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Avian Influenza in the Americas

IICA's vision



IICA and the Comprehensive Management of Water Resources for Territorial Development

The Case of Yacambu – Quibor in Venezuela

The GIRH YQ Project constitutes a frame of reference and a proposal for action aimed at creating the conditions necessary for the economic and social development of the Yacambu-Quibor region.

Ernani M. C. Fiori,
IICA Representative in Venezuela

Anahis Hernández,
IICA Information and Communication Consultant in Venezuela



The Yacambu River watershed.

end on April 28, 2006. Yacambu-Quibor is located in the Andres Eloy Blanco and Jimenez municipalities of the state of Lara, Venezuela. The project will hereinafter be referred to as the “GIRH Y.Q. Project”, or simply “GIRH”¹.

This is a regional development project of national importance, with effects that will transcend the local and state levels, increasing the already significant contribution of the Yacambu-Quibor region to Venezuela.

GIRH YQ was created to guide the economic and social development of areas affected by the large watercourse regulation and transfer projects undertaken in the upper Yacambu watershed for the benefit of the Quibor Valley. These projects are currently being executed by

The development phase of the Project for the Comprehensive Management of Water Resources in the Yacambu-Quibor region came to a satisfactory

Empresa Sistema Hidráulico Yacambú-Quíbor (the Yacambu-Quibor Water System Corporation, or SHYQ C.A.), and are scheduled for completion in four to five years (2006-2009/2010).

¹ This article is based on information obtained from GIRH Project documents authored by the project development group.



A panoramic view of the Quibor Valley

This is a regional development project of national importance, with effects that will transcend the local and state levels, increasing the already significant contribution of the Yacambu-Quibor region to Venezuela.

adopt a participatory approach. Its development was financed by the Andean Development Corporation, the Yacambu-Quibor Water System Corporation (SHYQ C.A.), and IICA. Its main counterpart is SHYQ C.A.

The development of the project featured the active participation of 16 institutions, 71 local professionals, 200 farmers, businesspersons and community leaders,

eight local consultants, six international consultants, 15 professionals from SHYQ C.A. and 21 IICA staffers.

The assistance provided by IICA was coordinated by Eng. Ernani Fiori, who serves as the

The project is also the result of an inter-thematic effort which involved technical cooperation from the Inter-American Institute for Cooperation on Agriculture (IICA), working in conjunction with public, private, regional and national entities, as well as a number of national and international consultancies, in order to build consensus and



Panoramic view of farm in Quibor.



IICA Technical Group during its Project Identification Mission, pictured here with SHYQ C.A. technical experts.



Working group meeting on the participatory development of the GIRH YQ Project.



IICA delivers GIRH YQ Project documents to SHYQ C.A. officials (17 May 2006).

organization's representative in Venezuela, and Eng. Nelson Espinoza, the head of the Institute's Investment Projects Unit. Eng. Miguel Angel Arvelo, IICA Rural Development Specialist in Venezuela (currently IICA Representative in Ecuador), Eng. Rodolfo Teruel, Regional Project Development Specialist, and Dr. Santiago Clavijo, IICA Consultant in Venezuela, also participated in the technical coordination and development of the project.

The GIRH YQ Project constitutes a frame of reference and a proposal for action aimed at creating the conditions necessary for the economic and social development of the Yacambu-Quibor region. Its estimated duration is four years, depending on the length of time required to complete the water transfer and irrigation works. Its execution entails great challenges for all of the actors involved, both public and private. These challenges include validating the project at various levels of responsibility and participation, establishing mechanisms with which to fund production, studying and promoting viable supply chains, promoting rural tourism, training and organizing actors and institutions, promoting sustainable agriculture and ensuring the safety of agricultural products.

