Refresher course

On

CASITA - Capacity building in Asia Using Information Technology Applications in Disaster Management

Organized by

Hanoi Architectural University
and
Asian Disaster Preparedness Center (ADPC)
and
International Institute for Geo-Information Science and Earth Observation (ITC),
Enschede, The Netherlands.

2005 Netherlands
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Annex:

Support letter Makerere University.
1. NAME OF THE REFRESHER COURSE AND FIELD OF STUDY

CASITA - Capacity building in Asia Using Information Technology Applications in Disaster Management

2. NAME OF THE ORIGINAL NFP TRAINING/ PROGRAMME/ COURSES

- Water Resources and Environmental Management (WREM) in ITC
- Earth Resources and Environmental Geosciences (EREG) in ITC
- Urban Planning and Land Administration (UPLA) in ITC
- Watershed Management course at IHE

3. PARTICIPATING DUTCH AND OVERSEAS INSTITUTIONS/ORGANIZATIONS

a) International Institute for Geo-information Science and Earth Observation (ITC)
   Department of Earth System Analysis (ESA) & Department of Water Resources (WRS)
b) Hanoi Architectural University, Hanoi, Vietnam
c) Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand
d) 

Brief Profile of Collaborating Institution:

- **International Institute for Geo-information Science and Earth Observation (ITC)**
  P.O. Box 6,7500 AA Enschede, The Netherlands
  Website: [www.itc.nl](http://www.itc.nl)
  Coordinator: Dr. C.J. van Westen (Department of Earth Systems Analysis). Telephone: +31 53-4874263, Fax: 053-4874336, E-mail: westen@itc.nl
  The International Institute for Geo-Information Sciences and Earth Observation (ITC) is an institute for international education in the Netherlands, offering courses on the application of geographic information systems and remote sensing techniques for a wide range of application fields. ITC primarily focuses on international education, supported by research and project services. Its activities relate to international knowledge exchange aimed at capacity building and institutional development in countries that are economically and technologically less advanced. ITC's educational programmes are geared primarily at mid-career professionals. Enschede forms the home base for ITC's degree-oriented education. Alternatively, ITC offers educational programmes, or parts of programmes, in cooperation with educational institutes in the home countries or regions of its envisaged targets groups. ITC has an alumni pool of more than 15,000, and an academic staff of more than 130.

- **Makerere University, Department of Geography**
  Attn: Bamutaze Yazidhi
  PO Box 7062, Kampala, Uganda
  E-mail: bamutaze@arts.mak.ac.ug
  Makerere University (Kampala – Uganda) is one of the oldest universities in central and sub-Saharan Africa, providing a centre of excellence for higher as well as scientific education. Over the years, the University's mission has been to provide quality teaching, carry out research and offer professional services to meet the needs of the changing society. As part of the University, the Geography Department, which is one of the oldest departments established in the late 1940s, has a mission of educating high quality specialists in geographical studies and natural resources management through the transfer of skills in the use of new tools and techniques for natural resources management. The
Department currently employs 16 core staff and has over 2000 students enrolled in its educational programmes. At the University use will be made of the available IT infrastructure as well as lecture and practical rooms.

Division of Responsibilities and Tasks Between the Partner Institutions

ITC will be responsible for:
- The formulation and submission of the refresher course proposal
- Overall coordination
- Announcing the course through its website and newsletter
- Submitting the list of names of Alumni to Makerere University
- Selection of candidates together with Makerere University
- Teaching and practical supervision in the course

Makerere University will be responsible for:
- Contacting the participants and arranging their tickets, lodging and other administrative tasks (transport, restaurant, banking, etc)
- Teaching and practical supervision in the course
- The reproduction of lecture and practical materials
- Selection of candidates together with ITC
- Evaluation and Certificate preparation at the end.
- Organizing the workshop venue and renting of computers
- Arranging field logistics

4. COURSE DESCRIPTION

Description Of The Course Activities

Hazard, vulnerability, and risk assessment are key technical parameters for disaster management, which need to be evaluated by scientists from different disciplines. They are important as the form the basis for the evaluation of disaster mitigation alternatives. The final objective of disaster management is the mitigation and/or spatial redistribution of risk.

