



International Hydrological Programme

41st session of the IHP Bureau
(Paris, 26 – 28 March 2008)

PROPOSAL FOR THE ESTABLISHMENT OF

A REGIONAL RESEARCH CENTRE
FOR THE SUSTAINABLE MANAGEMENT
OF WATER RESOURCES IN THE
CARIBBEAN ISLAND STATES,
IN SANTO DOMINGO,
DOMINICAN REPUBLIC

AS A CATEGORY 2 WATER-RELATED CENTRE
(UNDER THE AUSPICES OF UNESCO)

Item 6.2 of the provisional agenda

The Bureau is requested to consider the proposal and to decide upon the endorsement of the establishment of the centre for consideration by the 18th session of the IHP Intergovernmental Council (Paris, 9 – 14 June 2008).

**PROPOSAL FOR THE ESTABLISHMENT IN SANTO DOMINGO,
DOMINICAN REPUBLIC, OF A REGIONAL RESEARCH CENTER**

***CENTER FOR THE SUSTAINABLE MANAGEMENT OF
WATER RESOURCES IN THE CARIBBEAN ISLAND STATES***

**PRESENTED TO UNESCO BY THE GOVERNMENT
OF THE DOMINICAN REPUBLIC**

1. Background

To satisfy the water needs for the supply of a growing population, for the production of food, for exploiting its potential of generation of energy and for recreational use, specially in support to an economic activity of such relevance as it is tourism in the Caribbean Region, while maintaining at the same time quality conditions and preserving the biodiversity, is a priority and an important challenge for the island states of the Caribbean.

Many island of the Caribbean are under real pressure, not only in terms of the quantity of freshwater, but also regarding its quality due to the small size of the islands and the particular conditions of their geography, topography and geology. The scarcity of water resources is a limiting factor for their economic and social development. This situation is even more critical in the coralline islands with prevailing low areas, where there are limited resources of ground water which are only protected by a thin permeable ground.

In the year 2000, the Dominican Republic took an important step towards improving the environmental management in the country with the promulgation of the General Law of Environment and Natural Resources (Law 64-2000), law which regulates the management of the natural resources of the country. Through this law was created the State's Secretariat of the Environment and Natural Resources, to which ascribes the INDRHI (National Institute of Hydraulic Resources, acronym in Spanish). The INDRHI is the official entity responsible for the administration of water resources, water-related planning, the management of the hydromet network, the management of water in the irrigation systems and the development of hydraulic infrastructure.

Among the main situations related to water resources which require priority attention in the Dominican Republic are, the increasing demand of water and the degree of tension that begin to take place in some areas of the country, the scarce and weak control of water contamination, the irrational overexploitation of aquifers, the low efficiencies in the use of water, the high losses of water as a result of leaks and illegal users, the low profitability of the activities of implementation and maintenance of water services, as well as the problems associated to droughts and floods. The focus and solution of the various present problems and the negative tendencies that are identified as possible indicators of potential challenges, which can be diagnosed as situations that will tend to aggravate in the future, require the development of technical and administrative capacities.

2. Creation of a Research Center

At the end of the year 2006 the INDRHI considered the creation of a center of research on water to generate a better knowledge basis of the phenomena related to weather and water runoff, the exploitation and quality of the water sources, the use of water, the management of the hydrological risk and the resource management schemes. Within the national context, and given the exclusive competences of the INDRHI regarding irrigation issues, the institute proceeded to create a research center, whose initial priority focus was conceived to be the use of science and technology for the development of irrigation, being the sector with the highest use of water, while maintaining as an objective the development of research on water resources.

On February 22, 2007, under the name of Research Center on Technology of Water for Irrigation (CITAR, acronym in Spanish) the center started its operation, and despite it had some priorities on irrigation issues, an intersectorial focus on water management remains, specially regarding water quality, having as a basis the infrastructure and programmes the INDRHI already owned, such is the case of the monitoring programme and the laboratory of water quality.

