

Water, Architecture, and Territory

Principal Investigator / PI

Luis Miguel Ginja

Integrated Researchers of CIAUD

Cristina Delgado Henriques, Elisabete Rolo,

Sérgio Barreiros Proença.

Collaborating Researchers of CIAUD

External Researchers

Keywords

Water Tower, Architecture, Territory, Water, Heritage

Partner Institutions

CIAUD / FAUL

Expected Future Partner Institutions

Municipalities and IGESPAR

OBJECTIVES

The general objective of this research is to compile and catalogue images and drawings of water towers so that they can be studied using a model designed for this purpose. For workability reasons, the region to be studied will initially be the district of Évora, which will serve as a pilot project for an investigation extended to the national territory.

The specific goals are:

- Establish a design methodology for documenting the elements listed;
- Identify different typologies of water towers and their relationship with the territory;
- To design an analysis model to study in-depth the collected objects and systems, focusing on the relationship of architectural structures with the territory;
- Produce framework texts on the formal characteristics of architectural elements, their relationship with the territory, and the energy sources used in an approach focused on sustainability;
- To contribute to the preservation and knowledge of the built heritage, essentially the structures linked to water, and to identify good construction practices in the sustainable relationship between Man's need to operate on the natural territory and the development of modern cities;
- Raise awareness of the need for the conscious use of water considering the Sustainable Development Goals.

BIBLIOGRAPHIC REFERENCES

BARTON, Barry, *Water towers of Britain*. London: The Newcomen Society, 2003.

BECHER, Bernd; BECHER, Hilla, *Water Towers*. Cambridge, Mass: MIT Press, 1988.

CARRERI, Francesco, *Walkscapes: o caminhar como prática estética*. Barcelona: Gustavo Gili, 2020.

LEFEBVRE, Henri, *As peças que faltam*. Lisboa: BCF Editores, 2019.

ROCHE, Daniel, *História das coisas banais*. s.l.: Círculo de Leitores, 1999.

ABSTRACT + IMAGES

"Rachel Whiteread's cement mould of a London habitat, House (1993), is presented for eight months on the site where the original destroyed property stood before it too was demolished." T.L. (LEFEBVRE, 2019 [2011], pp. 91-92)

Les unités perdues is a 2011 book by Henri Lefebvre that describes several irrecoverably lost artefacts. More than a description or a list, it is a reminder which reinforces the evidence that the preservation of heritage, not only material but also cultural, is a duty intrinsic to society.

Water is one of the essential elements for life on the planet. The 21st century faces the challenge that this fundamental resource may no longer be a common and accessible asset. The boom in urban, industrial and agricultural societies is so massive that water consumption levels have never been so high. The carefree gesture of turning on the tap and having easy access to drinking water is a fundamental part of everyday life for the vast majority of the population in the global north. It disconnects people from all the journey water describes before it reaches us. Then, it is vital to becoming more aware of water and its value, treat it as a valuable asset and avoid wasting it, especially in an uncertain future marked by climate changes.

The history of water supply dates back to the Roman Empire, where water plumbing and distribution techniques enabled the construction of aqueducts that supplied public fountains, government buildings, bathhouses, and residences of the elite. In the second half of the 19th century, increasing the drinking water supply in cities became a challenge, especially in the urban centres most involved in the Industrial Revolution. Urban populations were more exposed to diseases without abundant water, and industrial development could be compromised (Roche, 1999).

The water distribution circuits are based on capture, transport, storage, and distribution stages. It is a relatively simple operation model but requires a certain hydrostatic pressure to guarantee flow and pressure conditions in the supply. This hydrostatic pressure can originate from the topography of the territory, from capture and storage sites at significantly higher elevations than the consumption sites, or through water tower reservoirs. These unique pieces constitute an industrial heritage with technical and architectural relevance and a direct relationship with the territory as unique landmarks in the landscape.

In Portugal, there are no studies addressing this kind of building, its typological characteristics and its relationship with the territory and the landscape, but this happens in Europe and North America, where industrial heritage is more exhaustive and, consequently, more studied. Noteworthy are the photographic survey work of Hilla and Bernd Becher (Becher, 1988) and the book *Water Towers of Britain* (Barton, 2003).

