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Water Interpretation Centers: A Case Study in Spanish Territory

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Abstract: The shortage of water in the Iberian Peninsula has become one of the most pressing environmental problems and of greater transcendence in recent decades. This issue is also underlined at the international level because of climate change. The proliferation of interpretation centers that focus their attention on water in Spain is a relevant response to the need for public awareness of the problem of water as a scarce resource, as well as at the international level. Among the issues that we raise in this work we highlight: to what extent has been the strategy of the construction of Water Interpretation Centers (WIC) and if its contents, methodologies, resources and facilities have effectively contributed to a greater awareness of the population on the problem of water? Finally, how are these centers fragile in time in relation to their stability and the working conditions of their staff? The methodology is based on descriptive–evaluative research, with the following phases: preparation of a census of interpretation centers at the state level, and the design and submission of a form around six topics and data analysis. In conclusion, we can highlight that 150 centers have been registered. Finally, the main conclusion is that the crisis has affected the sector, causing a drop in financing and in the supply of activities, where it has not recovered at present.

Keywords: water museum; education museum; environmental education; water interpretation centers; heritage

1. Introduction

1.1. Definition of Heritage Center and Museums

Heritage is a selection of assets and values of a culture, which are part of the symbolic or real property of certain groups, which also allow processes of individual and collective identity, and which contribute to the characterization of a context [1]. A broader concept of heritage would be that it is a sociocultural fact constituted, in a holistic way, by various manifestations of historical, artistic, ethnological, scientific–technological and environmental character, which together allow the comprehensive knowledge of the different societies both from the past and of the present, giving rise to structures of social identity that become cultural symbols [2]. Sibony [2] express that the patrimonial elements are time-bearing objects that have to be interpreted in order to extract the messages that it sends us through them. According to Ballart & Juan (2001) [3], the valuation of heritage objects depends on the intellectual, historical, cultural and psychological frames of reference, which vary according to the people and the groups that attribute their value [4].

Therefore, it could be said that heritage centers are places where to understand past and present societies, being the heritage elements those that allow the understanding of our present and the origin of future positions, linking it with our cultural roots and traditions. In this way, they are configured as socially symbolic and identitarian elements, on which to articulate critical visions, where the respect to diversity and plurality is enhanced from social, cultural and political perspectives

at the same time that the need to preserve said patrimonial elements is valued [5]. These functions are also carried out by historical spaces as they have been and are today modern museums or the so-called progressive museums [6]. According to the International Council of Museums, a museum is a nonprofit-making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment [7]. In this sense, the American Association of Museums define a museum as “an organized and permanent, non-profit institution essentially educational or aesthetic in purpose, with professional staff which owns and utilizes tangible objects and displaying them to the public on some regular schedule”. In addition, to argue that the museum’s function to provide pleasure and delight to visitors is not incompatible with an educational mission including others terms relate to exploration, study, observation, critical thinking, contemplation and dialogue [8].

1.2. Evolution of Museums

It is common knowledge that museums have a long history, dating since ancient times, but the modern museum, a collection open to the public for edification and amusement, is essentially a product of the 18th century enlightenment [9]. While at their beginning as cultural institutions the role of a museum was to raise the public’s level of education and culture, being a place where to collect, protect, preserve and present to the public rare, beautiful, old objects with heritage value; nowadays, their role is much more diversified. In the postmodern society, heritage centers are passing through a process of reconfiguration of their role, which is not limited any more to conservation/preservation, but combines education with leisure and social responsibility [10]. In addition, it could be said that, in consumerist societies, the heritage center has become a place to satisfy rather the appetite for playing and consumption rather than the need for knowledge. This partly responds to the trend to promote a more inclusive and less elitist space, mirroring the community of which it is part of.

Therefore, although it could be thought that this reality can sacrifice the quality of the institution in what refers to the content of the information, making it more superficial, commercial and poor, in a globalized world like today, cultural tourism attracts another type of visitor [11]. Thus, museums have started being more and more connected to the public agenda and to the themes of actuality: gender differences, cultural diversity, environment awareness, social inclusion, etc. [12]. In this sense, modern museums put the emphasis on inclusion, meaning making and active learning as well as increasingly accepting responsibility for social change [5].

1.3. The Educational Function of Museums

As had been recognized since at least the early nineteenth century, heritage centers, by their very nature, are educational institutions. However, the recognition of education as a specialized function of heritage centers is primarily a 20th century phenomenon, paralleling the emergence of modern human development theory, the establishment of the social sciences and the establishment of the modern state school and its rejection of the classical curriculum [13]. Definitely, museums are public institutions, which have always intended to teach, inspire, impress or persuade audiences [14].

An essential consideration about the learning process in the museum is that knowledge of the visitors is mediated not only by museums objects and the way in which they are exhibited but also powerfully by the visitors’ culture, previous personal experience and conditions of their visit [12]. Therefore, if learning is an active process that requires engagement, and the educational intention of museum exhibitions is to facilitate visitors’ opportunities to teach their own understandings, museums have addressed this issue in a variety of ways, including by providing several different interpretations of an object or exhibit or by encouraging visitors to add their comments as well as posing provocative questions to visitors, rather than answers, or seeking to upset linear or chronological representation [12]. In this sense, museums should be an integral part of any educational setting, and the most desirable museums are those that are used for educational purposes and are associated

with the life activities outside of them. Then, the challenge for heritage centers is to find ways to formulate exhibitions that lead to inquiry and that guide visitors to apply the results of such inquiry to life situations [7].

1.4. Museums for Social Change Towards Socio-Environmental Justice

Museums are not institutions that follow a linear curriculum, nor are they part of a formal system that leads to degrees and certifications. Instead, museums are places where visitors are free to make their own meanings and to choose what they wish to learn. In this sense, museums should be a place where we as a society progress and move in the direction of more social justice and increased democracy. This has come to be called a progressive museum [11]. If we were totally satisfied with our society, the intention of museum could be merely to pass on the knowledge, customs and practices of the past to a new generation, but if we strive to better society then we need progressive education, which is the education needed for a progressive society, i.e., one that strives to become more democratic; to change the status quo in the direction of ameliorating gaps between rich and poor, gender inequality fighting against climate change, the refugee crisis, etc. Thus, if education is acknowledged as the fundamental responsibility of museums, and museums acknowledge their progressive origins, then they must also accept their responsibility to work towards building and supporting a participatory democratic society.