Background

The Water Infrastructure of Yacambu-Quibor

The construction of the Yacambu-Quibor Water Infrastructure, which began in 1973, was driven first by the Ministry of Public Works (MOP), and later by the Ministry for the Environment and Renewable Natural Resources (MARNR, created in 1977). Since its inception, the focus of the project has been the construction of watercourse reg-

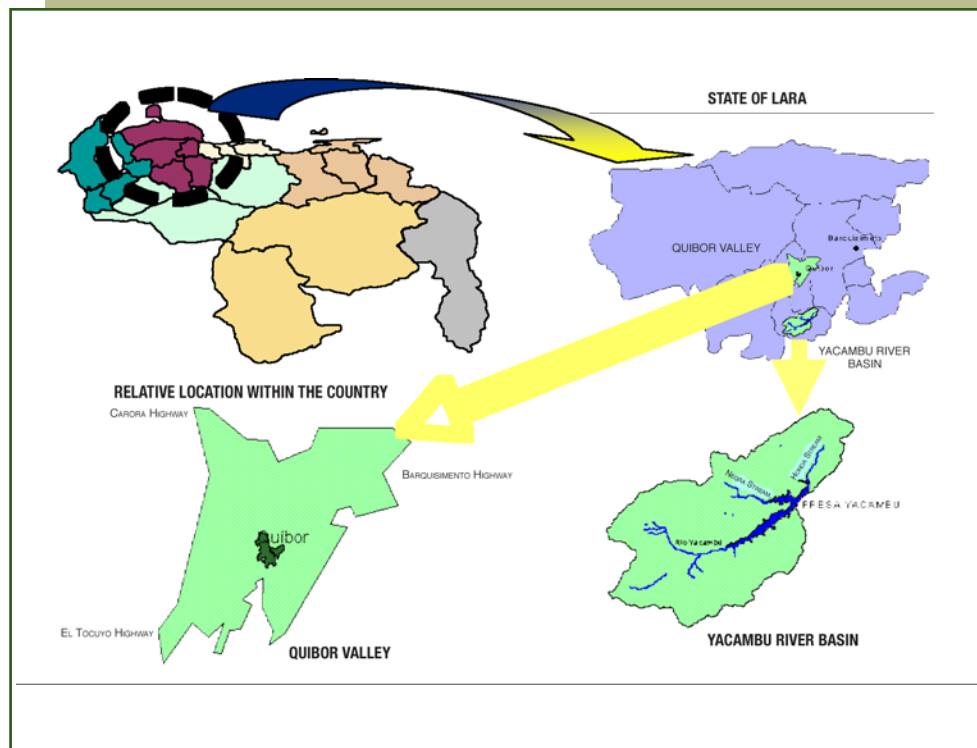
ulation infrastructure – a dam, a berm, a diversion tunnel, a reservoir spillway and a transfer tunnel.

This nationally relevant project is located in mid-western Venezuela, in the southeastern section of the state of Lara, in the municipalities of Andres Eloy Blanco and Jimenez. The GIRH YQ Project is located in this region, and is a beneficiary of the aforementioned waterworks.

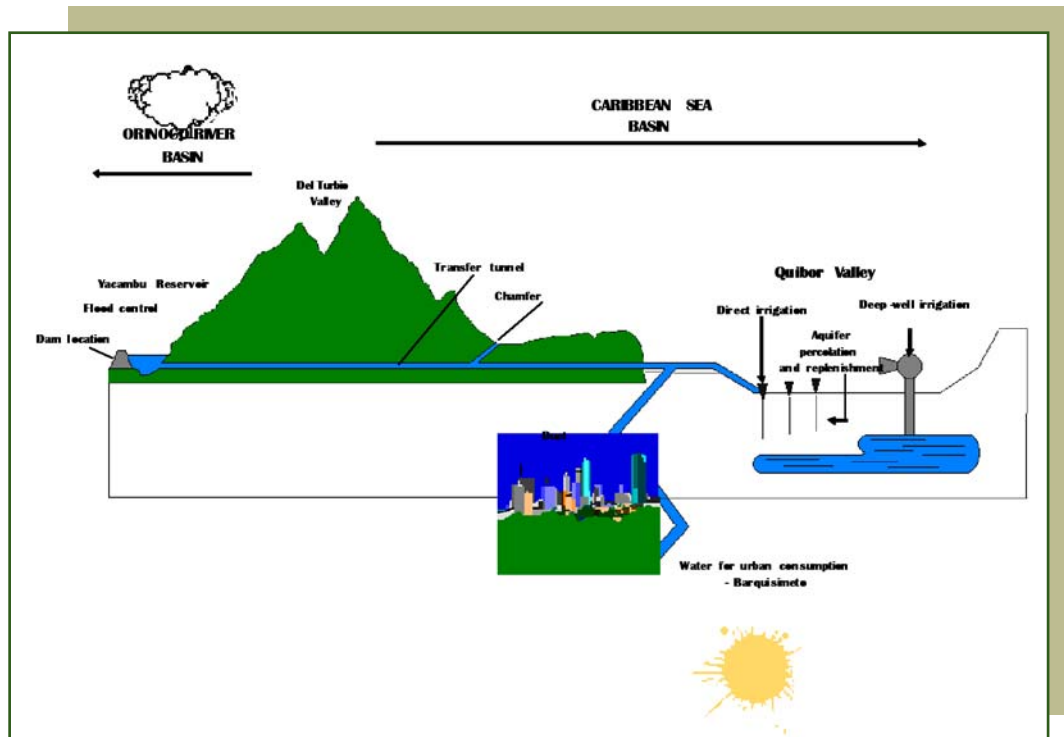
The "Yacambu-Quibor Water System Corporation" (SHYQ, C.A.)

