

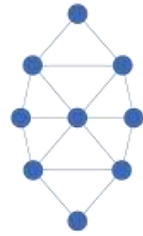


Mapping Ancient Hydro-Technologies (AHTs) for the upcoming Virtual Science Museum of UNESCO and the World Inventory (WIN) of water museums

Eriberto Eulisse, Executive Director

Global Network of Water Museums, a *flagship initiative* of IHP





**WATER
MUSEUMS**
GLOBAL NETWORK



unesco

Intergovernmental
Hydrological Programme

WHO WE ARE

The Global Network of Water Museums (WAMU-NET) is an independent non-profit NGO based in Venice, Italy. It's managed by its members according to democratic principles and with equal right of vote in the GAs.

A 'flagship initiative' of IHP aimed at promoting Water Sustainability Education through museums.

> Rights and duties for all members.

Governing Bodies (2024-25)

President and Deputy Presidents

Eddy
Moors
Netherlands



Chen
Yongming,
China

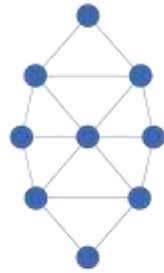


Sara
Ahmed,
India



Abdenbi
El Mandour,
Morocco





**WATER
MUSEUMS**
GLOBAL NETWORK



OUR COMMITMENT TO BUILD A «NEW CULTURE OF WATER»

We must “reinststate a **new relationship between humanity and water:**
a new ‘sense of civilization’ which
can help to **reconnect people and water**
in all its dimensions - including scientific,
technical, social, cultural, artistic and spiritual”

«Manifesto” (ethical charter) of WAMU-NET, 2017

OUR MISSION



**INSPIRE PEOPLE TO CREATE
A NEW RELATION WITH WATER**



**RISING AWARENESS OF FARSIGHTED USES
AND WATER VALUES FROM THE PAST**

WHY MUSEUMS?

Museums address & explain complex problems in simple ways : they know how to ***communicate with the public***

Museums are learning platforms for ***adults & children***

People learn science topics both from the classrooms, media and from ***personal interactions in informal settings***, such as museums, and **experiential learning**



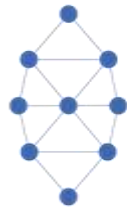
INTERNATIONAL CONFERENCES

1st Conference (2017): Venice, Italy

Toward a Global Network of Water Museums

28 museums from all across the world met in Venice





**WATER
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Resolution (2018) of UNESCO-IHP (Intergovernmental Hydrological Programme)

titled

«THE GLOBAL NETWORK OF WATER MUSEUMS
AND UNESCO-IHP IN SUPPORT OF
WATER SUSTAINABILITY EDUCATION»



UNESCO-IHP RESOLUTION N.5-XXIII (2018) UNESCO-IHP RESOLUTION N.7-XXIV (2021)

WAMU-NET is endorsed as a 'flagship initiative' of IHP to promote water sustainability education worldwide