1.5. Fragile Institutions in Uncertain Times

As previously discussed, nowadays, education is a major museum function, carried out by specialized staff. In large museums, the education staff, including part-time workers, docents and occasional teachers, may represent up to 50% of all employees. Museum educators engage in an extremely broad range of activities, such as: tour programs, school programs, community, adult and family programs, partnerships with other organizations, online educational programs, among others. [7]. This showed that museum educators carried out more than 45 different kinds of task on these programs. On the other hand, the workforce dedicated to museum education is primarily female, reflecting traditional gender divisions in our society.

1.6. The Museum Experience in Spain

1.6.1. Evolution of the Museum Experience

During the 1980s and 1990s, a great variety of museum experiences of different natures emerged throughout the geography of the Iberian Peninsula. A panorama that can be interpreted as a stage of splendor, euphoria and growing interest in showing, exposing, systematizing, disseminating and making available to visitors the cultural, artistic, naturalistic, scientific, archaeological and technological diversity of a specific territory. In the beginning, this proliferation of heterogeneous museum initiatives was associated with a certain ambiguity in its functionality, lack of definition of purpose and absence of perspective. The museum was testing different exhibition models, in its attempt to find a harmonious and balanced concept that responded on the one hand to its interests as an institution with a vision and a defined mission, and on the other, to the needs and demands of contemporary society [15].

At the beginning of the 21st century, during the economic bubble and the brick culture arise the so-called "Interpretation Centers" in the Spanish state, as a form of public or private equipment whose purpose is in some cases nobly linked to the interpretation, awareness and dissemination of a good heritage, defined in its most integral perspective as initiatives that cover natural, historical, cultural and ethnographic aspects [16]; and in others to the pure electoral speculation protected by ephemeral municipal initiatives [17] unable to foresee the provision of qualified technicians to promote, maintain and project over time this new type of local museums.

1.6.2. Water Interpretation Centers (WICs)

The shortage of water in the Iberian Peninsula has become one of the most pressing environmental problems and of greater importance in recent decades. The proliferation of WICs that focus their attention on water in Spain is a relevant response to the need for public awareness of the problem of water as a scarce resource. However, the discourse and practices on the subject treated by the interpretation centers on water sometimes denote a lack of deepening and complexity of the subject in line with the new philosophical, didactic and scientific currents from the hand of the new water culture and ecosystem services.

1.6.3. Fragile Institutions

With regard to the profile of the professional of such equipment would be: “A woman under 40 years, with high level of qualification, with specialized training and work experience of less than 6 years in the same center. Mainly develops their work in a public facility managed by a private company, with a part time and temporary job, charging between EUR 900 and 1200 per month, working primarily with school groups”. This highlights the precariousness in this sector [18,19].

1.7. Purpose of the Study

Among the objectives of the study we propose:

- Prepare a census of water interpretation center of the Spanish state, including also an international perspective.
- Systematize the set of characteristics that meet the water interpretation center according to their functionality, support, content, resources and available facilities.
- Analyze the implicit conceptual model that inspires them based on the principles of the new culture of water and ecosystem services.
- Diagnose the effects of the crisis in the sector due to poor planning and management of the same.

These objectives will attempt to answer the following research questions:

- To what extent has the construction strategy of water interpretation center has been successful and if their contents, methodologies, resources and facilities have contributed effectively to a greater awareness of the population on the water problem?
- What topics and centers of interest it promotes as a priority?
- What motivations have driven its construction?
- Are there reasons of environmental importance beyond the simple fashion and euphoria for feverishly inaugurating local infrastructures?

2. Materials and Methods

The methodology applied was based on the framework of a descriptive–evaluative research that allows to characterize the water interpretation centers in the Spanish state as well as to evaluate said variables or characters. This information was collected by means of a survey in which the phases followed start from the elaboration of a population census on which to collect the information, followed by the design of the questionnaire, the collection and analysis of data [20].

2.1. Census Preparation

The census of the WICs was prepared taking into account different sources of information: (a) Databases of the state, autonomous and municipal administrations throughout the state, competent in matters of environment, tourism, protected natural areas and environmental education; (b) consultation of experts, entities and key organizations in the field of environmental education, water and aquatic ecosystems and interpretation of the natural heritage; (c) consultation with the

environmental education associations of each Autonomous Community; (d) bibliographic search and web search under the terms of: “Equipment for environmental education”, “Water Interpretation Centers”, “Water House”, “Water Museum”, “River Classroom”, “River Museum”, “Sea Classroom”, “Sea Museum”, “Visitors Center”.

On the other hand, the water interpretation center understands any interpretative equipment that has an objective to value the water and its aquatic ecosystems, encompassed under different names such as: Interpretation Center, Water House, Water Museum, River Classroom, Sea Classroom, Visitor Center related to the water and water ecosystem, the interpretation center related to the water treatment plant among others.

2.2. Design Research, Form and Data Analysis

The form or questionnaire that allowed us to gather the necessary information for the investigation, was elaborated taking into account 6 thematic blocks, which were: description of the center; thematic contents; equipment and facilities; message and discourses; museums and their staff. Each thematic line was developed by a series of questions that refer to specific contents that allowed gathering information in order to fulfill the objectives pursued, being multiple response options (symbolized by a black dot), short answer and option drop down (symbolized by a black square).

The form was designed using the Google forms application. This was sent along with a letter of introduction and invitation to the research project via email. Those centers that did not have an email were contacted via telephone, via Facebook or via WhatsApp. The data were collected according to the content blocks established in the form. A descriptive analysis was carried out. This information is shown below in the next section.

3. Results

3.1. Census of WICs

The census is ordered by Autonomous Communities, which details the province and the municipality to which it belongs, the full name of the Museum, the source of information consulted for inclusion and a brief description of it. On the other hand, the total Water Museums includes 119 centers, including museums of all the autonomous communities, as well as Andorra. This census can be seen in Figure 1, from the Census of water interpretation center.

