

International Hydrological Programme

23rd session of the Intergovernmental Council
(Paris, 11-15 June 2018)

PROPOSAL FOR THE ESTABLISHMENT OF THE 'CENTRO EXPERIMENTAL REGIONAL DE TECNOLOGÍAS DE SANEAMIENTO (CERTS)' IN URUGUAY AS A CATEGORY 2 CENTRE UNDER THE AUSPICES OF UNESCO

Item 8.2 of the provisional agenda

Summary

This document presents a proposal for the establishment of the 'Centro Experimental Regional de Tecnologías de Saneamiento (CERTS)' in Uruguay as a Category 2 Centre under the auspices of UNESCO.

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Introduction

Access to adequate sanitation is a fundamental human right recognized by the General Assembly of the United Nations in 2010. Uruguay has been one of the first countries to include this right in its Constitution since 2004. It represents an enormous challenge to comply with, as it means addressing sanitation solutions for those people living in small villages that do not have collective sanitation networks. Most of the small towns in Uruguay that are in the periphery of the urban centres, seaside cities and rural population, do not have sanitation networks. Moreover, as long as traditional network systems are not implemented, it is necessary to keep and maintain adequate treatment systems to manage house waste in order to improve the quality of life of the population and avoid sanitary and environmental risks.

According to the WWDR 2017 Report, the Latin American and Caribbean region (LAC) will confront a major challenge concerning sanitation¹, mostly because of the enormous increase of the urban population. The LAC region will need to comply with environmental and health world standards. Sustainable sanitation solutions adapted to specific areas and climates within LAC region will be necessary. Regional collaboration in order to provide adequate sanitation solutions through innovative processes seems to be crucial for future developments.

The United Nations agenda for 2030 establishes the Sustainable Development Goal (SDG) 6, regarding access to water and sanitation for the whole world's population.

And in particular, SDG 6.2 indicates that by 2030 it should achieve equitable access to adequate sanitation and hygiene services for all and put an end to open defecation, paying special attention to the needs of women and girls and people in vulnerable situations.

In fact, half of the Uruguayan population has no access to sanitation networks. In order to take care of this situation, we must develop human capacities with expertise in this area.

The proposed Centre – Centro Experimental Regional de Tecnologías de Saneamiento (CERTS) – under the auspice of UNESCO, as a Category 2 Centre, aims at developing strategies and low-cost technologies, as well as knowledge and capacities to look after for solutions for individual and low-scale effluents, for towns of less than 10.000 inhabitants, both at the national and regional levels.

Background

The CERTS has its origins in the installation of an Experimental Centre of New Water Technologies in the city of Canelones (Uruguay), similar to Seville's CENTA (Spanish acronym for Centre for New Water Technologies). This project begun with the signature of a cooperation agreement between the Ministry of Territorial Administration and Environment (MVOTMA) of Uruguay and the Ministry of Environment of Spain in 2007. The agreement was signed in the Conference of Iberoamerican Water Directors (CODIA), to provide a regional framework for wastewater treatment.

¹ UNESCO. World Report on the Development of Water Resources 2017. Wastewater disapproved resource.

The installation of the centre has progressed, by the time being an executive project of the building with its testing platform has been developed, also full laboratory equipment has been received, as well as all the agreements necessary to install the Centre within the urban effluent treatment plant of OSE (Administration of Sanitary Works of the State), in Canelones (Figure 1).



The project was incorporated in the national five-year budget for the period 2010-2015, with 1 million Uruguayan pesos (USD 34,000) per year. It was also included in 2017² as part of the National Water Plan, and after that the Uruguayan National Water Direction (DINAGUA) hired a consultancy firm (Scientia Consulting) to revise and update the CERTS project, as well as reformulates its strategy towards the signature of the agreements with different institutions and organisms for the creation of the CERTS as a Centre under the auspice of UNESCO.

The CERTS is the first experimental centre of sanitation technologies in the country and one of the very few in the LAC region.

It has been relevant to this proposal, the previous experience gathered with the creation of the Regional Centre for Groundwater Management (CEREGAS), a Category 2 Centre under the auspice of UNESCO. This Centre is functioning since 2015 in Montevideo, Uruguay, with the participation of various countries of the region.

