



Summary Report of the Final Workshop of CARE for SEA Megacities and Project Meeting

Metro Manila, Philippines
28-30 July 2026 and 31 July 2026

The “Climatic hazard Assessment to enhance Resilience against climate Extremes for Southeast Asian megacities” (CARE for SEA megacities) project is the latest activity under the Coordinated Regional Climate Downscaling Experiment Southeast Asia (CORDEX-SEA) collaboration, which is part of the World Climate Research Programme (WCRP) CORDEX. Started in October 2023, this three-year project is funded by the Asia-Pacific Network for Global Change Research (APN). CARE for SEA megacities aims to generate city-scale climate hazard information for SEA megacities (Bangkok, Hanoi, Jakarta, Kuala Lumpur and Manila) under multiple SSP scenarios that will be relevant and useful for policy-making to enhance urban resilience in a globally warmer future.

Following the technical and stakeholder workshop for CARE for SEA megacities and CORDEX-SEA held on 19-21 August 2025 in Jakarta, Indonesia, the final workshop of the project was held at ibis Styles Manila Araneta City, Metro Manila, Philippines on 28-30 July 2026. With support from APN and organized by the Manila Observatory, this workshop provided a venue for CARE for SEA megacities collaborators and the CORDEX-SEA community to present the latest research findings and launch the online data communication platform, including a demonstration on the use of the platform. The workshop was followed by a one-day meeting (by invitation) on 31 July 2026 for project collaborators to discuss next steps.

This workshop aimed to:

1. Coordinate and discuss updates on the urban climate downscaling activities under the CARE for SEA megacities project;
2. Launch the online data communication platform; and
3. Guide partner stakeholders through the data platform and gather insights to enhance its utility.

Attended by up to 51 in-person and 21 online participants, the hybrid three-day technical and stakeholder workshop included the following sessions:

- Session 1: Updates on CORDEX-SEA and urban climate research in Southeast Asia
- Session 2a: Key findings from CARE for SEA megacities: Extreme heat
- Session 2b: Key findings from CARE for SEA megacities: Extreme rainfall scenarios
- Session 3a: Stakeholder Workshop on Data Portal
- Session 3b: Stakeholder Workshop on Climate Storylines and Stories
- Session 4: Stakeholder Workshop on Designing a climate resilient city



There were 21 presentations (including keynote address and technical presentations) delivered onsite and online, as well as two stakeholder workshop activities: Data Portal, and Climate Storylines and Stories on the second day, and Designing a climate resilient city on the third day.

The Final Workshop of CARE for SEA Megacities began with the Welcoming Remarks from Fr Jose Ramon T Villarin SJ, Executive Director of the Manila Observatory, followed by the Opening Remarks given by Dr Faye Cruz, CARE for SEA megacities Project Lead. Dr Linda Anne Stevenson, Programme Director of APN, delivered a keynote presentation about APN, highlighting the latest achievements from its 30 years of policy-relevant global change research in the Asia-Pacific region and future directions under its Sixth Strategic Phase.

On the first day (28 July 2026), Session 1 consisted of presentations on updates from CORDEX-SEA and urban climate research in Southeast Asia. Dr Thanh Ngo-Duc reported that most of the planned dynamical downscaling of selected CMIP6 models has been completed by the CORDEX-SEA community; hence the next steps include the data analysis and plans for the timeline and protocols for the public release of these datasets. Session 1 also highlighted recent findings on the impacts of urbanization on heat and precipitation in Southeast Asia. High-resolution modeling across several Southeast Asian cities shows that extreme heat and urban heat island (UHI) intensities are highly sensitive to land surface models, soil conditions, and urban characteristics, specifically surface imperviousness, urban fraction, mean building height, and anthropogenic heat. In addition, high-resolution dynamical downscaling studies showed that urban land cover can significantly influence precipitation patterns. Enhanced atmospheric instability, moisture convergence, and vertical mixing were identified as the primary mechanisms through which urbanization contributes to increased rainfall over megacities.

Key findings from the experiments conducted under the CARE for SEA megacities project were discussed in Session 2. The session on extreme heat (Session 2a) presented the large expansion of urbanization in Southeast Asian megacities from 2001 to 2020, and the future increase in surface temperature over cities especially during the nighttime. The analyses further suggested that the effects of global warming are likely to outweigh those of urbanization. However, additional research is needed to better quantify and explain the specific contribution of urbanization to future extreme heat projections. Extreme rainfall patterns in different cities are driven by distinct mechanisms, resulting in varied approaches to conducting pseudo-global warming (PGW) experiments, as presented in the session on extreme precipitation (Session 2b). This variability is also highlighted in results of the numerical simulations. However, it was agreed that a consistency on the experimental design and analysis is still essential, even though extreme rainfall cases differ among the cities. The discussion also pointed out that other factors should also be considered, such as the large-scale drivers depicted in GCMs, analyses of



uncertainty from forcing data used in the PGW method, topography, and land use and land cover (LULC) changes.

