

**REVIEW OF ACTIVITIES AND EVALUATION OF THE FUNCTIONING OF THE  
CENTRE FOR THE SUSTAINABLE MANAGEMENT OF WATER RESOURCES IN  
THE CARIBBEAN ISLANDS STATES (CEHICA), IN SANTO DOMINGO,  
DOMINICAN REPUBLIC**

**CATEGORY 2 CENTRE UNDER THE AUSPICES OF UNESCO**

**FINAL REPORT**

**Carlos Estévez Valencia**

**UNESCO, December 2019**

## EXECUTIVE SUMMARY

Over the past decades, UNESCO has established several category 2 centres (C2C) in the field of water sciences and management. These water-related category 2 centres (WC2C) are expected to contribute directly to attaining the strategic objectives and programmatic priorities of UNESCO's Intergovernmental Hydrological Program (IHP). In this context, these centres serve in their areas of specialization, with international or regional scope, as poles of expertise providing services and technical assistance to Member States and cooperation partners.

The Centre for the Sustainable Management of Water Resources in The Caribbean Islands States (CEHICA) in Santo Domingo, Dominican Republic, is one of UNESCO's WC2C. CEHICA started operations in 2010. An agreement between UNESCO and the Government of the Dominican Republic was signed on 8 March 2010 and will expire on 8 March 2020.

UNESCO requires that WC2C undergo periodic reviews to assess the Centres' performance with respect to their terms of reference and then contributions to UNESCO's mandate and programme. The principal outcome of the review is a recommendation as to whether the agreement between UNESCO and the host government should be renewed to inform the decision-making process which includes UNESCO Member States, the UNESCO Secretariat and other stakeholders on the overall performance of the Centre, its contribution to UNESCO's Strategic Goals (documents C/5) and the eighth phase of IHP (IHP/2012/IHP-VIII/1 REV), the implementation of the Comprehensive Strategy for Institutes and Category 2 Centres (Resolution 37 C/93, document 37 C/18 Part I and its annexes), and possible improvements that may be suggested for the future.

An evaluation of CEHICA was conducted in November 2019. Mr. Carlos Estévez was appointed external reviewer, accompanied by Mr. Miguel Doria, Regional Hydrologist for IHP LAC.

The review included a visit to CEHICA and key stakeholders in Santo Domingo conducted on 11 and 12 November 2019. During this period, the reviewer met with CEHICA staff, interviewed CEHICA experts, external researchers, collaborators and beneficiaries of training activities. The mission's agenda also included a visit to CEHICA's facilities and its laboratory, holding discussions with the staff of those units. He also met with the President of CEHICA (who also serves as president of the IHP National Committee of the Dominican Republic) and National Director of the National Institute of Water Resources INDRHI, which is the body that hosts the units of the Centre, the Minister of the Environment, the Minister of Agriculture and the Deputy Minister of Irrigation.

### CONCLUSION OF EVALUATION

**The recommendation is that UNESCO's Agreement with CEHICA is renewed for a further duration of six years.**

## **1. Introduction:**

The Centre for Sustainable Water Resources Management in Caribbean Island States (CEHICA) was established in 2010 as a Category 2 Centre under the auspices of UNESCO. Three years earlier it was created by the National Institute of Water Resources (INDRHI) as a research centre focused on irrigation issues for the Dominican Republic. However, it started having cross-sectoral demands for water resource management and after discussions with different Caribbean countries and representatives of UNESCO's Intergovernmental Hydrological Programme, it was decided to expand the Centre's approach and objectives to benefit the island countries of the subregion in water resources management and research.

The bilateral agreement, signed on 8 March 2010 by UNESCO and the Government of the Dominican Republic, established in its articles:

- *XV.- UNESCO may, at any time, carry out an evaluation of the activities of the Centre in order to ascertain: whether the Centre makes a significant contribution to the achievement of the strategic goals of UNESCO; and/or whether the activities effectively performed by the Centre are in conformity with those stated in this Agreement.*
- *XVIII.- This Agreement shall have a duration of ten (10) years since its entry into force, and may be tacitly renewed.*
- *XX.- This Agreement may be revised by mutual agreement between the Government of the Dominican Republic and UNESCO.*

In order to enhance the operation and effectiveness of individual UNESCO water related centers, as well as the effectiveness of their networks, UNESCO - in conformity with its principles and guidelines for C2C and institutes and related strategy - requires that WC2C undergo periodic reviews, as indicated in the Agreement.