INTERNATIONAL CONFERENCES

2nd Conference (May 2018): Den Bosch, Netherlands

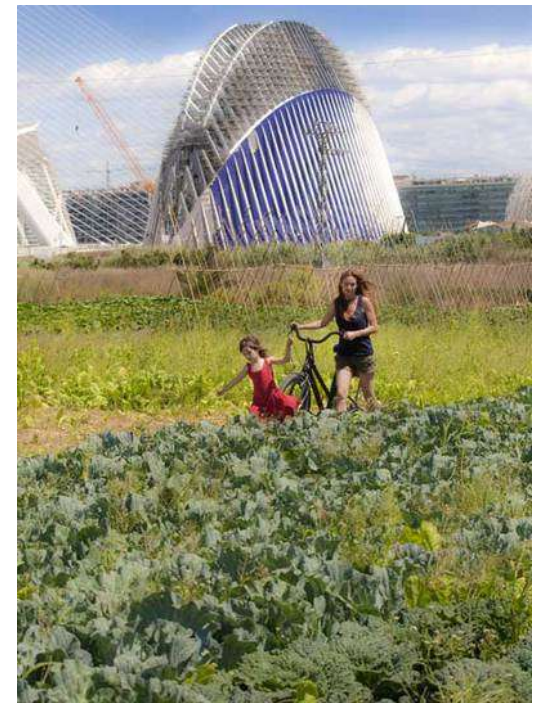
3rd Conference (2019): Valencia, Spain



Università
Ca' Foscari
Venezia

Civiltà dell'Acqua

CENTRO INTERNAZIONALE



INTERNATIONAL CONFERENCES

4th Conference (2022): Marrakech, Morocco Water Museums and Groundwater : Making the Invisible Visible



KINGDOM OF MOROCCO
MINISTRY OF RELIGIOUS ENDOWMENTS
AND ISLAMIC AFFAIRS



MUSÉE MOHAMMED VI
POUR LA CIVILISATION DE L'EAU AU MAROC
MINISTÈRE DES HABOUS ET DES AFFAIRES ISLAMIQUES

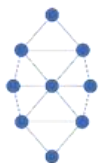
INTERNATIONAL CONFERENCES

5th Conference of WAMU-NET: Porto, Portugal



Cities of Water: Peace and Prosperity through Education

Parque Patrimonial das Aguas: 9-12 October 2024



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MEMBERS



www.watermuseums.net/network

● Water Awareness

● Natural Science

● Open air

● History & Heritage

117 members in 43 countries

106 institutions + 11 individuals (30.09.24)

+10.000.000 Visitors/ Year

● Transversal Categories

MEMBERS (117) GROUPED BY COUNTRIES (43)

N. 16 INSTITUTIONS

+ 11 INDIVIDUALS

THE AMERICAS (n.17)

- BRASIL (2)
- CANADA (1)
- COLOMBIA (1)
- CUBA (1)
- ECUADOR (1)
- MÉXICO (2)
- URUGUAY (1)
- USA (7)
- VENEZUELA (1)

AFRICA (n.5)

- BURKINA FASO (1)
- MOROCCO (1)
- RWANDA (1)
- SENEGAL (1)
- CAMEROUN (1)

EUROPE (n.68)

- AUSTRIA (2)
- BELGIUM (3)
- CROATIA (1)
- DANMARK (1)
- FINLAND (1)
- FRANCE (2)
- GERMANY (2)
- GREECE (2)
- HUNGARY (1)
- IRELAND (1)
- ITALY (25)
- MACEDONIA (1)
- MALTA (1)
- PORTUGAL (2)
- ROMANIA (3)
- SLOVENIA (1)
- SPAIN (6)

- THE NETHERLANDS (11)
- UNITED KINGDOM (2)

ASIA (n.12)

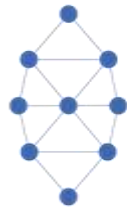
- AUSTRALIA (2)
- BANGLADESH (1)
- CHINA (5)
- INDIA (3)
- INDONESIA (1)

MIDDLE EAST (n.6)

- JORDANY (1)
- IRAN (1)
- IRAQ (1)
- QATAR (1)
- SOUTH KOREA (1)
- TURKEY (1)

WATER RELATED UNESCO PROGRAMMES

UNESCO Programme	Sites	Countries
World Heritage (WHC)	1199	168
Man & Biosphere	738	134
Geoparks	213	48
Global Network of Water Museums	117	43
Eco-Hydrology Demonstration sites	37	26



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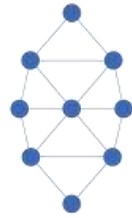
Ongoing cooperation with the UNESCO Water Family (Chairs and C2Cs)

Cooperation with UNESCO C2C centres:

- Moors Eddy, IHE Delft Institute for Water Education, UNESCO Centre cat.2, NL

Cooperation with UNESCO Chairs:

