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Toward a World Inventory of Water-Related Museums, Heritage Assets and Values to Promote Sustainability Education

Eriberto Eulisse
Global Network of Water Museums

Two resolutions of UNESCO-IHP (2018 and 2021) have highlighted the importance of fostering water sustainability education through networked water museums and developing a world inventory (WIN) of these institutions. To achieve this goal, the Global Network of Water Museums has developed a methodology to initiate a worldwide census of water museums, interpretation centers and water-related heritage values. The benefits of adopting a common methodology are clear. By using a transnational toolkit it will be possible to highlight the large variety of valuable aquatic heritages and the paradigmatic models of human coexistence with water environments worldwide. All institutions involved in implementing the WIN at the regional and national level will be empowered to communicate and target the SDGs and provide inspiration through the use of holistic approaches and good practices inherited from our "watery past" to better plan future resilience.

KEY THEMES

< *Fig. 1 No suitable picture/quality*

Introduction

In recent decades statements, studies and documents of the Intergovernmental Hydrological Programme (IHP) of UNESCO have helped to define the importance of preserving, protecting and strengthening the functionality of rivers and aquatic ecosystems to ensure the quality of life for humans and non-human species. In the 2018 Resolution of UNESCO-IHP n.XXIII-5 emphasized the need to strengthen educational activities that promote more sustainable uses of water[1]. This resolution also paved the way to acknowledging the role and function of a worldwide network of museums aimed at fostering water sustainability education and awareness.

The Global Network of Water Museums (WAMU-NET) was established in 2019 to spread greater awareness of the value of water and promote more forward-looking management models, drawing inspiration from the rich "watery past" of humankind – that is, inherited historical heritages, practices and cultures of managing water. Indeed, in the Anthropocene, an era full of water challenges, museums provide an important means of educating people about water and re-connecting individuals to water. Museums can help change harmful behaviors and attitudes related to water and can promote tangible improvements of the critical conditions created by poor management of aquifers, rivers and freshwater ecosystems.

Today, as stressed by the WAMU-NET Charter (2019), a "new culture of water" is needed more than ever[2]. In the Anthropocene there is a crucial need for a paradigm shift aimed at fostering new perceptions and behaviors toward water and its management in the long term. Museums can inspire individuals to embrace new possible solutions for a balanced coexistence with water in all its manifestations. But how can museums effectively help accelerate this paradigm change in the face of the prevailing ideology of "development at all costs" that is typical of the consumer society?