The main objectives of these reviews are to assess the centres performance with respect to their terms of reference and contributions to UNESCO's mandate and programme, to provide a recommendation as to whether the agreement between UNESCO and the host government should be renewed, and to ensure that the focus and coverage of the activities of the centres are in line with the strategic objectives of UNESCO. This review process is applied to all centers. This document contains the report of the first review of CEHICA.

## **2. Objectives and functions of CEHICA:**

CEHICA's main objective is to generate and disseminate scientific and technological knowledge related to sustainable water management in the Caribbean island states, in order to increase practical knowledge and improve capacities for a more effective use of water resources, taking into account the social, environmental and economic characteristics of these States.<sup>1</sup> Provide research and study services; design, coordinate, support and guide specialized capacity-building programmes; and produce publications. Through its research work and capacity-building programmes, it will perform the following functions:

- Promote and perform scientific research on water management in the region, and hydrologic aspects thereof;
- Promote and facilitate applications of technology towards better practical use of water;
- Expand and coordinate research activities, in cooperation with the various international agencies and the relevant entities of the States of the region, most particularly by taking advantage of the scientific and professional capacities of the

---

<sup>1</sup> The Caribbean island states that the Centre intended to work with, at the beginning of its operation included: Antigua & Barbuda, Bahamas, Barbados, Cuba, Dominica, Jamaica, Dominican Republic, Granada, Haiti, Saint Cristobal & Nieves, Saint Vincent & The Grenadines, Saint Lucia, and Trinidad & Tobago.

region, as well as using the corresponding networks of the UNESCO Intergovernmental Hydrological Programme (IHP);

- Organize and implement activities for knowledge and information transfer for training and upgrading the human resource base for sustainable water resources management and for hydrological aspects of interest to the States of the region:
- Provide reliable information on water resources and their sustainable management by improving the transfer and sharing of information strategies, and the means of dissemination and assimilation of such information:
- Deliver consulting and technical advice in the region and in other countries, as requested by the interested parties and in fulfilment of the Centre's objectives;
- Issue scientific and technical publications and informative materials in the form and formats deemed appropriate, on the issue of sustainable water resources management and related and/or supplementary themes, as well as on hydrological aspects of interest to the States of the region.

For the next phase, in case its status as Category 2 is renewed the centre proposes to add the following objective with the intention to contribute in a better way to the implementation of phases VIII and IX of PHI and the 2030 Agenda and its objectives:

- Develop or support initiatives for the integrated management of water resources at appropriate levels, emphasizing their efficient use, scarcity initiatives, as well as the protection and restoration of ecosystems; and including cross-border cooperation; sustainable management of coastal water resources and estuaries; action to combat climate change and its effects; and promote action against desertification, soil degradation and flooding.

### **3. Review of CEHICA activities:**

This review is based on the Terms of Reference (TOR) drafted in 2019 by UNESCO's Secretariat in consultation with Dominican Republic authorities. The review and evaluation were undertaken with the following purposes:

- to assess the extent to which the agreement CEHICA conforms with the Integrated Comprehensive Strategy for Category 2 institutes and centres under the auspices of UNESCO (37 C/Resolution 93 and Document 37 C/18 Part I and its Annex), and, if needed, to provide guidance on how this can be achieved; and
  - to assess the Centre's performance with respect to its objectives and functions, as specified in the Agreement between UNESCO and the host government, and its contribution to UNESCO's strategic programme objectives and respective sectorial and UNESCO-IHP strategies, priorities, and themes.
-

