



R&D&I EXPERIMENTAL CENTRE

Foundation CENTA: CENTER OF NEW
WATER TECHNOLOGIES

Singular platform since 1990



FUNDACIÓN CENTRO DE LAS NUEVAS TECNOLOGÍAS DEL AGUA



Document drawn up by the Fundación Centro de las Nuevas
Tecnologías del Agua (CENTA) / Foundation Centre of New
Water Technologies (CENTA)

Table of contents

1. Background to the visit	5
2. R&D&I Experimental Centre at Carrión de los Céspedes: Origins and Evolution	6
3. The Experimental Centre today	11
4. The Foundation CENTA.....	14

1

Background to the Visit

The **R&D&I Experimental Centre** which is located 28 Km from Seville, in the municipality of **Carrión de los Céspedes**, supports the research activities of the Foundation CENTA and hosts its main offices. It has become today a **singular technological platform**, unique in the entire world, covering over **41,000 m²** dedicated to experimentation. The **pool of technologies** available and its specialisation in **extensive treatments** are what makes it so singular and what has made it a **reference point for research and innovation** in the water sector, both nationally and internationally.

Therefore, the visit to these singular facilities is the perfect showcase for technical people, researchers, administrations, specialized students and, in general, professionals on sanitation and water purification in small communities.

2

The Carrión de los Céspedes Experimental Centre: Origins and Evolution

The Carrión de los Céspedes **R&D&I Experimental Centre** started its activities in **1990**, in the framework of the R&D Plan for Wastewater Treatment through Non-Conventional Technologies adopted by the Regional Government of Andalusia in 1988.

The plan was designed to identify technically and financially feasible solutions to tackle wastewater treatment in small villages in Andalusia, where large-scale solutions had obviously failed.

Initially, the plant was intended to collect experimental data adapted specifically to the context of Andalusia, for the design, maintenance and operation of natural wastewater treatment technologies, since their lower implementation cost, their resilience and efficiency, their landscape integration and their ease of handling, made them ideal for rural areas with technical and/or financial constraints.



Image 1. Aerial view of the Experimental Centre taken in 1990.

Originally, the **21,000 m²** surface area of the plant were devoted only to extensive technologies, with a treatment capacity of **170 m³/d**, and purified about 40% of the wastewater generated by the town of Carrión de los Céspedes.

Thus, the technologies used to carry out the first studies were:

- Green Filter
- Peat Filter
- Constructed Wetlands
- Lagooning

The location of these facilities near the village of Carrión de los Céspedes in the province of Seville was not a random choice. The town was chosen as it is highly representative of Andalusian towns (rural population, with some 2,000 inhabitants, without industrial waste) and for its proximity and good connections with the cities of Seville, Huelva and their universities.

From the very beginning, the experimental plant has been characterised by two distinct features:

- The **applicability** of its research activities and profound knowledge of real, practical problems.
- Its dedication to **educational and dissemination activities**.

Step by step, the plant achieved and exceeded the objectives of the R&D Plan, achieving its own momentum and significance, as shown by several milestones passed during its evolution.

One of these milestones was, undoubtedly, the participation of **companies from the private sector** in research and prototype development. Consequently, as well as studying its own systems, the plant started collaboration with specialised companies. This collaborative work has certainly entailed technological improvement of the experimental centre, by keeping pace with the **innovations seen in the sector**, and giving rise to the pool of over 30 different **technologies** which include from the simplest and more natural ones to the state of the art reactors, with testing on a scale far beyond that of laboratory studies.



Image 2. Aerial view of the Experimental Centre taken in 1995.

Another relevant milestone was the **dissemination of this experience to other territories**, as Morocco and other **countries of the Mediterranean**, under a technology transfer programme which started in 1998, and which led to the construction of an Experimental Centre in Tetouan (Morocco), modelled on the Carrión centre and adapted to the local context.

Most recently, in 2007, the CENTA Foundation signed a Collaboration Agreement with the Directorate-General for Water of the Ministry for Environment, Rural and Marine Affairs to run a project to establish a similar Experimental Centre in Canelones (Uruguay), in the framework of the **Latin-American Cooperation Programme for Water Resource Management**, fostered by the Conference of Latin-American Directors-General for Water (CODIA).