Despite the lack of research in our country, we have found that the maintenance of these structures is generally adequate and their state of preservation assured. Many still serve the function for which they were designed and are in their genesis landscape-ordering elements. They matter as icons of recognition and man's relationship with the territory, both for their singular typology and their vertical presence in the landscape. They cause the resonance of a symbolic past of the menhir that we recognise as familiar, a territorial landmark (Carreri, 2020). This familiarity is also rooted in its historical condition as a monument value. The particularity of this type of structure – which differs significantly from other reservoirs (below ground or at level with the territory) – is based on its height. Their presence as a landmark in the landscape is because they are applied in areas with low natural relief of the terrain. Its architectural value is twofold – the design of the reservoir (and its material component) and the structural elevation elements.

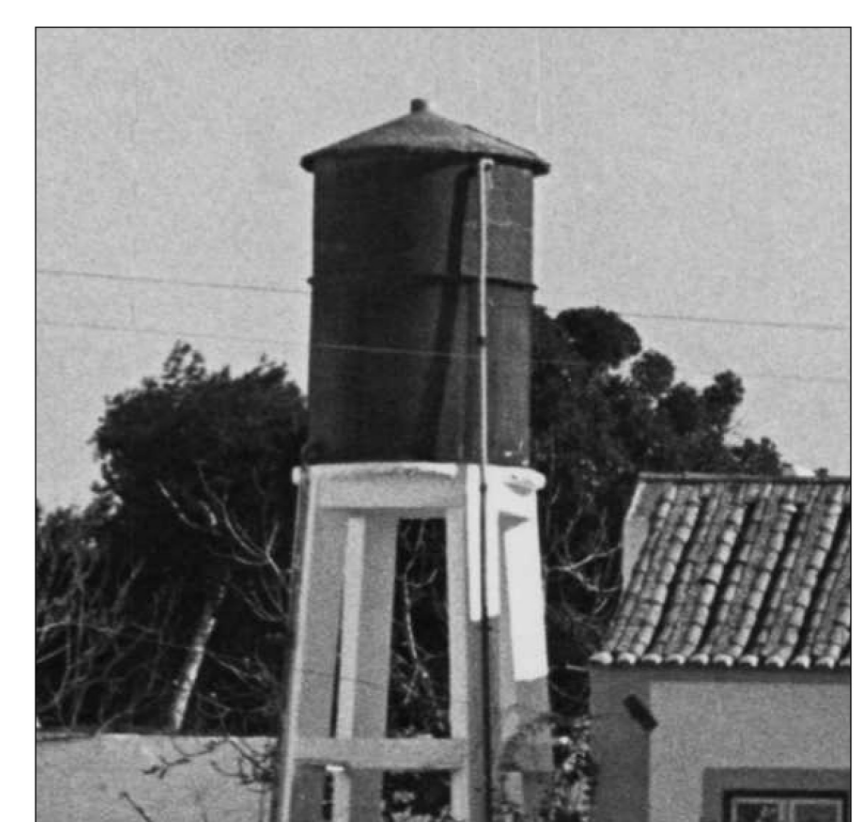
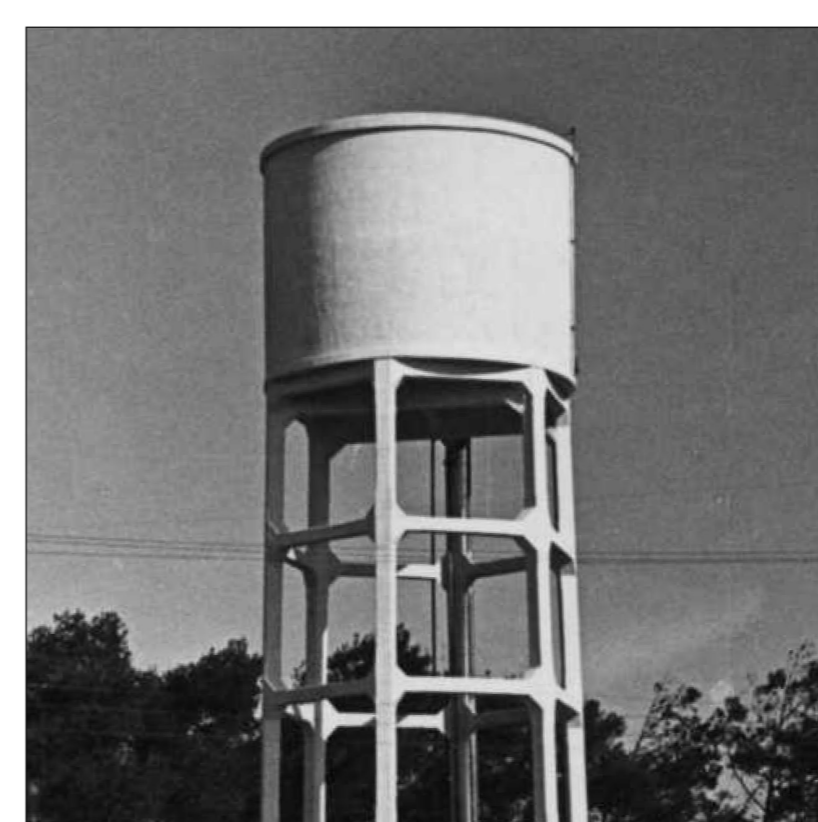
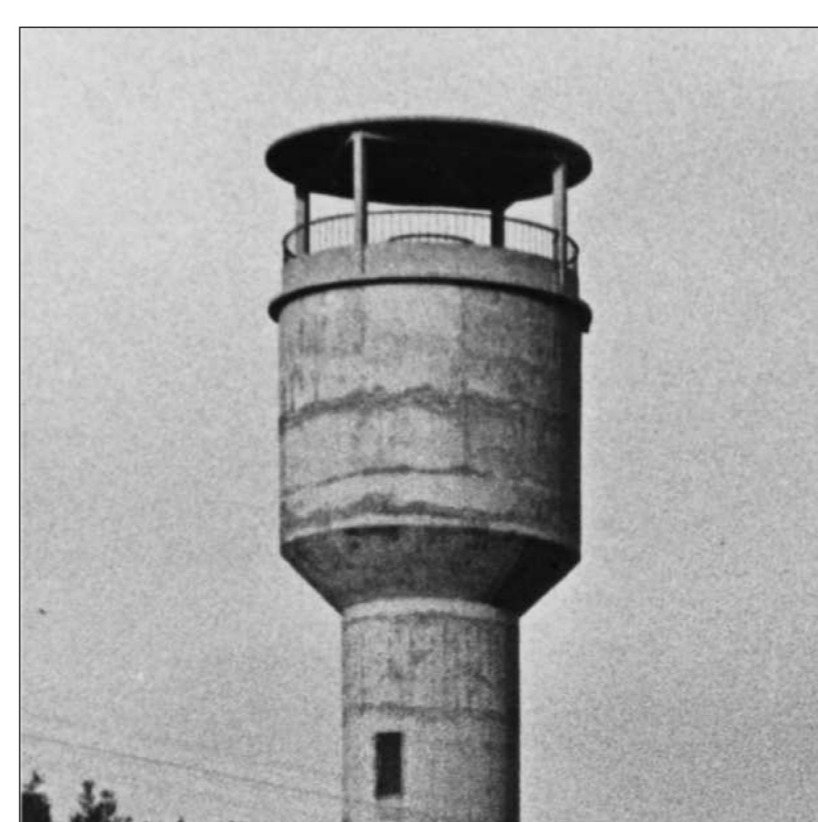
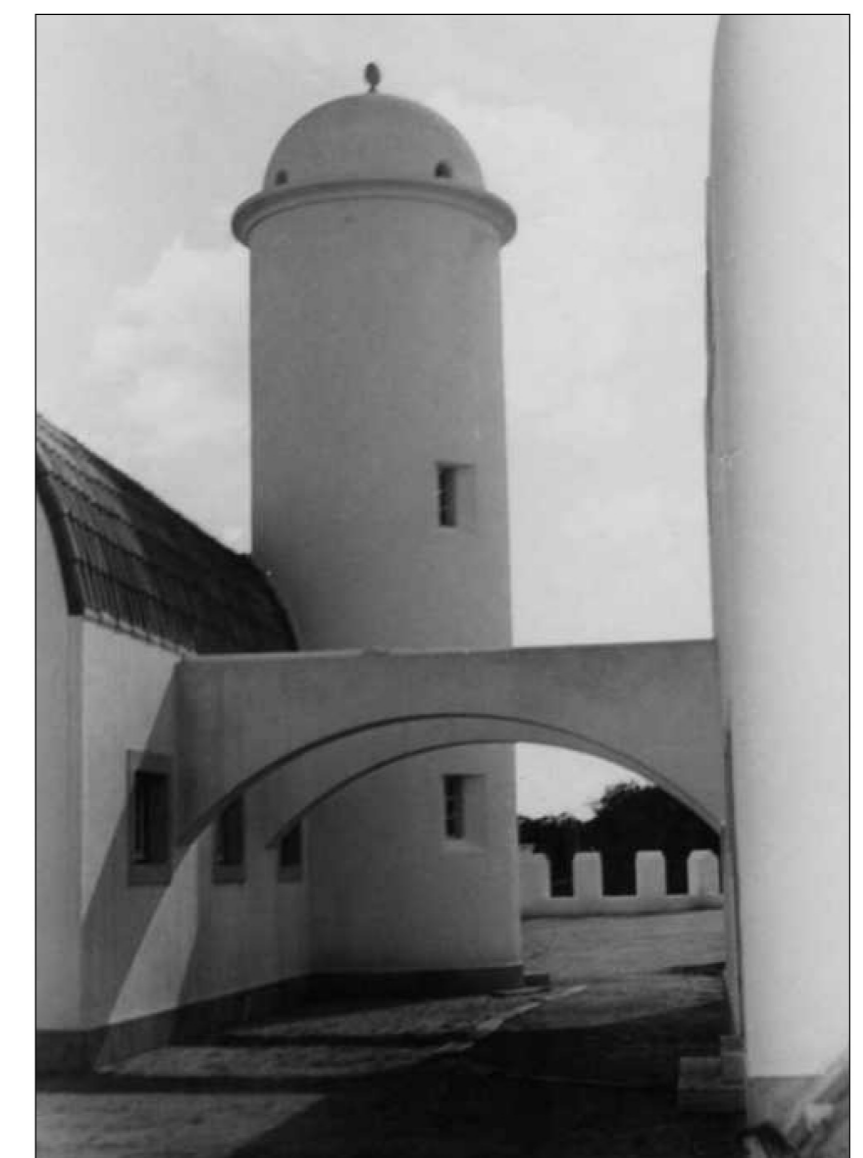
It is also important to note that these infrastructures do not just remember the past. In Portugal, two relatively recent examples represent the importance of studying and documenting this heritage. One is in the relocated Aldeia da Luz (2002) and the other on the campus of the University of Aveiro (1988-89). Both are unmistakable landmarks in the rural and urban landscape, respectively.