## Detailed Schedule of Evaluation Meetings

- Day 1. Monday, 11 November 2019

Time	Agenda	Counterpart
09:00-10:00	<p>Meeting (briefing and introduction) and interview with CEHICA Director and team:</p> <ul style="list-style-type: none"> <li>▪ Executive Director of CEHICA</li> <li>▪ Technical Advisor International Cooperation at the National Institute of Water Resources</li> <li>▪ Head of water quality and environmental management at CEHICA</li> <li>▪ Responsible of water quality laboratory</li> <li>▪ Water lab cleaning and soil lab</li> <li>▪ Responsible for the microbiology lab</li> <li>▪ Sample Reception Manager</li> <li>▪ Responsible for the chemical physical laboratory</li> <li>▪ Auxiliary soil lab technician</li> <li>▪ Auxiliary soil lab technician</li> <li>▪ Technical microbiology laboratory</li> <li>▪ Head of Soil Lab, irrigation and energy area</li> <li>▪ In charge of the agrology area</li> <li>▪ Water Quality Program Counterpart</li> <li>▪ Soil Engineer</li> <li>▪ Driver</li> <li>▪ Messenger</li> <li>▪ Executive Secretary</li> <li>▪ Secretary</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mr. Juan Chalas</li> <li>▪ Mr. José Raúl Pérez</li>   <li>▪ Mrs. Agustina García Castillo</li>   <li>▪ Mrs. Ana Lucía Valenzuela</li>   <li>▪ Mrs. Rosa Encarnación</li> <li>▪ Mrs. Altagracia Medina</li>   <li>▪ Mrs. Belkis Mejía</li> <li>▪ Mrs. Rosa María Vásquez</li>   <li>▪ Mr. Ángel Cristián De los Santos</li> <li>▪ Mr. Miguel Mármol</li> <li>▪ Mr. David Reinoso</li>   <li>▪ Mr. Luis Bello</li>   <li>▪ Mr. Luis Amauris Romero</li> <li>▪ Mrs. Garby Rodríguez</li>   <li>▪ Mr. Bernardo Segura Landa</li> <li>▪ Mr. Víctor Calderón</li> <li>▪ Miss Josefina Herrera</li> <li>▪ Mrs. Altagracia Reyes</li> <li>▪ Miss María Isabel Henríquez</li> </ul>
10:00-10:45	Interview (Skype) with CEHICA's external associate researchers.	<ul style="list-style-type: none"> <li>▪ Dr. Juan Luis Ramirez Duval (and Georg Lamberty), Institute for Technology and Resources Management in the Tropics and Subtropics (ITT), Cologne University of Applied Sciences, Germany.</li> <li>▪ Dr. Rita Fonseca, Insititute of Earth Sciences, University of Évora, Portugal.</li> </ul>
10:45–11:15	Interview with CEHICA's national associate researcher	<ul style="list-style-type: none"> <li>▪ Mr. Francisco Febrillet</li> </ul>
11:15-11:30	interview with CEHICA training program beneficiary	<ul style="list-style-type: none"> <li>▪ Miss. Ana Montero, National Institute of Drinking Water and Sewerage (INAPA)</li> </ul>
11:45 –12:30	Interview with the head of the Department of Environment and Natural Resources of the Ministry of Foreign Affairs.	<ul style="list-style-type: none"> <li>▪ Mr. Francisco Socías Rodríguez</li> <li>▪ Raúl Pérez (CEHICA)</li> <li>▪ Juan Chalas (Director Ejecutivo de CEHICA).</li> </ul>
15:45-16:45	Interview with: <ul style="list-style-type: none"> <li>▪ Minister of Agriculture,</li> <li>▪ Deputy Minister of Agricultural</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minister Osmar Benítez</li> <li>▪ Mr. Juan José Espinal</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Sector Planning</li> <li>▪ Irrigation Coordinator of the Ministry of Agriculture</li> <li>▪ Executive Director CEHICA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Eugenio Burroughs</li> <li>▪ Mr. Juan Chalas</li> </ul>
17:00-17:30	Evaluation and coordination meeting	<ul style="list-style-type: none"> <li>▪ Miguel Doria (UNESCO),</li> <li>▪ Carlos Estévez (UNESCO consultant),</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>