On the second day of the workshop (29 July 2026), the session on the Data Portal began with a presentation by Prof Fredolin Tangang, highlighting the various applications of CORDEX-SEA data, and emphasizing the need for broader outreach to promote the utilization of CORDEX-SEA data and help identify priorities for the next phase of the initiative. This was followed by a presentation by Dr Jerasorn Santisirisomboon demonstrating the data portals of the CARE for SEA megacities project and CORDEX-SEA. The development of these data portals is led by the team from Ramkhamhaeng University Center of Regional Climate Change and Renewable Energy (RU-CORE), who will continue to enhance and improve both platforms following the workshop, incorporating feedback from the participants.

The rest of the second day focused on the stakeholder workshop on Climate Storylines and Stories, in collaboration with the WCRP Lighthouse Activity My Climate Risk through the Ateneo de Manila University Regional Hub (MCR-Ateneo). This session was designed to guide participants in using the storyline approach in articulating plausible climate impacts and in creating a collaborative climate story. After an online introduction by Dr Theodore Shepherd, co-chair of My Climate Risk and pioneer of the climate storylines approach, the participants were divided per city for the group discussions. Each city chose one hazard to examine its key physical drivers, social determinants of climate risk, its plausible climate impacts by the middle of the century (2040-2060) based on the CARE for SEA megacities data portal and their lived experiences of historical analogues, and ideal responses. After completing the climate storyline diagram, each group reported back to the plenary to share their discussions. Interestingly, all groups selected urban flooding as their city's most common hazard. The changes in intensity and patterns of future rainfall contribute to the worsening of flooding in urban low-lying areas. The cities also highlighted that vulnerable groups must be prioritized in disaster response, and the strengthening of capacity of stakeholders or community must be encouraged. Most of the cities emphasized that early warning systems and more efficient or connected flood control plans must be implemented. The last task of this activity was for each group to use their diagram as a guide in creating a climate story, reflecting on their shared experiences. The groups made a creative story based on their personal experiences, their visions of the future, and their personal insights. This task was designed to encourage collaborative and systems-based approaches among stakeholders and science researchers in identifying gaps and opportunities in making "usable" climate science and utilizing it for future planning.

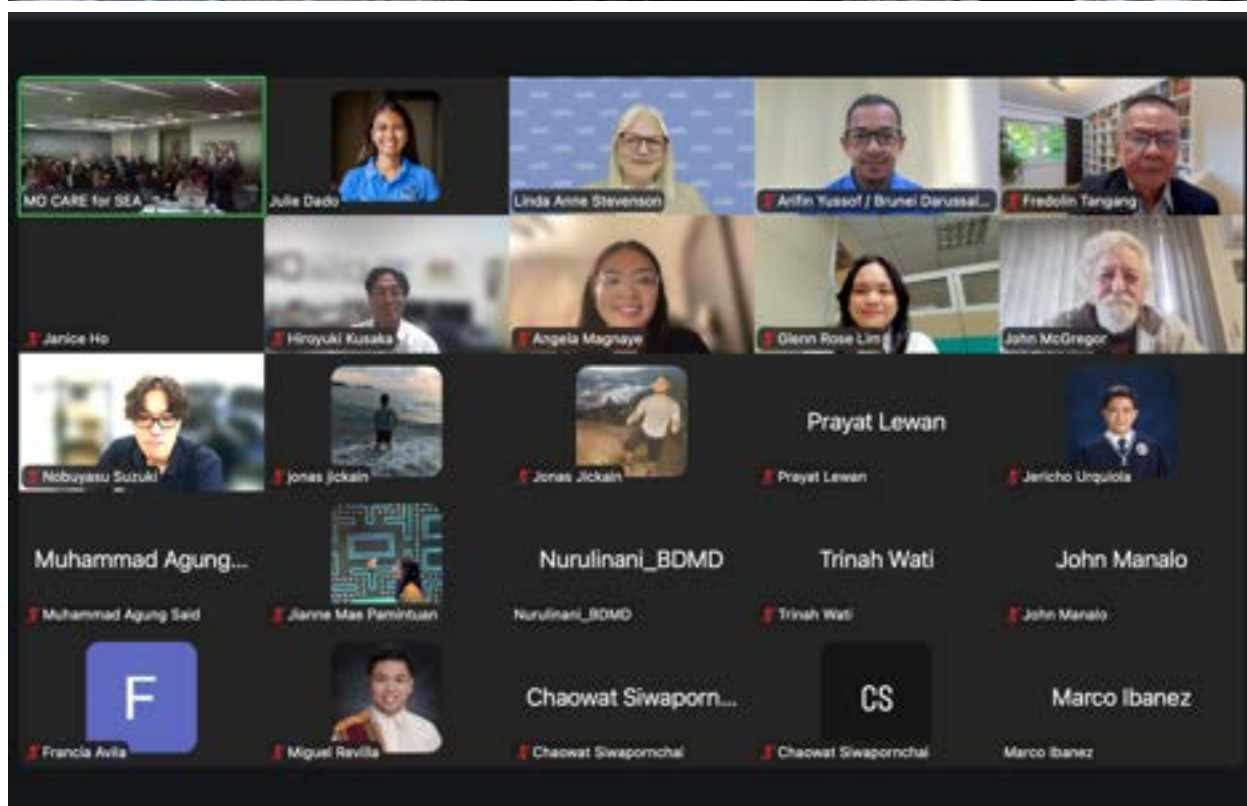
Building on the discussions and activities from the first two days, the third day of the workshop (30 July 2026) focused on encouraging participants to explore strategies that advance both the developmental and climate resilience aspirations of their respective cities. Conducted in collaboration with WCRP Academy, the activity was based on the Normative Future Visioning