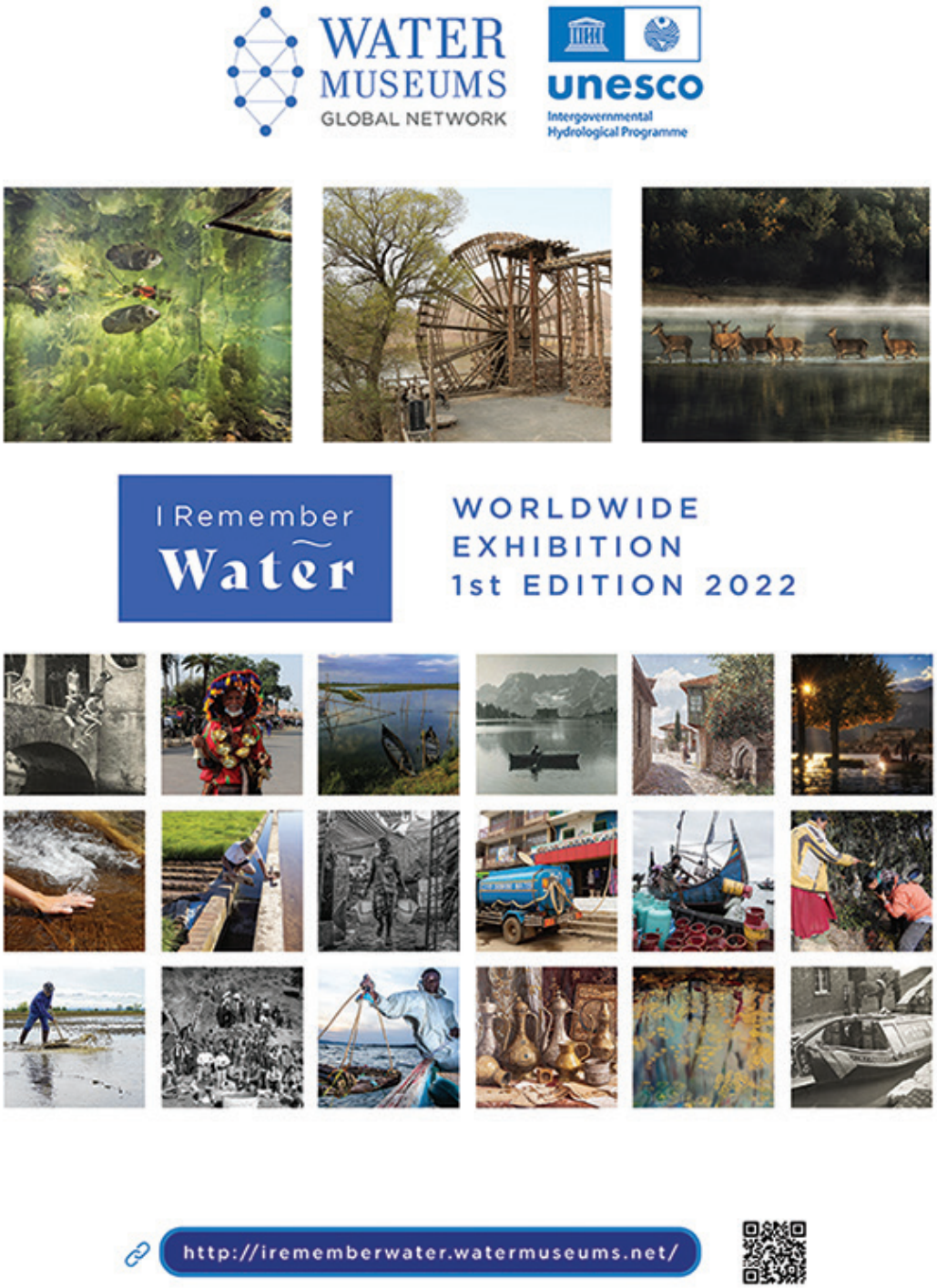
Water museums stimulate people of all ages to think about innovative ways of managing water and protecting water-related heritage for the future – with solutions that draw on modern hydraulic technology but also on ancient management practices and knowledge. Offering daily educational activities for thousands of young people, many museums around the world are active to promote a paradigm shift, that is, a radical change in the way of considering not only the very causes of problems, but also possible solutions for more judicious use of water.

However, in today's context it is important to build a new culture of water not only based on the teaching of basic scientific knowledge and water history, but also supported by non-formal education geared toward reestablishing deeper emotional connections with this vital fluid. An educational approach that recognizes the importance of perception and emotion in reestablishing a meaningful connection with water has been gradually incorporated into scientific literature. Some approaches focus on water-related cultural and heritage values (Strang 2023) or the "emotional geographies" or the "sense of place" of riverine communities (Vallerani 2018), and others on fresh "human-river encounters" (Wantzen 2023). Whatever the focus it is essential to promote holistic educational approaches

1. Resolution n. XXIII-5 of UNESCO-IHP, https://www.watermuseums.net/assets/Uploads/footer-links/RESOLUTION-XXIII-5-Global-Network-Water-Museums-EN-final.pdf

2. Charter of WAMU-NET, https://www.watermuseums.net/contacts/.

^ *Fig. 2 Poster of the youth contest and award "The Water We Want."*



^ *Fig. 3 Poster of the itinerant exhibition "I Remember Water"*

aimed at inspiring new perceptions and attitudes toward water.

New approaches to promoting water values and historical management practices

As of 1 January 2023, WAMU-NET counts more than 80 water museums and institutions in 33 different countries. These members collectively host an average number of approximately 40 million visitors per year (ante COVID)[3]. All together – networked – the affiliated water museums reveal considerable potential to inspire people to adopt more forward-looking water practices.

Among the different activities developed by WAMU-NET and aimed at raising awareness about more farsighted water uses, consider the youth contest and award "The Water We Want" and the exhibitions "I Remember Water" and "Valuing Ancient Water Cultures." "The Water We Want" is an annual competition that aims to involve young people in expressing ideas and visions about the importance of water for life through drawings, pictures, videos and other media (fig. 1)[4]. The competition was launched in 2020 with a social media campaign that included 22 professional videos and mini-videos. In 2023, the fourth edition is underway[5].

