

Editorial

The 4th EWaS International Conference: Valuing the Water, Carbon, Ecological Footprints of Human Activities

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It is a privilege and pleasure to write the preface of the fourth conference of the EWaS Series of International Conferences! EWaS4 was actually the first (and hopefully the last) conference forced to become a virtual event, due to the restrictions imposed by the rapid expansion of COVID-19, and the protection measures imposed necessary to control this deadly virus.

Since its first steps on Earth, humankind made clear that it came to stay, expand, and dominate in all aspects of the natural environment. Human's primitive behavior was initially being guided by its pure survival instincts. Humans had to use every means to fight for their right to live in a far too hostile environment, where bigger, stronger, mightier, and for sure more predominant species ruled. Using his undoubtedly superior weapons combined, i.e. brains, speech, and thumbs, humans eventually succeeded to fully dominate over every other living creature on Earth, putting their footprint as an everlasting sealing wax on Earth's open letter to life.

Unfortunately, this did not come with no costs and no strings attached. Human's wellbeing pursuit had significant negative impacts. Almost all anthropocentric activities considered the environment as an expendable item (not even an asset!). There was only one simple goal: evolution!

Looking carefully back to the way humans walked on Earth for all these centuries, anybody can realize that humankind's evolution pathway seemed more like an endless boat trip over the seven seas of prosperity, in which quite controversial harbors were successively being reached.

Initially there was the **"industrial revolution"** harbor, where everything should, could, and would be used under the name of human's progress. The environment was no exception.

Then, the shelter of the **"green approach"** was reached, where science and progress were the ultimate victims of a witch hunt, through a process where the deification of the environment took place. The environment should be kept intact, no matter what.

Having traveled all the way between this pendulum's farthest ends, the ship of human's evolution, counting the unavoidable casualties while trying to heal the inevitable wounds, quite recently found a narrow pass to the **"sustainable development"** land. But is this the end of this journey? Are the sustainable development's goals enough to make humankind reach a "Nirvana" status? Unfortunately, not. Sustainable development has to do with what is considered sustainable based on past and current experiences. Nobody knows what the future holds for us. What the next generation(s) will be forced to face. Will it be enough to leave them an environment that is under "sustainable mode" based on today's perspective? Probably not. Future generations will most likely be forced to face unexpected and unpredictable challenges, threats, hazards, and dangers. The same happened actually with us (the current generation) facing the climate change conditions that could not have been predicted not more than a century ago. Let us not make the same mistake as our ancestors did. Let us not be that "naive".

We have to move to the **"worth-living development"** era, where the goal will be to leave the next generation(s) a better world to live in. The opportunity cost should be handed over as reduced as possible to them. The price they will be asked to pay to restore the environment should be as

limited as possible. This will lift from their shoulders quite a big load, in order to be better prepared to withstand any unpredictable threat that the future will bring on them. To achieve this, we have to reassess and reevaluate all aspects of our activities' footprint. In every aspect of our life. In every turn of our way.

Over recent decades, there has been an increasing interest in the integrated management of water systems. Under the pressure of population growth and urbanization, economic development, international trade, and climate change, projections indicate that demand for freshwater will significantly increase over the next few decades.

Entities such as cities and industries claim increasingly more water, while, at the same time, face problems of pollution and environmental degradation, and, in cases such as the Mediterranean, severe water scarcity.

It is of utmost importance to establish a way to integrate the complex and interrelated nature of our global resource systems. To use an approach that allows us to better understand and analyze the interlinkages between the natural environment and socioeconomic activities, and to work towards a more coordinated management and use of natural resources across sectors and scales. Identifying and managing trade-offs and building synergies through this analysis allows for more integrated and sustainable planning, decision-making, policymaking, and implementation.

In this context, the fourth Efficient Water Systems (EWaS) International Conference entitled "Valuing the Water, Carbon, Ecological Footprints of Human Activities" attempts to enlighten the reevaluation of human activities' foot-printing, presenting international case studies to bring together theory and practice.

Looking back at the history of EWaS it is like looking a child growing.

- *The 1st EWaS*, took place in Thessaloniki, back in April 2013. Everything started when three close friends from three Greek Universities (Profs. Zouboulis, Kanakoudis, and Samaras) decided to give it a chance and start realizing a dream of launching a specialized conference focused on **Efficient Water Systems**. This is how EWaS was born and made its first baby steps, actually!
- *EWaS2*, took place in Platanias in Crete island in June 2016. It was co-organized by the University of Thessaly and the Technical University of Crete. The EWaS dream was kept alive, resulting in a successful sequel that made EWaS a promising "tradition". EWaS2 was two times bigger than EWaS1. EWaS started growing fast!
- *EWaS3*, took place in Lefkada island in June 2018. It was the first EWaS Conference solely organized by the University of Thessaly, that decided to take the risk, stand on its own feet, and attempt something that a few years ago seemed more like a "mission impossible". EWaS3 grew to be 50% bigger compared to EWaS2. It grew enough to attract highly distinguished researchers and become a well-acknowledged platform where also young researches could present their work and get insightful feedback.

So, here we come now to *EWaS4*, which went digital, even if it was initially planned to be held in Corfu island. EWaS4 withstood the inevitable pressure and kept almost 80% of its strengths, proving that the EWaS initiative maintained its reputation, supported by a continuously growing pool of followers. Out of the 100 papers submitted, 80 were finally selected for oral or poster presentations, classified in the following themes:

- Theme A: HYDRAULICS
- Theme B: URBAN WATER MANAGEMENT
- Theme C: WATER - ENERGY - FOOD NEXUS
- Theme D: RIVERINE SYSTEMS
- Theme E: HYDRODYNAMICS AND WAVES
- Theme F: GLOBAL CHANGES AND SMART CITIES
- Theme G: HYDROLOGY
- Theme H: RAW & WASTEWATER TREATMENT - WASTE MANAGEMENT
- Theme I: GROUNDWATER AND IRRIGATION SYSTEMS

- Theme J: ADVANCED METHODS FOR ENVIRONMENTAL SYSTEM ANALYSIS

The Conference also hosted four Special Sessions (SS):

- SS-01: “WATER SUSTAINABILITY: CHALLENGES AND INNOVATIVE APPROACHES”, coordinated by Prof. Maurizio Giugni (University of Naples Federico II - Italy)
- SS-02: “EFFICIENT AND EFFECTIVE WATER NETWORK DESIGN, SIMULATION AND MANAGEMENT”, coordinated by Prof. Marco Franchini (University of Ferrara - Italy)
- SS-03: “WATERBORNE DISEASES”, coordinated by Prof. Panagiotis Karanis (University of Nicosia - Cyprus)
- SS-04: “WATER AND WASTEWATER TREATMENT INNOVATIVE OPTIONS”, coordinated by Prof. Anastasios Zouboulis (Aristotle University of Thessaloniki - Greece)

The present edition includes a selection of papers presented in EWaS4.

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