The proposed course is an adaptation of two elective modules at ITC, entitled "Natural Hazard and Disaster Management" and “Risk Assessment” in which the Departments of Earth Systems Analysis, Urban and Regional Planning, and Water Resources are collaborating. These courses are fairly recent and most of the ITC alumni will not have been able to follow these courses, which focus on risk assessment rather than hazard assessment.

The course starts with an overall understanding of the disaster management issue and moves toward a discovery of the various options and best combinations available to mitigate hazards becoming disasters. The course has five modules that impart the information and skills in risk assessment problem analysis, understanding and appreciation of the various approaches to risk reduction, determination of appropriateness of the strategies and/or measures to achieve the desired goal of risk/damage reduction. The training methodology includes interactive lectures, film/slides shows/presentations, workshops, individual work, case studies, plenary sessions, panel discussions and field visit cum lecture/interviews.

Lecture topics in chronological order include:
The course will consist of the following components:

1. Introduction (2 days)
   - Natural disasters
   - Impact of disasters in Africa
• Disaster management: overview of phases
• Risk assessment methodology: overview of methods (such as RADIUS, HAZUS)
• Presentation by course participants
• Refreshing knowledge on GIS/Remote Sensing

2. Hazard mapping (3 days)
• Methods for hazard assessment
  • Seismic hazards
    ▪ Overview of methods for seismic hazard assessment
    ▪ Data requirements for seismic hazard mapping.
    ▪ Scenario earthquake (maximum magnitude, epicentral distance, earthquake attenuation)
    ▪ Ground conditions (amplification effects)
  • Flood hazard
    ▪ Overview of methods for flood hazard assessment
    ▪ Data requirements for flood hazard mapping.
    ▪ Case study for flood hazard assessment: flood depth, velocity, lateral erosion
  • Landslide hazard
    ▪ Overview of methods for landslide hazard assessment
    ▪ Data requirements for landslide hazard mapping.
    ▪ Case study for landslide hazard assessment
  • Drought hazard
    ▪ Overview of methods for drought hazard assessment
    ▪ Data requirements for drought hazard mapping.
    ▪ Case study for drought hazard assessment

3. Mapping elements at risk (2 days)
• Classification of elements at risk
  ▪ Building stock
  ▪ Critical facilities
  ▪ High loss facilities
  ▪ Transportation networks
  ▪ Utility lifeline systems
  ▪ Agriculture
• Mapping elements at risk
  ▪ Using high resolution Remote Sensing images
  ▪ Rapid field survey with automated data collection techniques
• Generation of GIS database

4. Vulnerability and risk assessment (2 days)
• Framework for decision making
• Application of vulnerability curves for structural damage different building types and hazard intensities
• Vulnerability of population
• Cost estimation
• Risk assessment
• Risk scenarios
• Multi-hazard risk assessment

5. Use of Remote Sensing and GIS for disaster management (1 day)
• New developments in Remote Sensing and GIS related to disaster management
• How risk assessments are used in disaster management;
• Presentation by participants
• Evaluation and closing.
Target Groups

The course is designed for environmental scientists who are active in the field of earth sciences, (land and) water resources management, environmental management, hydrology, urban planning, disaster management, government organizations dealing with risk-related affairs, and relevant departments from academic organizations, and non-governmental organizations.

Participants will mainly be selected from countries in the Eastern Africa Region. During the selection of the candidates, special attention will be given to female candidates. From the total number of applicants 60 percent will be reserved for ITC alumni and of these 60 percent at least 50 percent is female.

An intake of a maximum of 20 participants will be considered to join this workshop.

5. JUSTIFICATION

Developing and organizing this refresher course can be justified toward ITC’s clients in the field of geosciences as follows:

- External demand:
- Contribution to the Development of the requesting Organization/country/region
- Internal ITC/ESA Demand

External demand

Africa is the most disaster prone regions in the world. Natural, as well as man-induced hazards annually havoc the region, and cause destruction to property, crops and infrastructure, this often in situations where society is confronted with other serious problems, such as civil war, famine and poverty. Disaster management at a government level in Africa is much less advanced than in other parts of the world, and disaster management is often restricted to disaster relief only. One of the problems involved is the lack of human capacity, apart from the lack of resources and organizational structures.

