Ancestral Hydro-Technologies for Climate Emergency. Using the Past to Rescue the Future

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Can we learn from the past to adapt to future?

Human beings have been historically able to adapt to extreme conditions.

Understanding how a local population have been co-existing with extreme events and conditions in the past, managing and adapting to their environment.

Recover, understand and transfer the specific socio-ecological-cultural and technical systems (SETS), the intangible heritage, basic to improve climate adaptation.
The "social fabric" to reduce vulnerability

**Social Fabric**: Experience of community with different threats, and its capacity to confront them, to recover and to adapt (to the presence and to the effects).

**The place**: Physical geography and its characteristics of built territory.

Local and/or Indigenous Knowledge Systems

Knowledge of the specific socio-cultural and technical system of an area is essential to understand how a local population has coexisted with extreme events in the past, managing their adaptation to the environment.

Community experience in the face of different threats and its capacity to confront, recover and adapt.
Water Heritage

EGYPTIAN Water Culture (ca 3150-31 BC)

ETRUSCAN Civilization – Tuscany, Umbria, Latium - Italy (Iron Age, ca 800-100 BC)

ROMAN Period (146 BC-AD 330)

MINOAN Civilization
Southeastern Greece (Bronze age, ca 3200-1100 BC)

CLASSICAL AND HELLENISTIC Times Greece (ca 480-100 BC)

INDUS VALLEY Pakistan (Bronze age, ca 3200-1100 BC)

ZENU SOCIETY Colombia (ca 600-400 BC)

PREHISPANIC AMUNAS Peru (XII-XIII Century)

Hydro-Technologies (45)
Hydraulic Heritage (21)
Ancestral Water (24)
Ancient Water (24)
Lessons Learned from the past - Water Heritage

(a) These civilizations understood the importance of sanitation, water supply, and drainage and sewerage systems for human survival and well-being and made these an essential part of urban planning to achieve water resource sustainability;

(b) Water quality and security as one of the critical aspects of the design and construction of their water supply systems.

(c) A combination and balance of smaller scale measures (such as cisterns for water harvesting systems) and the large-scale water supply projects (such as reservoirs for storage of aqueduct flows) were used by many ancient civilizations thereafter;

(d) Water technologies were characterized by simplicity, ease of operation, and the requirement of no complex controls, making them more sustainable.
Ancestral Hydro-technologies: Amunas, Perú

AMUNAS - Raining harvesting above 4,400 meters through ditches, taking water to previously identified areas with fractured rocks on the mountain. The water slowly moves to emerge, months later, through the springs (springs or puquios), that are between 1,500 and 1,800 meters below.

SOWING AND HARVESTING WATER

River with no SHW

River with SHW

Water Flow

Time (months)

Water Flow

Time (months)
Zenu Society - 400-600 bC

Complex hydraulic system
(over 500,000 Ha)

MULTIFUNCTIONAL
- Flooding Control
- Water Security
- Food Security

Combination of ridges (Camellones), channels (natural and artificial) and water reservoirs (deep ponds/dikes)

Barcelona, La Mojana - Sucre (Colombia)
Ancestral Hydro-technologies: Hydraulic Zenu system, Colombia

- **Rainy Season**
  - Seeds and crops are protected from being washed away.
  - Turning excess water to advantage (400 BC).
  - Water and sediments are a source of irrigation and nutrients.
  - Floodwater drains nutrients, leaving a sandy soil in which is hard to grow crops.

- **Dry Season**
  - Large expanses of land under water for several months, no crops left.
  - Problems in both seasons, flooding in winter, drought in dry season (Today).

WEFE NEXUS

- Global trends
- Climate Change
- Population Growth
- Consumption Patterns
- Economic Growth

- Energy Security
- Water Security
- Food Security

UN-WATER SUMMIT ON GROUNDWATER 2022
Can we replicate Ancestral Hydro-technologies?

Construction and Implementation of an Ancestral Model of amphibian culture for Adaptation to Climate Change, Socio-Ecosystem Resilience and the Conservation of wetlands.

Association of producers, fishermen, farmers and agroecological artisans of Purísima Córdoba
Using the past to rescue the future: TEK and NBS

Indigenous peoples and local communities have been recognized as key social actors for conservation and sustainable development.

Article 8j of the Convention on Biological Diversity (CBD) of the United Nations (UN).

TEK, developed in direct contact with nature, engineered to sustain rather than exploit resources, fostering symbiosis between species.
Living solutions inspired by, continuously supported by and utilizing Nature, designed **to address societal challenges** in a resource **efficient and adaptive manner**, while providing economic, social and environmental benefits (EC, 2015).
There is a vast need for sustainable and cost-effective water supply and sanitation facilities.

Applicability of selected ancient water supply management systems (e.g., storage of rainfall runoff facilities) for the contemporary developing world should be seriously considered.

Several ancestral hydro-technologies should be considered not as historical artifacts, but as potential models for sustainable water technologies for the present and the future.

International Conference
Ancestral Hydrotechnologies as a Response to Climate, Health and Food Emergencies in the Mediterranean
“Use of Cultural Heritage to Rescue the Future”

16-17 February 2023 – Barcelona
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