

1

INTRODUCTION

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Even before climate change surfaced as a critical challenge for cities, the stresses of rapid and mass urbanization were already problems facing many countries, especially developing countries. The nexus between the climate crisis and urbanization is so distinct that the Intergovernmental Panel on Climate Change (IPCC) prepared a regional fact sheet dedicated to the vulnerability of urban areas in its Sixth Assessment Report. The impacts of climate change are clearly exacerbated by urban characteristics such as the lack of vegetation, the abundance of dense concrete structures, and intense human and economic activities that raise temperatures, alter water cycles, and increase the risk of flooding. Coastal cities, in particular, face the added threat of rising sea levels (IPCC 2022). In a way, climate change has not only magnified the problems of urbanization but has also added another layer of complexities to the mounting challenges that cities face.

Southeast Asia is currently home to four major agglomerations or megacities (cities of over 10 million people); Jakarta, Manila, Bangkok, and Ho Chi Minh City (Citypopulation.de n.d.). The speed of urbanization in the region is particularly striking. In the 1960s, only

a quarter of Southeast Asia's population lived in urban areas, today more than half live in urban areas, and this number will increase to two-thirds by 2025 (Leggert 2015).

Southeast Asia is experiencing some of the world's fastest changing demographics, and also one of the most vulnerable regions to climate change. Three Southeast Asian countries; Myanmar, the Philippines, and Thailand are among top ten countries that have suffered the greatest economic damage and number of fatalities from climate disasters (Eckstein et al. 2019).

On the city scale, the region is also home to the most vulnerable cities to climate risks. A report by consultancy firm Verisk Maplecroft ranked urban centres worldwide based on their environmental and climate risk, revealing that 99 of the 100 most threatened cities are in Asia (Nichols 2021). Topping the list is Jakarta, which experiences land subsidence, heat stress, water scarcity, natural hazards and pollution due to a combination of climate change and human activity. Close behind are other Indonesian cities Surabaya and Bandung, which are similarly plagued with extreme levels of environmental risk. In addition, other Southeast Asian cities such as Kuala Lumpur and Manila are also assessed to have high environmental risks.

Yet, climate action is not solely about adapting to the impacts of climate change. Cities, as economic, social and cultural hubs with intense rates of consumption, are also crucial in mitigating greenhouse gas emissions (UNFCCC n.d.). With proactive local governance, cities can emerge as leaders by planning and implementing solutions that strengthen climate adaptation and mitigation. On the policy side, cities can make significant decisions on urban planning, land use management, and attract major investment projects that focus on balancing economic growth, livelihood, and sustainability.

Climate change research in Southeast Asia often tackles adaptation and mitigation in its intensive agricultural and land-use sectors, which are major contributors to its greenhouse gases and help drive the loss of natural ecosystems, rich biodiversity and massive carbon sinks (ADB 2009). In contrast, research on urban climate solutions in the region is less abundant, yet offers promising possibilities for building adaptive resilience and leading a sustainable transition that could impact millions. In order to respond to those challenges, policymakers and practitioners in the region need to understand climate risks in the urban context,

coping mechanisms, prediction systems, and tools and interventions to better equip cities with strategies to face climate challenges.

It was in this context that the Climate Change in Southeast Asia Programme at the ISEAS – Yusof Ishak Institute initiated a workshop and compendium on Cities and Climate Change in Southeast Asia. Through case studies that hold unique contextual insights, this compendium highlights cities in Southeast Asia that are already exploring such possibilities. The compendium seeks to understand the nexus of climate change and urban development better, share insights and best practices, and promote practical solutions by academics, experts and practitioners as part of their on-going research. The analysis presented in this compendium does not aim to provide meticulous prescriptions on how cities should cope with climate change, but rather provide propositions and brief assessments to help practitioners in the region understand problems, challenges, and opportunities moving forward.

The compendium is organized into three sections: (I) Climate Risks in the Southeast Asian Urban Context, (II) Climate Resilience and Urban Governance, and (III) Urban Climate Interventions.

CLIMATE RISKS IN THE SOUTHEAST ASIAN URBAN CONTEXT

This section highlights the manifestation of climate risks in a Southeast Asian city context, particularly understanding the linkages of climate impacts *vis-a-vis* environmental conditions, livelihood, and cultural assets of cities. The three chapters in this section analyse the interaction of climate change and water security, food provision, and heritage preservation in various urban context.

