

Urban-Act Knowledge Exchange: Collaborative Development of Climate Services for Climate-Sensitive Urban Development

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Extreme weather events, such as floods, storms, or heat waves, are expected to become more frequent and intense due to climate change. These events have significant economic impacts and adverse effects across various sectors. Understanding climate risks is crucial for effectively adapting to the impacts of climate change. Climate risk assessment has become an essential tool to help decision-makers and users identify, prioritise, and plan adaptation measures, with climate data being an essential and fundamental part of risk assessment.

Mr. Surapong Sarapa, the Director of the TMD Climate Center, emphasised the role of the Thai Meteorological Department (TMD) as a national climate service provider in delivering climate services and sharing meteorological knowledge, particularly in the application of climate data and information in sectoral work.

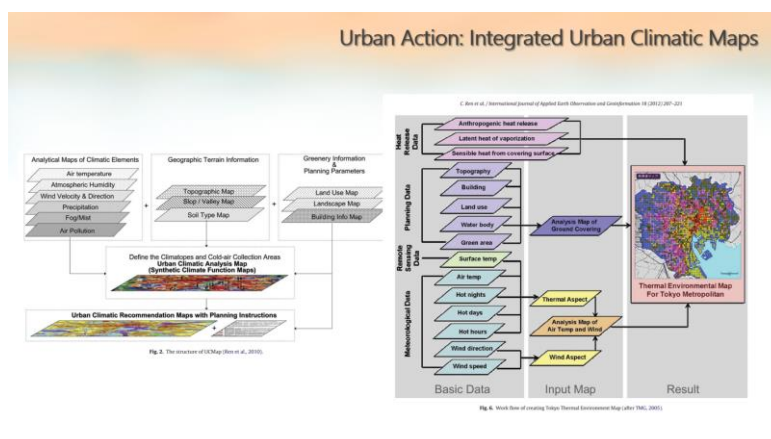
As an initial step towards creating an effective climate service to support climate-sensitive urban and spatial development, the Thai Meteorological Department (TMD), in collaboration with GIZ under the Urban-Act project, organised a virtual exchange meeting on "**Climate parameters and climate change impacts on the urban sector**" on Friday 29th March 2024.

The meeting focused on establishing a common understanding of climate change impacts and relevant climate data in urban sectors, including demonstrating how sector users can apply climate data to their work. The event was well-attended by over 100 participants from national governmental agencies, academia, universities, and project pilot city agencies.

During this meeting, speakers and experts shared knowledge and valuable insights on climate data and presented case studies of climate service applications.

Climate parameters and their implications

The presentation by Ms. Apinya Chaila, a meteorologist from TMD Climate Center, provides a brief overview of the climate service provided by TMD. The service is now provided to 6 (six) sectors: agriculture and food security, public health, water resource management, tourism, transportation, and urban. The services provide multi-timescale climate parameters, such as rainfall, temperature, wind, and sunshine. Historical climate data, showing climate trends and changes, play a crucial role in planning and identifying adaptation measures in different sectors. Ms. Apinya also gave an example of an information and evaluation tool called 'Urban Climatic Map,' which provides local climate information in a simple format to urban planners or decision-makers. In order to develop such a map, close collaboration between TMD and partners is required in every step, from identifying needs and goals, to analysing and generating results, Ms. Apinya highlighted.



Concept of Urban Climatic Map

Climate change impacts on urban sector

Ms. Ruthaikarn Buaphean, a meteorologist from TMD Climate Center, provided background information on climate change impacts, particularly on the urban sector. She explained that the 'Urban Heat Island (UHI)' effect is one of the climate-related issues in cities. UHI occurs when the air and surface temperatures in urban areas are higher than in the surrounding rural areas due to factors such as increased temperature, differences in urban surfaces, buildings, and human activities (like driving cars and using air conditioning). This effect can cause discomfort and have a negative impact on health. Ms. Ruthaikarn highlighted the importance of not only using climate projection data but also specific expertise in different sectors, such as the health sector, to address future climate risks. She also mentioned that climate projection data, including temperature, rainfall, wind speed, and humidity, are available at the climate center and can be used by planners and decision-makers to anticipate future climate risks.