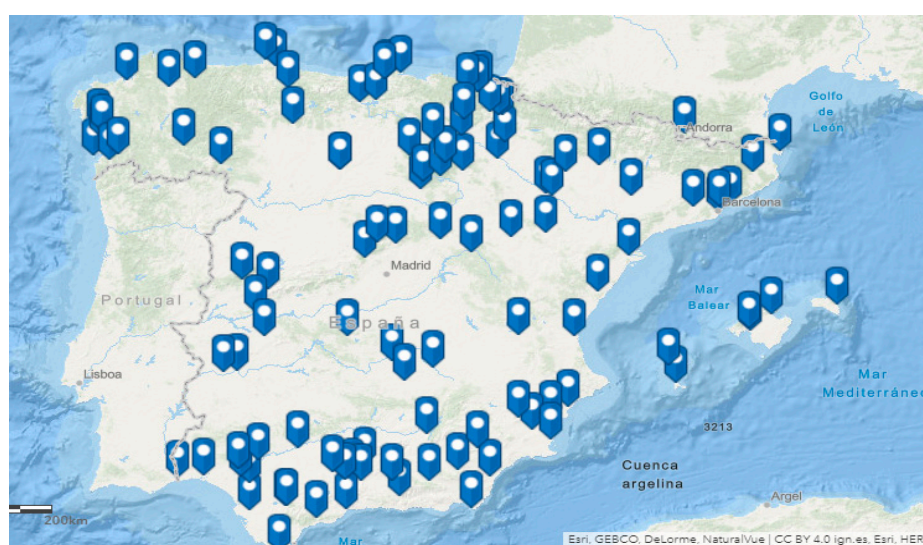


Figure 1. Location of the WICs in Spain.

By Autonomous Communities, the following Water Museums have been identified: 27 in Andalusia, 6 in Aragon, 4 in Asturias, 0 in the Canary Islands, 5 in Cantabria, 6 in Castilla la Mancha, 9 in Castilla León, 9 in Catalonia, 1 in Ceuta, 6 in the Valencian Community, 7 in Extremadura, 9 in Galicia, 7 in the Balearic Islands, 3 in La Rioja, 3 in the Community of Madrid, 3 in Murcia, 9 in Navarra, 4 in the Basque Country, 0 in Melilla, and 1 in Andorra. These centers can be seen in Figure 1 which shows the distribution of interpretation centers throughout the Spanish territory.

The identified water interpretation center corresponds to different typologies: Interpretation Centers; Public Use Equipment, such as a Visitor Center; and Environmental Education Equipment, such as River Classroom, among others. The most representative figure has been the water interpretation center (52), Visitor Center (17), Water Museum (12), Water House (10), River Museum (5), Sea Museum (5), Ecomuseum (4), and under the concept of others other figures would be included such as: Museum of Environmental Education, Information Centers, Mills, Museum of Natural Sciences, among others (14). This typology of the center can be seen on the Figure 2 that show the center number for each type.

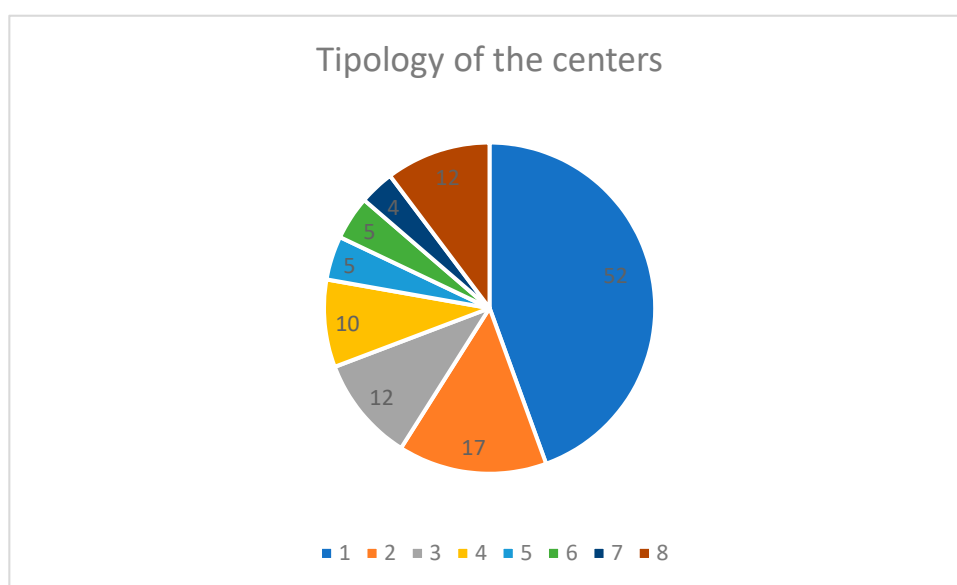


Figure 2. Typology of the centers of the study. 1. Water Interpretation Centers; 2. Visitors Centers; 3. Water Museum; 4. Water House; 5. River Museum; 6. Sea Museum; 7. Ecomuseum; 8. Others figures.

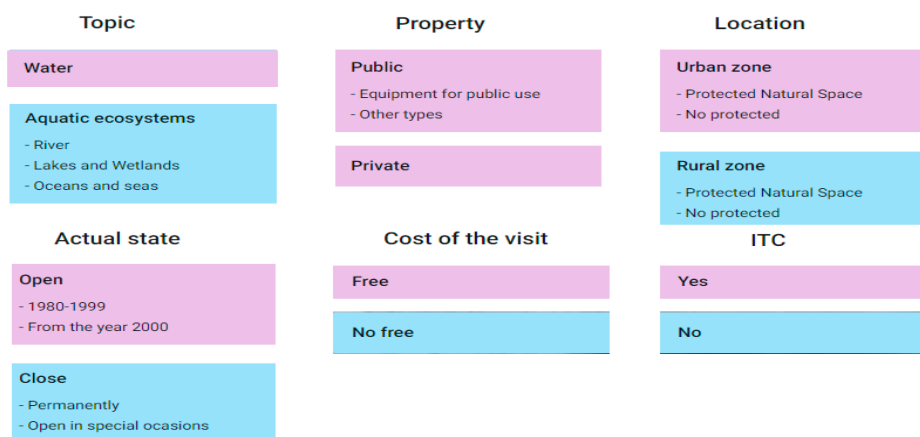
The information obtained has mainly been identified, thanks to the consultation of the database of the administrations at the state, regional, provincial and municipal levels, specifically: 78 by expert personnel and key organizations: 19 by entities of Environmental Education: 6 and by bibliographic and web search: 16.

After studying the characteristics of the census of the water interpretation center, the sample has been classified according to different variables, which can be seen in Scheme 1, Classification of the sample of water interpretation centers.

Once the census was completed, and before moving on to the second phase, it was decided to carry out a purification of those centers that, after an exhaustive analysis of their characteristics, did not meet the objectives of the study for different reasons or were closed, having proof of it by different means. In total, 10 centers were eliminated.