² Programme 10. Education for water, communication, research and capacity development. Project P10/3: Promotion of lines of research and innovation and P10/4: Training and permanent training of human resources.

Objectives and functions

Vision

The proposed CERTS will become a reference centre, both nationally and regionally, to develop knowledge and human capacities in low-cost sanitation technologies.

Mission

The mission of the proposed centre is to contribute to the education of the population and to train technicians in the country and the region to give adequate and affordable sanitation solutions.

Context

Access to water and sanitation are recognized as a fundamental human right. In 2010, the General Assembly of the United Nations recognized them through Resolution 64/292, both safe and clean drinking water, as well as sanitation, are essential for the realization of human rights³. In Uruguay, such rights are recognized since 2004 in Art. 47 of the Constitution of the Republic, introduced at the initiative of civil society, through a plebiscite. In this way, Uruguay was the first country to regulate access to water and sanitation as a human right⁴. Through Law No. 18,610 of 2009, the National Water Policy establishes that "the State shall act in accordance with the effective exercise of such rights."

Access to sanitation at the urban level is carried out, in general, through conduction networks and treatment systems for its adequate final disposal.

In Uruguay, this service is in charge of the Municipal Government in Montevideo and the Administration of Sanitary Works of the State (OSE) in the rest of the country. However, many of the small towns in the provinces⁵ and peripheral neighbourhoods do not have collection networks, and sanitation is carried out by individual systems with eventual collection through "barometric trucks" for their final disposal in remote treatment systems.

The coverage of collection networks at national level reaches 60% of the urban population (95% of the total), 38% has static storage systems, 2% pour directly into a watercourse. The dispersed rural population is 5% of the total. In the inland of the country, 58% of households in urban areas have individual sanitation solutions (wells). The emptying of the wells by means of barometric represents a high cost for the users, the majority of the wells present surface and/or underground losses by pouring their contents into gutters or the surrounding land.

³ Source: Resolution A/RES/64/292. UN General Assembly. July 2010.

⁴ Source: Office of the High Commissioner for Human Rights of the United Nations (UN). <http://www.ohchr.org/Documents/Issues/Water/Handbook/Uruguay.pdf>

⁵ Less than 10,000 inhabitants.

According to data from the 2011 National Census, 65% of households use the barometric service even though most of them do not have impermeable septic tanks and leaks occur, which can affect the quality of groundwater. Added to this is the impact of the dumping of the barometric in specific places that may affect the groundwater and in general have little control.

Urban wastewater, together with runoff from arable areas and industrial effluents, are the main causes of the deterioration of most of the country's water bodies. In a set of 151 water bodies studied (rivers, reservoirs, coastal lagoons, natural, artificial or modified lagoons), 70% of them are considered eutrophic, and 40% have high biomass and/or harmful phytoplankton blooms⁶.

Regional Context

Sanitation is a major challenge for the LAC region, where it is one of the most urbanized regions in the world. Almost 80% of the population lives in urban areas and it is expected that this rate will increase even more with 86% of the population living in cities by the year 2050⁷.

In this regional context the LAC regional challenge is to respond to an increasingly urban population. Urban wastewater discharges are increasing in the region due to: i) population growth (the urban population went from 314 million in 1990 to almost 496 million today and is expected to reach 674 million by 2050)⁸ and ii) the increase in water supply and sanitation services. In 2015, 88% of the urban population had access to improved sanitation facilities⁹, of which probably less than 60% were connected to sewerage systems¹⁰. Given that there has not been an equivalent increase in wastewater treatment in most of the LAC region, urban sanitation continues to be one of the main concerns of governments.

According to the UNESCO's WWDR 2017 Report¹¹, the population that is not connected to the sanitation network depends mainly on in situ disposal systems, such as latrines and septic tanks. In these systems, wastewater is removed by direct runoff or percolation to nearby water courses and aquifers, which generally contaminates the water.

Besides the environmental impact, improving sanitation and wastewater treatment is also a key intervention strategy to control and eliminate many other diseases, such as cholera and some neglected tropical diseases, such as dengue, dracunculiasis, lymphatic filariasis, schistosomiasis, transmitted helminths on the floor and trachoma¹².

