf)

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
productive management of natural resources.				
4.b Community organization and education for the control of fires. Executed in Cantón La Cruz with the cooperation of the Guanacaste Conservation Area (ACG) and MINAE. In Annex VIII of PRODOC (Ref 2, Item 8b): Foster community participation and test new methods to prevent and control forest fires in Costa Rica and then share this experience with Nicaragua.	Most relevant if considered to increase public awareness of its responsibility towards water and watershed management.	Ref. 9. Started 21.01.2003- Finished 11.2003; 69% of resources were spent, Changed direction of ACG and went on. Validated participatory method to prevent and control fire. The area suffered fewer fires than the year before. In coordinated manner activities of environmental education, community awareness, propagation and communication were performed.	Ref. 9. “Cultura de hacienda”. Weak alliances with Health and Education Ministries. MINAE-MARENA only worked in the end.	Ref. 9 Recommended the expansion to other areas in Costa Rica and also to Nicaragua.
4.c Reclamation of the Tepenaguasapa River sub-basin. In Annex VIII of PRODOC (Ref 2, Item 9c): Facilitate and test different schemes for community organization	Most relevant if considered to increase public awareness of its responsibility towards water and watershed management.	Ref. 9. Started 08.2001- Finished 12.2003; 98% of resources executed; generated the tools and methodological instruments for participatory watershed management;	Ref. 9 and 14. San Miguelito marshes are RAMSAR locations. In Nicaragua, the projects with forest component were more successful as they were more comprehensive	Ref. 9 Projects on the control of forest harvesting for sustainability are a must for the future.

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
and management in the area of sub-basin rehabilitation. It will establish a monitoring program, foster alternative land uses and training, and design a reclamation plan.		institutional arrangements were a success; gender considerations were good. 45% women out of 465 participants; monitoring of water quality by students was difficult due to accessibility but excellent as an educational and awareness tool.	since they included fruit trees.	
4.d <i>Ara ambigua</i> <sup>11</sup> and <i>Dipteryx panamensis</i> habitat recovery. Fundación del Rio en NI y ASCOMAFOR (Asociación de Comanejo Forestal) in CR. In Annex VIII of PRODOC (Ref. 2, Item	Ref. 9 and 11. Involves active participation of rural organizations, a requirement to value the success of the Project. The activity is justified as promotion of cultural ecotourism, an alternative activity to obtain financial benefits for the families.	Ref. 9. Started in Costa Rica 6.03.2002 – Finalized 11.2003. Ref. 11. Nicaragua. Started 01 / 08 / 2002 - Finished 31/01/03 75% of resources executed; Research, forest protection and reforestation, income	Ref. 11 Lack of enthusiasm about this activity in general, Budget too low in NI. (spent US\$4,128) Coordination with ASCOMAFOR did not work. Ref. 9 Coordination between Nicaragua and Costa	Ref. 9 and 11 It is important that Procuencia San Juan considers the need to invest in research on flora and fauna in the biological corridors of the Municipality El Castillo, Rio San Juan, to learn about the population dynamics of endangered species. Reclaim more permanent presence of

<sup>11</sup> The great green macaw (*Ara ambigua*) has a limited distribution in the Atlantic wet lowlands of Central America, from Honduras south to northern Colombia, with a small isolated population in Guayaquil, Ecuador. In Costa Rica, this species is currently limited to the Northern Zone, more specifically in the area between the San Carlos, San Juan, and Sarapiquí rivers extending to the northern foothills of the Central Volcanoes Range. It highly depends on the Almendro tree (*Dipteryx panamensis*) both for feeding and nesting substrate. This endangered species, which is listed in Appendix I of CITES, is in serious danger of disappearing from Costa Rica in the near future.

Ref. <http://www.lasuerte.org/conservation.htm>

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
9d): Reclaim and save the gallery forest habitat that is home to the green macaw ( <i>Ara ambigua</i> ), a highly endangered species that nests in the almond trees ( <i>Dipterix panamensis</i> ).		generation and environmental education. Execution with community partners was positive. Rural tourism was a success.	Rica was difficult. ASCOMAFOR has good management capacity but weak administrative capacity.	technical unit assistance. (notice that the origin of problems are deforestation in most areas).
<b>Component 5: Local, national and bi-national level institutional arrangements</b> IN PRODOC (Ref 1, Item 33): Remedy shortcomings in institutions working at the local and national levels, and to encourage enhancement of bi-national coordination between institutions within the SJRB as well as to ensure that the prescribed actions of the SAP are incorporated into national policies.		Through interviews and references 21 to 29, it can be concluded that the relevant authorities of both countries have been very active in finding ways to better coordinate and subscribe to binational agreements.	Just as an example, in the III meeting of the Steering Committee (Ref. 22) the following agreement was reached, in short: .. “to insure the adequate integration of PROCUENCA-SAN JUAN to the policies of relations of both countries, and to advance in a sustained manner towards the formulation of a proposal for the binational management of the San Juan River Basin.”	
<b>Component 6: Capacity building and institutional</b>	The formation of basin councils is an excellent idea towards integrated	Ref. 9. No basin councils were reported.	In general, the competences of municipalities are	A special strategy is required to foster the formation of basin councils. The



Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
<b>strengthening</b> IN PRODOC (Ref 1, Item 35) : This component will foster the formation of basin councils in critical sub-basins and encourage the participation of such councils within the municipal sustainable development councils existing within the SJRB.	management of water resources. IN PRODOC: 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.		limited and, in many instances, can be considered as urban users of water. It seems that, for this component, a clear conceptual framework on what is intended is needed.	competences of basin councils should be specific and not in conflict with those of municipalities. Municipal authorities can support basin councils, but, basin councils <i>per se</i> could have competences and authority over specific powers related to integrated water management. Residents within their boundaries can be members of municipalities and basin councils indistinctively.
6.a Support for local environmental management, CR and NI AMURS (Asociación de Municipalidades del Río San Juan) In Annex VIII of PRODOC (Ref. 2: Item 11a) Develop and test a system that brings municipal authorities and representatives of civil society together.	To have municipal authorities working together could be good. In the case of Nicaragua, by protecting the lake all can be benefited. In the case of CR, those that belong to the same watershed would be benefited	Started 9.2003- Finished 11.2003 Only US\$49,000 executed out of US\$75,000 planned. Counterpart money not accounted. Three months of execution. Should have started 4.2002. Limited results. Municipalities started working together. Environment emphasis is new and positive. Need strengthening.	Ref. 9 All cantons of Costa Rican side formed a Federation of Local Governments. New experience. Delayed in part due to administrative regulations.	Clear proposals of what to expect and how to conform basin councils should be made. Like in other countries there is conceptual conflict about local government like municipalities and basin organizations. Costa Rican side has large watersheds compared to those of Nicaragua. The approach in each could be different; however, basin councils should be organized to solve, administratively and

Table I. WORK PROGRAM COMPARATIVE RESULTS

Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
				financially, defined problems like those of water resources with a legal framework that habitates them.
6.b Reclamation of the Oyate River Sub basin, NI AMURS Technical Team 08.2001-12.2003 In Annex VIII of PRODOC (Ref. 2, Item 11b): Establish a basin committee in the Oyate River sub-basin in order to foster reclamation actions.	The idea of this project is to involve and strengthen the Municipal government. It was to be considered a strategic partner to develop decentralized and participative management oriented towards the protection of the environment.	Ref. 9 and 10. Started 28 08 2001-Finished Jan 31, 2004. 99% of resources executed; Validated method of working together. Participation is aggressive and involved. The experience performed in this activity of natural regeneration increased biodiversity. Activities, like planting of tress, training, conservation and fire protection, etc. were made as planned with normal difficulties.	Interview was general Interested in the use of the lake for future water needs. Ref. 9 and 10. El Morrito were not a satisfactory institutional arrangement. Fund delays. The objective of the activity was partially satisfied but little contribution to the objective of the component due to inadequate planning.	Considering that Nicaragua has smaller watersheds contributing to the basin, it might be good to include for the analyses several small watersheds to conform an economical area. If municipalities have same boundaries as the watershed, this is much better, but, in general, powers for water management could be more specific with competences not in conflict with those of municipalities.
<b>Component 7:</b> <b><i>Education and training in conservation and the sustainable use of natural resources</i></b> IN PRODOC (Ref. 1, Item 37): This component has been	Educational	The design of this component was general without previously defining specific measures to be implemented for the whole basin.	IN PRODOC: Best sustainable production practices will be identified. The information will be disseminated in both countries and knowledge will be	Environmental education is viable tied to technical assistance required for the execution of supported productive and protection plans for activities and landholdings of individuals. It would be better if this

Table I. WORK PROGRAM COMPARATIVE RESULTS

<b>Component/Activity Objective</b>	<b>Relevance to Project Objectives</b>	<b>Results Impacts</b>	<b>Observations Problems</b>	<b>Recommendations</b>
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.			furthered through training for various kinds of local organizations working in the fields of development and environmental conservation.	technical assistance were structured together with research and programs which provide funds to implement policies to promote conservation of natural resources.
7.a Environmental education in the municipality of San Carlos (MARENA delegation in San Carlos, NI) In Annex VIII of PRODOC (Ref. 2, Item 12a): Learning by doing, children, women, and youth, deforestation, pollution, inappropriate use of agrochemicals, sustainable development of biodiversity, the true value of water, and lost economic opportunities.	Educational	Ref. 9 and 12. Started 9.2001-Finished 12.2003 98% of resources executed; activities concentrated in the improvement of the recollection and treatment of solid waste. Education at all levels and actual doing it. Good coordination. The preparation of organic compost and the cultivation of worm as by products were a success. Awareness of the community about the benefits of management of organic and inorganic	Ref. 9. Positive and replicable. Disbursement procedures were not efficient. Some of the structures were not built because of delay in second disbursement.	Environmental education is viable when tied to the technical assistance required for the execution of supported productive and protection plans.