3.2. Corresponding Sample and Analysis of the Form Information

After sending the form to 109 Water Museums, 26 responses were obtained, representing 23.85% of the census. The results obtained from the forms of the surveyed interpretation centers are analyzed below, by thematic blocks.



Scheme 1. Classification of the sample of water interpretation centers.

3.2.1. Descriptive Data of the Centers

Mainly, the surveyed centers responded to two types of names such as water interpretation centers (nine) and Visitor Centers (eight), compared to other types (Water Museum, Sea Classroom, Ecomuseum, etc.). Most of the centers surveyed corresponded to centers affiliated to Andalusia (eight) and Navarra (seven), although responses were obtained from 11 Autonomous Communities. On the other hand, the centers are attached to public institutions: local (City Halls, nine), joint and regional (seven) and autonomous (nine), and one center to a private institution, being the type of public financing (17 centers) compared to the private one (two centers). Most of the centers were opened during the period 2000–2009 (nine centers) and 2010–2017 (eight centers). Between 80% and 90% of the centers receive both spontaneous and organized visits, both from adults and from schoolchildren. Mainly the age group of the visits (56%) include childhood and youth (0 to 30 years) and 44% of adults and seniors (from 31 years). This information can be seen on the Figure 3. Finally, most centers have a website (69.2%) and accessibility measures (88%).

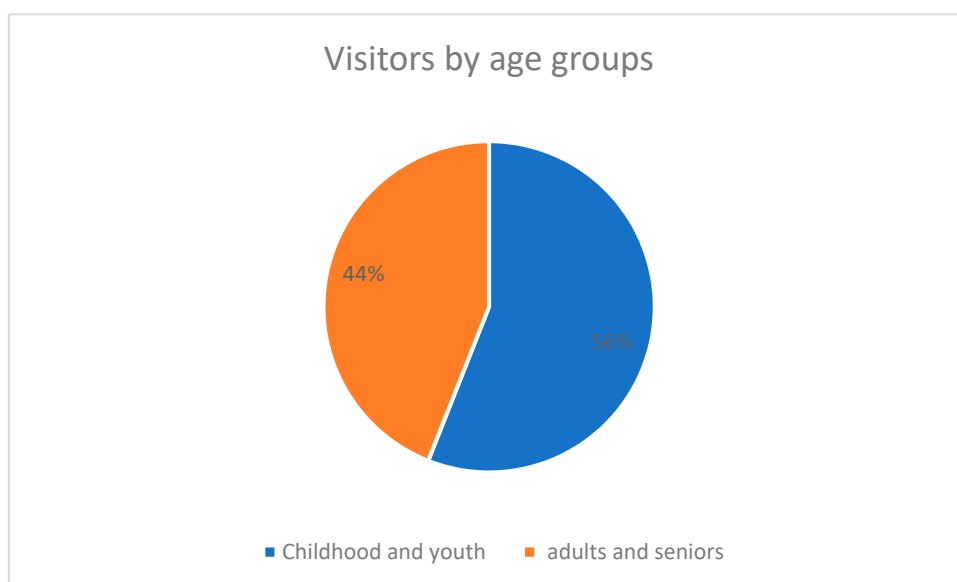


Figure 3. Visitors by age group.

Another variable studied in the research was the opening hours of the center to the public. In this sense, taking into account the responses of the centers surveyed, it was found that 73% of the centers remain open throughout the year, with a schedule that changes depending on the season of the

year. On the contrary, 27% of the centers remained closed, and could be visited upon reservation request. In addition, these centers consist of recently built facilities with modern interpretive provisions, however you have financing problems for the hiring of qualified personnel to carry out said work and offer a program of permanent educational activities, due in part to the reform of the Law of Local Administrations that prevent local corporations from hiring new workers, most of which are said centers, dependent on small population municipal organizations with few resources of their own to carry out the provision of basic services, among other tasks. Finally, these centers that remain active but closed, use these facilities for specific initiatives throughout the year such as school visits, celebration of commemorative days and for training activities, among other actions (see Figure 4, activity of the centers).

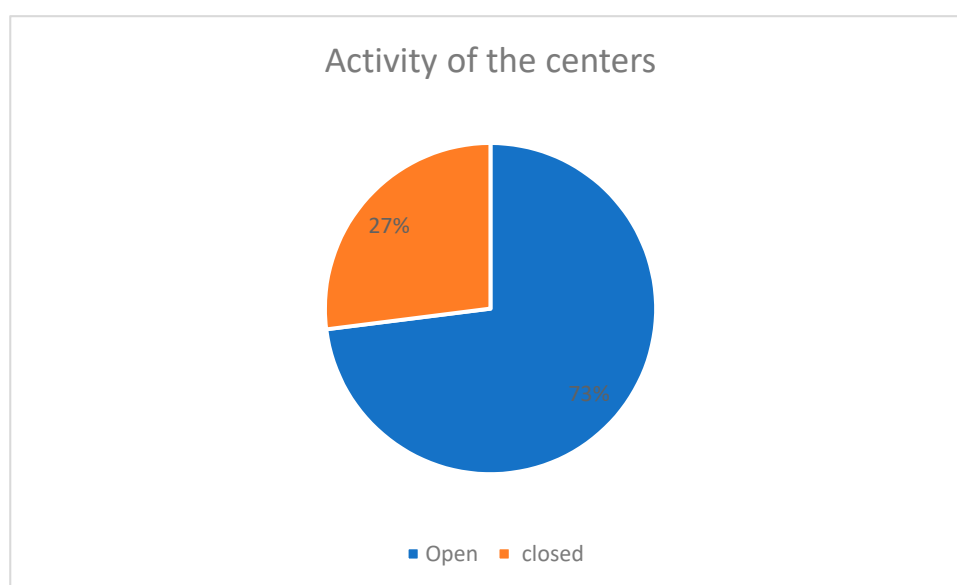


Figure 4. Activity of the centers.

