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Sea Level Rise and Floating Structures along Asian Coastlines: New Adaptation Strategies for Sinking Cities like Jakarta and Others » Asia Research Institute, NUS

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Sea Level Rise and Floating Structures along Asian Coastlines: New Adaptation Strategies for Sinking Cities like Jakarta and Others

Date	:	18 Mar 2025
Time	:	16:00 – 18:00 (SGT)
Venue	:	Online via Zoom
Contact Person	:	LIM, Zi Qi

Jointly organized by the Asia Research Institute at National University of Singapore, and the Society of Floating Solutions (Singapore); with friendly support from the Max Weber Foundation and its DIJ-ARI Research Partnership on Asian Infrastructures.

CHAIRPERSON

Dr Stefan Huebner, Asia Research Institute, National University of Singapore

PROGRAMME

	WELCOME REMARKS
16:00	Dr Stefan Huebner | National University of Singapore, and Society of Floating Solutions (Singapore)
	PRESENTATIONS
	Dr Stefan Huebner | National University of Singapore, and Society of Floating Solutions (Singapore)
	Assoc Prof Margo van den Brink | University of Groningen
	Dr Sonja Rombach| University of Groningen
	Prof Katherine Dafforn | University of Massachusetts Boston
	Assoc Prof Rukuh Setiadi | Diponegoro University
16:05	Dr Anh Cao | University of Tokyo
17:20	QUESTIONS & ANSWERS
18:00	EMD

ABSTRACT

Many Asian cities, along with others worldwide, are increasingly interconnected by the shared threat of sinking—a stark reminder that climate change is predominantly a crisis driven by water-related challenges. Coupled with more intense storms and rising groundwater levels, urban flooding has become a defining issue of the twenty-first century. The most vulnerable regions include coastal areas in Southeast Asia, East Asia, and the Netherlands.

This interdisciplinary symposium will explore floating structures—such as floating homes, recreational facilities, and solar PV systems—as a new adaptation strategy for flood-prone urban environments. Rising sea levels, a consequence of climate change, demand locally viable adaptation strategies. Traditional responses include retreating to higher ground, which can exacerbate social inequities without adequate government support; land reclamation, which disrupts biodiversity and can alter water temperatures; constructing seawalls, which can be affected by coastal erosion and groundwater level rise; implementing nature-based protective measures; or flood-proofing individual buildings. An emerging alternative is integrating floating structures into urban environments through advancing (or shifting) parts of urbanization onto aquatic surfaces. These structures, capable of vertical mobility, adapt to fluctuating water levels.

In cities like Jakarta, the excessive extraction of groundwater to meet growing freshwater demand accelerates land subsidence, further compounding the risk of sinking. The creation of large water reservoirs is a potential solution, which then reinforces the relevance of floating structures in this aquatic environment. Growing interest in floating structures from international organizations such as the United Nations and the Intergovernmental Panel on Climate Change, alongside national governments, underscores the timeliness of this symposium. By combining expertise across governance, engineering, urban planning, architecture, historical applications of floating structures, and biodiversity, the symposium will deliver a comprehensive analysis of the opportunities and challenges associated with an advance onto aquatic surfaces in the shared adaptation context of sinking Asian cities like Jakarta and others.

ABOUT THE SPEAKERS

Stefan Huebner is President of the Society of Floating Solutions (Singapore) and Senior Research Fellow at the Asia Research Institute, National University of Singapore. He is working on the history, present, and future of ocean industrialization and new forms of urbanization that became possible through floating structures. Recent articles were published in *Ocean and Coastal Management*, *ChannelNews Asia*, and *AsiaGlobal Online*. His monograph on "Earth's Amphibious Transformation", covering the connections between socioeconomic development and environmental transformations in the context of the accelerating use of floating and seabed-fixed platforms to extend the human habitat onto aquatic surfaces, will be released by Cambridge University Press in 2025. In 2019, he served as U.S. Social Science Research Council Transregional Research Fellow at Harvard University, where he was previously a Fulbright scholar in 2018. Further articles explore, for example, urbanization projects for Tokyo Bay since the 1950s, the origins of Asia's oceanic Anthropocene through offshore oil drilling, and the connections between ocean industrialization and environmentalist thought.

Margo van den Brink is Associate Professor Water Governance and Spatial Planning at the Faculty of Spatial Sciences, University of Groningen, the Netherlands. Her research focuses on (urban) water and climate adaptation, spatial quality and integrated flood risk management. Her overall research ambition is to improve water governance and institutional design for enhancing the transition to flood and climate resilience. She holds a PhD (cum laude) from Radboud University, Nijmegen School of Management and studied Science and Technology Studies at Maastricht University. She is currently leading the governance work package of the Dutch Floating Future research programme, which is aimed at investigating the possibilities for upscaling floating urban developments, from a technical, ecological and governance perspective.

Sonja Rombach completed her BSc in Geography at Kiel University, Germany in 2021 with a thesis on the potential of floating homes as a special adaptation method to sea level rise in Kiel. During her studies, she took part in various formats to promote her own start-up (Land & Sea). She then completed her MSc in Environmental Geography and Management at Kiel University, Germany, with her thesis on opportunities and limitations of stakeholder engagement using the example of Kiel marine research. Currently, she conducts her PhD research on the social value of floating communities at the Department of Spatial Planning and Environment, Faculty of Spatial Sciences, University of Groningen, the Netherlands, since 2024.

Katherine Dafforn is Distinguished Professor of University of Massachusetts Boston and Director of the Stone Living Lab. She is also an environmental scientist recognised for her contributions to understanding and managing human impacts in marine systems. She co-founded the Living Seawalls project in 2018. Through this work she has been engaged in the ecological design of marine foreshores and has provided nature-based solutions for several urban renewal projects.

Rukuh Setiadi is Associate Professor in the Department of Urban and Regional Planning, Diponegoro University, Indonesia, and a researcher at the Sustainable Development Goals Centre of the university. He is interested on the intellectual space between urbanization and climate change, with particular interest in the transformative adaptation and future-oriented urban responses to climate change. He has participated as a contributing author of the 6th Assessment Report of the Intergovernmental Panel on Climate Change on Chapter 6 "Cities, Settlement and Key Infrastructure". He gained training, research and planning experience in a number of projects funded by national and international organizations and programs. He is also an expert member of SeaCities Lab initiated by Cities Research Institute, Griffith University Australia.

Anh Cao is Project Assistant Professor at the Institute of Industrial Science, University of Tokyo. She has been working on adaptation trends in practices in Asian deltaic coastal cities, aiming to identify adaptation measures that are implemented to cope with flooding induced by sea level rise. She conducted various fieldworks in Tokyo, Ho Chi Minh City, Manila, and Jakarta, interviews with city governments and household questionnaire surveys with residents. Her work also explores risk perception, policy perception, and the social conflicts between stakeholders and limits to adaptation in these cities. She is also working on the advanced practice of watershed flood management using surface hydrological prediction system. She conducted a nation-wide survey, investigating the current status of flood early warning systems at the local government level and highlighting biggest challenges in creating risk knowledge and disseminating early warnings. Her work enhances the application of soft measures (i.e., early warning systems) in flood risk reduction across Japan and other cities across the globe.