• **Day 2. Tuesday, 12 November 2019**

Time	Agenda	Name
9:00-9:30	Interviews with beneficiaries of training activities in environmental flow and minimal ecological flow	<ul style="list-style-type: none"> <li>▪ Mr. Juan Saldaña,</li> <li>▪ Mrs. Maireni</li> </ul>
10:00-11:00	Interview with the Minister of Environment and Natural Resources.	<ul style="list-style-type: none"> <li>▪ Minister Ángel Estévez</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>
11:30-12:00	Interview with Hydraulic Adviser of the Presidency of the Republic.	<ul style="list-style-type: none"> <li>▪ Dr. Gilberto Reynoso</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>
12:00-13:00	Tour CEHICA's facilities, talk with staff of the laboratory	<ul style="list-style-type: none"> <li>▪ Water and soil lab professionals and officials</li> </ul>
15:00-16:00	Visit to the Water Management Unit of the Pontifical Mother and Teacher University (PUCMM), co-executor of the drought and climate change project	<ul style="list-style-type: none"> <li>▪ Paolo Herrera, Dean of the Postgraduate</li> <li>▪ Silvio Carrasco. Director</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>
16:30-17:30	Interview with Chairman of the Board of Directors of CEHICA.	<ul style="list-style-type: none"> <li>▪ Mr. Olgo Fernández, Executive Director of National Institute of Water Resources (INDRHI)</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>
17:45-18:30	Closing meeting, evaluation and challenges for the year 2030	<ul style="list-style-type: none"> <li>▪ Miguel Doria (UNESCO),</li> <li>▪ Carlos Estévez (UNESCO consultant),</li> <li>▪ Raúl Pérez (INDRHI)</li> <li>▪ Juan Chalas (CEHICA).</li> </ul>

#### **4. Results of the visit:**

##### **Alignment of CEHICA activities with the agreement signed with UNESCO and UNESCO strategies, objectives and priorities.**

###### **Good practices and remarks**

Based on the information provided to the reviewer prior and during the visit to CEHICA including the interviews conducted with CEHICA's management, staff, beneficiaries and associate researchers, as well as with affiliated government agencies, – the activities pursued by CEHICA are deemed to be in alignment with those set out in the agreement signed with UNESCO. Specific examples covering the range of activities corresponding to the CEHICA objectives were part of the interviews and are well documented in publications and different documents reviewed by the evaluator.

The research conducted and coordinated as well as the application of technology towards better practical use of water and educational strategy of CEHICA, were based on the cooperation with international agencies, universities and relevant entities of the States of the region, especially from the Dominican Republic. The Centre has also used the corresponding networks of the UNESCO Intergovernmental Hydrological Programme (IHP), particularly in Latin America and the Caribbean. It is an average of more than a dozen research projects carried out for a total amount of not less than half a million dollars, with an average duration of 2.3 years each.

Simultaneously, the Centre has organized and implemented training activities targeted at public officials, water irrigation organizations and other water users institutions. These courses focused on water resource management, hydrological behaviour in the face of drought and climate change; in the design and regulation of environmental flow and minimum ecological flow. In addition, CEHICA produced with scientific, technological and informative publications on the issue of sustainable water resources management and related and/or supplementary themes, as well as water quality monitoring or hydrological aspects of interest to the decision makers of the sub region. It is an average of 1.2 workshops, courses or trainings that are taught per year.

Finally, CEHICA has been an active participant of Meetings of National Committees and Focal Points of the PHI-LAC, contributing to the development of the water family of the region.

**The following is a brief summary of CEHICA research projects:**

1. Modelling of Hydrological Regimes and Erosion Processes -Sedimentation and Simulation of Scenarios for the Restoration of Watersheds. Main researcher: Fidel Pérez. Amount of financing: US\$ 63,000.00. Funded: MESCyT and FONDOCyT. Period: 2010-2012.
2. "Simulating the Effects of Climate Change on Water Resources and Adaptation Strategies in the Northern Yaque River Basin". Main researcher: José Francisco Febrillet. Amount of financing: US\$ 60,000.00. Funded: MESCyT – FONDOCyT. Period: 2013 – 2015.
3. "Using Sediments from Reservoirs as Nutrients for the Fertilization of Agricultural Soils in the Dominican Republic". Inv. Main: Bernardo Segura. Amount of financing: US\$ 166,600.00. Funded: MESCyT – FONDOCyT. Period: 2016-2019.
4. "Assessment of the Sustainability of the Decentralization Process of the Irrigation Service in the Dominican Republic". Main researcher: Juan Chalas. Amount: US\$ 10,000.00. Funded: MEPyD – FIES. Period: 2018 – 2019.
5. "Financial, Physical and Environmental Sustainability of the Irrigation Tariff Service in the Dominican Republic". Inv. Main: Juan R Chalas. Amount: US\$ 22,000.00. Funded: MEDyD – FIES. Period: 2018 – 2019.
6. Determination of evaluation indicators for the performance of the Irrigators Organizations in the Dominican Republic. Researcher: Juanito Montilla, Gerardo Mendez and Tomas Gonzalez. Period: 2018.
7. Degradation and Persistence of Pesticides in Soils in the Province of Constanza, Dominican Republic. Main researcher: Miguel Marmol. Period: 2018.
8. "Evaluation of Efficiencies in the Mao–Gurabo irrigation system and performance indicators of the plot irrigation". Main researcher: Juan R Chalas. Period 2018 – 2019.
9. "Assessment of the Salinity Behavior in the Well Fields, which Supply Water for Irrigation to the Baiguá, Project in Dominican Republic". Main researcher: Agustina Garcia. Period: 2018 – 2019.
10. "Renaturalization and Conservation of Water Resources of the New Valley National Park through Hydromorphological Research".. Main researcher: Agustina García. Amount: US\$ 176,000.00. Funded: MESCyT – FONDOCyT. Period: 2018 – 2021.