The exhibition "I Remember Water" aims to collect significant memories worldwide that recall past water practices and significant heritage sites (fig. 2). The goal is to reflect on pathways that can lead to more just and sustainable futures. Water memories – whether they are tangible or intangible, sensory or emotional, short-term or long-term – are fundamental to our existence as individuals and as collective societies. From the ornate public fountains and household taps that in the last century provided free water to citizens in growing urban settlements to people's emotional relationships with water, the images exhibited on this new digital platform illustrate the rich diversity and the striking affinities in humans' connections with water and in unique heritages across the world[6].

The exhibition 'Valuing Ancient Water Cultures' was organized at UNESCO's headquarters in Paris as an official side event of the UN-Water Summit on Groundwater (fig. 3)[7]. Through case studies from Asia, Africa, Europe and Latin America, the exhibition showed how museums can raise awareness of water vulnerability, "making the invisible visible," and inspiring people and professionals with innovative ideas and approaches for simultaneously promoting sustainable eco-tourism and planning better resilience to climate change impacts. For example, the exhibition proved how the involvement of local communities in monitoring groundwater quality and quantity is a crucial prerequisite for sustainable water use in line with the SDGs. The exhibition demonstrated how traditional knowledge passed down through generations over a long history of struggle and coexistence with water can reshape contemporary thinking on

3. This figure is calculated from the yearly number of visitors of 80 water museums affiliated with WAMU-NET, considering data available in 2019, before the COVID-19 pandemic.

4. Youth Contest and Award "The Water We Want," https://thewaterwewant.watermuseums.net/.

5. Link to the social media campaign of TWWW: https://www.watermuseums.net/campaigns/the-water-we-want/

6. "I Remember Water," https://irememberwater.watermuseums.net/.

7. See https://www.watermuseums.net/campaigns/valuing-ancient-water-cultures.

WATER MUSEUMS GLOBAL NETWORK

unesco Intergovernmental Hydrological Programme

Valuing Ancient Water Cultures

© 2022 Raki Films - from the documentary series 'Children of Water' by Joy Penroz & Sylvain Grain.

An Inspiring Source of Innovations for Sustainable Groundwater Management

Learning from past practices and knowledge to make the invisible visible: from Indian stepwells to Omani *aflaj*, Moroccan *khettaras*, Algerian oases, Chilean *socavones*, Mexican *tecuates*, and Mediterranean cisterns and wells

^ *Fig. 4 Poster of the itinerant exhibition "Valuing Ancient Water Cultures"*

^ *Fig. 5 The World Inventory (WIN) campaign of water museums and interpretation centers will be promoted under the auspices of the IHP Resolution n.7-XXIII*

Phase	Implementation Step
Phase 1	1st step: 1.1 - Remote survey of existing water museums, interpretation centres and collections through a predefined taxonomy, or classification system, made of six categories (*)
	2nd step: 1.2 - Questionnaire for collecting quantitative and qualitative data of museums and institutions already mapped with the 1st step
Phase 2	1st step: 2.1 - Remote survey on future (potential) water museums, interpretation and visitor centers related to cultural landscapes (waterscapes), including ancestral hydro-technologies, community-based practices, the intangible heritage, traditional and indigenous knowledge, and citizens' observatories
	2nd step: 2.2 - Remote survey on the potential contributions of ancient water management practices and cultures to achieve the SDGs (climate change adaptation strategies and good practices to manage scarce water resources in arid regions)

(*) The six categories of classification are grouped into three main typologies to facilitate the systematic classification and the comparison of data:
a) Type 1: Existing institutions
1. MUCD - Museums, Collections and Documentation Centers
2. IDEM – Interpretation and Visitors' Centres, Digital Museums, Eco-Museums, Community-based Museums, Extended Museums
b) Type 2: Potential/Future institutions
3. WASH - Waterscapes (Cultural Landscapes), Sites, and water-related Heritage Assets
4. ANTE - Ancestral Hydro-Technologies, Community-based practices, and Citizens Observatories
5. INTL - Intangible Heritage and the Heritage of "Living Waters"
c) Type 3: Contributions to achieve the UN SDGs
6. GOOD – Good practices to manage resilience and scarce water resources and solutions that can potentially contribute to climate adaptation

^ *Tab. 1 The two phases, four steps of implementation, and six categories of classification proposed to implement the world inventory (WIN) of water museums and interpretation centers.*

water and heritage across the world.