Alejandro N. Ciencia and **Gladys A. Cruz** discuss the existing challenges of water provision in the City of Baguio, Philippines, that are further exacerbated by climate risks such as drought, heavy rainfall, and mismanagement of water resources. Ciencia and Cruz further recommend the participation of all stakeholders in water provision to ensure adequate, safe, and affordable water provision to the city.

Ku Nurasyiqin Ku Amir and **Bakri Mat** challenge the conventional conception of urban areas as non-food production centres. Drawing from the experience of community agriculture practices in Penang, Malaysia, Amir and Mat indicate that through agroecology, cities can

address both food supply chain disruption during COVID-19 and improve their resilience in adapting to climate change.

Nguyen Ky Nam identifies that climate change has profoundly impacted many heritage sites on Vietnam's central coast, notably the Complex of Hue Monuments. While the Government of Vietnam has acknowledged heritage preservation as an essential component of Vietnam's Updated Nationally Determined Contribution (NDC) to the Paris Agreement, strategies tackling climate change at the national level are still too broad and challenging to be implemented in particular heritage preservation sites.

CLIMATE RESILIENCE AND URBAN GOVERNANCE

The second section of this compendium underlines the role of urban governance in enhancing climate resilience and specifically highlights the need for cities to manage urban development better, strengthen cooperation with national governments and global city networks, and utilize a community-based approach.

There are four chapters featured in this section:

Nigel K. Downes highlights how the urban expansion of Ho Chi Minh City has reduced the city's flood detention and retention capacity, which further increases flood risks. Downes further suggests that the city government of Ho Chi Minh City needs to integrate granular and more precise "block-scale" climate adaptation scenarios.

Kristoffer B. Berse and **Elton Evidente** provide an assessment of the local climate adaptation plan in the Philippines. Their research finds a clear commonality among the policy areas to address water sufficiency, knowledge, and capacity development to combat climate change among localities in the Philippines.

Nila Kamil and **Sayel Cortes** discuss the role of international city networks in helping cities to advance their climate ambitions. Drawing from the experience of Jakarta's collaborations with the C40 Climate Leadership Group (C40), the International Council for Local Environmental Initiatives (ICLEI) and CityNet, their research points out that the collaboration have helped Jakarta to enhance their climate ambitions.

Lastly, **Virajhita Chimalapati** proposes historic urban areas in the region to adopt the knowledge system approach to democratize flood mitigation approaches. The approach acknowledges collective

knowledge as an asset to encourage co-creation, collaboration, and bridging various stakeholder experiences in managing natural disasters.

URBAN CLIMATE INTERVENTIONS

The final section of this compendium seeks to promote instruments and tools to manage urban growth while strengthening their capacity to manage climate risks. This section demonstrates the benefits of scaling up nature-based solutions, adaptation finance, utilizing financial disclosure mechanisms for the private sector, and advocating for more proactive donors in delivering financial assistance for climate adaptation projects.

Demonstrating the experience from the Jakarta Metropolitan Area (JMA), **Adiwan Aritenang** examines to what extent nature-based solution infrastructure can help the city prevent flood occurrences in the Jakarta Metropolitan Area.

Bruce M. Mecca and **Ines Ayostina** suggest that the city government of Jakarta leverage de-risking instruments and create bankable project pipelines to stimulate private finance for climate adaptation projects.

Renard Y.J. Siew further advances the discussion to involve the property and construction sector in Malaysia to ramp up climate mitigation targets in cities. Utilizing the framework of the Task Force for Climate Financial Disclosures (TCFD), his research finds that the majority of publicly listed Malaysian property and construction companies are still not aligned to the TCFD recommendations and have poor climate disclosures.

Finally, **Michiyo Kakegawa** emphasizes the role of Official Development Assistance (ODA) in promoting climate adaptation tools. Drawing from the experience of Japanese ODA in Vietnam, her study suggests that the Japanese government must start integrating Ecosystem-based Adaptation (EbA), a cost-efficient intervention that is highly impactful in ensuring resilient communities in ODA recipient countries.

CONCLUSION

In the workshop organized by the Climate Change in Southeast Asia Programme at the ISEAS – Yusof Ishak Institute online on 5–6

October 2021, all contributors noted that climate change research has been gaining ground in the region. However, the climate impacts, development trajectory, and capacity to adapt across urban areas in the region vary immensely. The research findings in this compendium should help policymakers, practitioners, and relevant stakeholders to develop more nuanced ideas and scenarios to balance urban development and sustainability moving forward.

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