Understanding the value of a research Center for the Caribbean countries, which share natural conditions, economic and institutional challenges similar or at least comparable, it has been decided to expand the focus and objective of the Center, to benefit the Member States region by developing research in water resources management. So it is important that the name of the Center reveals its intention for developing research services for the management of water resources in island focusing in the region, thus, adopting the name: "Center for the Sustainable Management of Water Resources in the Caribbean Island States" (The Center).

This Center is based on the tradition of INDRHI as a state entity in water management and its experience in managing irrigation systems and the capacities developed to carry out its legal mandate. Among these are the creation and the implementation of an early warning system through the installation of a hydro-climatic and hydro-metric network able to transmit hydrometeorological information in real time, the development of several studies related to flood control of and the hydrological processes, the updating of the water balance, the modernization of the users' register and the development of digital cartography.

3. Mission, objectives and scope of the Center

Mission

The Center for the Sustainable Management of Water Resources in the Caribbean Island States, is an organization specialized in research, oriented to generate technical, scientific, social and economic knowledge on water

resources to support the decision-making process in the search for innovative and sustainable solutions which satisfy water needs, the use and development of the science and technology for the sustainable exploitation of water. Technical capacity-building of human resources is another priority aspect in the Center's mission.

For the Caribbean region, the Center will be supporting the implementation and coordination of research activities concerning issues of common interest for the countries of the region, as well as the development and maintenance of an information and expertise database system, and the evaluation of the situation of water resources in the countries of the region.

Objectives

The objective of the Center is to generate and transfer scientific and technological knowledge related to sustainable water management in islands, so as to increase the practical knowledge and improve the capacities for a more efficient use of water resources, considering the social, environmental and economic dimensions of the Caribbean Island States.

The specific objectives of the Center are:

- a) Fostering research on water management, as well as different aspects related to the management of water sources and the hydrology, through agreements of cooperation for the use and development of the local capacities of the institutions of the region and specially of those under the auspices of the International Hydrological Programme (IHP) of UNESCO.
- b) Organizing and guiding specialized studies and research in hydrologic and hydrometeorological issues for a better understanding of extreme hydrological phenomena and a better management of risks so as to develop defense and prediction capabilities for the population and the diverse social and economic interests.
- c) Carrying out studies and research on soil and water.
- d) Generating and spreading reliable scientific and technical information on various aspects related to water management, to facilitate the formulation of policies considering a better information base and knowledge for a better use of water at the local, national and regional levels.
- e) Fostering at the regional level the development of institutional and professional capacities through activities of capacity-building and professional improvement.
- f) Fostering the development of methodologies and education materials for training water users and the staff of the entities responsible for the water services management, and contributing to implement knowledge and technology to increase the efficiency in water use.

- g) Promoting research for the strengthening of the organizations related to water supply services.
- h) Creating areas, networks and means of cooperation and exchange of information and knowledge regarding water use for agricultural purposes, so as to contribute to the objectives of sustainable management of water for food production.
- i) Promoting the conservation of water resources and their rational and sustainable use, through research and increase availability of information about the interrelations among ecosystems, hydrology and water demand to support development.
- j) Developing and maintaining an updated database on water resources and social and economic information of relevance in the region.
- k) Supporting the International Hydrological Programme of UNESCO, as well as the United Nations agencies and the international organizations interested in water resources in their efforts to evaluate the state of water resources on a worldwide and regional scale, and to have reliable statistics.

Scope

It is through studies, research work and the development of technical and institutional capacities that the Center aims at promoting water savings; advancing in the knowledge of the phenomena and processes of the hydrological cycle, including aspects of extreme events of water-related origin, such as droughts and floods, and the effects of climate change; promoting the conservation of water sources and achieving a better understanding of the environmental aspects associated to water use and management; improving the management of water resources, integrating the environmental, social policy and economic technical factors; optimizing the use and programming of hydraulic infrastructure development; supporting capacity-building; and transferring technology to achieve rational and efficient water use in island states.