3.2.2. Thematic Contents of the Centers

34.61% of the surveyed centers transmit information on facts and figures about water and its properties. In relation to the processes and elements of the natural cycle, they are treated by 53.84% compared to 38.46% who treat the urban water cycle. On the other hand, with regard to water management, it stands out in 61.53% of the centers dealing with the topic of water uses, followed by information related to water management companies (15.30%), being minority centers that address information on cases of privatization, the transfer of water management to the municipality by private water companies and participatory processes in water management. When addressing the issue of aquatic ecosystems, it focuses on the river ecosystem (53.84%), wetlands (38.64%) and the flora and fauna associated with them (38.46%). In relation to the services associated with these ecosystems, supply services are mainly treated (50%), followed by cultural services (42.30%) and to a lesser extent regulatory service (23.07%). Regarding the cultural and social heritage associated with water, hydraulic infrastructures and facilities stand out (73%), followed by the uses of water in different civilizations throughout history (34.61%) and aesthetic, spiritual aspects and leisure associated with water (19.23%). Finally, the main problems associated with water treated by the interpretation centers are: water pollution (42.30%), loss of ecosystem services (26.92%) and loss of biodiversity (23.07%), and in relation to the improvement proposals, the following stand out: aquatic ecosystems conservation programs (38.46%), citizen awareness campaigns about water (26.92%) and water use efficiency programs in the economic sectors (26.92%).

3.2.3. Equipment and Facilities

In relation to the interpretive supports used by the centers included: the interpretive panels (84.61%), the audio-visual media (65.38%) and the models (57.69%); and to a lesser extent: interactive media (38.46%), manipulative media (23.07%) and staging or living stories (3.84%). Regarding the didactic resources used by the centers, they are mainly based on the development of guided visits (92.3%), the use of information brochures (88.5%), educational workshops (65.4%), trails with interpretive media (65.4%), use of teaching materials (57.7%) and other types of resources (38.5%). In relation to the cost of the visit, in 69.23% of the centers it is free, after 23.07%, at a cost of EUR 3, and to a lesser extent with 3.84% between EUR 3 and 6 and more than 6 euros. Finally, the interpretive itinerary offered by the centers is usually free-running (84%) compared to the sequenced itinerary in areas (16%).

3.2.4. Message and Speeches of the Interpretive Media

Mainly, the discourse handled by the interpretation centers tends to be informative (80.08%), educational (57.7%), awareness-raising (34.6%) and, to a lesser extent, focused on entertainment (11.5%) and provocative (3.8%). Regarding the focus of the message, it is mainly based on facts (57.69%), of a multidisciplinary nature (34.61%), favoring reflection (23.07%, based on data and figures (23.07%) and to a lesser extent on topics and stereotypes (3.84%). On the other hand, the discourse on the causes of environmental problems is centered around human causes (85.7%) versus natural causes (14.3%); the discourse of consequences: informative (73.03%), proactive (23.07%) and ethical–moral (11.53%); and the discourse of actions is treated from a local perspective (42.30%), followed by the local–global binomial (38.46%), and from the individual and collective level (30.76%).

3.2.5. Effects of the Crisis (2008–2013) in the Environmental Education Sector

Funding during the crisis period (2008–2013) decreased in 50% of the centers surveyed, compared to 23% that remained the same, and 3.84% that increased. In relation to the current financing with respect to the years after the crisis, in 53.80% it has remained the same, and in 20.80% of the centers it has increased. On the other hand, regarding the offer of programs and activities offered by the centers during the crisis period, it decreased in 38% of them, remained the same in 34.61% and increased in 7.69%. At present, the offer remains the same as in those years in 46.15%, it has increased in 34.61% and it has decreased in 8% of the centers. If we take into account the number of visitors who visited the interpretation centers during the crisis period, it decreased in 35% of the centers, remained the same in 34.61%, and increased in 7.69%. Currently, the number of visitors has increased in 50% of the centers, the same number has remained in 34.61% and it has decreased in 4% of the centers.

On the other hand, during the crisis, professionals remained at 12 of the surveyed centers and decreased in seven. In the same period, in two centers there was a reduction in working hours, and in one, a change in the hiring of the professional category. They were also registered in three centers, Employment Regulation Files (E.R.E.) and a Temporary Employment Regulation File (E.R.T.E). Currently, the same professionals have been kept in 15 centers, in four centers they have increased and in two centers they have decreased. In this sense, four part-time hires and one full-time hire have been registered.

Finally, in relation to the modernization of the facilities of the centers after the crisis period, it has not occurred in 53.84% of the centers compared to 26.92% where it did. Regarding the materials and resources that the center has in relation to the years of the crisis, it has remained the same in 69% of the centers compared to 15.38%, where it has increased.

3.2.6. Professionalization of the Environmental Education sector:

50% of the environmental education professionals in the surveyed centers are men compared to 35% who are women. Mainly aged between 41 to 50 years (31%), 31 to 40 years (27%), over 51 years (15.38%) and 20 to 30 years (11.53%). In relation to the family situation, 42% are married with a

family burden, and 31%, compared to 23.07%, who are single. Regarding academic training, 81% of the sample had a university degree compared to 18.2% with an educational level corresponding to training formation. In 100% of cases, professionals have complementary training. On the other hand, with regard to the professional category of recruitment, it corresponds to a graduate in 34.61% of the centers, followed by a monitor in 18% and an assistant in 15%. Finally, 85% of the professionals surveyed consider the environmental education sector as a precarious sector compared to 15%, who do not consider it so. Among the main reasons for considering environmental education as a precarious sector, the following stand out: insufficient remuneration (58.8%), followed by temporary hiring (35.5%), hiring with a different professional category than the educational level (35.3%), for being a part-time hiring (11.84%), for not covering subsistence allowances and travel (5.4%) and for other reasons that are not specified (29.4%).

4. Discussion

In relation to the preparation of the census, we can conclude that, of the 119 registered centers (see Appendix A), most of them are in Andalusia, with a difference compared to other regions such as Galicia, Navarra, Castilla la Mancha and Castilla León. The autonomous communities with no or few centers: Canary Islands, Ceuta, Melilla, Community of Madrid and Murcia (see Figure 1). On the other hand, the figure of the water interpretation center stands out mainly in comparison with the Visitor Center, being less common: River Museum, Sea Museum or Ecomuseum. In this sense, the fundamental theme of these centers is aquatic ecosystems versus the water theme.

