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AMAZON RIVER BASIN

Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin

INTEGRATED AND SUSTAINABLE MANAGEMENT OF TRANSBOUNDARY WATER RESOURCES IN THE AMAZON RIVER BASIN

COUNTRIES: Bolivia, Brasil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela

IMPLEMENTING AGENCY: United Nations Environment Programme (UNEP)

EXECUTING AGENCY: Organization of American States/ Office for Sustainable Development and Environment (OAS/OSDE)

LOCAL EXECUTING AGENCY: Organization of the Amazon Cooperation Treaty (OTCA)

PROJECT DURATION: 2005-2007 (PDF-B Phase)

GEF GRANT: 0.7 US$ millions

CO-FINANCING: 0.6 US$ millions

UNEP/OAS: 0.15 US$ millions

PROJECT COST: 1.45 US$ millions

INTRODUCTION

The Amazon River Basin occupies the entire central and eastern area of South America, lying to the east of the Andes mountain range and extending from the Guyana Plateau in the north to the Brazilian Plateau in the south. The Basin covers more than 6,100,000 km^2, or 44% of the land area of the South American continent, extending into Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela. The Basin has widely varying climatic and topographic characteristics, with elevations ranging from sea level at the River's mouth, to an altitude of 6,500 m in the Andes.

The Amazon River, which runs for approximately 7,100 km from its source in Peru to the Atlantic Coast of Brazil, is the world's longest, widest, and deepest river. Its discharge of approximately 210,000 m_ per second exceeds the combined discharge of the world's nine next largest rivers. The Amazon River system is divided into 10 subbasins, the largest of which in area are the Negro, Xingú, Madeira, Tapajós, and Juruá subbasins. In terms of discharge, from a hydrological standpoint, an estimated 65% of the Basin's total flows into the Atlantic Ocean comes from the Solimoes and Madeira river sub basins, originating in the Andes and comprising about 60% of the Basin's land area.

Most of the Basin is covered by tropical rainforest, accounting for more than 56% of all broad leaf forests in the world. Its ecosystems are characterized by great biodiversity, with more than 30,000 plant species, nearly 2,000 fish species, 60 reptile species, 35 mammal families, and approximately

1,800 bird species. The Amazon River Basin is also an important source of natural resources for human economic development. It contains some of the world's largest known reserves of bauxite (nearly 15% of the world total), and industries within the Basin are some of the largest suppliers of iron and steel to world markets. Wood and wood byproducts, gold, and tin are other products from the Basin that are increasingly in demand for export.

The population of the Amazon River Basin is estimated at approximately 10 million, mostly concentrated in urban areas along the river and its main tributaries. A high percentage of the total population consists of indigenous communities settled mainly along the banks of the river and belonging, inter alia, to ethno–linguistic groups. In recent decades, there has been an accelerated process of immigration into, and settlement within, the Amazon River Basin. Population growth rates range from 5.2% to 7.2%, well above the national averages for the Amazon countries. These factors, combined with the high levels of poverty, place constant pressure on the region's natural resources, and in particular on residual native forests.

The Andean slopes are subject to severe erosion, with more than 1,000 tons/km^2/year of sediment flowing toward the Atlantic Ocean. Measurements in the upper Madeira River subbasin indicate that, of the 3,200 tons/km^2/year of sediment produced, up to 60% reaches no farther than the Andean foothills, at which point, the sharply reduced longitudinal gradients lower the stream's carrying capacity resulting in internal sediment deposition within the Basin. Overall, the Amazon River transports an average of 600 to 800 million tons of sediment annually, with the majority of the sediment coming from the Solimoes (62%) and Madeira (35%) river sub basins and originating in the Andes.

ENVIRONMENTAL ISSUES AND CONCERNS

The main environmental problems of a transboundary nature affecting the project area can be summarized as:

Anthropogenic pressures, owing to the uncontrolled expansion of human activities which contribute to the destruction of fragile ecosystems.

Deforestation and clearing of plant cover causing soil loss and erosion, reduced biodiversity, and sedimentation in the rivers.

Changes in the hydrologic cycle associated with changes in the global climate and exacerbated by the alteration of the Amazonian forests due to the fires and the droughts.

Water pollution and quality degradation, resulting mainly from the indiscriminate use of agricultural pesticides, control of illicit crops, dumping of solid wastes and inadequate water use and wastewater treatment from populated areas.