**The following is a brief summary of CEHICA capacity-building activities and the Centre coordinated/implemented initiatives:**

1. Regional workshop "Research Priorities on Sustainable Water Management in Caribbean Island States". Took place in the Dominican Republic in 2008.

2. Regional workshop on Networks and Cooperation for Water Resources Research. Took place in the Dominican Republic in 2008.
3. VI Coordination Workshop UNESCO/OAS ISARM Americas Programme. Cross-border aquifers from America. Took place in the Dominican Republic in 2008.
4. Course-Regional Workshop "Increased Water Supply". Carried out with the collaboration of CAZALAC. Took place in the Dominican Republic in 2009.
5. Regional workshop "Sustainability of Water Resources Management in Island States. In coordination with USAID, FIU, GLOWS. Took place in Dominican Republic in 2014.
6. Course – Regional Workshop "HEC-ResSim. Simulation Model for The Reservoir Operation". With the support of ICIWaRM. Took place in the Dominican Republic in 2014.
7. Course – Regional Experience Exchange Workshop. "Water and Soil Conservation" taught by the Mexican Institute of Water Technology (IMTA) and organized in collaboration with IICA within the framework of a Technical Collaboration Program for Caribbean Countries. Took place in the Dominican Republic in 2014.
8. Regional Course "Determination of Ecological and Environmental Flows". Made in coordination with the Water, Gender and Governance UNESCO Chair in the Dominican Republic in 2017.
9. Regional course "Ecohydrology in Coastal Zones", organised in the Dominican Republic in coordination with the UNESCO Chair on Water, Women and Governance in 2018, with the collaboration of IHP-LAC (the Regional Ecohydrology Program for Latin America and the Caribbean) and the International Centre for Coastal Ecohydrology (ICCE-Portugal)
10. Virtual course "Water Safety and Sustainable Development Goals, Scarcity and Water Quality" organized by UNESCO Montevideo in 2018.

**Following is a brief summary of CEHICA's publications:**

**Published articles:**

1. Watershed Erosion Evaluation of Empirical and Physical Models at Aguacate Reservoir, 2012.

E. J. Nelson Civil Engineering Department, Brigham Young University. Provo, Utah. J. E. McCarthy Engineer, Aquaveo LLC. Provo, Utah. M. Paudel Engineer, Aquaveo LLC. Provo, Utah.

F. Perez Hydrology Department Head, Instituto Nacional de Recursos Hídricos (INDRHI). Santo Domingo, Dominican Republic.

2. "Water and Development: A History of Cooperation in the Dominican Republic" *FREE FLOW*. Reaching Water Security through Cooperation. UNESCO Publishing. 2013.
3. "Simulation of the effects of climate change on water resources and adaptation strategies, using the Water Evaluation and Planning (WEAP) model, in the basin of the North Yaque region of the Dominican Republic". *Aqua-Lac Magazine*. 2015

#### **Articles to be published:**

1. Evaluation of the Sustainability of the Decentralization Process of the Irrigation Service in the Dominican Republic. Submitted to Aqua-Lac for editorial weighting, 2019.
2. Financial, Physical and Environmental Sustainability of the Irrigation Tariff Service in the Dominican Republic. Submitted to Agua-Lac for weighting. 2019.
3. Evaluation of the Sustainability of the Decentralization Process of the Irrigation Service in the Dominican Republic. Submitted to Aqua-Lac for weighting. 2019.