With regard to the uses of water, the Center will support the decision-making process in the search for innovative solutions to save water, which will be useful to support the design of supply systems and more efficient and competitive institutional schemes.

4. Functions

The Center for the Sustainable Management of Water Resources in Caribbean Island States will offer research and study services; will design, coordinate, support and guide specialized capacity-building programmes; and will also produce publications. The Center will fulfill the following functions through its research work and its capacity-building programmes:

- a) Promote and carry out scientific research on water management and hydrological processes in the region.
- b) Foster and make available water management technology applications in the region and hydrological aspects.
- c) Expand and coordinate scientific research activities, in cooperation with different international agencies and entities of the Member States of the region, specially strengthening the scientific and professional capacities in the region and using the pertinent networks of the International Hydrological Programme (IHP) of UNESCO.
- d) Organize and implement capacity-building activities and information transfer to train and update human resources in relation to sustainable management of water resources, as well as in hydrological issues of interest to the Member States of the region.
- e) Provide reliable information on water resources and their sustainable development, improving the transfer and exchange of information, and developing strategies and means of publication and assimilation of this information.
- f) Provide professional and technical advice services in the region and in other countries, according to the needs of the interested counterparts and in accordance with the objectives of the Center.
- g) Edit scientific and technical publications, and informative materials, on sustainable development of water resources and on related or complementary topics, as well as hydrological issues of interest to the Member States of the region.

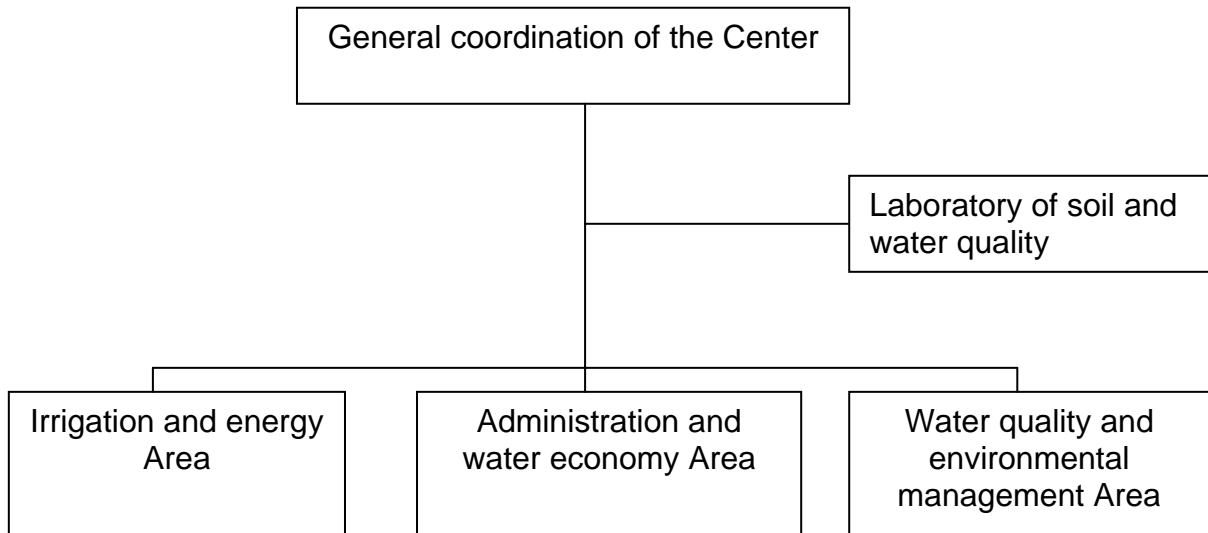
5. Structure and Legal Status

5.1 The nature of the Center

The center will function as an entity with its own legal status and with the necessary autonomy to acquire goods and services that allows it to fulfill its objectives. The Center will be allowed to receive budget allocations, subsidies, perceive remuneration for rendered services, and manage resources to carry out its duties. It is proposed that it receive the auspices of the United Nations for Educational, Science and Culture Organization (UNESCO), through the signing of an agreement with this international organization and the Government of the Dominican Republic. Under this agreement the Government will agree to allow the use of public installations for the Center activities and will provide for utilities and other operating expenses such as staff support. Other units of INDRHI such as the Geomatic Department and the “virtual room” (video conference room with a capacity of 50 people) will provide support to the Center.