THE PROJECT

The goal of this project is to strengthen the institutional framework for planning and executing, in a coordinated and coherent manner, activities for the protection and sustainable management of the land and water resources of the Amazon River Basin in the face of ongoing climatic changes being experienced in the Basin. The proposed project endeavors to realize a shared vision for the sustainable development of the region, based upon the protection and integrated management of transboundary water resources and adaptation to climatic changes. This goal can be stated as seven specific objectives:

1. Make progress toward the integrated management of land and water resources through more effective decision-making by the relevant national institutions, to determine the vulnerability of people and ecosystems to the consequent changes in aquatic and terrestrial ecosystems.
2. Strengthen the shared strategic vision of the Basin as the basis for integrated land and water resource planning and management.
3. Strengthen the technical-institutional structure for the identification of land and water resources at risk of environmental impairment (critical areas or "hot spots") in order to protect and/or rehabilitate these areas.
4. Generate more knowledge about the types and sources of water pollution in the Basin, the means to monitor them, and the mechanisms to attack their root causes.
5. Assess the vulnerability of ecosystems and local communities to climatic variations, particularly those resulting in droughts and floods.
6. Make progress toward the harmonization of the legal framework for the sustainable development and management of the Basin, the development of economic instruments, the

strengthening of technical and institutional capacities, and the promotion of public participation.

7. Strengthen the TCA Secretariat as an effective coordination agency for countries in the Basin in the short-, medium-, and long-terms.

PRIORITY AREAS FOR ACTION

Detailed determination of project components and activities will take place during the project preparation phase, based upon the results of studies to be conducted and the public participation and involvement process. However, based on preliminary consultations and the results of seminars, meetings and workshops held to discuss the conceptual underpinnings of this initiative, the project has been designed around five pillars, or principal components:

I. CONSOLIDATION OF A SHARED VISION FOR THE AMAZON RIVER BASIN AND FORMULATION OF A TRANSBOUNDARY DIAGNOSTIC ANALYSIS (TDA) FOR THE AMAZON RIVER BASIN

This Component will consolidate and disseminate a shared "Vision" for the Amazon River Basin to be developed and agreed by the eight countries of the Basin. Through this Component, governmental institutions responsible for land and water resources management and the environment, academic institutions, private enterprise, nongovernmental organizations (NGOs), and civil society, in general, will develop and share major strategic objectives for the Basin, particularly with respect to transboundary issues requiring coordinated and joint action in areas related to the protection and sustainable use of land and water resources, adaptation to hydrological variability and climate change. The expected results and outputs of this Component include:

A Transboundary Diagnostic Analysis (TDA) of the Amazon River Basin, agreed by the eight countries, with the main environmental issues, their possible root causes, and "hot spots" within the Basin defined and identified at the subbasin level.

An analysis of the political and legal framework governing the development and management of the Amazon River Basin, with an emphasis on reconciling policy conflicts, rationalizing sectoral demands and requirements, and coordinating actions for the sustainable development of the land and water resources of the Basin.

A Framework Strategic Action Program (Framework SAP), agreed by the eight countries, outlining the policy, legal, and institutional reforms needed to address the critical issues within each subbasin as identified in the TDA, to be implemented during subsequent phases of the project.

A consolidated Vision for the sustainable development of the Basin, agreed by the eight countries, with established mechanisms and processes for its promotion and dissemination within the region.

Strategic alliances and agreements established among countries (within the framework of the TCA) and with financing agencies identified and briefed for the execution of priority transboundary activities.

Identified and jointly implemented measures, within identified "hot spots," to combat water pollution and deterioration of water quality, to promote the exchange of knowledge and technologies, and to enhance mechanisms for multinational and inter-institutional cooperation, including the development and/or harmonization of laws, regulations, and operating protocols.

II. INSTITUTIONAL STRENGTHENING AND CAPACITY BUILDING FOR INTEGRATED WATER RESOURCE MANAGEMENT IN THE AMAZON RIVER BASIN

The strengthening of the institutional and technical capacities of Basin-wide, national, and sub-national institutions to implement a shared vision is critical to overcome the current fragmented efforts taking place in the Amazon Basin. This Component seeks to strengthen the technical and managerial capacity of water resource management institutions responsible for the sustainable management of the Basin, to support the regional coordinating role of OTCA, and to strengthen the capacity of Basin institutions to exchange information and experiences on matters pertaining to land use, water resources, climate, and meteorology. Specific efforts will be made to upgrade the existing hydrometeorological stations in the upper, middle, and lower Amazon River Basins, in order to improve, qualitatively as well as quantitatively, the availability of necessary hydrological, physical-chemical, and biological information within the Basin at appropriate spatial and temporal resolutions. The expected results of this Component include:

Strengthened capacity of national water agencies and sub-national institutions to implement the Framework Strategic

Action program and reforms identified during the TDA/SAP formulation process.