#### **Edited Books.**

1. *Increased Water Supply*. 2010.
2. CEHICA. *Water Management Support Initiative in the Dominican Republic and the Caribbean*. 2010. Update 2017.
3. Participation in the book entitled "*Technical Guide Water Room*". This book had a limited number of copies

It is the opinion of the reviewer that CEHICA's activities make a positive contribution towards UNESCO strategic objectives, responding to local and sub-regional water security challenges and contributing to the Intergovernmental Hydrological Programme's eighth phase, especially in themes 3, 4, 5 and 6, with knowledge, innovation and adding capabilities to policy development, the empowerment of people and water user organizations for water security and to promote the achievement of the SDG 6 targets and other related targets.

CEHICA has collaborated in the implementation of the strategic objective 5: Promoting international scientific cooperation on critical challenges to sustainable development. Especially in the generation and sharing of knowledge in relation to natural resources, and capacity development through international scientific collaboration for the protection and sustainable management of terrestrial ecosystems, biodiversity, freshwater security and the rational management of the Earth's geological resources. Particularly in Main Line of Action 2 "Advancing science for sustainable management of natural resources, disaster risk reduction and climate change action", working for a better management of natural resources towards the achievement of Sustainable Development Goals (SDGs) and targets related to biodiversity and climate change resilience; and Main Line of Action 3 "Improving knowledge and strengthening capacities to achieve water security", helping Caribbean states strengthen their response to water security challenges towards the achievement of water-related Sustainable Development Goals (SDGs) and targets, and other targets from relevant international water agendas.

In addition to the above, since 2017 CEHICA has decided to develop its training activities in collaboration with the UNESCO Chair on Water, Women and Governance, located in Santo Domingo, stated in the list of training activities above. Furthermore, it is worth to note that there is gender equality at CEHICA from the perspective of the number of women and men working in the Centre.

### **Recommendations**

CEHICA should consider that training courses, workshops and research projects should further approach a larger number of Caribbean island states. Almost all of the research projects implemented were funded by the Innovation and Science Fund of the Dominican Ministry of Higher Education, Science and Technology (MESCyT) for field studies within the borders of that country. It is recommended that the Centre makes additional efforts to establish partnerships and to expand the field of research to other island states and, as far as possible, to develop a joint project with Haitian institutions or universities on transboundary water resources, in line with indicator SDG 6.5.2. CEHICA clearly complies with the mandate established in UNESCO Global Strategy for the C2C and Institutes –(37C resolution 93/2013 B. Activities and Operation), which states that C2Cs and their activities should have a global, regional, or sub regional reach. However, this was only verified in relation to a small set of research projects. Notwithstanding, it is

important to note that that research projects have been submitted to international agencies and have been approved, but the funds were not received yet, as is the case of project approved by the International Atomic Energy Organization (IAEA).

CEHICA should focus part of its action on supporting Caribbean states to meet the 17 SDGs of the 2030 Agenda, especially those targets and indicators contained in SDG 6 and related ones. Is appreciated that the Center and the Government of the Dominican Republic have proposed to add a new CEHICA function in the renewal agreement: “to contribute to the implementation of phases VIII and IX of PHI and the 2030 Agenda and its objectives”:

*(g) Develop or support initiatives for the integrated management of water resources at appropriate levels, emphasizing their efficient use, scarcity initiatives, as well as the protection and restoration of ecosystems; and including cross-border cooperation; sustainable management of coastal water resources and estuaries; action to combat climate change and its effects; and promote action against desertification, soil degradation and flooding.*

## **Effectiveness of activities towards achieving stated objectives with a regional or international view**

### **Good practices and remarks**

CEHICA’s objectives are pursued through a suite of programs delivered through several distinct components, including: 1) research and application, 2) education and capacity-development, with an emphasis on resiliency and adaptation to the effects of climate changes, 3) networking and information-sharing and 4) providing a basic service, almost nonexistent in the small Caribbean states, which is the laboratory for water quality and soil. The reviewer noticed samples of soil coming from Haiti and the northern area of the Dominican Republic; which are good indicators of international collaboration

Notwithstanding, there are notable vulnerabilities that the center should correct, particularly in the laboratory that does not have state-of-the-art equipment. This fact was discussed with the President of the Centre, pledging to start with the 2020 budget of INDRHI a subsidy to remodel the infrastructure and machinery of the water and soil laboratory.

Another element that is considered important is the policy alliance developed by CEHICA.