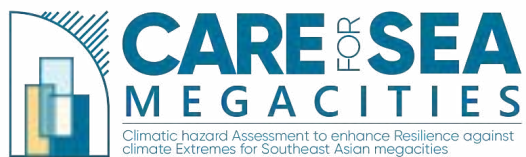
framework developed by Tomorrow's Cities: Urban Risk in Transition. The activity began with each city team analyzing the social landscape of their respective cities using a guided worksheet. This exercise established a baseline understanding of each city's social and environmental context, which informed the succeeding activities. Participants then reflected on their experiences and envisioned the future of their cities by creating a "postcard from the future," allowing them to articulate their aspirations for climate-resilient urban development. In the final activity, each city team developed a modified Business Model Canvas tailored to their local context. The canvases incorporated key considerations such as city demographics and characteristics, appropriate climate resilience strategies, participatory approaches, and strategic partnerships. To conclude the session, each city presented its proposed vision for building a climate-resilient megacity. The presentations showcased a diverse range of innovative ideas, including a digital twin command center for Bangkok, the creation of framework towards a centralized and connected transportation systems for Manila, cultivating climate literacy among Malaysian youth for Kuala Lumpur, a flood-resilient city for Jakarta, and an Early Warning Early Action (EWEA) system for Hanoi.

In the afternoon of 30 July 2026, workshop participants visited Marikina City, one of the partner stakeholders of the project. During the courtesy meeting with Marikina City Mayor Marjorie Ann "Maan" Teodoro, the CARE for SEA megacities project was introduced, and Mayor Teodoro shared the environmental and climate resilience initiatives of the city. A visit to the Marikina River allowed participants to see the latest flood mitigation efforts of the city after having experienced the damaging impacts of urban and river flooding in the past years.

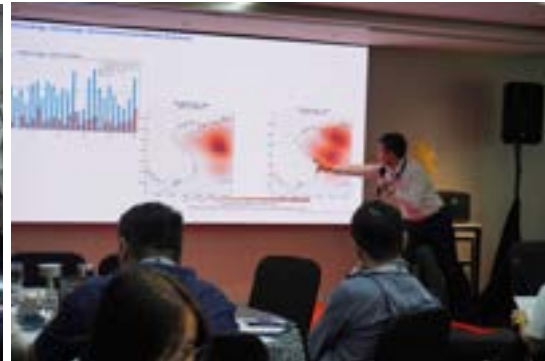
Project collaborators conducted a meeting on 31 July 2026 at the Manila Observatory to discuss the progress and remaining deliverables of the CARE for SEA Megacities project. Current efforts are focused on data analysis, manuscript preparation, development of knowledge products (e.g. fact sheets) and data dissemination. Considering the upcoming end of the project, the group agreed to request a no-cost extension to allow additional time to complete the remaining deliverables. It was also agreed that the CORDEX-SEA datasets need to be consolidated soon to accelerate their public release once the reference paper is published. Discussions on the next phase included the continuation of CORDEX downscaling activities with CMIP7 to strengthen the initiative's visibility and support stakeholder needs, although the specific scientific priorities for the next phase require further discussion. Remaining agenda items will be addressed through the project's regular online coordination meetings.



Participants of the Final Workshop of CARE for SEA Megacities at ibis Styles, Metro Manila, Philippines and online, 28-30 July 2026



Opening session and Keynote address (28 July 2026)



Presentations on the latest research in urban climate in Southeast Asia and key findings from the CARE for SEA megacities project (28 July 2026)



Presentations on the latest research in urban climate in Southeast Asia and key findings from the CARE for SEA megacities project (28 July 2026) *(continued)*



Stakeholder Workshop: Data Portal (29 July 2026)



Stakeholder Workshop: Climate Storylines and Stories (29 July 2026)



Stakeholder Workshop: Climate Storylines and Stories (29 July 2026) (continued)



Stakeholder Workshop: Climate Storylines and Stories (29 July 2026) *(continued)*



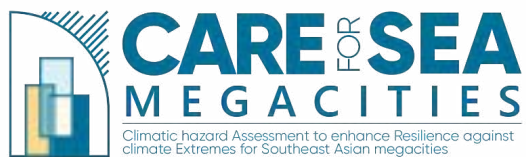
Stakeholder Workshop: Designing a climate resilient city (30 July 2026)



Stakeholder Workshop: Designing a climate resilient city (30 July 2026) *(continued)*



Courtesy Meeting with Marikina City Mayor and Visit to Marikina River



Project Meeting of CARE for SEA Megacities, Manila Observatory, Philippines, 31 July 2026