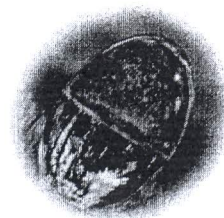


## **7th International Conference: Water Security & Climate Change Adaptability**

*Water is a precondition to life on Earth and is essential for sustainable development. Water insecurity is typically driven by a combination of environmental, societal, technological, and governance factors. These are affecting poor and vulnerable communities and are compounded by contributing factors, including population increase, unmanaged migration, land-use change, reduced soil health, accelerated groundwater extraction, widespread ecological degradation and biodiversity losses. The most water insecure countries facing challenging hydrological environments with weak institutions and chronic under-investment in water infrastructure. Even when water is abundant and the hydrologic regime is benign, mismanagement (for example, misallocation or poor pollution regulation) or inadequate infrastructure investment can lead to water insecurity. However, water security in the context of climate change cannot be adequately assessed by any single integrative index. In the world, the impacts of climate change are highly variable and uneven. Some regions are experiencing extraordinary periods of drought, others increasingly severe and frequent floods and storms, while some face both sets of extremes. In addition, water security often intersects with other security issues, like, energy and food security, which has the direct relationship with national security. Therefore, there is need to map out the relative sectors which are affecting the overall blue productivity, sustainability and climate change adaptability.*

**There are 5 other various conference sub-themes which are allied with the main theme:**

- 1. Climate Change & Maritime Security**
- 2. Hydro-Sustainability: Water, Energy & Food - Nexus (WEFN)**
- 3. Glacial Lake Outburst Flood (GLOF)**
- 4. Hydro-politics & Indus Basin Governance**
- 5. Water Pollution & Waste Water Management**



### **1. Climate Change and Maritime Security**

Oceanicity is a measure of the degree to which the climate of a region is influenced by a maritime airflow from the oceans. In contrast to continental climates, maritime climates experience generally cool summers and mild winters. Maritime security is a general term for the protection of vessels both internally and externally. Both climate change and, to a lesser extent, maritime security have been recognized as a priority in the cross-sectoral, global policy agenda. (Training Resources Maritime Institute, n.d.) The areas of maritime operation in terms of shipping industry and climate change need protecting include, maritime tourism, transport, terrorism, piracy, robbery, illegal trafficking of goods and people, illegal fishing, pollution and maritime communities. (Germond & Mazaris, 2019) Climate change and maritime insecurity can have diverse and severe socioeconomic impacts at local, regional and global scale. From a short term, anthropocentric viewpoint, both phenomena challenge population health and welfare; in the longer term, environmental degradations as the cause and output of climate change and criminal activities pose a major obstacle for the sustainable development of next generations.

### **2. Hydro-Sustainability: Water, Energy & Food - Nexus (WEFN)**

The word nexus means to "connect" although its application is varied. The view that water resources, energy generation, and food production in relation with climate change are interdependent is not novel. Many factors necessitate this paradigm shift such as climate change and water scarcity, population growth,



introduction of new technologies, changing lifestyles and unsustainable land and resource use in WEFN domains, etc. More specifically, in the context of hydro-sustainability and climate change, major contributing factors are: i) absence of institutional coordination; (ii) influence of political priorities on decisions rather than use of scientific knowledge to shape the decisions; (iii) lack of capacity to understand interlinkages between sectors; (iv) lack of multi-stakeholder engagement in planning and decision-making processes; and (v) lack of incentive mechanisms and adequate finance to support the approach. Internationally, the WEF nexus has become accepted as a mechanism for facilitating progress toward the relevant sector-related SDGs, i.e., SDGs 2, 6, and 7 (Simpson et al., 2022). The WEF nexus approach is, therefore, recognized as a promising tool for achieving the relevant sector-related SDGs and holds promise for the guidance of development initiatives aligned with Nationally Determined Contributions (NDCs) of the Paris Agreement.