- Hein Carola, UNESCO Chair, 'Water, Ports and Historic Cities', TU Delft, NL
- Moratò Farreras Jordi, UNESCO Chair 'Sustainability', Universitat Politècnica de Catalunya, Barcelona, SP
- Taks Javier, UNESCO Chair 'Water and Culture', UDELAR, Uruguay
- Karl M. Wantzen, UNESCO Chair 'Rivers and Heritage', Univof Strasbourg, FR



WATER
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IHP Resolution n.7-XXIV (2021)

TOWARDS A “WORLD INVENTORY” (WIN) OF WATER MUSEUMS, INTERPRETIVE & VISITORS’ CENTRES

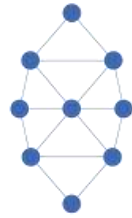
The Intergovernmental Council of IHP invites:

“the IHP Secretariat to compile an inventory of the different water museums (...) across the world, and encourages Member States to support the Secretariat in this effort by communicating information on existing water museums”

<https://www.watermuseums.net/activities/world-inventory/>

CENSUS OF NATURAL & CULTURAL HERITAGE TANGIBLE AND INTANGIBLE ASSETTS





**WATER
MUSEUMS**
GLOBAL NETWORK



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Intergovernmental
Hydrological Programme

IHP Resolution n.7-XXIV (2021)

**TOWARDS A “WORLD INVENTORY” (WIN) OF WATER
MUSEUMS, ECO-MUSEUMS, VISITORS’ CENTRES ...**

- **IMPLEMENTATION TOOLKIT**
- **TAXONOMY: MUSEUMS, INTERPRETIVE CENTRES, HERITAGE SITES BUT ALSO GOOD PRACTICES OF WATER MANAGEMENT**
- **STRATEGIC FRAMEWORK OF PARTNERSHIPS**

PRELIMINARY METHODOLOGICAL FRAMEWORK

➤ Transnational Toolkit (2 steps and 4 phases)

STEP 1: two phases

1.1 - 1st phase

Remote survey of existing water museums, interpretative centres, eco-museums, knowledge networks but also survey of potential/future ones (waterscapes, heritage assets ...)

1.2 - 2nd phase

Direct contacts with institutions identified with the 1st phase:
Questionnaire for collecting quantitative and qualitative data

PRELIMINARY METHODOLOGICAL FRAMEWORK

STEP 2: two phases (in parallel)

2.1 - 1st phase

Research & dissemination: good practices related to ancient water management systems for their potential contributions to achieve the SDGs (climate change adaptation, etc)

2.2 - 2nd phase

Synergies with local authorities interested to create new (future) water museums and interpretative centres

TAXONOMY FOR THE WORLD INVENTORY (1)

Six categories (grouped in three main types) are used to make systematic classification of existing water museums, interpretive centres etc - but also to enable identification of potential new ones :

a) TYPE 1: EXHISTING INSTITUTIONS

1.1 MUCD - Museums, Collections and Documentation Centers

1.2 IDEM – Interpretive and Visitors’ Centres, Digital Museums, Eco-Museums, Community-based Museums, Extended Museums

TAXONOMY FOR THE WORLD INVENTORY (2)

B) TYPE 2: POTENTIAL / FUTURE MUSEUMS AND INTERPRETATION CENTRES

2.1 WASH - Waterscapes (Cultural Landscapes), Sites, and water-related Heritage Assets

2.2 ANTE - **Ancestral Hydro-Technologies, Community-based practices,** and Citizens Observatories

2.3 INTL - Intangible Heritage and the Heritage of 'Living Waters'

C) TYPE 3: GOOD PRACTICES TO ACHIEVE THE SDGS

3.1 GOOD – Good practices and solutions that can potentially contribute to climate adaptation and good practices to manage resilience and scarce water resources

TWO PILOT CASE STUDIES : ITALY AND THE NETHERLANDS



The toolkit provides 2 case studies implemented at regional level on the Po Delta (IT) and the Rhin Delta (NL)

<https://www.watermuseums.net/activities/world-inventory/>

WHY AHTs?