⁶ Source: Kruk *et al.* (2013). Análisis Calidad de Agua en Uruguay. Asesoramiento Ambiental Estratégico y Vida Silvestre Uruguay.

⁷ UN-DESA 2014. *World Urbanization Prospects: The 2014 Revision*. Nueva York, Naciones Unidas. www.un.org/en/development/desa/publications/2014-revision-world-urbanization-prospects.html

⁸ op. cit.

⁹ UNICEF / WHO 2015. Progress in sanitation and drinking water: update report 2015 and Evaluation of the MDGs. New York / Geneva, Joint WHO / UNICEF Programme for Monitoring Water Supply and Sanitation. www.wssinfo.org/fi_leadadmin/user_upload/resources/JMPUpdate-report-2015_English.pdf

¹⁰ United Nations Children's Fund / World Health Organization). 2000. World Assessment of Water Supply and Sanitation in 2000. New York / Geneva, UNICEF/WHO. www.who.int/water_sanitation_health/monitoring/jmp2000.pdf

¹¹ UNESCO. World Report on the Development of Water Resources 2017. Wastewater disapproved resource.

¹² Aagaard-Hansen, J. y Chaignat, C. L. 2010. Neglected tropical diseases: Equity and social determinants. E. Blas and A. S. Kurup (eds.). Equity, Social Determinants and Public Health Programmes. Geneva, Switzerland, World Health Organization (WHO).

LAC sanitation problems are of major concern for the CODIA member states, and in particular for LAC countries in impoverished regions or neighborhoods.

Objectives

The proposed CERTS has the following objectives:

- Develop new knowledge related to low-cost sanitation systems for both, individual and small populations, to contribute improving the quality of life of the society and to achieve the SDG, particularly the number six, which defines sanitation as a human right.
- Verify and optimize the operation of different low-scale urban effluent treatment technologies to improve the existing sanitation systems in order to widen the coverage
- Train educators and technicians, from the country and the region, in urban low-cost effluent treatment systems, to cover the demand of sanitation solutions for the population.

Functions

The Centre will work throughout the development of projects in three strategic areas: i) research and knowledge; ii) technology transfer, training capacities and human resources and iii) coordination of interinstitutional capacities.

- 1) Research and knowledge: development of research projects related to different technologies (filtrating membranes, biological reactors, etc.): verification and optimization of the low-cost technologies (lagoons, wetlands, septic tanks, enzymes, microbial cultures, etc.); operation, design, and maintenance of the systems. Certification and validation of effluent treatment technologies.
- 2) Technology transfer, training capacities and human resources: organization of courses, exchange activities and technology transfer with research institutions from the region and outside the region. Integrate technicians from enterprises, public institutions, educators, etc. Develop the infrastructure to train postgraduates in technical education institutions.
- 3) Coordination of interinstitutional capacities: connect the national and international research and education centres with the companies that offer sanitation services together with the public organizations entitled to apply public policies in this area. Also, bring together institutions, financing opportunities with other related areas of knowledge (economy, society, environment, health, etc.)

In the short-term the following activities are proposed:

- 1) Behavioural studies of 8 treatment pools within MEVIR (Uruguayan Movement for the Eradication of Rural Insufficient Housing) popular housing complexes in towns with less than 2500 inhabitants. This will be carried out in collaboration with MEVIR, OSE and research centres. Ongoing project.

- 2) One-week course of low-cost sanitation technologies developed by CENTA from Spain. Tentative date: August 2018.
- 3) Use of sludge from agricultural effluent treatment plants with INIA (National Agronomics Institute) and OSE. Use of biological cultures to improve static systems in the effluent treatment. Tentative initial date: October 2018.

Opportunity and relevance of the proposal

The proposed CERTS is focused on covering the real existing demand of specific knowledge for the region, to solve a serious problem regarding the sanitation of the population that is not connected to the traditional sanitation network systems, that in the case of Uruguay is almost 50% of its population.

The lack of research and expertise in this area is one of the main limitations we have to reach a solution to this situation.

There is no other centre in the region with these characteristics. Similar experience in the research area are found in some research centres of the region, such as the Universidade Federal de Santa Catarina, Universidad de San Carlos, Universidade de Sao Paulo and some operative centres such as SABESP (Brazilian water and waste management company owned by São Paulo State) in Franca (Brazil) and COPASA (Sanitation Company of Minas Gerais in Belo Horizonte). Those centres are examples and models for our centre, as well as synergy partners for the exchange and networking.