Interministerial and intersectoral mechanisms for encouraging the participation and involvement of all relevant ministeries and organizations from civil society in the process of developing the project document, TDA, Framework SAP, and Vision for the Amazon River Basin. Established institutional arrangements for project execution, including the participation of civil society and indigenous groups, with an emphasis on the most vulnerable communities.

Strengthened capacity of the OTCA to coordinate with sectoral ministries, civil society, and stakeholders in general the formulation and implementation of plans and programs for integrated water resource management and sustainable development within the Basin.

An operational hydrological-environmental information and decision support system (DSS) implemented and operating in each country, to support decision-making in the Amazon River Basin, oriented initially toward assisting the Basin countries and their communities in dealing with hydrological variability due to climate change and associated droughts and reduced instream flows.

An operational information system for the exchange of data and experiences among Amazon countries in the fields of land and water resource management, climate, and meteorology, and a Documentation Center for the Amazon River Basin established within the framework of the OTCA and consistent with the standards of IW-LEARN.

A project document, agreed by the countries within the framework of the OTCA, for a second, implementation phase.

III. FORECASTING THE HYDROLOGICAL IMPACT OF CLIMATE VARIATION AND CHANGE AND THE IMPLICATIONS FOR DEVELOPMENT

This Component will build a scientifically-based consensus on climate, within and among the Amazon countries, in the interest of environmentally sustainable development and the prevention of losses due to extreme events in the Basin. Specifically, the objective of this Component will be to strengthen the capacity for forecasting the impacts and consequences of climatic variation (in the short- and medium-terms) and change (in the longer term) on the land and water resources of the Amazon River Basin. Development of this capacity will include obtaining or producing forecasts with respect to: (i) global climate variation and change; (ii) regional climate variation and related phenomena (i.e., ENSO); (iii) climate variation and change in selected areas of the Basin; (iv) hydrological trends in the Basin and its principal sub basins, including its glacial headwaters; (v) trends in the sediment loads and surface discharges of the major rivers of the Basin; and, (vi) extreme hydrological events (droughts and floods). This Component also will aim to consolidate and strengthen the preparation and execution of joint research projects, and promote the exchange of scientific information, knowledge, and experiences among the relevant agencies in the participating countries. This Component will seek to encourage closer contacts between the scientific community and decision-makers, and to strengthen joint research groups on specific priority topics, thereby helping to shape a new generation of scientists resident within the Basin. This Component will complement efforts to acquire and disseminate information of the land and water resources, and climate, of the Basin to all stakeholders and interested persons within the Basin and elsewhere. The anticipated results for this Component include:

New research programs into climatic trends and their effects within the Amazon River Basin conducted by staff in academia and meteorological research institutions within the Basin.

An operational hydroclimatological and soil use forecasting system installed within the Amazon River Basin, providing data for enhanced forecasting and drought/flood modeling capacity at both the Basin and subbasin levels.

An assessment of the vulnerability of specific communities and ecosystems to extreme hydrological events, especially droughts and drought-induced fires, at the subbasin level.

Identified options to assist the most vulnerable communities and identified ecosystems to adapt to extreme hydrological events, initially focused on drought management and response at the subbasin level and in the headwater areas of the Amazon River system.

Defined and agreed strategic actions identified in the Framework SAP for reducing the impacts of development on climate variation and change, through horizontal cooperation and with international support within the Amazon River Basin.

IV. INTEGRATED AND SUSTAINABLE MANAGEMENT OF LAND AND WATER RESOURCES

Whereas Components 1 and 2 specifically target the political-legal and institutional factors contributing to the degradation of land and water resources in the Basin, at the subbasin level, this Component will focus actions on the geographic manifestations of these failures, targeting not only critical environmental issues, but also related socio-economic development problems in selected "hot spots", as identified through the TDA and public participation processes. Specifically, this Component will seek to implement sustainable land-use and conservation measures, promote the rehabilitation of degraded lands and waters, and initiate the adoption of sustainable land-use systems and water management practices in critical and vulnerable communities and ecosystems (i.e., in specific "hot spots"). Priority socio-economic issues like human health, sanitation, and poverty alleviation, as identified at the World Summit on Sustainable Development (WSSD), will also be important aspects of this Component. Expected results and outputs include:

Documented analyses of the principal threats to hydro-biological resources from land-based activities in identified critical areas of the Basin, by subbasin.

