



# GIS for Disaster Risk Assessment - Level II

An Advanced Course

7-18 December 2009, Bangkok, Thailand



Individuals and organisations working in disaster management often require a set of tools for hazard and risk assessment for enabling them to formulate risk mitigation and preparedness plans. Location plays a critical role in hazard occurrence as well as in its impacts. A geographical information system (GIS) is an important tool to integrate various spatial datasets for a comprehensive multi-hazard risk assessment. This course deals with the procedures to collect and analyse spatial data for hazard and risk assessment for various natural and human-induced hazards, providing a number of choice options to the professionals participating in this course (depending on their interests and background) for evaluating specific types of hazards and the associated risk.

## Objective

The main objective of this course is to provide knowledge and skills in multi-hazard risk assessment to the professionals with GIS and remote sensing (RS) background. Participants will gain practical knowledge on uses of GIS and RS, not only in hazard and risk assessment, but also in loss estimation and multi-criteria analysis for taking a decision.

## Course content

### Module-I: Hazard, Vulnerability and Risk

- Hazard, vulnerability and risk (HVR)
- Spatial characteristics of HVR
- Spatial data sources and referencing systems
- Assessment of HVR and applications of GIS and RS

### Module-II: Multi-Hazard Risk Assessment

- Introduction to multi-hazard risk assessment
- Elements at risk, its classifications and mapping
- Spatial analysis for multi-hazard risk assessment
- HVR assessment for floods/earthquakes/landslides

### Module-III: Loss Estimation

- Loss estimation techniques
- Risk curves and estimation of annual loss
- Loss estimations for multi-hazards

### Module-IV: Spatial Multi-Criteria Evaluation

- Concept of spatial multi-criteria evaluation
- Assigning weight in spatial multi-criteria evaluation
- Guidance for decision making

### Module-V: Cost-Benefit Analysis

- Tangible and intangible damages
- Financial and economic evaluations
- Cost-benefits analysis of disaster risk reduction measures

### Module-VI: Project

- Group exercise on small-scale projects related to floods, earthquakes and landslides

## Software to be used

Participants will have options to carry out hands-on practical exercise either using ARC-GIS and ILWIS (a free open source software).

## Starting date and duration

7-18 December 2009 (two weeks).

## Benefits

Participants will be able to accomplish the following at the end of the training:

- understand the spatial and quantitative aspects of hazard, vulnerability and risk
- mapping the elements at risk
- spatial data analysis and integration
- end-to-end hazard, vulnerability and risk analysis for various disasters such as floods, earthquakes and landslides.
- carry out loss estimation for various disasters
- apply multi-criteria analysis for decision making
- cost-benefit analysis for various disaster risk reduction projects.



## Participants

The training course is designed for professionals who have a basic knowledge of GIS and RS and who are interested in multi-hazard risk assessment using these tools. This course will be suitable for professionals working in government organisations, municipalities, NGOs, international organisations and academic institutions.

## Organising institutes

The *Asian Disaster Preparedness Center (ADPC)* in Bangkok, Thailand is a leading regional resource center dedicated to disaster reduction in Asia and the Pacific region. ADPC works with governments, NGOs and communities of the Asia and Pacific region to strengthen their capacities in disaster preparedness, mitigation and response through professional training, technical assistance, regional program management, information provision and research. From 28 February 2005 on it is recognised as an Inter-governmental Organization with a mandate to expand disaster management and mitigation activities in various countries. For more information: [www.adpc.net](http://www.adpc.net).

The *Geoinformatics Center of the Asian Institute of Technology (AIT)* in Thailand is a non-profit center for training and capacity building in remote sensing, GIS and GPS technologies. It was established at AIT in 1995. The Center has undertaken a number of disaster risk assessment projects in south and south-east Asia, drawing participants from more than 25 countries within the Asia-Pacific region and to date more than 1,000 persons have been trained. For more information: [www.geoinfo.ait.ac.th](http://www.geoinfo.ait.ac.th).

The *International Institute for Geo-Information Science and Earth Observation (ITC)* is the largest institute for international higher education in the Netherlands. ITC provides international education, research and project services in the field of geo-information science and earth observation using remote sensing and GIS. ITC is an associated institution of the United Nations University (UNU). The cooperation between ITC and the United Nations University is directed at developing and carrying out a joint programme on capacity building in disaster management and in land administration, and at disseminating knowledge on these and directly related issues. For more information: [www.itc.nl/unu/dgim](http://www.itc.nl/unu/dgim).

## Course fee

The tuition fee is US\$ 2,000 per person which covers cost of resource input, set of training materials, refreshments during the training sessions, transportation for study visits (if any), a social/cultural visit in the weekend and minor medical expenses (if necessary). The tuition fee does NOT include accommodation (US\$ 40-50 per night), living expenses (DSA) and air-fare.

## Medium of instruction

The medium of instruction of the courses is English.

## Prerequisites

Basic knowledge and skills on GIS and RS is essential for attending the course. It will be advantageous if participants have basic understanding of the concepts of disaster risk management, although this is not mandatory.

## Assessment and certification

Participants will receive a certificate of attendance upon completion of the course.

## Applications

Applications can be sent by e-mail, fax, or surface mail and application forms are available at [www.adpc.net](http://www.adpc.net) and [www.geoinfo.ait.ac.th](http://www.geoinfo.ait.ac.th).

## Contact

Training Coordinator  
Urban Disaster Risk Management Team  
Asian Disaster Preparedness Center (ADPC)  
SM Tower, Paholyothin Road  
Samsen Nai, Phayathai, Bangkok 10400  
Thailand  
T: +662-298 0681-92 Ext 133  
F: +662-298 0012-13  
E: [watsala@adpc.net](mailto:watsala@adpc.net)



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