An inspiring source of innovation
for sustainable water management
and the ecological transition at global level

PROMOTING PARADIGM SHIFT



From the prevalent cultural paradigm of 'domination over Nature' to one of 'ecosystem sustainability' & biodiversity preservation

Valuing Ancient Water Cultures



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 *khattaras*, Algerian oases, Chilean *socavones*, Mexican *tecuates*, and Mediterranean cisterns and wells

Supported by



Kingdom of the Netherlands



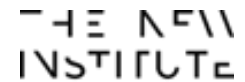
Permanent Delegation of Italy
UNESCO



NETHERLANDS NATIONAL
IHP-HWRP COMMITTEE



**IHE
DELFT**
Institute for
Water Education
under the auspices of
UNESCO



THE NEW
INSTITUTE
Centre for Environmental
Humanities (NICHE)
at Ca' Foscari
University of Venice



Ca' Foscari
University
of Venice



unesco
Chair



LIVING
WATERS
MUSEUM



International Groundwater Resources Assessment Centre



MUSÉE
DES ÉGOUTS
DE PARIS

OUR CONTRIBUTION TO THE UN-WATER SUMMIT ON GROUNDWATER (2022)

VALUING ANCIENT WATER CULTURES

Hydro-Technologies (AHTs) & Ancestral Knowledge
as an Inspiring Source of Innovation



Monumental well of San Patrizio, Orvieto, Italy and Qanat underground galleries, Iran

Indigenous Hydro-Technology and the *Tecuates* of the Tehuacan Valley, Mexico

ANCIENT TECHNOLOGY SOLUTIONS FOR FARSIGHTED GROUNDWATER MANAGEMENT IN ARID AREAS

The famous Tehuacan-Cuicatlan Valley of Mesoamerica is an invaluable heritage of humanity located in an arid and semi-arid zone of striking biodiversity. The struggle for water is the predominant theme throughout regional history and several hydraulic artefacts bear evidence of the innovative capacity and constant adaptation of humans to adverse natural conditions. Indigenous communities domesticated teosinte and created modern corn around 5,800 BC. Early development of crops allowed for the emergence of agricultural settlements. From the 2nd millennium BC, rainwater harvesting was also developed through a system of small dams and canals. Over the centuries, local communities built complex canal networks to convey spring water to the terraced agricultural plots by raising, leveling, and compacting the soil. Terraced farmlands also facilitated the recharge of the groundwater table.

With the continuous water flow in the canals, the mineral component of the liquid element encrusted the irrigation ditches and created an impressive, fossilized structure called *tecuates* - a name derived from the Nahuatl 'te-coatl' (i.e. stone-snake), which refers to indigenous cosmovision linking water to life. The evocative archaeological remains of these canals are still visible today. However, the indigenous water culture of *tecuates* was progressively disrupted by the Spanish colonist, who introduced another hydraulic technology: that of *galerías filtrantes* (seeping galleries) of Arab origins. Still today, local communities use the *galerías* brought by the Spaniards.

The various hydraulic waterworks introduced in each period generated complex socio-technological systems that sometimes still coexist. Unlike other parts of the world, today

the *galerías filtrantes* of Tehuacan are kept operational thanks to the hard work of farmers' water societies. Some 225 registered galleries are managed by well-structured water and canal societies and provide 170 million cubic metres of water for irrigation each year. (Fig. 1)

In 1980, with the belief that villagers had to cooperate more to solve their water needs - instead of waiting for government support - a civil association launched the program called *Agua para Siempre!* ('Water Forever!'). Since then, over 11,600 agroecological waterworks have been accomplished. In 1999, it was decided to also create the water museum *Agua para Siempre!* to promote indigenous water education and preserve the traditional knowledge of using natural resources. Today the museum is actively engaged in protecting groundwater by considering three basic principles: the empirical

knowledge of agro-ecology; the regional socio-cultural organizational patterns; and the use of appropriate local technology for each tributary watershed. (Figs. 2 and 3)

The entire water heritage of the Tehuacan Valley clearly illustrates the continuum paradigm of managing water over millennia through a combination of different hydro-technologies. Such a rich heritage of ancestral techniques and know-how illustrates well a key contribution to sustainable water management targeted by the SDGs. (Fig. 4)



Fig. 1. Hand-dug 'galería filtrante' (seeping tunnel) collects water for irrigation. © Raúl Hernández Garcíadiego.