With regard to the characteristics of the surveyed centers, it should be noted that, in most of them, the financing belongs to public funds, mainly dependent on local and regional institutions, mostly built in the period from 2000 to 2017, with an average of 1000–5000 visitors a year, both spontaneous and organized visits by schoolchildren (childhood and youth, represented by 56%) and adults (from 31 years of age, 44%). On the other hand, the main interpretive supports used by the centers are: the interpretive panels, the audio-visual media and the models; and to a lesser extent: interactive media, manipulative media; and almost nonexistent: staging or living story. In relation to the didactic resources used by the centers, they are quite numerous and diverse, as they are, in increasing order: guided visits, the use of informative brochures, educational workshops, trails with interpretive media and educational materials. On the other hand, the message is characterized by being mainly informative, followed by educational, and to a lesser extent, focused on aspects of awareness and entertainment. This message is based mainly on facts, with a multidisciplinary character and with a reflective purpose for the visitor.

On the other hand, the discourse model on water focuses to a greater extent on the processes and elements of the natural cycle compared to the urban cycle; in water management based on water uses, and the information transmitted on privatization, remunicipalization and citizen participatory processes being a minority. Therefore, focusing rather on a reductionist view versus a complex view, which includes the good state of ecosystems and good management of ecosystem services as guarantors of water suppliers, among other services. In relation to aquatic ecosystems, they are treated to a greater extent: river ecosystems, wetlands and the flora and fauna associated with them. In this sense, ecosystem services are made visible in the following order: supply, cultural, and to a lesser extent, regulation. As for the social and cultural heritage associated with water, the centers transmit information mainly on infrastructures and hydraulic installations, as well as the uses of water in different civilizations and the aesthetic, spiritual and leisure aspects; to a lesser extent, those aspects related to art, literature and the human right to water. In this line, a reductionist perspective is included again, highlighting mainly hydraulic elements (73%), which to a lesser extent are complemented by cultural and social elements (53.84%).

On the other hand, the discourse on the causes of the water problem focuses mainly on human causes, and in relation to the consequences, the discourse is characterized by being mainly: informative, followed by proactive and ethical-moral; and to a lesser extent, with a humorous or alarmist, catastrophic or sensationalist speech. In relation to the main problems transmitted, water pollution,

loss of ecosystem services and loss of biodiversity stand out. In this sense, it seems interesting to see the loss of ecosystem services as a problem, thus incorporating a more global and complete vision of the water problem. Although it is not known if the centers reflect this information with the same terminology, or depending on the interpretation by the technical staff. On the other hand, the least mentioned problems were climate change, natural disasters, the displacement of the local population due to the construction of reservoirs, among others.

Regarding the improvement proposals, they basically focus on aquatic ecosystem conservation programs (since many of the centers are visitor centers, inserted in protected natural areas), citizen awareness campaigns, and campaigns based on efficiency in the use of water in the different economic sectors; to a lesser extent, campaigns and incentives to reduce meat consumption in the diet. Those problems not dealt with by the centers reflected in the questionnaire were: participatory processes in water management, campaign to improve the use of plant protection products in agriculture, renaturation of cities with drainage spaces and incentives to guarantee the human right to water. In this sense, it could be concluded that the proposals for improvements to reduce or mitigate the effects of the water problem must go one step further to achieve more multidisciplinary views and include different social and cultural aspects from the individual and collective level. In fact, the discourse of actions is characterized by being largely focused on the local level, but also on the local–global binomial, and to a lesser extent from an individual and collective perspective.

In relation to the question of the effects of the crisis in the environmental education sector, based on the study of the water interpretation centers, it concludes that the crisis had effects in said sector, causing the decrease in their financing or being a minimum increase in such financing after the crisis period; occurring in the same way, in the offer of programs and activities, not having recovered at present; and lastly, improvements can only be seen in the increase in the number of visitors to the centers at present. In relation to the staff of the centers during the crisis, layoffs and changes in hiring were registered, without any improvement at present, being hired mainly part-time versus full-time. Lastly, in relation to the modernization of the center's facilities, most of it has not been carried out, and almost the same resources and materials are available as in the time of crisis.

If the staff of the water interpretation centers are taken into account, it stands out there are more male professionals than the female professionals, mainly aged between 31 and 50 years, their marital status being married with a family burden. On the other hand, they are working for administrations and public companies in front of private companies, full-time versus part-time, and most of them are graduates, with coordination, monitoring/interpretation and environmental education functions, as well as administrative. Regarding the question whether they consider environmental education as a precarious sector, the majority consider it to be so, mainly due to low remuneration, employment contracts and a different professional category than their educational level, among others.

Finally, when analyzing the objectives that promoted the construction and start-up of these centers by the promoting entities in the different municipalities, by analyzing the center's opening hours, the program of activities and the hiring of staff, it was obtained that of the surveyed centers, 61% of them opted more for an educational–environmental function compared to 39% that respond mainly to media and electoral purposes of the municipal or regional corporations that promoted them.

5. Conclusions

The main conclusions of the study are detailed below.

- (1) The cultural and social heritage associated with water and aquatic ecosystems is mainly related to hydraulic elements or infrastructures; other worldviews of ecosystems and new paradigms of water in the way of the complexity and systemic perspective is relegated to the background or is not contemplated.
- (2) Visitor centers must make an effort to make visible issues related to the human right to water, generally forgotten in most of the centers surveyed, as well as to make an effort to convey how aquatic ecosystems favor regulatory processes in the earth system.

- (3) It is important to work not only on the elements and processes of the natural cycle but also of the urban cycle, focusing on the privatization processes of water companies, the transfer of water management to the municipality by private water companies and the processes of citizen participation in water management and decision making.
- (4) It is advisable to make an effort to implement more active, participative and innovative methodologies that promotes the involvement of the local population in the management and planning of visits, pay more attention to local problems and conflicts that historically has caused the management of resources related to water, incorporate elements and resources more linked to water and emotions in daily life of culture and peoples, and its direct consequences for survival based on local testimonies, case studies and life stories.
- (5) The figure of the water interpretation center stands out mainly compared to other types of denominations, being the Autonomous Community of Andalusia the one that has registered the highest number of centers with a total of 27 cases.
- (6) The centers are mainly supported by public funds, having been built in the period 2000–2007 with an average of 1000 to 5000 visitors per year.
- (7) It is striking that climate change as a problem related to water and aquatic ecosystems has had little monitoring in these centers, being one of the least mentioned problems, among others.
- (8) It could be concluded that the proposals for improvements to reduce or mitigate the effects of the water problem must go one step further to achieve more multidisciplinary views and include different social and cultural aspects from the individual and collective level.
- (9) In relation to the effects of the crisis in the sector, this meant a decrease in funding and a reduction in the supply of activities and associated personnel, without having recovered to date.
- (10) Of the total number of centers surveyed, 61% were built by issues of environmental awareness, compared to 39% that responded mainly to media and electoral purposes of the municipal or regional corporations that promoted them.