Presently the Center works as a research unit of INDRHI, with autonomy and administrative independence to *"receive, hire, or buy buildings, equipments, machinery, rights and other goods that contribute to the development of the institute as well as to give the administration of its properties, as a whole or in part; to receive donations that do not involve financial charges or that owning them are compensated by the exchange value of the donations"*.

The main research areas and the organizational structure of the Center will correspond in general terms to the following organizational chart:



5.2 Executive Board

The Center will be ruled by an Executive Board integrated as follows:

- a) The Executive Director of the National Institute of Hydraulic Resources of the Dominican Republic, President of the Dominican National Committee to the International Hydrological Programme (IHP) of UNESCO (CONAPHI) in the Dominican Republic, according to the decree No. 131-87, who will preside it.
- b) A representative from a limited number of Member States of the region, no more than three (3) members, who have sent notification to that effect to the Director General of UNESCO. An equitable geographical representation if possible, should be aimed for.
- c) A representative of Director General of UNESCO.
- d) A representative of any other Intergovernmental Organization or Non-Governmental International Organization, that makes a significant contribution to the annual budget or to the functioning of the Center, and therefore, is entitled to have a seat by a decision of the Executive Board, up to a maximum of three organizations.

The membership of the Executive Board will be renewed every three (3) years.

The main functions of the Executive Board are the following:

- a) To approve the middle and long term programmes of the Center;
- b) To approve the workplan and annual budget of the Center;
- c) To approve and review the annual reports introduced by the Director of the Center;
- d) to establish the relevant rules and regulations and the appropriate financial, administration and human resources management procedures that should be applied;
- e) to decide on the participation of the regional intergovernmental organizations and the international institutions in the work of the Center.

The Executive Board will have periodical ordinary meetings, at least once a year, and extraordinary meetings convened by its President, either at his initiative or at that of the General Director of the UNESCO, or at the request of two thirds or more of its members.

The Executive Board will establish its own by-laws. During the first meeting the procedure established by the UNESCO or the Government of the Dominican Republic will be followed.

5.3 Secretariat

The Secretariat of the Center will be constituted by the Director of the Center and the staff of the Center, including any UNESCO staff members temporary assigned to the Center, and others appointed by the Executive Board. The Director of the Center is nominated by the President of the Executive Board, previous consultation with the Director General of UNESCO. Other members of the Secretariat can be persons appointed by the Director, according to the procedures established by the Executive Board; civil servants assigned by the Government of the Dominican Republic to the Center, according to national regulations.

6. Financial Aspects

The budget of the Center will be elaborated following the general structure of contributions described as follows.

6.1 Investment and operational expenses covered by the Government of the Dominican Republic

The fixed assets consisting in the acquisition of the building and equipment for the installations of the Center, as well as the functioning or general

expenditures, which include the maintenance of the building and installations, communications, water, electricity and gas services, salaries and remunerations of the Secretariat national staff, expenses for the organization of meetings of the Executive Board and expenses for the Advisory Committee evaluation activities will be covered by the Government of the Dominican Republic.

The operational yearly contribution of the Government is estimated in USD 400,000.00, considering in kind contributions, cash and assets. The Center is already working under INDRHI research initiatives and an amount of RD \$13.4 millions Dominican pesos equivalent to 401,957.66 US dollars have been approved in the INDRHI investment budget for 2008.