Fig. 2. Traditional rock dams filter water and simultaneously allow infiltration. © Raúl Hernández Garcíadiego.



Fig. 3. A small rural dyke delivers water for nature, agriculture and the households. © Pablo Herrerías Guerra.



Fig. 4. Water spring linked to a system of well and seeping galleries (*galerías filtrantes*). © Raúl Hernández Garcíadiego.

Copyright: Raúl Hernández Garcíadiego and Gisela Herrerías Guerra, Directors and founders of the water museum *Agua para Siempre!*, Puebla, Tehuacan, Mexico / Global Network of Water Museums.



INTERNATIONAL CONFERENCE

Ancestral Hydrotechnologies as a Response to
Climate, Health and Food Emergencies

1st Conference (2023): Barcelona, Spain



[https://www.youtube.com/
embed/0QA8x8407TM](https://www.youtube.com/embed/0QA8x8407TM)



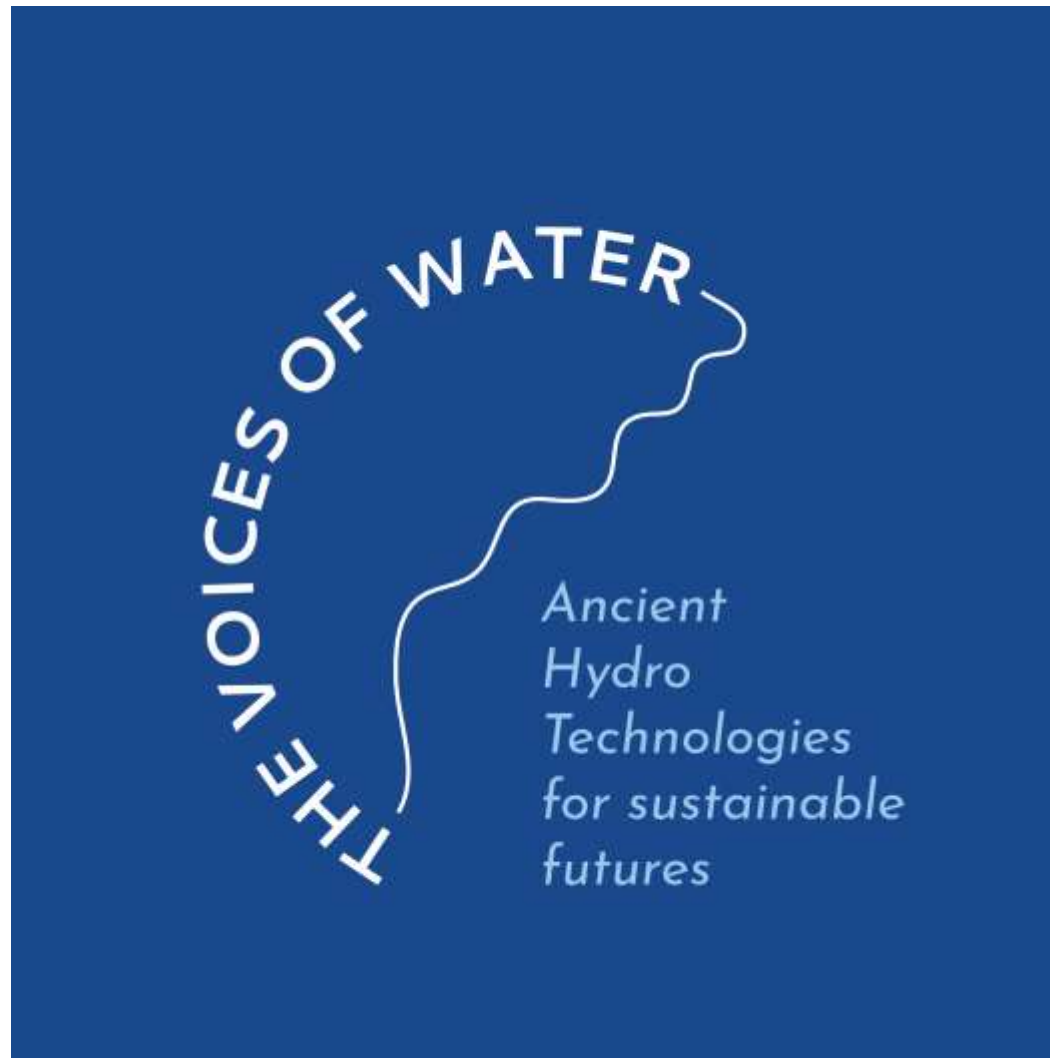
UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH
UNESCO Chair on Sustainability