This was appreciated in the memoranda of understanding of cooperation for exchange of experience, capacity building, and research and article generation, signed with:

1. The Monterrey Institute of Technology and Higher Studies. Water for the generation of articles on the situation of water resources in Caribbean countries. Cooperation contract signed in 2010.
2. The International Centre for Integrated Water Resources Management (ICIWaRM), USA, from 2011.
3. The University of Applied Sciences of Cologne (CUAS). Institute of Technology and Resource Management in the Tropics and Sub-Tropics (ITT), Germany. Cooperation Agreement signed in 2015.
4. The International Knowledge Centre for Science, Engineering and Technology (IKCEST). China. 2016
5. The University of Evora, Evora, Portugal. 2016

## **Recommendations**

During the interviews and meetings held during the evaluation of the Centre, it became clear the need to better socialize the work carried out by CEHICA. This work is not entirely visible to the ministerial authorities of the host government of the Centre. The Ministers of Environment and of Agriculture appreciated with great interest the work of CEHICA, to the extent that they found possibilities for action, linked with a variety of issues including 1) the availability of water, 2) the elimination or reduction of water pollution, 3) problems of the sedimentation of irrigation reservoirs, 4) the need to advance the installation of satellite monitoring technology, 5) update of the regulatory framework and water law, 6) to advise organizations of water users in charge of managing in their basins, 7) monitoring and controlling water extractions, 8) prevention of saline intrusion and recovering freshwater sources, artificially infiltrating aquifers and 9) improving the efficiency of resource management transfer of technology, among many other demands.

Accordingly, a brief publication or brochure is recommended, to explain in a few pages the work of the Center and the future possibilities. This should be to distribute to the political authorities of all Caribbean countries.

It is also recommended that CEHICA takes the necessary steps to collaborate with the IHP focal points of the island states, to meet the SDG targets.

It is also considered necessary that this is discussed within the Governing Board which

has not met for some time.

Finally, it is also recommended to expand CEHICA's alliance policy.

### **Quality of coordination and interaction with UNESCO Headquarters and other centers:**

#### **Good practices and remarks**

CEHICA liaises regularly with UNESCO's IHP Secretariat in Paris, as well as with the UNESCO Office in Montevideo, maintaining close relationships and frequent interaction on joint projects, initiatives and cooperation. CEHICA is consistently present at key IHP events such as the regional meetings of the national committees of the Intergovernmental Hydrological Programme (CONAPHI's) and various working groups within it. The Centre actively participate in virtual consultations and meetings that take place within the water family and has recently submitted several article proposals for Aqua Lac, scientific journal for Latin America and the Caribbean.

#### **Recommendations**

Following the policy agreed by UNESCO it is recommended that periodically and to the extent possible, CEHICA management, UNESCO and the global network of Category 2 Centers to reinforce engagement among researchers affiliated with C2C working in associated fields. To promote an improved exchange with other UNESCO Centers, CEHICA could "select" some of the WC2C with whom they share borders, especially with those who have also focused on the proposed new function to be added to the Agreement (SDG 6 and related) and make an electronic or virtual offer to share good practices and define medium-term strategies in which they can cooperate in areas such as climate change and water governance, together with the establishment of cooperation and joint research ties. The same with the centers to which their associate researchers belong.

### **Nature and quality of organizational arrangements, including management, governance and accountability mechanisms.**

The agreement signed in 2010 between UNESCO and the Government of the Dominican Republic notes, in its article V, that the Centre shall enjoy the personality and the legal

capacities necessary for the exercises of its functions, particularly the capacity to contract; to institute legal proceedings; and to acquire and dispose of movable and immovable property. In article VI: The Constitution of the Centre must include provisions concerning a) legal status of the Centre, conferring it, under the legislation of the Dominican Republic, the autonomous legal capacity necessary to exercise its functions, receive subventions, obtain payments for services rendered, and carry out the acquisition of assets, services, and all other means required. CEHICA has legal personality and therefore exists with the legal capacity for autonomy and legal and economic sufficiency. Related to the above, article IX states that the Government shall provide all the financial and/or species means necessary for the administration and proper functioning of the Centre, fully assuming the maintenance of the place and making available to the Centre the necessary personnel for the performance of its functions.

The article VIII of the 2010 Agreement refers to the Governing Board, which is chaired by the Executive Director of the National Institute of Water Resources (INDRHI) of the Dominican Republic and Chairman of the National Committee of the Dominican Republic of UNESCO's Intergovernmental Hydrological Program (CONAPHI). It will also be constituted by a representative of a limited number of Members States of the region – up to three – with an equitable geographic representation to the extent possible; a representative of the Director General of UNESCO and a representative (up to a maximum of three) of any other intergovernmental organization or international non-governmental organization that provides a significant contribution to the Centre's annual budget or its operations.