In short, it could be concluded that, based on the total number of centers related to water and its ecosystems registered in the Spanish territory (in total almost 120), in some way it has contributed to the dissemination and awareness of the importance of water and the conservation of aquatic ecosystems in most of the country. However, there is a need to incorporate and expand new essential content related to water and aquatic ecosystems in most of the centers surveyed (such as climate change and the human right to water), as well as the use of more diverse and innovative educational methodologies and resources such as interactive, manipulative or living stories.

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Appendix A

Table A1. Census of water interpretation centers.

Autonomous Community	Province	Name	Municipality	Source
AUTONOMOUS COMMUNITY OF ANDALUCÍA (27)				
ANDALUCÍA	Almería	1. Centro de Interpretación del Agua Valle del Almanzora	Tíjola	A
		2. Aula del Mar “El Corralete”	Cabo de Gata	A
		3. Centro de Interpretación del agua	Vera	A
		4. Centro de Interpretación del Agua “El Alporchón”	Vélez-Blanco	B
	Cádiz	5. Centros de Interpretación de Cetáceos y Aula de Mar	Tarifa	A
		6. El castillejo, Centro de Interpretación del Agua.	El Bosque	A
		7. Centro de Interpretación del Guadalete	Jerez de la Frontera	A
		8. Ecomuseo de Agua del Molino de Benamahoma	Grazalema	A
	Córdoba	9. Ecomuseo del Río Caicena	Almedinilla	B
		10. Centro de Interpretación del Embalse de Iznájar	Iznájar	D
	Huelva	11. Ecomuseo Molino del Pintado	Ayamonte	A
		12. Centro de Visitantes Anastasio Senra (Marismas del Odiel)	Huelva	A
	Jaén	13. Centro de Interpretación del Río Borrosa	La Iruela, Cazorla	A
	Granada	14. Centro de Interpretación del Agua	Loja	A
		15. Museo del Agua	Lanjarón	A
		16. Centro de Interpretación del Agua, Aljibe del Rey	Granada	A
		17. Centro de Interpretación del Agua y Museo Etnológico Molino Bajo	Huéneja	B
	Málaga	18. Aula de Mar de Málaga	Málaga	C
		19. Centro de Interpretación del Agua	Istán	B
		20. Centro de Interpretación de la Cultura del Agua y la Cultura Contemporánea	Villanueva de Algaidas	A
	Sevilla	21. Centro de Visitantes Guadimar	Aznalcázar	A
		22. Centro de Visitantes Jose Antonio Valverde (Pq Nat de Donana)	Villa de la Condesa	A
		23. Centro de Visitantes la Dehesa de Abajo	La Puebla del Río	A
		24. Centro de Interpretación del Agua	La Rinconada	A
		25. Centro de Interpretación del Río Genil	Badolatosa	D
		26. Centro de Interpretación del Río Guadalquivir	Palma del Río	A
		27. Centro de Interpretación del Ciclo Urbano del Agua	Carrión de los Céspedes	B
AUTONOMOUS COMMUNITY OF ARAGÓN (6)				
ARAGÓN	Zaragoza	28. Centro Internacional del Agua y el Medio Ambiente	Zaragoza	B
		29. El Centro de Interpretación de la Agricultura y el Regadío	Pastriz	B
	Huesca	30. CIA de los Monegros	Tardienda	B
		31. CI del Río Vero	Castillazuelo	A
	Teruel	32. Centro de Interpretación de la Laguna de Gallocanta	Campo Daroca y Jiloca	A
		33. Casa-Museo Molino Bajo	Blesa	B
AUTONOMOUS COMMUNITY OF ASTURIAS (4)				
ASTURIAS		34. Centro de Interpretación Ría Villaviciosa	Gijón	A
		35. Centro de visitantes e interpretación del mundo marino de Peñas	Viedo-Gozón	A
		36. La Casa del Agua de Bres	Taramundi	C
		37. Casa del Agua de Sobrescobio	Sobrescobio	C

Table A1. Cont.

Autonomous Community	Province	Name	Municipality	Source
AUTONOMOUS COMMUNITY OF CANTABRIA (5)				
CANTABRIA		38. Centro de Visitantes del Río Ebro	Fontibre	A
		39. Centro de Visitantes del Embalse del Ebro	Corconte	A
		40. Centro de Interpretación del agua y el río Aguanaz	Aguanaz	D
		41. Centro de Interpretación de las Marismas de Santoña, Victoria y Joyel	Santoña	A
		42. Ecomuseo Fluviarium	Liérganes	B
AUTONOMOUS COMMUNITY OF CASTILLA LA MANCHA (6)				
CASTILLA LA MANCHA	Ciudad Real	43. Centro de Interpretación del Agua y de los Humedales Manchegos	Daimiel	A
		44. Centro de Visitantes la Laguna de Ruidera	Ruidera	A
		45. Centro de Interpretación Baños del Peral	Valdepeñas	D
	Guadalajara	46. Centro de Visitantes Torre de Abraham	Retuerta del Bullaque	A
		47. Centro de Visitantes del Río Tajo	Zaorejas	D
		48. Centro de Interpretación de Barranco del Agua Dulce	Mandayona	A
AUTONOMOUS COMMUNITY OF CASTILLA LEÓN (9)				
CASTILLA-LEÓN	León	49. Aula de río: Vega del Condado	Vegas del Condado	A
	Burgos	50. Aula de río: Pineda de la Sierra	Pineda de la Sierra	B
		51. Aula de río: Rincón de Ucero	Rincón de Ucero	A
	Soria	52. Casa del Parque del Cañón de Río Lobos	S. Leonardo de Yagüe	A
		53. Centro de Interpretación del Río Cidacos	Los Campos	D
	Zamora	54. Casa del Parque de la Laguna negra	Vinuesa	D
		55. Casa del Parque del Lago Sanabria Monasterio de Santa María	Zamora	A
		Palencia	56. Museo del Agua	Palencia
	57. La Casa del Agua		Saldana	D
AUTONOMOUS COMMUNITY OF CATALUÑA (9)				
CATALUÑA	Tarragona	58. Casa del Museo del Delta del Ebro	Amposta	A
		59. La casa de Fusta del Delta del Ebro		A
		60. Mas Caials, Centro de Educación Ambiental, Investigación y Ámbito Marino, Cadaqués	Cadaqués	A
	Girona	61. Museo del Agua	Salt	A
		62. Centro de Interpretación del Agua de Torrelavit	Torrelavit	A
	Barcelona	63. Museo del Agua	Barcelona	D
		64. Museo de la Mina Vella	Vilassar de Mar	B
	Lleida	65. La Casa de l' Aigua de Trinitat Nova	Trinitat Nova	C
		66. Museo del Agua	Lleida	A
AUTONOMOUS COMMUNITY OF CEUTA CITY (1)				
CEUTA		67. Centro de Restauración Forestal y Educación Ambiental	Ceuta	D
AUTONOMOUS COMMUNITY OF COMUNIDAD VALENCIANA (6)				
VALENCIA	Valencia	68. Centro de Interpretación Raco de l'Oll del Parque Natural de la Albufera	Valencia	B
		69. Centro de Interpretación Parque Natural Hoces del Cabriel	Venta del Moro	A
	Alicante	70. Centro de Visitantes la Laguna de la Mata Torrevieja	Alicante	A
		71. Museo del Agua	Cabanes	A
	Castellón	72. Centro de Visitantes del Parque Natural del Fondo	San Felipe Neri—Crevillent	A
		73. Centro de Interpretación del Prat de Cabanes y Torreblanca	Alicante	D

