Course Outline

Annual International Training Course

1. **Course Title:**
   Introduction to Disaster Risk Assessment and Risk Mapping in a Changing Climate

2. **Duration:**
   2 weeks (August 16th – Saturday 29th August 2025)

3. **Background:**

Recently, the number of event and severity level of natural disaster reported worldwide are dramatically increasing. Flood, drought, Tsunami, and earthquake are the example of inevitable disasters that even the developed countries and communities around the world are currently facing with. The effective remedial measures together with practical risk and vulnerability assessment are immediately required by the government agencies in those areas. The disaster events are naturally dynamics; accordingly, the remedial plan requires the frequent update with enough information. In addition, the disaster risk and vulnerability assessment are usually time consuming, which require (almost) every local agency to be involved. Therefore, the basic knowledges on disaster risk and vulnerability assessment are very important for the local government officers in those disaster-prone areas.

Naresuan University (NU) is situated in the lower Northern region of Thailand, where the Chow Phraya River was originated. The area is one of the most vulnerable areas to flood and drought disasters of the country. To assess the flood risk levels of the area, the research team at Faculty of Engineering, Naresuan University developed the flood risk map based on the Geographic Information Technology (GIS) along with the application of QGIS for Flood Risk Map. The training on flood risk map development was once completed in November, 2021 at Faculty of Engineering, Naresuan University. There were more than 20 officers from the local government agencies participated in the 3-day training. This research was conducted under the assistances of experts from Thai Network for Disaster Resilience (TNDR) and Asian Disaster Preparedness Center (ADPC).

The Thai Network for Disaster Resilience (TNDR) aims to promote cooperation in disaster management in Thailand with at least 16 educational institutions and government agencies in terms of research, academic research and development of curriculum to management disasters.

Asian Disaster Preparedness Center (ADPC) is an autonomous international organization that works to build the resilience of people and institutions to disasters and climate change impacts in Asia and the Pacific. Established in 1986, it provides comprehensive technical services to countries in the region across social and physical sciences to support sustainable solutions for risk reduction and climate resilience. ADPC supports countries and communities in Asia and the Pacific in building their DRR systems, institutional mechanisms and capacities to become resilient to numerous hazards, such as floods, landslides, earthquake, cyclones, droughts, etc.

Thailand International Cooperation Agency (TICA)

TICA is a national focal point for Thailand's international development cooperation. It was established in 2004 to realize Thailand's aspiration to be a contributor to international development cooperation. Believing that global challenges are best addressed through international cooperation and global partnership, TICA continues to work closely together with its development partners to realize the global development agenda through various capacity-building and human resources development programmes. In response to the recent changes in the global landscape of development cooperation, TICA has strengthened its partnerships to harness the synergy of South-South and Triangular Cooperation to tackle global development challenges, including expediting the implementation of Sustainable Development Goals (SDGs). It also continues to realign our focuses in order to deliver Thailand's commitments as a global reliable partner.

Since 1991, TICA, in collaboration with educational institutions in Thailand, has offered short-term training courses under its Annual International Training Course (AITC) programme. The number of courses offered each year varies between 25 to 35 courses for 20-35 participants per course. AITC not only fosters good and friendly relations which Thailand has already enjoyed with recipient countries across regions, but also helps Thailand to reach out to those countries with which we desire to engage more closely. The courses offered by TICA in 2023-2025 are categorized into 5 themes: Sufficiency Economy Philosophy (SEP), food security, climate change and environmental issues, public health, BCG Model related.

Organization/Institution

- Naresuan University (NU)
- Thai Network for Disaster Resilience (TNDR)
- Asian Disaster Preparedness Center (ADPC)

4. Objectives:

The program is designed to:

1. Provide the guidelines of disaster risk and hazard mapping based on the available tools and technologies,
2. Deliver the fundamental knowledges of Geographic Information System (GIS) and disaster risk assessment including hazard, vulnerability and exposure to the participants,
3. Strengthen the research and industrial collaboration among international organizers and participants.

5. Course Contents:

Module 1: Fundamentals of Disaster Risk Management

- Overview of Risk Management Concepts,
- Phases of the Disaster Risk Management Cycle,
- Techniques for Disaster Risk Identification and Assessment,
- Approaches to Risk Analysis and Evaluation,
- Strategies for Disaster Risk Reduction: Prevention, Mitigation, and Preparedness.

Module 2: GIS and Remote Sensing in Disaster Management

- Basic Principles of Remote Sensing and GIS,
- Applications for Damage Assessment and Detection,
- Leveraging GIS for Disaster Monitoring and Response,
- Case Studies: Utilizing GIS for Disaster Risk Management,
- Integrating GIS and Remote Sensing in Risk Management Frameworks.