In fact, the Centre has operated with some autonomy of the board of the Centre, dealing directly with the Governing Board's President, as the Board has stopped meeting frequently.

### **Financial Aspects**

The budget of the Centre is drawn up with the general structuring of contributions described below.

1. Investments and operating expenses of the Dominican Government: these are fixed asset, consisting of the acquisition of real estate and the equipment of the Centre's facilities; as well as current or ordinary expenses, including the maintenance of existing buildings and facilities, communications, water and electricity services, gas, salaries and remuneration of the Secretariat's national

staff, meetings of the Board of Directors and expenses for the evaluation work of the Advisory Committee. The Dominican government's operational contribution is estimated at USD 400,000 per year, considering contributions in kind, cash and assets.

2. Resources for Research Projects, including some equipment and specialized tools required for research, human resources training and publications: these resources come from budget allocations that ensure the Board by the Dominican Government and projects that are obtained in competitions or result from contracts with other public or private bodies, whether national or international, multilateral development support banking, country agencies, UNESCO member states and states of the region that cooperate with the Centre.

### **Recommendations**

While CEHICA has its own legal personality, as a non-profit institution, it is recommended to strengthen its autonomy without necessarily distancing itself from INDRHI, which is the body that promoted its creation and whose executive director is the president of the Centre. CEHICA employees are public officials hired by INDRHI, although evaluated and promoted or sanctioned by the director of CEHICA. It is logical to assume that these officials do not wish to lose the status of public servants they have held for years. Having a work contract with CEHICA would mean losing that status and the contractual security that it entails. However, it is important to move towards greater autonomy with respect to the government in office. It is recommended to evaluate that those public officials who work in the Centre and that depend on the Department of Human Resources of INDRHI, maintain that status of public officials, but they could be permanently assigned to perform their functions under the dependence of the director of CEHICA, so, legally formalized if they are assigned "on duty" indefinitely in CEHICA. In this way they are still legally civil servants, but the hierarchical authority over these personnel would be formally defined in the headquarters of the Centre. This is something that is already happening in practice, since it is the Director of CEHICA who annually evaluates his staff.

With a logic similar to what is proposed for the staff of the Center, it is proposed to move towards greater autonomy in the management of the building where CEHICA is located. It is recommended that a contract be signed between INDRHI (the host entity of CEHICA) and the Center, where a loan for the use of offices and laboratories is formalized for 5 or 10 years, extendable.

It is suggested that the renewal of the Agreement should focus on the composition of the Governing Board and the way in which there are at least one or two representatives of the others Caribbean countries that can really participate in these periodic meetings. This is easier than 10 years ago, as the right technology for online meetings is now available. It is also recommended that the board organizes with the international cooperation training events in the Centres in LAC, usually financed by donor funds, which would allow face-to-face meetings.

Finally, while the centre's budget ensures its operation (premises and equipment, human resources, service payments), it has had financial difficulties in the development of projects, particularly from international funds or from other Caribbean's states, except for those projects that have been funded by the MESCyT's. It is recommended to evaluate the coordination of actions with diverse projects that are implemented in other developing countries of the Caribbean and to have the information of the various international donors that can assist in this coordination.

## **5. Conclusions**

CEHICA has been created as a UNESCO C2C in a sub-regional context of island states with major hydrological and climate challenges, along with budgetary difficulties. As a result, the Centre must deal with the challenges of cultural organizations that are not always trained in water management and water risk management. In turn, it must cope with difficult coordination between people with different languages and governments, universities and institutions with low budgets.

While it still lacks means to systematically provide services with greater excellence, it is undoubtedly a positive force for the generation of water intelligence, the training of relevant actors in the field of water, the dissemination of knowledge and the implementation of new technologies for more efficient water management.

It is recommended that the Agreement between UNESCO and the Government of the Dominican Republic be renewed, taking over the recommendations proposed in this document, so that in future evaluations CEHICA could be presented as a Centre that plays a relevant role in conceiving, introducing and implementing advanced technologies, water governance mechanisms and procedures for operational purposes, appropriate

for island states. It is also considered necessary for the Governing Board to replay a leading role in the management of the center.

December 2019