

## **Background Sheet**

### **VENEZUELA**

#### **Caroní River Watershed Management Plan (VE-L1006)**

#### **Tocoma Hydroelectric Project (VE-L1003)**

### **I. BACKGROUND**

- 1.1 For over 40 years, Venezuela has been committed to fostering the development of the southeastern Guayana region of the country. Through the creation of the Venezuelan Corporation for Guayana (CVG), a special, state-owned regional planning and development corporation, the government launched a strategy for integrated regional development through economic diversification in the early 1960s that is still going strong. The driving force behind this strategy, the CVG has managed public and private investment in sectors such as iron and steel, aluminum, forestry, tourism, energy and transportation infrastructure, and now oversees some 13 different enterprises in five states throughout the region. The economic growth of this region has benefited the local population and made a significant contribution to the overall development of Venezuela.
- 1.2 One of the pillars of this strategy has been the development of the hydroelectric potential of the Lower Caroní River to supply energy for national, as well as local consumption. The hydroelectric potential of the Caroní River watershed, mainly restricted to the Lower Caroní area, is estimated to be on the order of 24,229 MW, which is the largest in Venezuela and among the largest of the world. Developing this source of energy to meet projected increases in demand has allowed Venezuela to pursue a balanced energy strategy designed to reduce the country's long-term dependence on fossil fuels.
- 1.3 CVG-EDELCA is the public enterprise responsible for the planning, development and operation of hydroelectric power facilities in the Lower Caroní. Three dams—the Presidente Raúl Leoni (Guri), the Caruachi and the Macagua—are now in operation, and a fourth—Tocoma—is in the final stages of feasibility study and site preparation prior to construction. As of December 2003, the three existing hydroelectric plants generated approximately 72 percent of the electricity consumed in the country. Once completed, the Tocoma Hydroelectric Project would add an estimated 2,160 MW of electric power to the national grid, further increasing Venezuela's supply of energy derived from renewable sources.
- 1.4 The Bank has been involved in the development of the hydroelectric potential of the Lower Caroní River since 1984 when it participated in the financing of the final

stage of the Guri Hydroelectric Project. In addition, in 1993 it participated in the financing of the Caruachi Hydroelectric Project. The Guri Project included: (i) the elevation of the crest of the existing dam to the level 272 m; (ii) construction of four new secondary dams; (iii) construction of a new powerhouse with ten new generators; and (iv) new transmission lines to connect Guri with the national power grid. The total cost of the project was US\$1.8 billion. The Bank loan (US\$350 million) was used to finance specifically the construction of the new transmission lines. The Caruachi Project included: (i) the construction of a main gravity dam, containing an integrated powerhouse and intake structures; (ii) two secondary dams; and (iii) 12 turbines and 12 generators. The total cost of the project was US\$1.55 billion, and the Bank loan was US\$500 million.

- 1.5 The sustainability of this resource has become a high priority for the Government of Venezuela and CVG-EDELCA. The Ministry of Environment and Natural Resources (MARN) and the National Parks Institute (INPARQUES) are involved in improving the management of national parks and monuments in the watershed of the Upper Caroní, controlling the misuse of natural resources due to illegal mining and forestry or unsustainable tourism, and helping to address a variety of issues affecting the indigenous communities of the area. CVG-EDELCA maintains a regular professional staff of environmental and social development specialists who are engaged in water quality and meteorological monitoring activities in the watershed, as well as in a number of social development programs with local indigenous communities. CVG-EDELCA also has supervised the preparation of the Integrated Watershed Management Plan (IWMP) for the Caroní River, which is now under final review by the MARN. The plan resulted from the environmental and social assessment undertaken earlier by CVG-EDELCA as part of the development of the Caruachi Hydroelectric Project, which the IDB helped finance in 1993. The plan is designed to provide an effective framework for the sustainable management of the watershed and the hydrological potential of the Caroní River.

