

**STATEMENT OF THE  
9TH INTERNATIONAL CONFERENCE ON FLOOD MANAGEMENT (ICFM9)  
“River Basin Disaster Resilience and Sustainability by All  
- Integrated Flood Management in the Post COVID-19 Era”**

18-22 FEBRUARY 2023, Tsukuba and Tokyo, Japan

The 9th International Conference on Flood Management (ICFM9) was held from February 18th to 22nd 2023 in Tsukuba and Tokyo, with more than 400 participants gathering from over 40 nations across the continents.

ICFM9 delegates participated in a high-level symposium in Tokyo, two and a half days of knowledge sharing and extensive exchanges, as well as field visits in the Kanto area. Following these activities, the delegates of ICFM9 have agreed to the following declaration. The declaration shows delegates' commitment to flood risk reduction, and their appeal to the public, professionals, managers, and decision-makers to engage in the crucial task of improving flood disaster resilience and sustainability under changing climate conditions in the post COVID-19 era.

**Acknowledging:**

1. From 2000 to 2019, floods affected 1.6 billion people worldwide and accounted for 44% of all disaster events, the highest figure for any disaster type. Floods also killed 104,614 people and caused US\$651 billion in economic damage during this period<sup>1)</sup>.
2. IPCC AR6 reports an increase in the frequency and intensity of heavy precipitation events since the 1950s over most land areas for which observational data are sufficient for trend analysis (high confidence)<sup>2)</sup>. Though recording and reporting of flood events has improved in recent decades, this trend is closely related to a 2.3 fold increase in the number of flood events between 1980-1999 and 2000-2019<sup>1)</sup>. In addition, sea-level rise is accelerating, and since the 1990s it has doubled to 4 mm/yr.
3. The economic burden experienced by low-income countries from climate-related disasters is many times greater than that experienced by high-income countries. High-income countries experienced average losses from climate-related disasters of 0.41% of GDP, compared to 1.77% for low-income countries over the period 1998-2017<sup>3)</sup>.
4. The world's urban population grew rapidly from 751 million in 1950 to 4.2 billion in 2018. Fifty-five percent of the world's population currently lives in urban areas. This figure is expected to increase to 68% by 2050<sup>4)</sup>. Urban expansion has often been carried out in an unplanned manner, leading to social, economic and environmental deterioration, and more intensive and severe flood damage. While urbanization will continue to increase, the population of 61 countries or areas is

projected to decrease by 1 per cent or more between 2022 and 2050<sup>5)</sup>.

5. Recurrent heavy rainfall events combined with already saturated water systems have caused the failures of protective infrastructure, especially in the case of embankment structures, which are susceptible to erosion and infiltration.
6. The COVID-19 pandemic has disrupted access to shelters and medical services, exacerbating damage and human suffering caused by floods. The pandemic has also slowed economic development and has hindered the advancement of social equity, making society more vulnerable to flood impacts, especially in low-income countries. The pandemic has demonstrated that our societies and systems are unprepared for sudden disturbances and changes. At the same time, the pandemic has created new opportunities for open science and learning. E-learning, in particular, is seen as a promising alternative methodology to enhance water and climate resilience during and after the COVID-19 pandemic.
7. ICFM9 is a contribution to the 9th phase of the Intergovernmental Hydrological Programme (IHP IX 2022-2029) UNESCO "Science for a Water Secure World in a Changing Environment."<sup>6)</sup>

**Declaring:**

8. The preventable loss of life and destruction of property as a result of flooding is unacceptable and requires bold and transformative action. Furthermore, flood disaster resilience is a prerequisite for achieving sustainable development. Flood resilience should therefore be strengthened by engaging all stakeholders in efforts to increase the capacity of societies to reduce disaster impacts, overcome loss and damage, and expedite recovery.
9. Concerted actions should be undertaken according to internationally accepted goals and targets, including those addressed in the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2030 Agenda for Sustainable Development, and the 2015 Paris Agreement. Good practices, gaps and challenges identified and discussed during ICFM9 contribute to the midterm review of the implementation of the Sendai Framework and to the objectives of the UN 2023 Water Conference.
10. Improving resilience requires understanding and addressing systemic factors that create flood risk. These factors must be addressed through cross-sectoral and basin-wide coordination. Economic recovery investment activities stemming from the COVID-19 pandemic should be linked with efforts for building a resilient society.
11. Alongside other disciplines, science and technology should play a central role in making society more resilient and adaptive to devastating floods - one of the most destructive natural disasters. Floods can cause severe damage to infrastructure, property, and human life. Thus, it is imperative to prioritize the quantification and visualization of resilience in efforts to combat this catastrophe. It is essential to provide evidence of the effectiveness of investments in flood resilience to policymakers and decision-makers. Additionally, science and technology can aid in preparing for

sudden- and slow-onset disturbances, such as pandemics, climate change, and social changes.

12. To achieve sustainability, structural and non-structural flood management and climate change adaptation must be combined with climate change mitigation.
13. Flood disaster resilience and sustainable development are closely and structurally interlinked. For this reason, it is necessary to understand their issues in a comprehensive manner. Flood managers must promote holistic, integrated and interdisciplinary approaches, and conduct planning, implementation and evaluation to enhance resilience.
14. On-site stakeholders from national and local governments, for-profit companies, non-government organizations, communities, as well as individuals, should recognize the importance of local and indigenous knowledge, and should incorporate the concept of citizen science in developing flood disaster resilience and sustainability. These stakeholders must all work to address the social inequities that create and exacerbate flood risk, and should take action in accordance with site-specific conditions. Laws and regulations should ensure that central/national level risk management has the authority to decide on regional or transboundary interests, while there should be decision-making processes that arbitrate in cases of differences between central management and local communities.
15. The three key concepts of resilience, sustainability, and inclusiveness should be considered as guiding principles to execute flood resilience projects, as emphasized at the 4th Asia-Pacific Water Summit held in Kumamoto, Japan, on April 23-24 April, 2022, and addressed in its three outcome documents, the Kumamoto Declaration<sup>7)</sup>, the Chairs' Summary<sup>8)</sup>, and the Kumamoto Initiative for Water<sup>9)</sup>.

**Agreeing:**

16. Establish cross-sectoral frameworks at local, national, regional, and global levels to link cutting-edge science beyond disciplines with on-site decision-making and action to achieve goals using an end-to-end approach.
17. Promote collecting, archiving, and sharing data and information on flood risk.
18. Improve models of flood events and their economic impact, as intensified by climate and social changes, to plan practical policies for national and global economic development.
19. Promote water cycle consilience by integrating the knowledge of water cycle, climate, agriculture, and energy using well-organized observation, modeling, and data and information systems.
20. Foster the integration of "Facilitators" to work as catalysts capable of providing expert advice in the local context based on a broad range of scientific and indigenous knowledge about flood resilience and sustainable development under climate change<sup>10)</sup>.
21. Understand and integrate the impacts of social inequity, and the rights of indigenous peoples into all strategy, planning, and action for flood resilience.

**Inviting:**

22. In order to continue the benefits of sharing experiences and approaches, the Ad Hoc Committee is invited to convene ICFM10 in 2026, to further develop flood risk management research and practice at individual, community, business, local authority, national and regional levels.

**References:**

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- 6) UNESCO Intergovernmental Hydrological Programme (IHP) “Science for a Water Secure World in a changing Environment” (IHP IX 2022-2029) <https://unesdoc.unesco.org/ark:/48223/pf0000381318.locale=en>
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