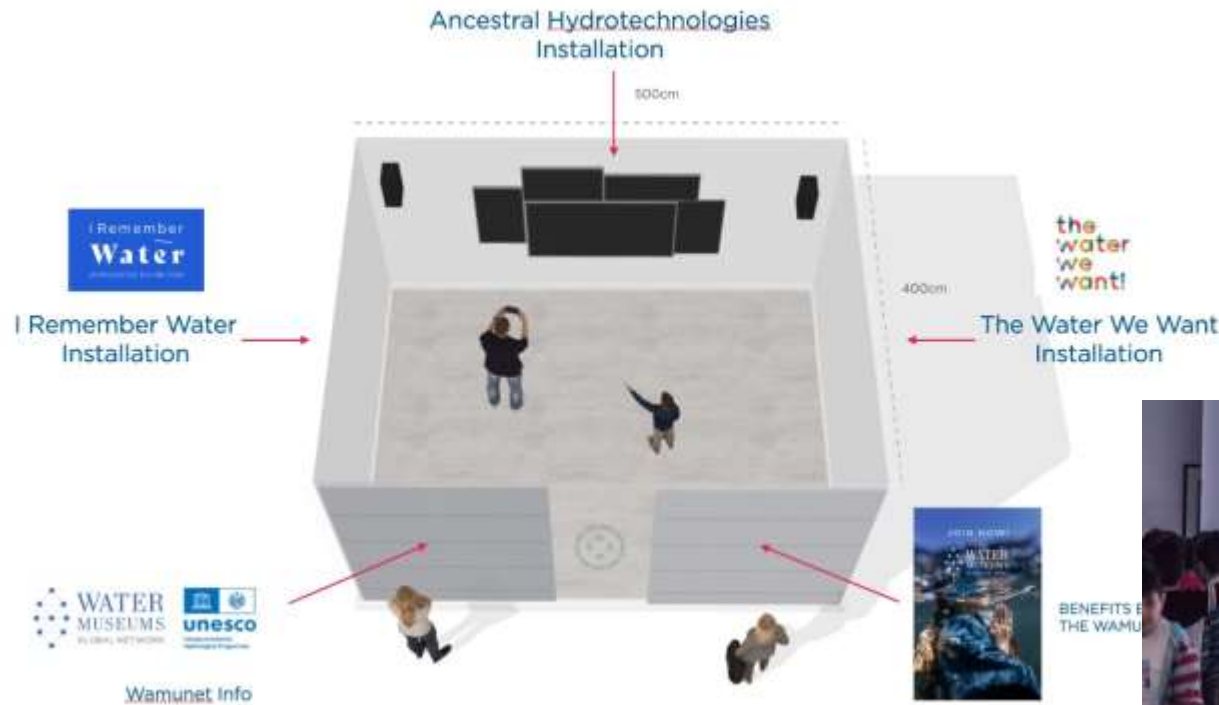
> Creation of a CoP (Community of Practice) with
other UNESCO Chairs to investigate AHTs as NBSs