The Yacambu-Quibor Water System (SHYQ, C.A.) was constituted as a state corporation in 1989, to manage the ongoing construction of the Yacambu Quibor Water Infrastructure. The corporation's share capital was split between MARNR (92%) and the Lara state government (8%). Its corporate philosophy emphasized environmental consciousness, development and participation. Accordingly, a number of mechanisms were established to work with project stakeholders.

The mission of SHYQ C.A. is to "...build, develop and maintain a water complex to supply the Quibor Valley with water for irrigation and the Barquisimeto Metropolitan Area with water for urban use, in a satisfactory and reliable manner, by promoting the sustainable management of the resources of the Yacambu River watershed".



Layout of the Yacambu-Quibor Water Infrastructure regulation and transfer works



According to its mission statement, the purpose of the corporation is to "...strengthen and encourage the sustainable agricultural development of the Quibor Valley, preserving the Yacambu River watershed, in order to improve the quality of life of its inhabitants by providing water in a satisfactory and reliable manner and developing the skills required to perform economic activities; and to consolidate the urban and industrial development of the Barquisimeto Metropolitan Area, by supplying water to the entity responsible for its distribution, thereby improving the quality of life of the population".

The main components of the water infrastructure complex are explained below. The watercourse **regulation** works consist of the following:

- A gravel dam, already finished. The dam is 162 meters high, and collects 325 square kilometers of water from the Yacambu River watershed and its tributaries.
- A stabilizing berm – already finished – on the left abutment.
- A concrete spillway-canal, currently under construction, with a holding capacity of 1200 m³/s. These works will support a reservoir with a gross capacity of 435 cubic meters and a useful storage volume of 330 cubic meters, of which 232.7 will be used to irrigate the Quibor Valley and 97.3 will be reserved for urban use in Barquisimeto.

The water **transfer** tunnel which conveys water from the Yacambu reservoir to the Quibor Valley is



Side view of the "Ing. José María Ochoa Pile" dam, from the inside of the "basin" which collects the waters of the Yacambu River.

The construction and development of the Yacambu-Quibor water infrastructure will produce a total of 327.34 million cubic meters of water per year, which will be available both for farming in the Quibor Valley and the potable water system of the city of Barquisimeto.

24.3 kms. long and 4.4 kms. wide (as of 2 May 2006, 92.08% of the tunnel had been completed; construction is scheduled to conclude

in 2008). The tunnel will transfer an average of 10.4 m³ of water per second.



SHYQ C.A. and IICA technical experts at the exit of the transfer tunnel

SHYQ C.A. has been addressing Yacambu River watershed conservation issues since 1990. Its main activities in this regard include collecting basic information, carrying out studies to help harmonize the legal framework governing protected areas and the expansion of Yacambu National Park, strengthening the agencies responsible for the area, working with communities to manage the watershed using a conservationist approach, and building sediment-control works. SHYQ C.A. has also been working with Quibor Valley stakeholder institutions and communities to develop production projects that emphasize sustainable agriculture through comprehensive crop management, chemical control and irrigation systems that make highly efficient use of resources, among other mechanisms.

