

Advanced Training on the Use of Geospatial Information Technology for Drought Risk Management

Course Programme & Outline

02-06 April, 2018

Phnom Penh, Cambodia

Background

Countries in Southeast Asia such as Cambodia continues to experience frequent drought events. These disasters have led to severe economic and livelihood losses, which in turn greatly influences food insecurity. Therefore, monitoring and understanding the consequences of drought to prepare, plan and mitigate its impacts is of paramount importance. Geographic information systems (GIS) combined with Remote Sensing (RS) has proved to be a very useful tool for drought risk management process that starts from monitoring to mitigation and response.

ESCAP is providing technical support to the Government of Cambodia as part of its capacity building initiative under the Regional Drought Mechanism to build the capacity of government stakeholders to understand the use of GIS and Remote Sensing technology as well as earth observation data for drought monitoring and early warning. A number of tools are being customized to support evidence-based decision making in Cambodia, including DroughtWatch System, being developed and customized for Cambodia by the Institute of Remote Sensing and Digital Earth (RADI) of the Chinese Academy of Sciences and the DataCube being developed by the Geoscience Australia.

Learning Objectives

This advanced training course is a follow-up activity to the last “*Introductory Training on the use of Geospatial Information Technology for Drought Risk Management*” held in Phnom Penh in November 2017.

The training course will realize the suggestions and recommendations made during the last training and will be more targeted, detailed and applicable towards a more sustainable drought risk management approach. The course will not only enhance the capacity of the relevant line ministries but will also strengthen the use of earth observation data for drought monitoring and risk management purposes. It will further facilitate technological cooperation and technological awareness in this field.

The training also aims to introduce the DroughtWatch System being developed by RADI and will inform the line ministries of its functions and specifications as required for its installation and operationalization. Further, the training will also inform the course participants of the need of a DataCube in Cambodia to further improve the data and information access as needed for the drought risk management process.

Towards the end of the training, the participants are expected to:

- Understand the various integrations of remote sensing and GIS in the agriculture sector;
- Understand digital image processing techniques;
- Satellite image processing and image interpretations;
- Gathering data using mobile applications and pre-processing;
- Generate drought indices and interpret its results;
- Working with data from different sources;
- Working in different data formats;

- Conduct overlay analysis in GIS software;
- Create intersects, buffers, unions and clips in the geo-processing wizard;
- Generate presentation and quality maps;
- Understand conceptually the functions and specifications of the DroughtWatch System and the DataCube.

Course Content

The course is focused on providing insight into various geospatial tools and techniques available for drought risk monitoring and management. In the first two days of the training, the participants will be familiarized with advanced image processing techniques using QGIS and ArcGIS software's followed by hands-on exercises to continue during the remaining days. On the third day, the participants will be familiarized with the DroughtWatch System and the DataCube during the first half of the session. The hands-on exercises will continue from the second half of the session till the close of fourth day. On the final day of the training participants present their case studies based on the hands-on exercises during the first half of the day. The training course will be closed with a short competency quiz to measure outcomes of the learning event.

Duration and Instructional Methodology

5 Days: 02 – 06 April 2018

This is a full-time, face-to-face course with lectures and hands-on exercises using local datasets and real case scenarios (70% lab exercises, 30% lectures and discussions). This course is divided into modules (see course outline). Each module is structured into sessions of 1.5 hour each. The average workload of the entire course is likely to be around 15 hours.

The whole course is designed in a way to have a balanced approach between theoretical and practical methodologies, which will enable the participants to gain maximum knowledge on the subject. It will be taught in lecture/discussion formats illustrated with Power Point presentations, live demos, videos, maps, diagrams, field visits, interactive sessions and content on web sites.

Expected Participants and Prerequisites:

The participating team from Cambodia will be comprised of selected members of key Government line ministries with the aim to improve the cross-sectoral exchange, learning and joint knowledge production. It is recommended that participants taking the course have a working knowledge of English including basic awareness about GIS and Remote Sensing applications.