ANCESTRAL HYDRO-TECHNOLOGIES

- AHTs are historical infrastructures and water-related heritage sites managed by local communities
- AHTs can be considered as NBSs (Nature-Based Solutions) since they have low energy, resources and carbon footprint
- These practices are inspired by nature and combine traditional knowledge of managing water for human use respecting freshwater ecosystem and natural life cycles
- Today AHTs are key models to preserve and restore biodiversity and ecosystems at global level, and to adapt to climate change
- AHTs can be further enhanced by the use of innovation technologies from engineering disciplines



Concept of traveling exhibition as WAMU-NET's contribution to UNESCO's Virtual Science Museum



Multi-channel, immersive video installation
officially launched in Bali by WAMU-NET



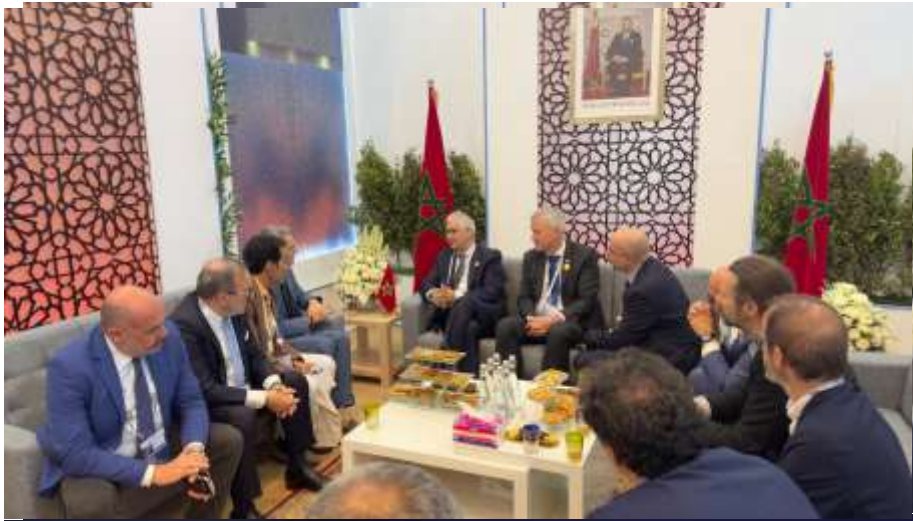
8 case studies of AHTs in 5 screens with videos, interviews, drawings and relevant info

MOROCCO – ALGERIA – GHANA – IRAQ INDONESIA – AUSTRALIA – PERU - BRAZIL





3,000 visitors in 5 days



The contribution of WAMU-NET to the Virtual Science Museum of UNESCO (+ 30 case studies by 2025)

<https://www.watermuseums.net/campaigns/the-voices-of-water/>



ABOUT NETWORK ACTIVITIES EDUCATION HERITAGE MEDIA EXHIBITIONS CONTACT US



Morocco



Algeria



Ghana



Iraq



Indonesia



Australia



Peru



Brazil





presents

THE VOICES OF WATER

Ancient Hydro-Technologies for the ecological transition

At a time when technological innovation has shown countless advantages but also limitations, we can learn from the invaluable lessons of our predecessors to foster new ways of coexistence with Nature. The contribution of WAMU-NET to the

<https://www.vimeo.com/787909748>

er Forum (Bali, Indonesia) featured in



THE WATER WE WANT

The Global Network of Water Museums for sustainability education

Explore the history of WAMU-NET: why a global network of museums and institutions was created with the aim of fostering a 'new culture of water', how it involves an increasing number of water museums and **young people**, and when it was endorsed by UNESCO-IHP (Intergovernmental

HYDRIA, MIO-ECSDE and the Global Network of Water Museums

present

PROMOTING WATER EDUCATION

Diverse and more forward-looking ancient practices of social water management have produced unique hydraulic heritage around the world and have been passed down through the generations for their capacity to preserve the ecosystem services on which human health is based. Explore how such farsighted systems of knowledge that are based on a long-term vision