Justification and Expected Impacts

The construction and development of the Yacambu-Quibor water infrastructure will produce a total of 327.34 million cubic meters of water per year, which will be available both for farming in the Quibor Valley and the potable water system of the city of Barquisimeto. Increased water availability will drive significant productive, social, economic, environmental and institutional changes, which will in turn have an impact on the quality of life and social development of the population at the local, regional and national levels.

The State of Lara and Food Safety

Agriculture

Largest onion producer	63.2%
Largest paprika producer	35.8%
Second largest tomato producer	16.4%

Livestock

Significant egg and milk production.
Swine and goat raising.

Some of the transformations expected in the Yacambu-Quibor region are described below. The GIRH YQ Project will play a key role as a facilitator of these changes.

By the time the project consolidation year (2017) arrives, the Quibor Valley Irrigation System is expected to have reached the following goals: (i) expansion of total cultivated farmland from current total of 3,500 hectares to 39,120 hectares (an increase of 1.117 per cent); (ii) an increase in overall direct and indirect employment resulting from the increase in farmland cultivated each year, from 11,700 jobs to approximately 96,000 (an increase of 820 per cent); and (iii) production of 970,000 tons of food per year (an 800% increase), which represents a production value of US\$ 580.7 million (a 760% increase).

The impacts of this new productive force will be vital to the food security of the country and the consolidation of poverty-reduction processes in the region.

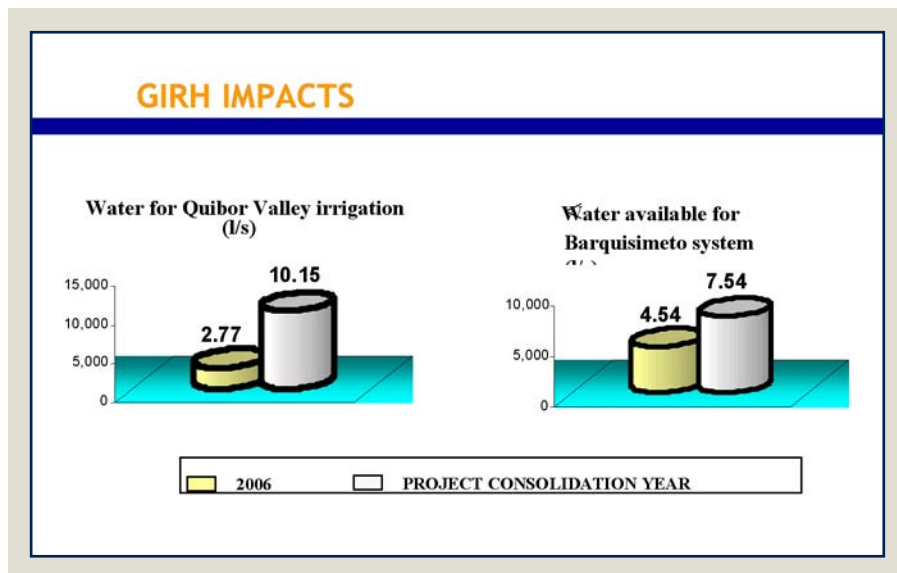
The impacts of this new productive force will be vital to the food security of the country and the consolidation of poverty-reduction processes in the region. They will also have a highly invigorating effect on neighboring regions, by creating a strong pole of economic development which will: i. diversify and increase agricultural production and productivity in the upper basins of the Yacambu-Quibor region – namely, the Las Raices Stream and Yacambu River watersheds. These transformations, coupled with those in the Quibor Valley, will further strengthen the contribution of the Yacambu-Quibor project to food security, poverty reduction and the improvement of the population’s quality of life. ii. Increase agro-industrial activity, transforming and adding value to agricultural production. iii. Expand and consolidate the craft and tourist industries.