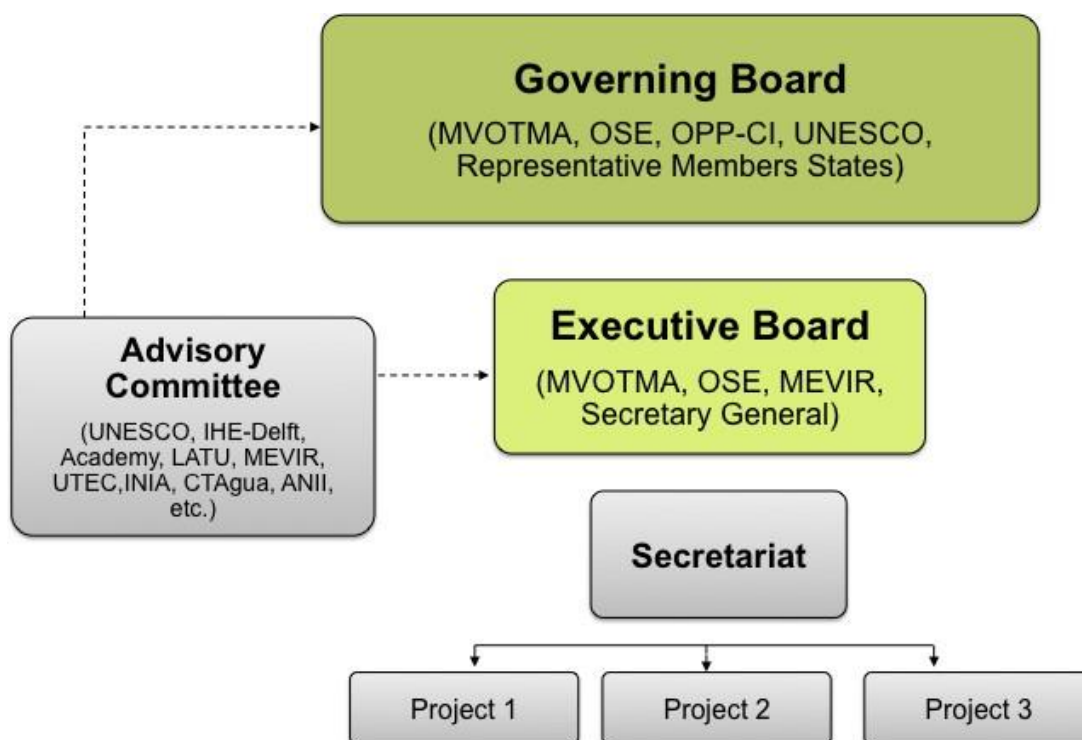
The project has advanced, as a result of important international cooperation activities and existing agreements with reference centres such as CENTA from Spain, the (Delft Institute for Water Education) of Delft, the CODIA, and the International Hydrological Programme (IHP) from UNESCO in which we are proposing to include the proposal.

Legal status

The proposed CERTS will constitute a specific trust guaranteeing that the use of the funds will be to achieve the agreed objectives. In the future, it will receive specific financial contributions for each research project that will come from both national or international research programmes.

Governance

The governance of the proposed CERTS is reflected in the following organization chart. It gathers the experience of governance and workflow of the CEREGAS.



Governing Board

The Administrative Council is the highest authority within the proposed Category 2 CERTS. It will meet at least once a year. Additional meetings may be arranged upon request of any of the members, with at least two weeks anticipation.

In its first meeting the CERTS shall adopt its rules. Procedures and mechanisms will be detailed in the Administrative Manual. In addition, at the first meeting, the Action Plan to be developed in the first period will be approved, together with the corresponding budget.

A Director, elected by the members of the Administrative Council, will supervise the CERTS. The executive action plan will be approved annually, together with the budget and its funding.

Also, each year an expenditure report must be presented and approved.