Proactive approach to tackle climate change – Case study: Climate Field School

A shift in the timing of the season led by climate change creates impacts on agriculture production. In order to cope with those impacts, Dr. Chalump Oonariya, a meteorologist from TMD Climate Center, showcased the project, namely 'Climate Field School,' which was implemented by TMD together with stakeholders in the agriculture sector. The project piloted the integration of climate data and information in crop calendars for rice cultivation. A crop simulation model was used to simulate crop yield based on 4 (four) key inputs consisting of weather data, crop characteristics, soil characteristics, and field management. A comparison of crop yield obtained from the model and field experiment showed different yields but similar trends. To increase the accuracy of the model, Dr. Chalump emphasised that a comprehensive understanding of local climate, expertise in the sector, field experiments, and field observation are needed. He also pointed out that insufficient weather stations or insufficiently dense networks of stations are considered a key challenge in getting high-resolution data. However, TMD is developing high-resolution data using a reanalysis technique, using models combined with other reliable data sources to fill this gap.

Integrating climate data in urban planning process

Historical climate data and information, such as mean temperature and rainfall data, have been used in urban planning for several years. Dr. Pornsan Vichienpradit, a professor from Chulalongkorn University, pointed out some potential entry points in the urban planning system where climate data and information can be integrated into the planning process to make urban planning more resilient and sustainable. The plans showing specific key substances, namely the land use plan, natural resources plan, environment plan, and water resources plan, under the provincial policy plan and comprehensive plan, were mentioned. Using fine-resolution climate project data will also help urban planners address and tackle climate change impacts at different levels, in particular at urban or city scales. Dr. Pornsan provided a list of climate data and information that can support climate-sensitive urban planning in Chiang Mai and Khon Kaen pilot cities, where urban flash floods are identified as a major problem in the cities. The list consists of monthly temperature data (maximum, minimum, and mean), monthly average rainfall over the last 20 years, frequency of extreme rainfall events, climate change scenario models, and natural disaster statistics. Effective communication also plays a vital role in increasing the public's perception and awareness of climate change impacts, Dr. Pornsan added.

Using climate data in climate change adaptation

Dr. Wijitbusaba Marome, Professor from Thammasat University, shared her insightful experience in applying climate data and information from an urban perspective. She gave examples of criteria for selecting climate data for developing climate risk maps, including intensity, duration, frequency, and average. The most crucial thing in addressing climate change in the urban sector is to understand how it affects urban areas or cities, followed by setting clear objective(s), identifying relevant climate data and information needed, applying it in the planning process, and identifying adaptation measures. Dr.

Learn more details about each topic and materials from the event, please visit:

Climate parameters/data and its implications in sectors : https://www.thai-german-cooperation.info/wp-content/uploads/2024/07/01_Climate-Parameter-29Mar2024.pdf

Climate change impacts on the urban sector : https://www.thai-german-cooperation.info/wp-content/uploads/2024/07/02_Climate_Change_Impacts-on-city.pdf

Proactive approach to tackle climate change and case study 'Climate Field School' project : https://www.thai-german-cooperation.info/wp-content/uploads/2024/07/03_GIZ_Urban_Climate_Action_CFS_rev2.0.pdf

Integration of climate data in the urban planning process : https://www.thai-german-cooperation.info/wp-content/uploads/2024/07/04_%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9A%E0%B8%B9%E0%B8%A3%E0%B8%93%E0%B8%B2%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%82%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B8%B9%E0%B8%A5%E0%B8%A0%E0%B8%B9%E0%B8%A1%E0%B8%B4%E0%B8%AD%E0%B8%B2%E0%B8%81%E0%B8%B2%E0%B8%A8%E0%B9%83%E0%B8%99%E0%B8%81%E0%B8%A3%E0%B8%B0%E0%B8%9A%E0%B8%A7%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%A7.pdf

An urban perspective on applying climate data and information : https://www.thai-german-cooperation.info/wp-content/uploads/2024/07/05_Use-of-climate-data-in-sectors-TU.pdf

Participating agencies:

- Office of the Permanent Secretary for Interior
- Department of Public Works and Town & Country Planning (DPT)
- Office of Transport and Traffic Policy and Planning (OTP)
- Office of Natural Resources and Environmental Policy and Planning (ONEP)
- Department of Climate Change and Environment (DCCE)
- Thai Meteorological Department (TMD)
- Chiang Mai Provincial Office of Public Works and Town & Country Planning
- Khon Kaen Provincial Office of Public Works and Town & Country Planning
- Phuket Provincial Office of Public Works and Town & Country Planning
- Chiang Mai City Municipality Office
- Khon Kaen City Municipality Office
- Chulalongkorn University (CU)
- Thammasat University (TU)
- Chiang Mai University (CMU)
- National Energy Technology Center (ENTEC)