The transformations expected in Yacambu-Quibor upon completion of the dam and water-transfer infrastructure, in 2009, are of great magnitude and complexity. They entail significant qualitative and quantitative changes which will drive new realities, new

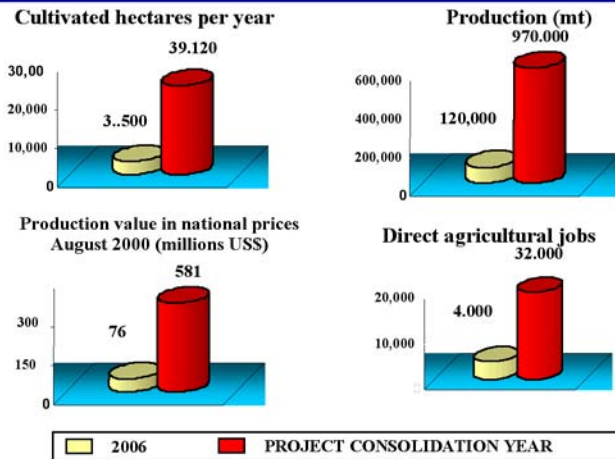
actors, and new economic agents with novel ways of organizing production and interacting with the environment. This will require a new institutional framework and a better-coordinated, more supportive and more competent social fabric, developed using existing capacities in the project’s target region.

The great challenge posed by the inflow of water from the Yacambu watershed calls for a planning and execution effort on the part of the actors involved, in order to prioritize and implement the actions required during the transitional period between the present time and the completion of the water infrastructure, thereby minimizing risks and maximizing benefits.

The progress of the aforementioned regulation and transfer works has led to the development of the “Project for the Comprehensive Management of Water Resources for the Development of the Yacambu-Quibor Region” (“GIRH YQ”). As part of this initiative, the Yacambu-Quibor Water System Corporation has requested the technical cooperation of IICA in Venezuela.



GIRH IMPACTS



The GIRH YQ Project lays the groundwork for the comprehensive management of the Yacambu watershed as a water provider, as well as the sustainable development of production in the Quibor Valley.

GIRH IMPACTS

- Agricultural and economic diversification
- Development of the agroindustrial sector
- 2000 farmers to benefit from irrigation system
- Increase in direct agricultural jobs from 4,000 to 32,000
- New markets
- Expansion of service sector-financial, product-support a technical advisory services.
- Increase rural tourism
- Consolidation of wood and clay crafts industries
- Increased employment
- Organization of communities and production
- Increased community participation
- Improved quality of life for the population
- Strengthening of watershed management
- Inter-institutional coordination

the project is to build institutional and organizational support, as well as to generate local production experiences as points of reference. The water-course regulation and transfer works under construction will be finished during the same period, as will the Quibor Valley Irrigation System and the duct which is to convey potable water to the city of Barquisimeto.

The GIRH YQ Project lays the groundwork for the comprehensive management of the Yacambu watershed as a water provider, as well as the sustainable development of production in the Quibor Valley.

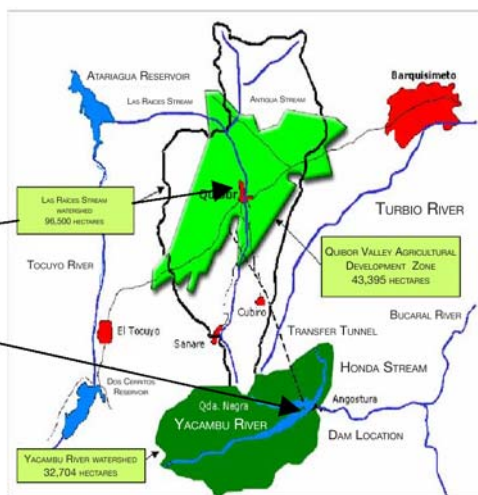
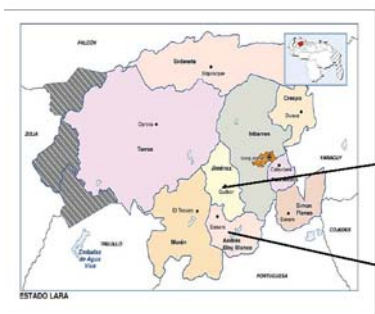
The Project is also in line with government policy. Its aim is to:

- approach the conservation and protection of the environment as a duty shared by citizens and the State, encouraging the community to take on a key role, together with local and regional governments, in the areas of the Yacambu River watershed, the Quibor Valley and the Las Raices watershed currently under development;
- implement actions to speed the creation of the new State institutions required by this initiative; and
- establish a productive-economic model geared toward achieving balance and local rural development.