In **1998**, the Andalusia Regional Government, through a series of collaboration agreements, handed over to the Foundation CENTA its more tangible inheritance of its R+D+I Plan regarding non conventional water treatment technologies: the Experimental Plant of Carrión. The initiative brought excellent results both for the experimental complex and for the CENTA, with added value on both sides.

Since the plant has been managed by the Foundation CENTA, continuous efforts have been made to improve its infrastructure, enlarge the facilities and dynamise its activity, making it a real experimental platform that provides support to many research groups in the field of water technologies.

The two enlargements to date are worth mentioning, one in **2004**, which extended the original surface area by 14,000 m²; doubling the treatment capacity of the plant (400 m³/d today, set to rise to 700 when current works are completed), and rearranging the experimental areas with new plots being dedicated to extensive technologies and other spaces reserved for the installation of pilot systems by companies or research centres for study and validation purposes.

That first, decisive enlargement was funded by the **Regional Government of Andalusia**, through European ERDF Funds, and has been completed with funds provided by the **Ministry of Science and Innovation**.



Image 3. Aerial view of the Experimental Centre taken in 2007.

The second enlargement was carried out more recently, in **2009**. A new plot of 6,000 m² has been added for research on regenerated water reuse, so extending the total area up to 41,000 m². Financial support for this enlargement was granted by the **Ministry of the Environment, Rural and Marine Affairs**.

3

The Experimental Centre today

Today, 20 years after its creation, the plant has far surpassed its initial goals, as shown by its growth in area and its development as a **research centre of excellence**.

Since 2009, the CENTA has been the owner of the facilities, which support most of its research and dissemination activities. For its part, the Regional Government of Andalusia, through the **Regional Ministry of Environment**, contributes to the promotion and support of the Foundation through its financial and institutional aid.

The latest infrastructure which has been built in the Experimental Centre is the **“Interpretation Centre for the Urban Water Cycle”**, which was inaugurated on 22 March 2011 on the occasion of World Water Day. The new building is an important initiative of the Foundation to disseminate knowledge and promote environmental awareness and is especially aimed at young people.

The new Interpretation Centre is a place intended for **training and the dissemination of knowledge** to complement the research activities carried out by the CENTA. The building includes several exhibition rooms, a room for workshops, a viewpoint, an audiovisual room, etc. The main activities are focused on environmental awareness raising, training, and dissemination of different aspects related to the **Urban Water**

Cycle. The building has been designed for this purpose with simple but elegant lines in a practical, functional internal distribution designed to be accessible and sustainable. Moreover, the new building is a good example of sustainable architecture since it has been made with natural, mainly passive, resources, achieving maximum comfort and a considerable reduction in energy consumption.



Image 4. Main building at the CENTA facilities.

For all these reasons, the Carrión de los Céspedes experimental complex stands as a fundamental, key element for the projection and development of the **CENTA Foundation Strategic Plan**.

Since March 2011, the *CENTA main offices* have been located in the Carrión Plant, where the management, communications, cross personnel and administration departments have joined the rest of the staff permanently employed by the R&D&I Experimental Centre (researchers and personnel working in other technological services).

The Foundation CENTA has laid down as its priority line of action the refurbishment and modernisation of infrastructure in order to continue its outreach activities and increasing its research capacity, which has not yet peaked. Thus, the improvement of the infrastructures will:

- Make the experimental complex more accessible to a greater number of **companies in the water sector**, in order to perform full-scale studies of their experimental prototypes, thereby promoting public-private collaboration.
- Adjust the infrastructure to the increasing demand for services provided by the Foundation, due to its qualification as a **Notified Body for the EC accreditation for water purification systems**, in accordance with standard UNE-EN 12566-3 Annex B under Directive 89/106/EEC, the CENTA Foundation being the only such body in Spain.
- **Increase the Experimental Centre's research capacity** so as to improve CENTA's work focused on the study of wastewater regeneration and reuse from an ecological, hydrological and social standpoint.