6.2 Research Projects Resources

The necessary resources for the execution of research projects, equipment and specialised tools required for research, human resources capacity-building and publications, will come from budget allocations that the Executive Board is able to ensure from the Government side and from the UNESCO support, either from their own budget or from resources requested to other research financing sources, including non-governmental organizations, international organizations, international banking agencies, specialized agencies supporting developing countries, and from the UNESCO Member States supporting the Center.

6.3 Investment and expenditures

INDRHI has contributed to the creation of the Center by investing funds in the refurbishing of the building for the Center offices, in the technical assistance for the re-design and remodelling of the soil and water quality laboratories, in the equipment and furniture of the Center, in the acquisition of tensiometers and automatic climate stations and in travel and per diem expenses for specialists. The approximate amount that INDRHI has spent for the creation of the Center and its functioning during 2007 is as follows:

Expenditures during 2007	Amount (USD)
Technical assistance for the refurbishing of the laboratories: travel expenses and per diem of specialists	10,000.00
Refurbishing of the building (includes USD 48,140 air-conditioning)	61,164.79
Staff salaries (10 months)	187,706.46
Furniture	8,606.71
Computer equipment	7,249.38
Equipment for field projects	15,000.00
Technical advice and information gathering	6,000.00
Soil and water laboratory equipment (includes gas chromatographer y atomic absorption).	202,554.90
Total	498,282.24

The research projects planned for 2008 envisage a budget of USD 514,057.39 as indicated below, amount that will be contributed by the INDRHI and by organizations that have cooperation projects with INDRHI.

**ADMINISTRATIVE AND OPERATIONAL EXPENSES OF THE RESEARCH CENTER
2008**

EXPENSES	US\$ / month	US\$ / year
Staff (salaries, incentives and perdiem)	18,706.46	243,183.98
Electricity and clean water	7,352.94	88,235.29
Communications (telephone)	300.00	3,600.00
Transportation	2,941.18	35,294.12
Reagents, gases and gassworks	10,320.00	123,840.00
Equipment		3,240.00
Travel abroad to exchange experiences		11,764.00
Capacity-building Workshops in the country		8,000.00
Office supplies		500.00
Total	39,620.58	517,657.39

7. Expected framework for UNESCO cooperation

According to the strategic priorities and objectives of UNESCO, it is expected that UNESCO will provide technical assistance and/or financial contributions to the activities of the Center.

The UNESCO contribution could result in:

- a) providing the collaboration of experts in the thematic areas and activities of the Center;
- b) temporary assigning staff members. This assignment will only be authorized by the Director General when justified by the execution of a joint project or activity in a priority area approved by the executive bodies of UNESCO;
- c) associating the Center to the different programmes developed and in those that its participation is considered necessary;
- d) providing the center with scientific material such as publications of interest;

The contribution will be considered in the UNESCO Programme and Budget.

When necessary, UNESCO will participate in the scientific, technical and capacity-building meetings organized by the Center.

8. Cooperation with other Member States

The Center shall establish cooperation links with universities and research centers in the region and in other countries, with which it shall agree to promote and develop research projects, as well as capacity building activities and publications. The Center shall stimulate the participation of other research centers and universities from the Dominican Republic and the Caribbean in research projects of common interest related to sustainable water management.

These research partners shall collaborate with the Center in order to develop greater local research capacities.

The Center shall coordinate research projects with universities, research centers, official organizations related to sustainable water management, and other public and private organizations of the region, to accomplish the aims, objectives, and workplans of the Center. The Center shall specifically support the coordination and execution of capacity building and research activities with other UNESCO Centers, especially those related to the International Hydrological Programme (IHP) of UNESCO, as well as with UNESCO Chairs, and IHP working groups and projects.