Module 3: Hazards Forecasting and Early Warning Systems

- Techniques for Natural Hazard Analysis and Assessment,
- Forecasting Natural Hazards: Methodologies and Tools,
- Reliability and Accuracy in Hazard Forecasting,
- Design and Implementation of Early Warning Systems and Impact-based Forecasting,
- Monitoring, Warning Services, and Effective Coordination Mechanisms.

Module 4: Climate Change Adaptation and Mitigation

- Fundamentals of Climate Change Science,
- Climate Modelling: Tools and Techniques,
- Frameworks for Climate Monitoring and Evaluation,
- Understanding Anthropogenic Climate Change and Adaptation Strategies,
- Current Climate Change Scenarios and Their Impacts,
- Mechanisms for Climate Change Adaptation and Mitigation,

- Health Protection from Climate Change.

Workshops

- Group activities and presentations,
- The workshop activities will be related to the contents of the modules.

Excursions

- 1-day excursion will be conducted each week; therefore, 2 trips are implemented into the course.

6. Participants' Criteria:

Applicants must fulfill the following requirements:

- Be nominated by their respective governments;
- Education: Multidisciplinary, i.e. Engineering and Sciences (Civil, Information Technology, Electrical, Management, Geography);
- Language: Good proficiency in English (speaking, reading and writing)
- Other: Basic computer programs and GIS.

7. Attendance and Evaluation

Participants who complete the training will receive a certificate based on:

- Real-time class attendance (not less than 80%),
- Interactive class participation,
- Presentation and report,
- Evaluation.

8. Venue:

Faculty of engineering, Naresuan University
99 Moo 9, Thapo, Mueang, Phitsanulok
THAILAND

9. Expected Results:

1. Participants can develop basic risk and hazard maps based on the knowledges and tools provided during the course.
2. Participants can develop reasonable risk and vulnerability assessment plan of their interested disaster modes and areas with GIS.
3. 20 participants from at least 3 – 5 countries.

10. Organization/ Institution:

- **Implementing Institute**

  Civil Engineering Department, Faculty of Engineering
  (Disaster Management Program)
  Naresuan University

- **Co-organizers**

  (1) Asian Disaster Preparedness Center; ADPC (https://www.adpc.net/)
  (2) Thai Network for Disaster Resilience; TNDR (https://www.tndr-tdpf.info/)

- **Contact Person**

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11. Expenditure/Funding:

Thailand International Cooperation Agency (TICA)
Government Complex, Building B (South Zone), 8th Floor,
Chaengwattana Rd. Laksi District, Bangkok 10210 THAILAND
Website: https://tica-thaigov.mfa.go.th/en/index
Email: aitc@mfa.go.th

Schedule for the Training Programme:

Topic	Time (Thailand time)	Content	Speaker	Note
Day 1: No class (Weekend) – Arrival of Participants				
Day 2: Introduction & Module 1 (Part 1)				
Course Introduction and Outline	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Disaster Risk Management	13:00 – 16:00	Workshops	Participants	-
Welcoming Dinner	17:00 – 20:00			
Day 3: Module 1 (Part 2)				
Disaster Risk Management	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Disaster Risk Management	13:00 – 16:00	Workshops	Participants	-
Day 4: Module 2 (Part 1)				
Remote Sensing in Disaster Management	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Remote Sensing in Disaster Management	13:00 – 16:00	Workshops (Google earth engine)	Participants	-
Day 5: Module 2 (Part 2)				
GIS in Disaster Management	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
GIS in Disaster Management	13:00 – 16:00	Workshops (QGIS)	Participants	-
Day 6: Excursion 1				
Excursion	8:00 – 17:00	1-day trip to flood prone area.	To be announced	-
Day 7: No class (Weekend)				
Day 8: No class (Weekend)				

Topic	Time (Thailand time)	Content	Speaker	Note
Day 9: Module 3 (Part 1)				
Hazards Forecasting	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Hazards Forecasting	13:00 – 16:00	Workshops	Participants	-
Day 10: Module 3 (Part 2)				
Early Warning Systems	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Early Warning Systems	13:00 – 16:00	Workshops	Participants	-
Day 11: Module 4 (Part 1)				
Climate Change Adaptation and Mitigation	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Climate Change Adaptation and Mitigation	13:00 – 16:00	Workshops	Participants	-
Day 12: Module 4 (Part 2)				
Climate Change Adaptation and Mitigation	9:00 – 12:00	Lecture	NU/TNDR/ADPC	-
Climate Change Adaptation and Mitigation	13:00 – 16:00	Workshops	Participants	-
Day 13: Excursion 2				
Excursion	8:00 – 17:00	1-day trip to disaster-prone area.	To be announced	-
Day 14: No class (Weekend) – Departure of Participants				