

WATER AND THE BUILT ENVIRONMENT

THURSDAY: SESSION 3, TRACK 1

SESSION CHAIRS

- Irene Susini, Frontiers Media SA
- Auroop Ganguly, Northeastern

SPEAKERS

- Auroop Ganguly, Northeastern
- Poulomi Ganguli, Indian Institute of Technology Kharagpur
- Kalyan Piratla, Clemson University
- S. Murty Bhallamudi, Indian Institute of Technology Madras
- Julia Hopkins, Northeastern
- Samrat Chatterjee, Pacific Northwest National Laboratory (DOE)

SESSION ABSTRACT

Most ancient civilizations were built around water bodies to ensure a steady supply of freshwater. Ranging from intricate irrigation networks and dams in Mesopotamia and Egypt, to sophisticated water supply and sanitation systems in the Indus Valley and Angkor Thom, water and the built infrastructures have been tightly coupled with each other since antiquity. This tradition, born out of necessity, has continued through the Middle Ages in the civilizations of Southeast Asia and the Middle East through Renaissance-era Europe, to modern times. However, despite millennia of experience, major knowledge-gaps and execution challenges remain in the relevant sciences, engineering, and policy principles.

According to the United Nations (UN), around 95% of all disasters globally are related to excess or deficit of water. In the period from 1995 to 2015, floods impacted 2.3 billion people worldwide, killed 157,000, and resulted in US\$662 billion in damage, while the corresponding figures for droughts were 1.1 billion, 22,000 and US\$100 billion. A 2018 UN report suggested that, globally, floods and droughts affected over 35 million and over 9 million people, respectively. The World Health Organization (WHO) estimates that more than 35% of the world's population lacks basic sanitation while about 11% do not have access to adequate water sources. Improved water, sanitation, and hygiene can prevent 9.1% of all diseases and 6.3% of all deaths worldwide. This dire situation is exacerbated by degrading, inadequate, or even non-existent built infrastructures associated with water.



Our understanding of water and the built environment, along with our ability to design, manage, operate, and maintain water related infrastructures, have benefited from lessons learned over millennia. Nevertheless, this interdisciplinary area continues to represent a grand societal priority that needs to be urgently addressed by researchers and practitioners.