The development of capacities and technology transfer shall be done in cooperation with national and foreign universities with which the Center shall establish or has ongoing collaboration agreements. The improvement and better use of the INDRHI laboratories equipment and facilities, as well as the design, construction, equipment and extension or rehabilitation of these laboratories, shall be done under technical collaboration with other research centers with experience in water research and technology transfer, and with the financial support of the Government of the Dominican Republic, of other UNESCO Member States, and of those public and private entities interested in the Center's activities.

9. Projects under execution 2008

The Center is presently executing 13 projects on Water Quality and Environmental Management, 8 projects on Water Resources Management and Water Economy, and 8 projects on Risk and Energy, as shown below. Among these projects, two research initiatives are to start, one with the support of the International Atomic Energy Agency (IAEA) and another for which the services of the "Centro de Estudios del Agua del Instituto Tecnológico y de Estudios Superiores de Monterrey" (ITESM) have been contracted.

The themes of the projects under development or being planned fall within the IHP Seventh Phase, including adaptation to climate change, strengthening of water governance, water and energy relations, and water quality assessment for ecosystem and human needs. A list of the main projects under execution in 2008 is attached to this document.

Annex 1.

Within the projects being executed by the Center for the Sustainable Management of Water Resources in the Caribbean Island States it is worth mentioning, among others:

Water Quality and Environmental Management

- 1) Study "Quality of surface streams in river basins (Yaque del Norte, Ozama - Isabela, Yuna, Yaque del Sur, Nizao, Higuamo, Haina, Duey and Nizaito)"
- 2) Study "Characterization of water resources in irrigation systems (Mao - gurabo, Luís Bogaert, Ulises Fc. Espaillat, Fernando Valerio, Jima Margen Derecha, Jima Margen Izquierda, Jima - Camú and channels of Bajo Yuna area of AGLIPO project)"
- 3) Study "Water quality in natural and artificial close systems (Tavera - Bao, Hatillo, Sabaneta, Sabana Yegua Higuey and Aguacate, Valdesia, Rincón Monción, Laguna Bavaro, Laguna Cristal, Laguna Redonda, Laguna Oviedo, Laguna Cabral or Rincón and Laguna Mallen)"
- 4) Study "Water quality in estuary water resources (Higuamo, Ozama - Isabela y Bahía de Samaná)"
- 5) Study "Assessment of groundwater quality (Valle de Constanza, Pedernales, Baigua, Valle de Azua y Fernando Valerio)"
- 6) Study on the sustainability of water resources quality in the tourist Eastern region of the country.
- 7) Study on the aridity index of the Dominican Republic.
- 8) Study on the acid rain in hydrographical regions of interest.
- 9) Study on water quality in rivers by using invertebrates as bio-indicators in the Dominican Republic (Saprobio Index method).
- 10) Study for the assessment of ecological flows in the Haitíses units, and the potential sustained extractions in the Eastern coastal zone (IAEA).
- 11) Assessment of sedimentation in reservoirs (IAEA)
- 12) Study on the draught index of the Dominican Republic

Water Resources Management and Economy

- 1) Characterization of the pricing system in irrigated areas managed by the Irrigation Boards

- 2) Water balance and diagnosis of the Azua basin (including the Vía river) using the WEAP 21 programme
- 3) Project economic study "conservation of the Vía river basin" (economic ecosystem valuation)
- 4) Study of the economic efficiency and marginal value of water in irrigated areas
- 5) Institutional scheme and organizational design of the water sector
- 6) Pricing structure for the different water uses in the Dominican Republic
- 7) History of water resources in the Dominican Republic
- 8) Water and poverty in the Dominican Republic

Others

- 1) Study "Water economy in rice production "
- 2) Study "Impact of water irrigation scheme in irrigation systems crop yield "
- 3) Study "Management of poorly-drained and saline soils (area of Fernando Valerio, YSURA and Villa Vásquez)"
- 4) Study "Irrigation and global water efficiency in irrigation systems"
- 5) Study "Forecast of the sustainability of the Baigua project agricultural soils"