The GIRH Project has also been designed taking the following issues into account:

The Project for the Comprehensive Management of Water Resources in the Yacambu Quibor Region (GIRH YQ)

The Project for the Comprehensive Management of Water Resources in the Yacambu-Quibor Region (referred to as the GIRH YQ Project, or simply GIRH) was created as a result of the circumstances described above. It constitutes a working agenda to be carried out between 2006 and 2009/2010 – a period which will be used to prepare for the inflow of water from the Yacambu watershed into the Quibor Valley. The purpose of



tion. The Yacambu River watershed is entirely under the jurisdiction of the Andres Eloy Blanco municipality, while the Las Raices Stream watershed is primarily under the jurisdiction of the Jimenez munic-

- i. The significance of the Yacambu-Quibor Project as a regional development initiative of national importance and impact;
- ii. The elements of national policy that involve territorial administration, local development and new institutions based on the development of social capital and human resources;
- iii. The centrality of communities and producers who benefit from the initiative;
- iv. The establishment and promotion of appropriate mechanisms to coordinate the actions of regional and local governments, relevant State institutions and communities;
- v. The contribution of the project to food security; and
- vi. The provision of a guaranteed potable water supply for the Barquisimeto metropolitan area.

ipality, although it shares some territory with Andrés Eloy Blanco. A small portion of the Las Raices watershed is located in the Iribarren municipality. For the purposes of this article, the upper watersheds that serve as water sources will be referred to as the Yacambu watershed.

Geographical Description

The project covers an estimated 129,118 hectares, which comprise two adjoining watersheds: the upper Yacambu River, which supplies the reservoir (32,704 hectares – 25.3%) and the Las Raices Stream (96,500 – 74.7 %).

The project links two watersheds from different basins: Yacambu, a tributary of the Acarigua River in the Orinoco River basin, and Las Raices, a tributary of the Tocuyo River in the Caribbean Sea basin. While both basins are located in the state of Lara, each belongs to a separate municipal jurisdic-

The Territorial Approach

The territorial approach, which is part of the strategy of the GIRH YQ Project, calls for the harmonization of comprehensive watershed management and other sectoral policies, in order to facilitate the transition toward the management of institutional and local development and the strengthening of social capital for the administration of networks and supply chains on a territorial scale. This approach requires social and institutional actors to identify and develop social, business and technical organization alternatives that involve production management and the marketing of value-adding activities, in order to develop territorial competitive capacity.

The GIRH YQ Project will thus have a highly invigorating effect on neighboring regions, by transforming Yacambu-Quibor into a strong pole of economic and social development.

Target population

The economic, social and environmental effects of the project will have a direct impact on the municipalities of Jimenez, whose population is projected to be over 103,783 by 2010, and Andres Eloy Blanco, which will have a population of approximately 52,710. The overall population of the project target area will be 156,493. The inhabitants of

the Barquisimeto metropolitan area constitute another large group of direct beneficiaries; by 2010, the city will have a population of approximately 1,200,000, which will enjoy a larger, improved potable water supply.

Objectives and intervention strategies

The overall objective of the GIRH YQ Project is to encourage sustainable development in the areas within the sphere of influence of the Yacambu-Quibor Water System, by building water infrastructure works, managing watershed conservation and transfer operations, promoting new institutions and strengthening the area's social and economic/productive base, in a manner consistent with principles of equity, sustainability and competitiveness.

Its specific objectives are as follows:

- i. To carry out actions aimed at strengthening the legal framework and the institutional, social and individual capabilities needed to create strategic partnerships that can support the new institutional framework, in order to ensure the viable, harmonious development of the Yacambu-Quibor region.
- ii. To develop water and watershed transfer management mechanisms for irrigation and urban use, as well as for the conservation of natural resources in a manner which ensures their sustainable use.
- iii. To promote the development of strategic agricultural, industrial and commercial production initiatives that strengthen regional competitiveness, food security, productive employment, food safety and the socio-economic well-being of the actors involved in the development of the Yacambu-Quibor region.
- iv. To complete the water regulation works and build the infrastructure required to develop the Yacambu-Quibor Irrigation System, involving future users in the process and complying with current legal regulations.