Harmonization, strengthening and implementation of environmental zoning and land-use plans for selected at-risk areas.

Sustainable development (income-generating) plans and programs prepared and implemented at the community level.

Dissemination of appropriate technologies for optimal and sustainable use of hydrobiological resources.

Reduced pollution and contamination caused by the indiscriminate use of agricultural pesticides, wastewater from populated areas, mercury in gold mining, and as a result of natural and anthropogenic alteration of soils.

Action plans and community programs developed to improve health and sanitation conditions in selected areas.

Numbers or acres of land subjected to sustainable) management practices, contributing to improved public health, welfare, and economic well-being.

V. PUBLIC PARTICIPATION FOR INTEGRATED MANAGEMENT OF WATER RESOURCES IN THE AMAZON RIVER BASIN

This Component consists of activities for the sharing of experiences and knowledge, the exchange of information, and the participation of civil society and stakeholders in the decision making processes required for project design and implementation, and in general terms, for sustainable land and water resource management and development in the Basin. Three groups of activities are envisioned:

i. The empowerment of participation and involvement by civil society through disseminating information to communities, corporations, organizations, public gatherings, and the media (including radio, television, Internet, print media, newsletters, etc.); through consultations with communities and affected groups, including indigenous populations, NGOs, and the private sector within the Basin; and through the identification and implementation of consultative processes to empower communities and affected groups within the decision-making framework of the Basin and the participating countries.

ii. The generation and dissemination of scientific and technical knowledge on the Basin's water resources, land and water use and management, climatic variation and change, water quality and sediments, aquatic biodiversity and fisheries, and hydrogeology, and the dissemination of information of general interest to the public, scholars at all levels from primary to tertiary, and other entities concerned with the Amazon River Basin.

iii. The execution of pilot demonstration projects replicating best practices, in terms of methodological approaches, results, and recommendations in other representative areas of the Amazon River Basin. The results of these pilot projects will form inputs to the Framework Strategic Action Program to be implemented during the second stage of the project. The selection of pilot demonstration projects will be made in close consultation with the affected local groups during the project preparation phase. Actions are expected to focus on water quality (pollution from mining and "garimpos"), environmental sanitation, potable water supply, sustainable fishing and fish farming, hydrological warning and response systems for droughts and floods, the rehabilitation of impaired areas, and land use

and soil conservation. The main results and outputs of this Component include:

Local implementation teams formed in each subbasin, involving, among others, stakeholders, NGOs, indigenous groups, and the private sector. Teams actively involved in project design and execution.

Periodic consultations through public meetings for feedback to project steering committee.

Documented project ownership and the active involvement of affected communities and groups, participating in the design, execution, and evaluation of the pilot demonstration projects.

Information compiled and synthesized in technical documents on the technical, economic, social, and environmental feasibility of the practices to be implemented during the following phase in the control the principle environmental problems identified.

Hectares of degraded land and water ecosystems rehabilitated, and lands and waters protected from degradation, within the Basin

PARTICIPATION AND SUSTAINABILITY

During the project preparation phase, activities will be designed to ensure greater and more effective participation and involvement by civil society, particularly by stakeholders and indigenous groups, at the level of the principal sub-basins. For each sub-basin, a program of meetings and consultations with civil society will be conducted, involving local authorities, universities, academic and research groups, governmental institutions, NGOs, industry, etc. A series of pilot demonstration projects also will be conducted in each sub-basin to address the issues and areas most representative of the transboundary problems affecting the specific area. In this way, the direct participation and involvement of affected communities in the selection and characterization of priority problems, and in the development of the technical proposals to solve them, will be facilitated. A Public Participation Program and Public Involvement Plan will be developed during the project preparation phase for implementation during subsequent phases of the project.

Sustainability of the project is related to the strengthening of the OTCA and participating national institutions (particularly those concerned with water resource management), the direct involvement and participation of affected communities, the involvement of financing agencies during the initial stages of project execution, and the incorporation of project results in the environmental agendas of each country and each of the economic sectors involved. The participation of the Permanent National Committees of the TCA, as inter-ministerial committees, and the National Executing Agencies, will enhance the sustainability of the project and contribute to the replication of sustainable practices within the Amazon River Basin. The participation and involvement of these agencies, as well as agencies of local government, stakeholder organizations, and other interested groups from within civil society, will ensure that adequate institutional, human, and financial resources are available to implement agreed strategic actions in the Basin.

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