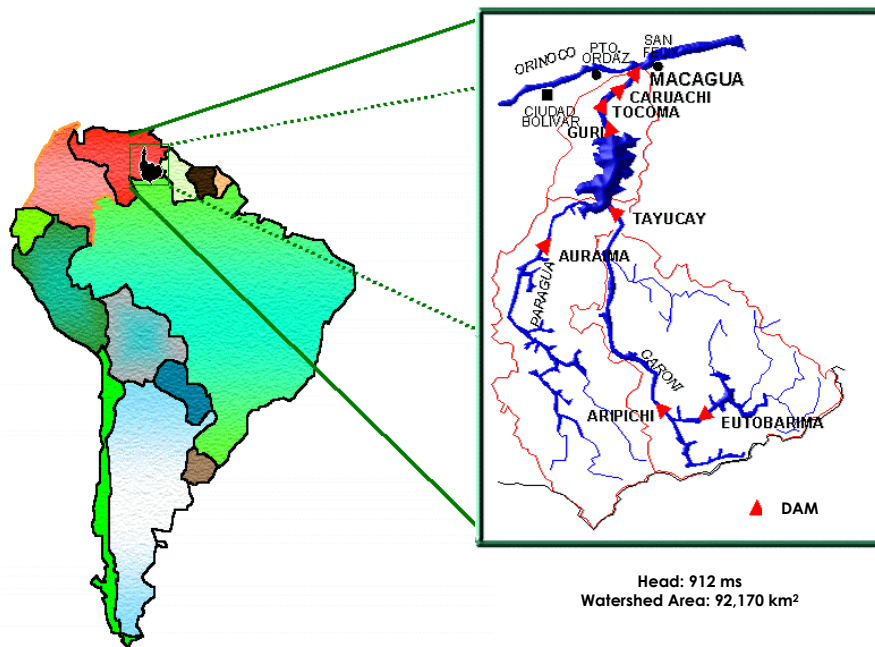
## **II. PROPOSALS FOR IDB LOANS**

- 2.1 Recognizing the vital relationship between the protection and sustainable management of the Caroní River watershed and the long-term viability of the hydroelectric complex on the Lower Caroní, the Government of Venezuela requested two separate but complementary loans from the IDB. The first loan—Sustainable Management of the Caroní River Watershed (VE-L1006)—would be for approximately US\$10 million to finance the initial implementation of the IWMP, and the second—Tocoma Hydroelectric Project (VE-L1003)—would be for approximately US\$750 million to provide financing for the completion of the Tocoma Hydroelectric Project. A brief overview of the characteristics of the Caroní River watershed and the objectives of the IWMP illuminates the close interrelationship between these two proposed operations.

## A. Overview of the Caroní River Watershed

- 2.2 The Caroní River Watershed is located in the central-eastern part of the State of Bolívar. The watershed occupies an area of approximately 92,170 km<sup>2</sup>—about 10 percent of Venezuelan national territory—and extends to the Paracaima Mountains (Serra Paracaima) on the border with Brazil. Its territory is divided among six municipalities: Raúl Leoni, Piar, Gran Sabana, Caroní, Heres and Sifontes. The Caroní River's main tributary is the Paragua River, which runs almost parallel to the Caroní, until joining it at San Pedro de las Bocas. The area from the confluence until the river's final discharge into the Orinoco River is known as Lower Caroní (Bajo Caroní).

**Figure 1**  
**Location of the Caroní River Watershed in Venezuela**



- 2.3 The environmental and social studies conducted for preparation of the IWMP and the installation of the Caruachi Hydroelectric Project have helped develop a substantial technical baseline for the understanding of the region. The watershed environment is characterized by high rainfall reaching 6,000 mm/year in some areas, with an annual mean of 2,900 mm, which is ranked among the highest in the world. Forests cover 67 percent of the watershed with an important portion classified as very humid and in a pristine state. In recognition of their biodiversity, parts of the Paragua Basin are of national interest, and the potential for ecotourism is still to be developed. Some 206 species of mammals, 670 species of birds,

109 species of reptiles, and 102 species of amphibians have been identified in the watershed.