The overall objective of the GIRH YQ Project is to encourage sustainable development in the areas within the sphere of influence of the Yacambu-Quibor Water System.a

GIRH YQ Project Phases

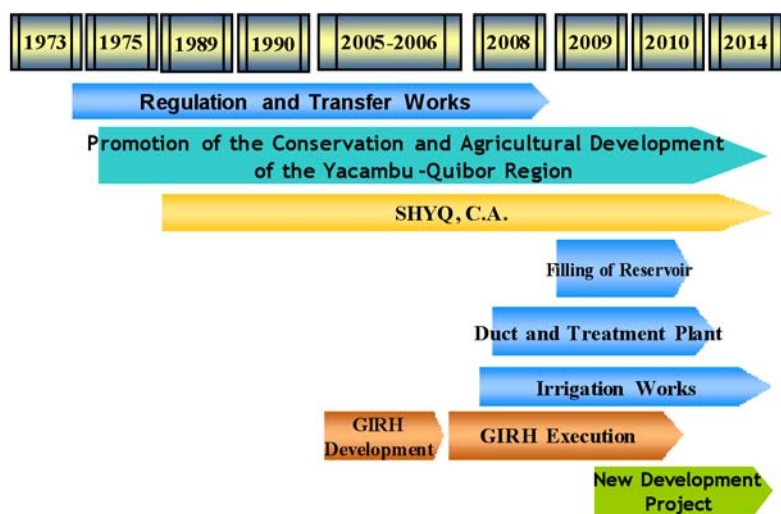
The construction of the transfer tunnel is scheduled to conclude in 2008, and the filling of the reservoir is to be completed in 2009. Once that point is reached, the water of the Yacambu watershed will be available for use in the Quibor Valley, from 2010 onward.

The Project for the Comprehensive Management of Water Resources in the Yacambu-Quibor region was developed in this context, and constitutes a working agenda to be carried out between 2006 and 2010. This period or phase of the GIRH Project is also known as the Skill Development or Transition Phase. Its basic purpose is to develop institutional and human capacities among actors and future beneficiaries, in order to ensure that the water obtained from the Yacambu-Quibor water infrastructure is used efficiently upon its arrival in the Quibor Valley. During the same period, the water regulation and transfer works will be completed, and construction of the Quibor Irrigation System and the Barquisimeto potable water duct will begin. GIRH YQ calls for closer coordination during this process between actors with relevant skills or tasks – for example, state institutions, producer organizations, businesses, communities, associations and cooperative societies.

A second phase of the GIRH YQ Project is scheduled for execution in 2010/2011 – 2015 and beyond. The Irrigation System will be completed during this period, and the irrigation sectors not yet reached in the Quibor Valley will be covered. Organizational conservation and agricultural production experiences will also be promoted and consolidated during this phase, which is to be planned and developed as a new project in 2008/2009.

the water of the Yacambu watershed will be available for use in the Quibor Valley, from 2010 onward.

General Timetable of Yacambu-Quibor Works and GIRH Phases



of stakeholders in the project's target area, based on the following sub-components:

- Institutional/legal issues
- Organizational development and local management
- Alternate funding mechanisms
- Agro-productive circuits and agribusiness
- Rural tourism
- Training for local development

Component 2: Sustainable watershed development

The purpose of this component is to contribute to the protection and conservation of the natural-resource base of the Yacambu River and Las Raices Stream watershed system, since this system will provide water for the Quibor Valley and Barquisimeto. The promotion

of economic activities, which seeks to raise the income of the population and reduce the possible negative impact of its actions on the area's natural-resource base, is predicated upon the system's function as a water source. This component is divided into the following three sub-components:

- Comprehensive watershed management
- Improved coffee production and sustainable agricultural and forest development in the upper Yacambu basins
- Joint, sustainable management of surface and ground waters

Component 3: Sustainable development of production in the Quibor Valley

This component is intended to: contribute significantly to the comprehensive development of agricultural productive potential, within an environmentally sustainable framework; generate techno-

GIRH YQ Contents and Components

The project is divided into four different operational components, summarized below.