In many countries some basic information for disaster reduction (technical studies, geographical data, etc) usually exists, but is not (readily) available to local authorities and other stakeholders. The information is also almost never available in a form that facilitates decision-making. With the use of GIS and remote sensing the possible effects on human and physical infrastructure of natural phenomena like floods, drought, earthquakes, landslides, volcanic eruptions and forest fires can be mapped and made visible. If this is done in a proper way, GIS and remote sensing can be used as a powerful tool for the analysis of hazard, vulnerability and risk, resulting in the development of different scenarios and concrete measures for disaster prevention. To achieve this, professionals in developing countries need to be trained in the application of GIS and remote sensing for disaster reduction. In this process of hazard identification and vulnerability assessment the use of GIS (e.g. handheld GIS and GPS) and Remote Sensing (e.g. high resolution imagery) is combined with participatory approaches, where local communities are involved in both the data collection, and in the scenario selection stages.

Contribution to the Development of the requesting Organization/country/region - Institutional strengthening/networking/marketing opportunities

- There are already contacts with organizations from these countries, such as CENECARTA (Mozambique), UCLAS (Tanzania), RCMRD (Kenya), National Center for Disaster Management (Ethiopia), University of Macarere (Uganda)
- ITC has been involved in training activities dealing with GIS and RS for several aspects of disaster management, for example in training professionals at Professional Masters, Master of Science and PhD level and in the organization of special courses in the region
• Earlier attempts to form a UNESCO supported network for capacity building for natural disaster reduction in the eastern African region could be revived through this course.

Internal ITC aspects

• The refresher course would fit in the expertise ITC has been building up over the last years in the field of disaster management, both in terms of projects as in terms of research. Within the spearhead on Geoinformation and Earth Observation for disaster management, the project proposal on “Strengthening local authorities in risk management”, which is a multidisciplinary project in which a number of ITC divisions will contribute, is closely related to the topic of the refresher course
• ITC is in the process of identifying high quality partners for decentralization. Setting up joint courses takes time. The refresher course may also serve as a further step to cooperation with Makerere University and to evaluate whether more joint activities can take place in future.

5. COURSE OBJECTIVES

One of the important aspects in the course is the application of GIS and Remote Sensing for disaster monitoring, hazard assessment and vulnerability assessment. Geographical Information Systems will be used hands-on by the participants in the evaluation of risk, through the combination of hazard and vulnerability information. One of the other important aspects is to give the participants an overview of the vulnerability reduction measures that can be applied, focusing on structural and non-structural measures.

Implementation of these objectives will be by means of a series of lectures complemented by hands-on practice in the interpretation and analysis of imagery, integration of remotely sensed and ground-based data, and use of Geographic Information Systems. The course will also include a field excursion component where the participants will learn to collect vulnerability information using mobile-GIS. Also several discussion sessions are planned, in which the participants can exchange their experiences, as well as through a series of presentations by the participants. At the end of the course participants will receive ILWIS 3.1 academic software as well as the lecture and practical materials on CD to ensure that the knowledge and tools learned can be applied at their home organisations.

Short Term Objectives

• to provide insight in recent and contemporary issues in disaster management in the Eastern African Region
• to build capacity in data extraction data, preparation, data analysis and data exchange for risk assessment using geoinformation tools
• to build capacity in using remote sensing and GIS in relation to disaster management issues
• Strengthen the capacity of representatives of regional and local governmental organisations and non-governmental organisations in the East African region to apply Geoinformation in disaster management.
• Demonstrate to the participants in the form of a local case study, dealing with the generation of databases for hazard, vulnerability and risk assessment.
• To strengthen the ties with alumni;

Long Term Objectives

• To increase the capacity of government organizations in the East African region responsible for hazard and risk assessment, and make them less dependent on foreign disaster response.
• To increase the awareness and capacity of municipal authorities in the field of risk management
• To secure new – and to strengthen existing networks aiming at a successful completion of these longer-term objectives.
7. PLACE WHERE THE COURSE WILL BE CONDUCTED

- Makerere University, Kampala, Uganda

8. PROPOSED COURSE PERIOD

In 2005 for 2 weeks in a period still to be decided.

9. LANGUAGE IN WHICH THE COURSE WILL BE CONDUCTED

English