In conclusion, the CENTA R&D&I Experimental Centre is a privileged place which, over more than twenty years of uninterrupted operations, has proved its enormous potential for promoting sustainable solutions to wastewater treatment problems. Over this period of time, it has become a reference point among experimental centres for the implementation of extensive technologies, also called non-conventional technologies (NCT), in Andalusian municipalities.



Image 5. Picture of the stabilization ponds and green filter at the Experimental Centre.

4

THE FOUNDATION CENTA

The **Foundation Centre of New Water Technologies** (CENTA) was an initiative launched in the year **1994** as a business association, with the support of public water administrations, whose aim was to become an Andalusia-based **reference Technological Centre** in the water sector.

From the beginning, the CENTA played the role of a driving-force for the water sector, by liaising between strategic agents: the administrations, companies and the scientific community.

Over **17 years**, this institution has adapted to the increasingly complex reality of water issues, which involved not only technological, but also management challenges.

In the same way, it had to meet the needs of the Andalusian situation and address the current situation regarding its responsibilities, both in the water sector and in the fields of research and knowledge.

With the support of the Regional Ministry for the Environment of the Regional Government of Andalusia, CENTA consolidated its evolution in **2008** when it became a **Joint Foundation** whose board, chaired by the Regional Minister of the Environment,

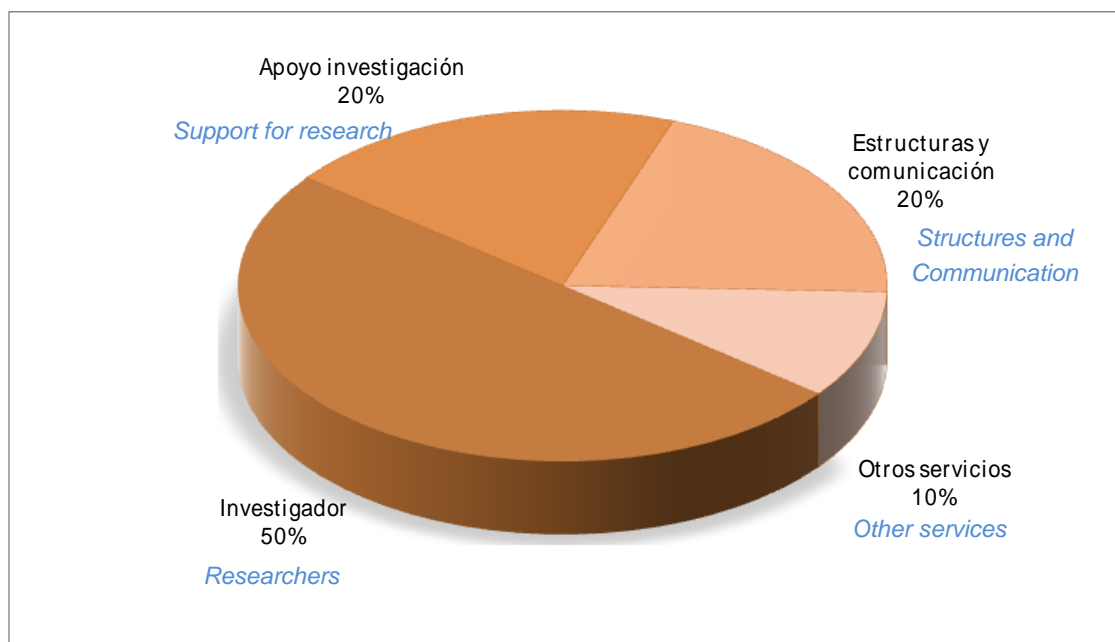
included members from administrations, universities and the main public and private water companies.