- 2.4 The soils are characterized by low fertility and poor physicochemical conditions and prone to erosion, limiting the agricultural aptitude to only 10 percent of the watershed. The water of the Caroní is rich in humic acids, with pH between 4 and 5, exhibits a dark color and low concentration of sediments and nutrients, typical of oligotrophic waters.
- 2.5 Approximately 86 percent of the watershed is classified as Areas Under Special Administration—*Areas Bajo Regimen de Administración Especial (ABRAE)*—represented by: the Canaima National Park, the Paragua Forest Reserve, the Protection Zone of the southern part of the Bolivar State, National Hydraulic Reserve of Ikabarú, several isolated national monuments, and the Border Security Zone. The main purpose of these ABRAEs is the protection of natural resources and biodiversity in order to ensure the sustainable management of the watershed and the maintenance of the river's hydrological characteristics.

## **B. Socio-cultural environment**

- 2.6 The total population of the watershed is 869,342 inhabitants, of whom 704,167 live in Ciudad Guayana. Santa Elena del Uairen, La Paragua, Ciudad Piar, El Manteco, Guri and Pau de Hierro are the most important smaller communities. The indigenous population represented by the Pemons, the Yekuana and the Kariña, includes 19,650 persons scattered among 300 communities with an average of 100 persons. The Pemon population represents 67 percent of the indigenous population in the watershed.
- 2.7 The economy within the watershed is based on industry associated with steel and aluminum and their derivatives, and the generation of hydroelectric energy resulting in a concentration of urban services and jobs in Ciudad Guayana. The energy generated in the Lower Caroní region is provided to local users and the national electrical energy grid.
- 2.8 The indigenous communities rely on subsistence agriculture, fishing, hunting and gathering of fruits from the forest for their survival. Their agriculture is based on *conucos*, plots cleared by fire for the cultivation of yucca, maize and other crops. Due to the low fertility of the soils, the plots are used only for about three years after which they are exhausted and new areas need to be cleared. This activity is concentrated in the Canaima National Park and affects approximately 2,300 ha. Tourism and mining also are introducing significant changes in the Pemon socio-economic organization.
- 2.9 Two other groups share the area with the Pemons: the *criollos* living in populated centers following a colonial model of settlement, and the miners. The criollos are engaged in agriculture and/or cattle-raising and other economic activities developed around populated centers. There is an important contingent of legal and illegal

miners in the watershed, introducing significant externalities to the environment. Gold and diamond mining is respectively introducing mercury and raising the concentration of sediment of some of the local rivers. Agriculture and cattle-raising is more intensive in the Paragua River Watershed and its expansion implies negative potential impact on the ecology of the area, which is covered by pristine forests, with a large portion characterized by soils deficient in nutrient content and structure.

### **C. The Integrated Watershed Management Plan for the Caroní River (IWMP)**

- 2.10 During the development of the Caruachi Hydroelectric Dam in 1993, CVG-EDELCA conducted a study to evaluate the overall impact of the existing and planned developments in the Caroní River Watershed. The findings of that study led to the decision to develop an Integrated Watershed Management Plan (IWMP) to define the institutional responsibilities, priority actions, and land use plan which would support the development of the hydroelectric potential of the river and ensure sustainable development of the watershed in the future.
- 2.11 Subsequent studies were designed to prepare the plan, with the objective of supporting the sustainable development of this important territory, respecting its characteristics and potentialities, responding to national, sub-national and local policies, strategies and plans for its use, and recognizing the international agreements subscribed by Venezuela which affect it. The specific objectives of the IWMP were threefold: (i) support the sustainable use of the watershed's resources to foster regional and national development, respecting its potential for energy generation; (ii) promote economic activities compatible with the watershed's energy generation capacity and the adequate functioning and operational life of the existing and planned hydroelectric complexes; and (iii) guarantee the conservation of specific areas rich in natural resources, biodiversity, rare and endangered species and recharge areas.
- 2.12 The identification of issues critical for attaining these objectives include the definition and creation of institutional arrangements to manage the watershed and the implementation of the following basic programs: (i) water and soil conservation; (ii) support for indigenous and non-indigenous communities; (iii) revision and improvement of the relevant environmental protection legislation; (iv) environmental education; (v) extension of technical assistance; (vi) research and studies; and (vii) monitoring and enforcement. The timetable to implement these programs is 10-15 years; however, it also takes into consideration the need to act in the short run on issues such as the institutional arrangements for watershed management and certain needed development actions, and in the medium run on the correction of environmental liabilities in critical areas caused by activities such as illegal mining and deforestation in the territory. The study for the IWMP was approved by CVG-EDELCA in December 2003, and submitted for approval to the MARN and the other governmental institutions involved in the management of the watershed.