The Administrative Council will be integrated by:

- a. A representative of the Uruguayan Government, who will preside the Council
- b. A representative of the General Director of UNESCO
- c. A representative of OSE (Administration of Sanitary Works of the State)
- d. A representative of the "Congreso de Intendentes" (Uruguayan Province Municipalities Congress)
- e. Three representatives of Members States.

The CERTS Director will be the Secretary of the Administrative Council.

Executive Board

The Executive Board is made up of delegates from the institutions participating in the Administrative Council of Directors and together with the Secretary General they are in charge of the implementation of the approved Action Plan. The Secretary General (Secretariat) will be responsible for the day-to-day management of the Centre as well as for the links with the different institutions.

The President of the Council will direct the meeting according to the agenda, approved previously, and shall:

- Be a mediator in the debates that emerged at the meeting.
- Propose alternatives if an agreement are not reached between the members.
- To consult with the Director of the Centre on issues those are of direct concern of the Centre's management.
- Coordinate with the Director of the Centre the follow-up of the agreements, to complete its fulfilment.

The Director of the Centre as Secretary of the Board of Directors will comply the following functions:

- He will be responsible for preparing the briefs of the meetings, which reflect the meaning of the discussions and the decisions taken.
- For this he must organize the rapporteur ship and follow up.
- Formalize the minutes of the meeting. Said minutes shall be ready at the conclusion of the meeting and approved by the members of the Board. Each member of the Council will receive a copy.

International Technical Advisory Committee

In order to incorporate the opinion of different institutions associated with CERTS, the International Technical Advisory Committee will be convened, which will be able to make recommendations to the Executive Board and the Administrative Council regarding technical and institutional matters. It will be integrated by formal invitation of the Executive Board, in accordance with the directives of the approved Action Plan.

National Technical Advisory Committee

It will hold similarly than the International Advisory Committee, but with National Academic Institutions linked to the various aspects related to the Centre, both in the operational field of the sector, as well as in academic and research areas.

Financing

The proposed CERTS will have a financing of the basic budget contributed by the MVOTMA,

which will finance the hiring of the Executive Secretary, and the support team, while the fixed expenses of office, security and administration of the property will be shared by the MVOTMA and OSE.

The costs of investments, operation, maintenance, research, teaching, associated to the different research projects, technology transfer, and generation of capacities will be financed by each project developed in the CERTS, as part of its proposal.

CERTS, through its Executive Secretary, will promote the formulation of projects that contribute to the Centre's objectives, seeking the collaboration of national and international research, innovation, and teaching funds.

The CERTS through its trust will be allowed to receive and manage the corresponding funds for the development of the different projects.

The execution of the infrastructure investment of the CERTS project designed by TRAGSA (Spanish State-owned holding company for infrastructure and cooperation) is the specific objective of the ongoing project to seek funding, both public and private.

Until the planned construction works are completed, the laboratory tasks will be carried out with the laboratory equipment of the CERTS, in OSE laboratory facilities, while the training and technology transfer activities will be carried out in the existing facilities to be agreed upon in each project, and the office and coordination activities of the Executive Secretariat will be carried out in the offices of DINAGUA (MVOTMA).

Cooperation with other entities

Contribution of UNESCO

UNESCO may provide technical assistance for the programme activities of the proposed Category 2 Institute, in accordance with the strategic goals and objectives of UNESCO.

The proposed CERTS will allow the coordination and multiplication of activities with other UNESCO category 2 centres, and Chairs in complementary areas of action, such as:

- Institute for Water Education, IHE Delft, the Netherlands. International Knowledge Centre for Engineering Sciences and Technology, Beijing, China.
- Regional Centre for Groundwater Management (CEREGAS) for Latin America and the Caribbean, Montevideo, Uruguay
- Chair of Water and Culture (University of the Republic, Uruguay)

Collaboration with other regional and international entities

The CERTS will help strengthen and develop its objectives in articulation with the CODIA. It will be a key component of CODIA's training programme in the area of sanitation. CERTS will articulate with other similar centres such as CENTA in Seville, Spain, and CENTA under development in Costa Rica with the support of AyA (Costa Rican Institute of Aqueducts and

Sewers) and the Water Directorate of the Ministry of Economy, Industry and Commerce, as well as with other research centres in the field at a regional level like that of SABESP in the city of Franca, that of UFMG (Federal University of Minas Gerais) -COPASA in the city of Belo Horizonte, and that of the UFSC (Federal University of Santa Catarina) in Florianopolis.