Today, the Foundation CENTA is a research centre, included in the Andalusian Register of Knowledge Agencies. It is a clear leader in the water sector at regional and national level. The official website of Foundation CENTA is: www.centa.es

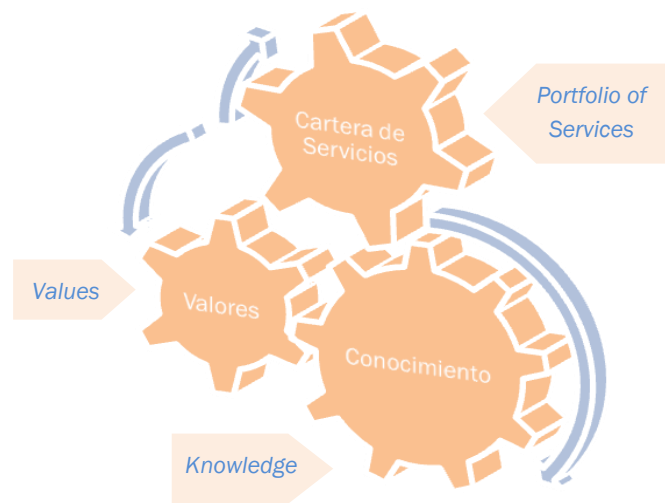
The Foundation CENTA sees research as a support tool for decision-making and the development of public water policies. This focus on research considers the generation of knowledge to be as important as its dissemination so that it can be implemented wherever it is needed.

The **mission** of the Foundation CENTA is to contribute, through the generation and dissemination of knowledge and excellence, to the efforts of the scientific community, administrations and private sector to promote the better and more sustainable management of water resources and to make Andalusia a technological reference point as regards water.

Currently, the Foundation has 33 employees working in the following areas:

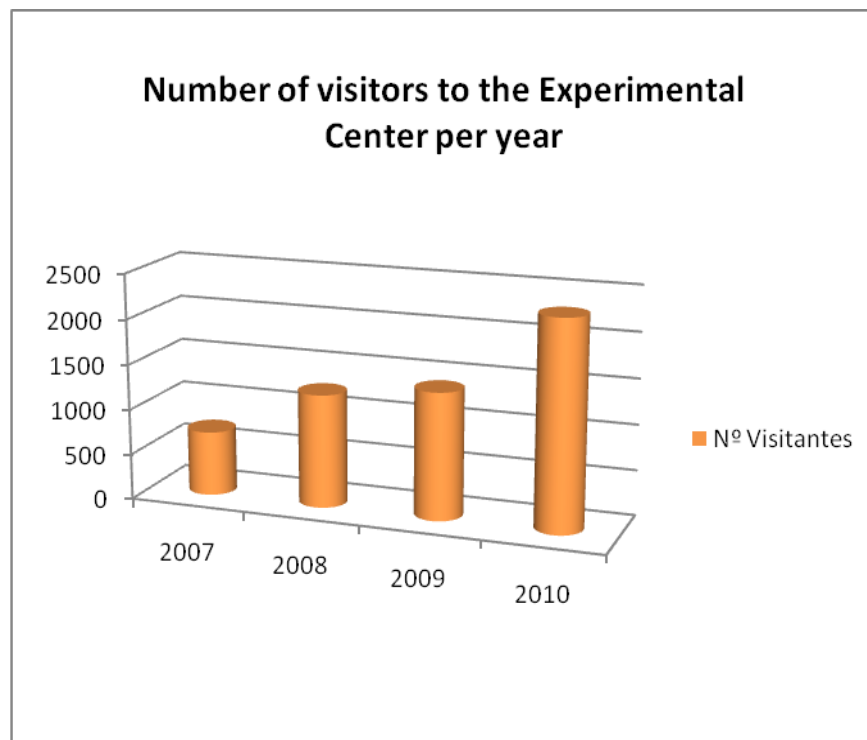


The Foundation CENTA identifies its **CORE BUSINESS** with knowledge generation as expressed in a specific portfolio of technological services.



“Research as a support tool for decision-making”

These technological services are complemented by intense dissemination work at scientific and social levels, with considerable resources devoted to activities aimed at transmitting values related to the management and conservation of water resources.



We also should underline the pledge of the Foundation to **comply with the Millennium Development Goals** and with the United Nations mandates, especially as regards its role in the promotion and direct management of development cooperation projects to improve access to drinking water and basic sanitation in North African and Central-American countries.



Image 6. Updated plane of the R&D&I Experimental Centre. Foundation CENTA.