**D. Sustainable Management of the Caroní River Watershed (VE-L1006)**

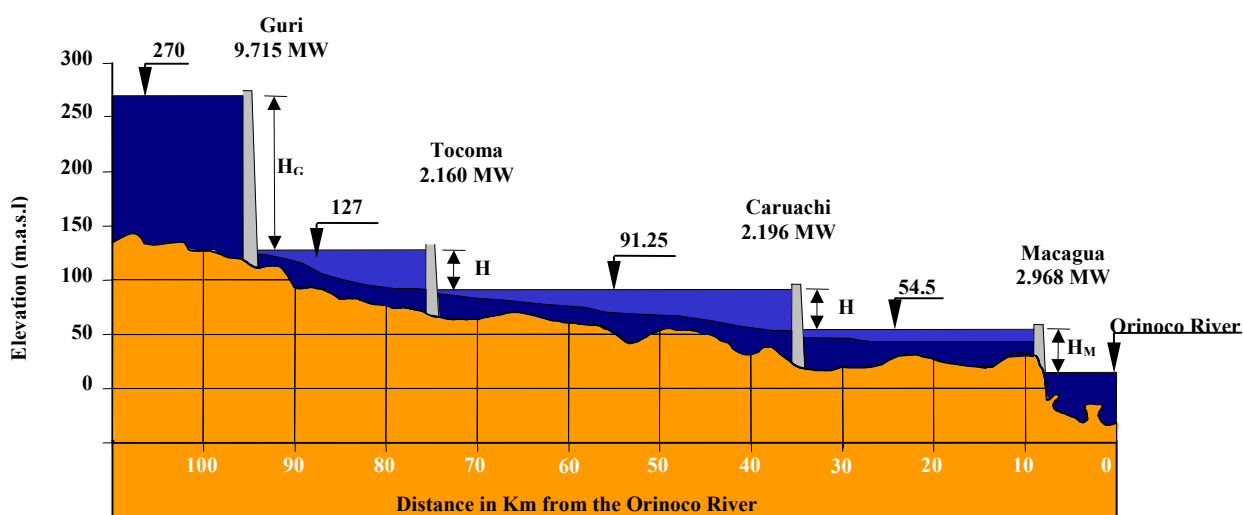
- 2.13 The proposed operation entitled Sustainable Management of the Caroní River Watershed (VE-L1006) would finance the initial implementation phase of the priority activities of the IWMP. The operation would focus on three purposes: (i) provide the means to implement the institutional framework for management of the watershed, defining the roles and responsibilities of the several actors and the means for public consultation; (ii) provide the framework for the insertion of the Tocoma Project and other developments as part of a watershed use planning process; and (iii) support the identification and correction of environmental and socio-cultural liabilities from previous activities, especially those related to the indirect impacts of existing developments within the watershed, including those related to the hydroelectric complex of the Lower Caroní.

**E. Tocoma Hydroelectric Project (VE-L1003)**

- 2.14 The Tocoma Hydroelectric Project will enhance the economic potential of the Guayana region and the energy supply of the country by completing the development of the Lower Caroní Hydroelectric Complex. Located in the northeastern part of the State of Bolívar, the site for the Tocoma Dam lies between the Presidente Raúl Leoni (Guri) and Caruachi dams, upstream from the confluence of the Claro and Caroní (see Figure 2). The site was selected from among three alternatives on the 22 km stretch of the river that were examined for their feasibility in terms of geophysical characteristics, environmental impacts, construction accessibility and cost. The dam's area of influence includes the municipalities of Piar, Caroní, Heres, and Raúl Leoni.
- 2.15 The construction of the dam will bring jobs and economic benefits to the area. The additional electric energy produced will meet demands for local and national economic development, and help diversify the sources of Venezuela's energy supply. The project is expected to enter into operation in the year 2014.
- 2.16 Under Venezuelan law, CVG-EDELCA prepared an Environmental Impact Assessment (EIA) of the proposed Tocoma Hydroelectric Project, which was approved by the MARN in March 2001. The EIA examined alternative locations for the dam, assessed its potential environmental and social impacts on its area of influence and recommended environmental management plans to be pursued during the construction and operation of the project. According to the assessment, the proposed dam is not expected to have a major negative environmental or social impact.
- 2.17 The existence of the Guri reservoir upstream, with its large potential for regulating the flow of the Caroní River, allows the size of the Tocoma reservoir to be considerably smaller than what would otherwise be necessary for a hydroelectric project there to generate the same amount of energy, thereby reducing the potential negative environmental and social impact. In addition, because the area of the Lower Caroní Hydroelectric complex has been under CVG-EDELCA's control for