Our project aims to address the lack of rigorous and scientifically consolidated documentation on elevated water reservoirs. To achieve this, we will survey those structures existing in one district, constituting a pilot project that will serve as a basis for national research. The district chosen for this initial project is Évora, which covers an area of 7 393 km² and 14 municipalities. The collected material will be photographed, catalogued, and analysed using a model conceived for this purpose. We will produce framework texts, convening the various disciplines of CIAUD – Architecture, Urbanism, and Design.

With this research, we intend to draw attention to these (occasionally) ignored structures and indirectly focus on the topic of water as a valuable resource. We propose to promote the theme of water towers, understand their evolution over time, constitute a historical record, and promote dialogue through the multidisciplinary analysis of the theme.

This knowledge will be disseminated in a colloquium, in two conferences with indexed papers, and in one editorial publication.

Figures. Water towers in various places, Portugal.
Source: EPAL/CDHT – X-arqWeb. [S.d.]. Disponível em: <<https://cdht-web.epal.pt/X-arqWeb/Result.aspx?id=9685&type=PCD>>. Acesso em: 27 maio. 2022.



SCIENTIFIC RELEVANCE FOR THE DISCIPLINE

The relationship between water and territory is intensively studied, as the relationship between territory and city or city and water. However, it is crucial to relate water capture, storage, and distribution structures to the territory. The compilation and cataloguing of these structures and systems are likely to form the basis for various MSc and PhD research projects about the themes of heritage and water resources and their sustainability.

The capacity to preserve the planet's natural resources is a topic that the scientific community must ensure. The transdisciplinarity of the subject to be studied promotes cooperation between different areas of knowledge existing in the CIAUD and contributes to organising research and teaching.