Moreover the CERTS will allow the coordination activities with other academic networks like the South American Institute for Resilience and Sustainability Studies (SARAS²), in Maldonado, Uruguay.

The CERTS will provide technical capabilities at the regional level, contributing to the effectiveness and efficiency of infrastructure investment programmes in the sector, of interest to international organizations and multilateral financing.

Collaboration with other national entities

The proposed CERTS will contribute and allow the development and strengthening of joint working areas:

- With sectorial policy decision makers (MVOTMA, MGAP – Ministry of Agriculture and Fisheries, SNAACC - National Secretariat of Environment, Water and Climate Change, OPP - Office of Planning and Budget)
- With the operational sector (OSE, MEVIR, provincial municipal governments, housing cooperatives, etc.)
- With the academic sector of public and private universities (UDELAR – University of the Republic, UTEC – Technological University, UCU – Catholic University of Uruguay, UM – University of Montevideo)
- With private actors interested in solving problems such as consulting companies and private operators that require the validation of treatment technologies.

Likewise, CERTS will allow the development of joint projects with other related research centres such as the INIA in projects such as the reuse of water and sludge in agriculture, the IIBCE (Clemente Estable Biological Research Institute) specialized in biological research of the MEC (Ministry of Culture and Education), the LATU (Technological Laboratory of Uruguay) in sewage technologies, etc.

Contribution to UNESCO's programmes and to the United Nations 2030 Agenda

The CERTS activities will advance UNESCO's objectives in the implementation of the UN 2030 Agenda for Sustainable Development, and specifically with the SDG 6 "Ensuring availability and sustainable management of water and sanitation for all". And in particular, with the SDG 6.2 to achieve equitable access to adequate sanitation and hygiene services for all and put an end to open defecation, paying special attention to the needs of women and girls and people in vulnerable situations.

The CERTS by working in Sanitation as a human right will also focus on other SDG with particular impact in improving the quality of life of the less benefited sector of Latin American

societies, including:

- SDG 1 “No poverty”. As one of the aspects of alleviation of poverty is adequate housing with access to running water and sanitation. CERTS will focus on sociological aspects of sanitation in cooperative housing and rural housing.
- SDG 2 “Zero Hunger” that focuses on food security. The proposed Category 2 Institute will promote research and development on water reutilization for crops.
- SDG 3 “Good health and well-being”. The proposed Category 2 Centre’s research will aim at reducing health risks by implementing correct sanitation solutions among the poorest, and focusing especially on women and children.
- SDG 4 “Quality education”. CERTS will work in coordination with primary school programmes in order to disseminate responsible management of sewage waters.
- SDG 9 “Industry Innovation and Infrastructure”. CERTS research and innovation will contribute to industrial solutions to the sanitation in small villages and towns.
- SDG 10 “Reduced inequalities” within and among countries. In fact the regional character of the proposed Category 2 Centre will expand innovation and sanitation solutions within Latin American countries, through the contribution of CODIA.
- SDG 11 “Sustainable Cities and Communities” on improving people’s life quality in small town through environmental friendly solutions of the sanitation.
- SDG 13 “Climate action”. CERTS will contribute in providing solutions to the adequate sewage water management in order to mitigate environmental impacts of the human activities.
- SDG 15 “Life on Land”. CERTS research and innovation will provide solutions to reduce chemical contaminants and nutrients (phosphorus and nitrogen) in fresh-water and in land ecosystems.
- SDG 16 “Peace, Justice and Strong Institutions”. CERTS will contribute strongly to the networking of regional and national academic and governmental institutions strengthening collaborations at all different levels.
- SDG 17 “Partnership for the Goals”. CERTS will work hard to contribute to the collaborative network with other UNESCO Centres and Chairs in order to boost partnership in developing countries.

CERTS will also contribute to the IHP Eighth Phase¹³ Strategic Plan in the Theme 4: Water and human settlements of the future.

¹³Water Security: Responses to Local, Regional, and Global Challenges Strategic Plan IHP-VIII (2014-2021). <http://unesdoc.unesco.org/images/0021/002180/218061e.pdf>