WATER SUSTAINABILITY EDUCATION

WATER MUSEUMS
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9 World Water
Education

**INTERNATIONAL
YOUTH CONTEST AND AWARD
3RD EDITION 2022**

**the
water
we
want!**

DRAWINGS

PICTURES

OTHER MEDIA

DEADLINE FOR ENTRIES: 22ND APRIL 2022

<http://thewaterwewant.watermuseums.net/>

YOUTH CONTEST AND AWARD

THE WATER WE WANT

6th Edition 2025

[https://thewaterwewant.
watermuseums.net](https://thewaterwewant.watermuseums.net)

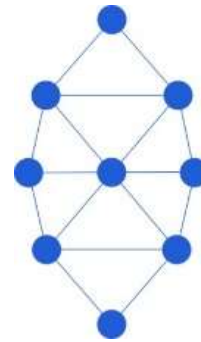
WATER SUSTAINABILITY EDUCATION

Day 2

ONLINE REPOSITORY

Day 3

AQUAPLAY



**WATER
MUSEUMS**
GLOBAL NETWORK



**TOWARDS A WORLD INVENTORY
OF WATER MUSEUMS**

A CALL INVOLVING NATIONAL IHP COMMITTEES AND TRANSDISCIPLINARY
POOLS OF EXPERTS TO IDENTIFY WATER MUSEUMS, INTERPRETATION
CENTRES, ECO-MUSEUMS, EXTENDED MUSEUMS, WATER LEGACIES,
AND WATERSCAPES WORLDWIDE

**THANK YOU
FOR YOUR
ATTENTION**

Resolution n. XXIV-7 of the Intergovernmental Council of UNESCO-IHP
titled "UNESCO-IHP in support of developing
the Global Network of Water Museums (WAMU-NET)"

DOWNLOAD THE TOOLKIT FOR THE TWO-STEP IMPLEMENTATION @



<https://www.watermuseums.net/world-inventory/>



WWW.WATERMUSEUMS.NET

INFO@WATERMUSEUMS.NET

IHP-IX

Strategic Plan

of the Intergovernmental Hydrological Programme

Science for a Water Secure World
in a Changing Environment

Ninth Phase 2022-2029

Phase 9 of IHP Strategic Plan (2022-2029)

Five priorities:

- Research
- Education
-

WAMU-NET è annoverato
fra le «Key activities &
Outputs of Priority Areas»
per promuovere e
monitorare le attività dei
musei dell'acqua

IHP 9 - Key activities & Outputs of Priority Areas

- **2.1 Public's awareness at all levels raised towards better understanding their contribution to the important multi-functions of water in domestic life, ecosystems and productive development.**
- **2.1.4. Use of networks and partnerships to increase coverage in mass media and social media, including cooperation with journalists on water topics, using easy-to-understand facts, statistics, infographics, and video clips by public figures, also making use of the Global Water Museums Network (WAMU-NET)**

IHP 9 - Key activities & Outputs of Priority Areas

- **2.2 Development and implementation of transdisciplinary research collaborations and educational approaches by UNESCO Water Family promoted to enhance participatory holistic practices**
- **2.2.4. Elaboration of formal, non-formal and informal education at all levels towards a better understanding of the importance of water for livelihoods and communities, through the mobilization of WAMU-NET and others, and implementation of Transformative Experience in informal science learning programs.**

PRIORITY 2 OF IHP PHASE 9: «WATER SUSTAINABILITY EDUCATION»

“UNESCO-designated sites and the Global Network of Water Museums will be mobilized in raising awareness and improving water culture of citizens.” (§ 119, p.25)

“IHP-IX encourages a broad conception of water education to favor a change in behaviors towards a society with greater eco-social awareness [...] supporting the development of interdisciplinary materials such as guidelines, briefing papers, and case studies on leading practices in water education for mass media contributing raising awareness of public at large.”

<https://unesdoc.unesco.org/ark:/48223/pf0000381318>