Component 1: Development of Institutional Capacity and Regional Competitiveness in Yacambu-Quibor

The purpose of this component is to work with political, institutional, public, private and community actors to develop a proposal that integrates and structures their actions, which are diffuse and sectoral at present. It also involves the development of regulatory and operational mechanisms to preserve the area and its resources, in accordance with the objectives of the water infrastructure and development works built in Yacambu-Quibor. In addition, this component includes the development of a frame of reference to guide the actions

The total cost of the GIRH YQ Project, in its Water Infrastructure Transition and Continuation phase, which includes the completion of the transfer tunnel, farm irrigation works and investment, is approximately five hundred million dollars (US \$ 500,000,000).

logical conditions that foster productivity, diversity and quality as a means of ensuring that crops from irrigated areas consistently gain access to value-adding supply chains and the market; and increase and improve efficiency in the use of resources, in order to substantially raise incomes and increase productive employment. This component is divided into four sub-components:

- Irrigation, infrastructure and irrigation charges
- Validation, generation and transfer of irrigation technology
- Sustainable agriculture in the Quibor Valley

Component 4: Completion of regulation and transfer works

This component involves the completion of the water catchment infrastructure in the upper Yacambu River watershed, and the subsequent transfer of water to the Quibor Valley – where it will be put to agricultural use through an efficient irrigation system – and the potable water system of the Barquisimeto metropolitan area, where it will be absorbed through a treatment plant and a duct. This component is divided into the following sub-components:

- Regulation works
- Transfer works
- Duct and treatment plant

Cost and sources of funding

The total cost of the GIRH YQ Project, in its Water Infrastructure Transition and Continuation phase, which includes the completion of the transfer tunnel, farm irrigation works and investment, is approximately five hundred million dollars (US \$ 500,000,000).

This outlay will be covered by the parties committed to developing the region – namely, the country's central, state and municipal governments, with support from national and international service and financial entities capable of supporting the project. These include the Andean Development Corporation (CAF), which is, to date, the project's largest external contributor.



Summary of Institutional Benefits

The development of the GIRH YQ Project and its delivery to SHYQ C.A authorities, amid the ongoing construction of the Yacambu-Quibor water infrastructure, has opened an important new chapter in the development of the Yacambu-Quibor region, the state of Lara and Venezuela.

For IICA, the invitation to participate in the development of this project and offer its input in terms of experience and methodology, with a view to achieving greater food security, reducing poverty, generating employment and increasing the quality of life of the region's population, was a great opportunity and challenge. All of this was done using an approach which encourages the development of built-in sustainability.

It should be stressed that the development of GIRH YQ was a significant team effort, which IICA facilitated by coordinating its capacities with those of all the national and local institutions involved, employing a territorial approach and analyzing and harmonizing the initiative's productive, socio-cultural, environmental and political-institutional aspects. The training and learning experience which the GIRH YQ development process afforded many national actors and counterparts should also be noted, as should the development of a working approach that can easily be transferred to other regions, both within the country and abroad.

Other accomplishments include the generation of proposals for inter-thematic efforts, the promotion of inter-institutional management as a means of bringing about interventions that further sustainable territorial development, the achievement of political coordination between public and private institutions at the local, regional and national levels, the promotion of teamwork, the unprecedented level of integration and coordination



Signature of the Framework Agreement between SHYQ C.A. and IICA for the execution of GIRH YQ.

achieved between different IICA jurisdictions and levels of authority, and, last but not least, the technical and political positioning of IICA in Venezuela as an organization capable of designing and supporting territorial development programs, with broadened horizons and a commitment to current national issues.

IICA and SHYQ C.A. Agree to Execute Project

The execution of the GIRH Project was set in motion on May 29, 2006, with the signature, in Barquisimeto, of the Framework Agreement for Technical Cooperation between IICA and SHYQ C.A.. The Agreement was signed by the chairman of SHYQ C.A., Eng. Jorge González, and the

Representative of IICA in Venezuela, Eng. Ernani Fiori. The purpose of the Agreement, which has a term of four years, is to coordinate the efforts of the parties with those of public and private organizations, both regional and national, to design, develop and implement alternatives for the harmonization of rural progress and food security. The Agreement also acknowledges that, since each region possesses its own distinct characteristics, rural life encompasses more than agriculture, and is linked to the urban world. A high degree of institutional development is therefore required, in order to ensure the equitable distribution of responsibilities, goods and services.

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