### 3. Glacial Lake Outburst Flood (GLOF)

A Glacial Lake Outburst Flood, or GLOF is sudden release of water from a lake fed by glacier melt that has formed at the side, in front, within, beneath, or on the surface of a glacier. Fragmentation of the source glacier, landslides and other processes can trigger displacement waves in the lake, potentially compromising the stability of the dam and resulting in a GLOF. The prominent factor responsible for the GLOF is climate change which seems by the fact that due to rising temperatures, glaciers in Pakistan's northern mountain ranges the Hindu Kush, Himalayas and Karakorum are melting rapidly and a total of 3,044 glacial lakes have developed in Gilgit-Baltistan (GB) and Khyber Pakhtunkhwa (KP). Of these, 33 glacial lakes have been assessed to be prone to hazardous glacial lake outburst flooding (GLOF). (*Scaling-up of Glacial Lake Outburst Flood (GLOF) Risk Reduction in Northern Pakistan | UNDP in Pakistan*, n.d.) GLOF are sudden events which can release millions of cubic metres of water and debris, leading to the loss of lives, property and livelihoods amongst remote and impoverished mountain communities. Over 7.1 million people in GB and KP are vulnerable; 26.7 percent and 22 percent of the population, respectively, are below the poverty line.

### 4. Hydro-politics & Indus Basin Governance

Water problems in Pakistan result largely from poor management, but the consequences of management failures are accentuated, both materially and politically, by international and subnational hydro-politics. Within Pakistan, water sharing is dictated by the Indus Waters Treaty, which allocates portions of Indus inflows between Pakistan and India and by the interprovincial Indus Water Apportionment Accord established between provinces in Pakistan in 1991, and various other local water institutions. The IWT, by performing an amputation surgery on the basin, made matters simple and allowed India and Pakistan to pursue their nationalist agendas without much need for more sophisticated and involved cooperation in the water field. The Indus basin is riven by uncertainty. Multiplying climate change impacts on the 'third pole' upstream (supplying some 80% of the water flows) threaten future water availability. (Sharma et al., 2010) This lack of cooperative sharing of water leaves the ecological and social consequences of the treaty to be negotiated and contested at the subnational scale. In the context of climate change, the Indus basin ranked in the top ten of the world's most vulnerable basins with inflows predicted to fall by 27% by 2050. (*Indus Basin Management Demands Political Cooperation*, n.d.) The combination of glacial retreat, decreasing ice mass,

early snowmelt and increased winter stream flow suggest that climate change is already affecting the Himalayan cryosphere the pressure on the Indus basin through population growth, environmental degradation and the overarching umbrella of climate change threatens the sustainability of the water resources. They also create uncertainty and risk for human development.

#### 5. Water Pollution & Waste Water Management

Water bodies can be polluted by a wide variety of anthropogenic substances, including pathogenic microorganisms, organic waste, POPs (persistent/ putrescible organic pollutants), fertilizers and plant nutrients, toxic chemicals, sediments, heat, petroleum (oil), PPCPs (pharmaceutical and personal care products), disinfection by-products, heavy metals, microplastics, and radioactive substances etc. (Ahmed et al., 2020) Impacts on surface water and groundwater resources (water pollution) and water-related illnesses are increasing, especially under changing climate scenarios such as diversity in rainfall patterns, increasing temperature, flash floods, severe droughts, heatwaves and heavy precipitation. (Leverenz & Asano, 2011) Water-related infectious diseases like malaria, dengue fever, chikungunya, along with their causative agents and the mode of transmission of these diseases have been affected by climate variability. (Mahfooz et al., 2020) Moreover, wastewater treatment systems present a significant challenge for the design engineer due to the need for high-quality reliable performance in light of a number of constraints, including long periods of time between maintenance activities, lack of redundant systems, high variability in flow rate and constituent concentrations, and site-specific factors. In Pakistan, amongst the abundant industries, five chief industries including pharmaceutical, petrochemical, coal manufacturing, textile and paper, and pulp have recognized to generate a high threat to the environment and health. In Pakistan only 1% of the domestic and industrial wastewater receives treatment only one treatment plant is working.

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# 7th International Water Conference 2022

29-30 December Islamabad

## Conference Sub-Themes:

1. Climate Change & Maritime Security
2. Hydro-Sustainability: Water, Energy & Food - Nexus (WEFN)
3. Glacial Lake Outburst Flood (GLOF)
4. Hydro-politics & Indus Basin Governance
5. Water Pollution & Waste Water Management

## Dates to Remember

Abstract Submission  
15 November 2022

Acceptance Letter Issuance  
25 November 2022

Full Length Paper Submission  
10 December 2022

## Paper/Abstract

Submission at:

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