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Component/Activity Objective	Relevance to Project Objectives	Results Impacts	Observations Problems	Recommendations
		waste.		
7.b Environmental education in San Carlos Canton, CR., Co-Executed by the Area de Conservación Huetar Norte (ACAHN), and the Municipality of San Carlos In Annex VIII of PRODOC (Ref. 2, Item 12b): Complementary to (a) Its purpose is to create educational programs showing the unique nature and importance of the basin and its ecosystems and natural resources.	Educational	Ref. 9 18.10.2001-11.2003. 48% executed; all educational and practical activities for soil conservation and environment protection in cities.	Ref.9 Feeling that these were dispersed activities. Disbursement delays. Execution entities not well coordinated. MINAE was not prepared. Poor level of cooperation of Ministry of Education for training of children. Recommended to work with higher income sectors.	Environmental education is viable when tied to the technical assistance required for the execution of supported productive and protection plans.
7.c Students for a clean Oro River, NI. In Annex VIII of PRODOC (Ref. 2, Item 12c): Involving secondary-school students in community-based efforts to clean up the river.	Educational	Ref. 9 and 15. Started 010704-Finished 30/08/04 Observed improvement in the collection of solid waste by giving work to carters. Waste deposited and delivered to a collection centre.	Ref. 15. At the beginning there were members of the municipal board against it. This reports just two months of work. Same type of activities as (a). It is considered a success, in	Support this type of activity promoting grassroots education and awareness of environmental impacts of mismanagement of solid waste and other contaminants of water sources. Look for multipurpose benefits, like in this case, getting benefits out

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<b>Component/Activity Objective</b>	<b>Relevance to Project Objectives</b>	<b>Results Impacts</b>	<b>Observations Problems</b>	<b>Recommendations</b>
		The waste was then separated / treated / composted for the purposes of recycling to the extent possible. Successful in spite of disbursement and other delays due to external reasons.	all aspects: educational for the community, gives jobs to small entrepreneurs, gets to clean the environment and promotes best practice in disposal of solid waste. It is not in the summary report.	of recycling.

<i>Timeliness:</i>	3	Most activities started late but have been meeting deadlines on time with regard to granted extensions.
<i>Achievement of results/objectives</i>	4	At the time of this evaluation, the SAP final report is still under preparation. The deadlines have not been met and timing has been extended two times. Hence, there is no final product to assess. However, considering the difficulties that delayed the execution of the activities in this planning stage and the fact that most of them, although having started late, were completed or close to completion –there was even a draft SAP-, this rating is given with the assurance that the results will allow the preparation of a good SAP and be useful for the execution of the project.
<i>Attainment of outputs:</i>	3	The basic studies were reasonably done. Demonstration projects were marginally satisfactory.
<i>Completion of activities:</i>	3	Some of the activities were finished in a very short time as they started late, some are unfinished.
<i>Project executed within budget:</i>	2	Very Good.
<i>Impact created by the project:</i>	2	There is enthusiasm about the bi national project at the political and technical levels. There is willingness to commit.
<i>Sustainability:</i>	4	Costa Rica and Nicaragua have conditions that will enable them to continue pursuing these objectives. The environment and tourism are their most valuable resources they have to sell. This is recognized in Costa Rica and Nicaragua, especially in the political, professional and business sectors. Although the project has added to this endeavour, at this point it has not motivated the institutionalization that is required to be able to manage the watersheds in a sustainable manner.
<i>Stakeholder participation/Public Involvement</i>	3	The project made more emphasis on activities to benefit the poor. Stakeholder participation should be looking at the possibilities of economic and social sustainability of watershed development including the integrated management of the basin. Thus those who can

		pay or those with potential, individual and juridical persons, in cities and rural areas should be included.
<i>Monitoring &amp; Evaluation:</i>	3	Although, we were told that this was the first formal evaluation of the project. I personally was contacted to participate in the midterm evaluation, but it was never carried out. In fact we have received in Nicaragua and Costa Rica complaints that, although they were requested, there had not been any contacts before this evaluation. Yet, we must recognize that we found lots of useful information not only with regard to the activities but, from summary report documents written by consultants which evaluate and critique the project by components.

The following rating system is applied:

1=Excellent	(90% - 100% achievement)
2=Very Good	(75%-89%)
3=Good	(60%-74%)
4=Satisfactory	(50%-59%)
5=Unsatisfactory	(49% and below)

GEF rating system: Highly satisfactory (80%-100%), Satisfactory (65%-79%), Marginally Satisfactory (50%-64%), Unsatisfactory (49% and below), N/A.