many years, few people have been allowed to settle there. Accordingly, the estimated need for resettlement does not appear to exceed 40-50 persons. Despite these findings, however, it is imperative that the IDB thoroughly examine the assumptions and analysis underlying the EIA as part of the Bank's "due diligence" responsibilities for the proposed Tocoma Project.

**Figure 2**  
**Profile of the Lower Caroní River Showing the Existing and Planned Dams**



### III. IDB "DUE DILIGENCE" ACTIVITIES

- 3.1 Following initial orientation missions in late 2003, the IDB will launch a thorough analysis of the feasibility of financing the two projects in February of 2004. While the projects are financially separate, their fundamental sustainability is intimately interrelated. With this in mind, the Bank will focus its environmental and social "due diligence" on both projects at once, and will conduct public consultations with stakeholders concerned with issues related to both the management of the watershed and the development of the hydroelectric project.
- 3.2 For the Tocoma Hydroelectric Project, the Bank's environmental and social "due diligence" analysis will focus on evaluating the original EIA for the project in order to determine whether it complies with the Bank's policies and requirements for projects of this type. This will involve examining the adequacy of the EIA's treatment of labor safety and health issues, programs for resettlement, community support, water-quality control plans for mitigating impacts and supervising compliance during construction and operation, and contingency plans for

emergencies and natural disasters. The findings of these analyses will shape the Bank's environmental and social strategy for the development of the loan operation.

- 3.3 For the Integrated Watershed Management Plan for the Caroní River, the “due diligence” study will examine: (i) the underlying technical quality of the proposed plan; (ii) the adequacy of baseline information; (iii) the diagnosis of social, economic and environmental problems; (iv) if issues relative to the indigenous communities were adequately taken into account; and (v) the feasibility of the institutional mechanisms recommended for the implementation of the plan. A strategic environmental assessment of the impacts of the plan will be prepared and program recommendations made for the Bank's proposed Project Concept Document and the associated environmental and social strategy for the development of the operation.

**A. Public Consultation**

- 3.4 As part of the review of the existing EIA for the Tocomá Hydroelectric Project and the technical studies for the IWMP, the Bank, CVG-EDELCA and the MARN will consult with stakeholders with interests in the watershed area, especially the directly affected population. The consultation process will be designed to: (i) provide input for the analysis of the adequacy of the EIA and the IWMP; and (ii) identify areas for future action that should be addressed in the proposed IDB operations.
- 3.5 The consultation process will involve a series of workshops with specific groups, such as environmental NGOs, indigenous communities, municipal officials, representatives of local industry, mining and agricultural interests, labor organizations, and local civic organizations. Several broader public meetings also will be held in major population centers in the region, and the IDB will hold working sessions in Washington D.C. with interested NGOs, government representatives and private sector interests. The results of these deliberations will feed into the preparation and analysis of the operations and the documentation prepared for review by the Bank's Committee on Environmental and Social Impact (CESI) and the Loan Committee.

**B. Schedule**

- 3.6 The Bank expects to complete the “due diligence” process and prepare the required documentation for CESI review by the end of June 2004. Should the operations go forward, it is expected that the projects would be presented to the Bank's Board of Executive Directors in the fourth quarter of 2004.
- 3.7 Additional information on the two operations may be obtained by emailing [caronitocoma@iadb.org](mailto:caronitocoma@iadb.org) or contacting the IDB Public Information Center (E-mail: [pic@iadb.org](mailto:pic@iadb.org); fax: 202.623.1928; tel: 202.623.2096).