Toward a world inventory of water museums, interpretation centers and heritage values

In 2021 the Intergovernmental Council of UNESCO-IHP stressed the opportunity of making a comprehensive inventory of water-related museums, interpretation centers, and heritage values worldwide[8]. To start making the census, a specific methodology was developed and officially presented in March 2022 at the 9th World Water Forum in Dakar, Senegal. A transnational toolkit was elaborated to provide a tested methodology and stimulate the production of outline inventories at the regional and national level. It is freely available on WAMU-NET website[9].

Thanks to this practical toolkit, guidance is provided not only to identify existing "water museums" in specific regions, but also to look for new potential museums, including visitor

8. Resolution n. XXIV-7 of UNESCO-IHP, https://www.watermuseums.net/assets/Uploads/footer-links/Resolution-XXIV-7-2021-UNESCO-IHP-WAMU-NET-2ndPhase.pdf.
9. The toolkit for the World Inventory of water museums and interpretation centers is available at https://www.watermuseums.net/activities/world-inventory/ [accessed 5 Dec. 2022].

centers, eco-museums and - according to the definition of Jalla (2017) and Folga-Januszewska (2017) – "extended museums."[10] Indeed, by adopting a broad definition of water museums it is possible to list in the world inventory (WIN) not only physical buildings and collections, but also interpretation centers, digital museums, community-based museums, social practices and heritage values. The heritage of "living waters" and the landscape of water, or waterscapes, are also considered in WIN for their potential to stimulate the creation of new museums and visitors' centers (fig. 4).[11]

Two pilot case studies in Italy and the Netherlands (focusing on the Po Delta and the Rhine Delta region) provide practical examples on how to implement the methodology and realize inventories at regional level using a predefined set of classification categories for the remote analysis of existing water museums (Phase 1 of implementation). These categories allow for the simultaneous identification of new museums or interpretation centres to be created - which are the focus of the Phase 2 of investigation.[12]

The methodology proposed by the transnational toolkit provides support to conduct the census in two different phases and four steps. Each phase includes two steps, as shown in table 1.

By adopting the proposed toolkit to identify both existing and potential water museums in different regions worldwide, research institutions and National IHP Committees can better target and communicate the SDGs in connection with two resolutions of UNESCO-IHP. In addition, they will be stimulated to highlight paradigmatic models of human coexistence with water, promote the related values, facilitate access to heritage sites and foster new human-river encounters. Educational activities on water sustainability will be strengthened and new holistic approaches promoted to plan better resilience.

In carrying out WIN, it will be possible to encourage younger and older generations to learn about different paradigms of water uses and management through time and become better acquainted with the ancient values associated with this precious life-giving element. This approach will simultaneously also support the right to water for other living species. Thus, by integrating the practical experiences of our predecessors into educational processes, we can think about innovative models for more forward-looking water uses and lay the foundations for a better world.

Acknowledgement

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10. In line with most recent museology perspectives and the ICOM definition of museums, WIN aims to include not only physical museums and collections, but also new museological experiences and practices, such as ecomuseums, community-based museums, interpretative centers and visitor centers. In this approach, public participation and citizens' involvement are also included. Intangible values, indigenous knowledge, and the "sense of place" of communities strongly connected to rivers and aquatic environments are also considered.

11. The project that inspired this approach was developed through the research carried out on the historical waterways of Venice's hinterland (Eulisse, Vallerani and Visentin 2023).

12. Pilot inventories developed in cooperation with the UNESCO Chair "Water, Ports and Historic Cities" of TU Delft, ICOMOS NL and the UNESCO Chair "Water, Heritage, and Sustainable Development" of Ca' Foscari, Venice University.

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Eriberto Eulisse is the executive director of the Global Network of Water Museums, a flagship initiative of UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP). He coordinates the UNESCO Chair "Water, Heritage, and Sustainable Development" at Ca' Foscari University of Venice and is the director of the Italian non-profit NGO Civiltà dell'Acqua.

Contact: eriberto.eulisse@unive.it