Table A1. Cont.

Autonomous Community	Province	Name	Municipality	Source
AUTONOMOUS COMMUNITY OF EXTREMADURA (7)				
EXTREMA-DURA	Cáceres	74. Centro de Interpretación del Agua	Cabezuela del Valle	A
		75. Centro de Interpretación del Agua y Medio Ambiente	Cambrón	A
		76. Centro de Interpretación del Agua del Parque Natural del Monfragüe	Villarreal de San Carlos	A
	Badajoz	77. Centro de Interpretación del Agua del Parque Natural de Cornalvo	Trujillo	B
		78. Centro de Interpretación del Agua	Mérida	D
		79. Centro de Interpretación del río Guadiana El Berrocal	Mérida	A
		80. Centro de Interpretación del Embalse de Canchales	Montijo	A
AUTONOMOUS COMMUNITY OF GALICIA(9)				
GALICIA	Ourense	81. Aula da Naturaleza de San Xoan de Río	San Xoan de Río	B
	A Coruña	82. Aula da Naturaleza del río Chelo	Oleiros	A
		83. Aula Activa do Mar	Rianxo	A
	Pontevedra-A Couruña	84. Centro de Interpretación do P. Nacional das Illas Atlántica	Varios	D
	Lugo	85. Centro de Interpretación da Lagoa de Antel	Cospeito	A
		86. Centro de Interpretación fluvial do río Umia	Ribadumia	A
	Pontevedra	87. CIRA-C.I. da Ría de Arousa	Villagarzia de Arosa	D
		88. Centro de interpretación de Ribeiras do Louro.	Porriño	D
		89. Museo da Auga	Mondariz	D
AUTONOMOUS COMMUNITY OF ISLAS BALEARES (7)				
BALEARES	Palma	90. Aula de Mar	Palma	A
		91. Camp d'Aprenentatge Es Palmer	Creu Vermella	A
		92. Centro de Interpretación Can Bateman	Parc Natural de s'Albufera de Mallorca	A
		93. Museo de Ciencias Naturales de Baleares	Palma	D
	Ibiza	94. Centre d'interpretació es amunts d'eivissa	San Juan Bautista	A
	Menorca	95. Centre de Recepció i Interpretació Rodríguez i Femenias-	Parc Natural de s'Albufera des Grau	A
	Formentera	96. Centre d'Interpretació de Sant Francesc	Parc Natural de ses Salines d'Eivissa i Formentera	A
AUTONOMOUS COMMUNITY OF LA RIOJA (3)				
LA RIOJA		97. Centro de Interpretación de la Reserva Natural de Sotos de Alfaro	Alfaro	A
		98. Centro de Interpretación del Parque Natural de la Sierra de Cebollera	Villoslada de Camero	D
		99. Centro de recepción e interpretación Lagunas de Hervías	Hervías	D
AUTONOMOUS COMMUNITY OF COMUNIDAD DE MADRID (3)				
COMUNIDAD DE MADRID		100. Centro de Visitante la Pedriza Parque Natural de la Sierra de Guadarrama	Manzanares el Real	A
		101. Museo del Agua y Patrimonio Hidráulico	Berrueco	B
		102. Centro de Visitantes Peñalara	Rascafría	B
AUTONOMOUS COMMUNITY OF MURCIA (3)				
MURCIA		103. Museo del Agua y la Ciencia	Murcia	D
		104. Centro de Visitantes Las Salinas del Parque Regional Salinas y Arenales de San Pedro del	Pinata	A
		105. Centro de Interpretación de la luz y el agua O Centro de la Naturaleza	Blanca	A

Table A1. Cont.

Autonomous Community	Province	Name	Municipality	Source
AUTONOMOUS COMMUNITY OF NAVARRA (9)				
NAVARRA		106. Observatorio de aves de la Reserva Natural El embalse de las Canas	Viana.	A
		107. Centro de Información del Batán de Villava	Villava	C
		108. Molino de San Andres		C
		109. Observatorio de Aves de la Reserva Natural Laguna de Pitillas.	Pitillas.	A
		110. Centro de Interpretación de las Foces Lumbier	Lumbier	A
		111. Museo de Educación Ambiental	Pamplona	A
		112. Centro de Información Depósito de Mendillorri		A
		113. Centro de Interpretación de la Depuradora de Arazuri	Arazuri	B
		114. Centro de Interpretación ambiental de las aguas subterráneas y el manantial de Arteta	Artera	B
AUTONOMOUS COMMUNITY OF PAÍS VASCO (4)				
PAÍS VASCO	Guipúzcoa	115. Centro de Interpretación del Agua	Andoain	D
		116. Centro de Interpretación de Txingudi ekoetxea	Txingud	A
	Álava	117. Museo de Educación Ambiental	Azpeitia	A
		118. Museo del Agua	Salinas de Araña	D
AUTONOMOUS COMMUNITY OF ANDORRA (1)				
ANDORRA		119. Centro de Interpretación del Agua y Madriu	Escaldes-Engordany	D

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