EXPECTED ECONOMIC AND SOCIAL IMPACT

With this project, we intend to gather, catalogue, and analyse information to produce essential knowledge about water towers, approaching the theme from three points of view – architectural, heritage, and ecological. We intend to make this knowledge available not only to the academic community but also to civil society. Crossing these initial objectives with the already established knowledge that a sustainable future will involve building networks to maximise existing resources using as little energy as possible, there will undoubtedly be economic interest and social relevance in the study. On the other hand, the publication of a book that conveys the knowledge produced may also have an economic impact – through sales – and will have the social impact of the wide dissemination of knowledge. By proposing to investigate, reflect, and develop knowledge in the collection of relevant architectural heritage and the perception of the use of clean energies, we touch on essential aspects of the UN Sustainable Development Goals.

RESEARCH PLAN AND TASKS

This project aims to fill the lack of rigorous and scientifically consolidated documentation on the topic of water towers in Portugal. It aims to be a pilot experience for a project defined as being more significant in scale and importance. The part that we understand as a pilot will be carried out by a reduced team and over a restricted intervention area (the district of Évora, which covers an area of 7 393 km² and 14 municipalities). The importance of the pilot project is to test the premises of the research and to constitute factual material for the elaboration of a more comprehensive scientific project covering the entire national territory. It will include a more extensive and multidisciplinary team that can attract other elements of civil society and the support of entities outside academia.

PROJECT STAGES

The project includes five distinct phases, some of which may take place simultaneously:

1. Research:

Bibliographic research on topics related to capturing, distribution, and use or fruition systems (mainly drinking water);

Bibliographic research of studies on water towers, even if with other approaches;

Literature review of the selected material;

Review of the problematic and formulation of hypothesis(es).

2. Observation:

Definition of criteria to guide the collection of material;

Photographic survey and cataloguing of water towers in the determined geographical area;

Elaboration of an analysis model to be used in the different collected materials;

Critical analysis of the collected material.

3. Publishing

Organisation of the information to be included in the publication and definition of the editorial structure.

Writing of the framework texts;

Image digital enhancement;

Development of the editorial design project.

4. Dissemination

Participation in two conferences with oral communication;

Publication of two indexed articles;

Dissemination of the edited publication;

Colloquium on the investigated subject and the obtained results.

5. Conclusion

Final reflection on the project and writing of a report;

CRITICAL SUCCESS FACTORS

The project we propose is based on two fundamental premises: the patrimonial valorisation of water distribution structures and, indirectly, the ecological knowledge. These premises align with the times we live in, when there is a need to preserve the collective cultural memory and when there is a pulsating awareness of environmental sustainability factors. Furthermore, the research has other critical success factors that will benefit the results.

Firstly, we consider the topic highly pertinent and contemporary, as it responds to critical societal challenges. Secondly, the team's constitution shows great enthusiasm for the subject and has diverse and complementary research interests, which allows for a plural vision of the investigative topic. According to the interests and competencies of each researcher members involved, we may call upon the areas of architecture, urbanism, and design. Complementary to the primary interests of the constituent members, the history and theory of the city, as well as its direct relationship with the territory, are catalysing poles of the team's interdisciplinary plurality.

The possibility of hiring a graduate researcher will speed up the information gathering process, which, while not requiring as high a critical sense as other tasks, will consume a significant amount of time.

SCHEDULE

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Research	Bibliographic research																		
	Literature review																		
	Review of the problem and formulation of hypotheses																		
2. Observation	Definition of criteria to guide the collection of graphic material																		
	Collection and cataloguing of graphic material																		
	Elaboration of an analysis model																		
	Critical analysis of the collected material																		
3. Publication project	Organisation of the information and definition of editorial structure																		
	Writing of the texts																		
	Image digital enhancement																		
	Editorial design project																		
4. Dissemination	Participation in two conferences																		
	Publication of two indexed articles																		
	Dissemination of the publication																		
	Lecture on the investigated theme																		
5. Conclusion	Final reflection on the project																		
	Writing of a report																		

EXPECTED SCIENTIFIC RESULTS

With this project, we expect, in general, to contribute to scientific knowledge in the area of Architecture and History, materialised in four types of specific indicators:

The participation in two conferences with oral communication, in which we can make known the project and exchange experiences with other researchers;

The publication of two articles (in indexed publication) will allow the wide dissemination of the research;

The publication of an e-book (or other similar publication) will be an essential contribution to the scientific community;

The realisation of a lecture to communicate the research results to an audience, such as the academic community in which we are inserted;

The new knowledge produced enriches and reverts directly to teaching practice.

BUDGET: € 7 500,00

The project budget is intended to acquire a bibliography on the theme, employ a graduate research fellow for six months, and disseminate the research results through participation in conferences and a publication.