Language:

English

Software:

Hands-on exercises will be based on ESRI ArcGIS editor 10.5 with extensions (spatial analyst) and QGIS.

Class Size:

The number of participants is limited to 30 to ensure quality support is provided.

UN Certificate:

Participants will be given a UN certificate on successful completion of the course.

Training Venue

Sunway Hotel, Phnom Penh

Institution:

This course is offered jointly by resource persons from ESCAP, UNOSAT, GISTDA, Institute of Remote Sensing and Digital Earth (RADI) from China, Asian Disaster Preparedness Center (ADPC), Geoscience Australia and eWater.

United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP), located in the United Nations Building in Rajadamnern Nok Avenue in Bangkok, Thailand, is one of the five regional commissions of the United Nations Economic and Social Council under the administrative direction of the United Nations headquarters. ESCAP's regional focus is managing globalization through programs in environmentally sustainable development, trade, and human rights. ESCAP works to overcome some of the region's greatest challenges by providing results oriented projects, technical assistance and capacity building to member States in areas such as Macroeconomic Policy and Development; Trade and Investment; Transport; Social Development; Environment and Sustainable Development; Information and Communications Technology and Disaster Risk Reduction; Statistics; and Sub-regional activities for development.

UNITAR'S Operational Satellite Applications Programme (UNOSAT) is a technology intensive programme active in all aspects of applied research relating to satellite solutions, from earth observations to telecommunication, positioning and navigation. UNOSAT delivers satellite solutions, geographic information to organizations within and outside the UN system to make a difference in the lives of communities exposed to poverty, hazards, and conflict, or affected by humanitarian and other crises. The main office of UNOSAT is located on the CERN site in Meyrin, Geneva, on the border between Switzerland and France and regional offices at Bangkok, Nairobi and N'djamena.

Geo-Informatics and Space Technology Development Agency (GISTDA) is a Thai space agency and space research organization responsible for remote sensing and technology development including satellites. GISTDA is a Government organization under the supervision of the Ministry of Science and Technology. It is Thailand's core agency responsible for providing remote sensing and GIS data and services to both public and private sectors, nationally and internationally. GISTDA also conducts capacity building programmes in GIS and its applications and actively involves in research and development in both GIS and space technology.

Institute of Remote Sensing and Digital Earth (RADI) under the Chinese Academy of Sciences (CAS) was founded in September 2012 through the merging of the Institute of Remote

Sensing Applications (IRSA) and the Center for Earth Observation and Digital Earth (CEODE). It has core competencies in four major areas: remote sensing data acquisition and processing based on the space borne airborne-ground Earth observation system; basic research into remote sensing and geospatial information science; information analysis on the global environment and resources based on the Digital Earth Science Platform; and research covering a broad spectrum of academic disciplines and international S&T collaborations.

Asian Disaster Preparedness Center (ADPC) is an independent regional non-profit 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 as a technical capacity building center, ADPC has grown and diversified its expertise across social and physical sciences to support sustainable solutions for risk reduction and risk management across a broad range of specialist areas. ADPC develops and implements cross-sectoral programs and projects on the strategic themes of risk governance, urban resilience, climate resilience, health risk management, preparedness for response and resilient recovery. Their strategic themes are complemented and underpinned by the cross cutting themes of gender and diversity, regional and transboundary cooperation as well as poverty and livelihoods.

Geoscience Australia is an agency of the Australian Government that carries out geoscientific research. The agency is the government's technical adviser on all aspects of geoscience, and custodian of the geographic and geological data and knowledge of the nation. Based on user needs, it produces geospatial products such as topographic maps and satellite imagery and is also a major contributor to the Australian Government's free, open data collections such as data.gov.au. The agency works in six priority areas that includes:

1. Building Australia's resource wealth in order to maximise benefits from Australia's minerals and energy resources, now and into the future;
2. Ensuring Australia's community safety so that Australian communities are more resilient to natural hazards;
3. Securing Australia's water resources in order to optimise and sustain the use of Australia's water resources;
4. Managing Australia's marine jurisdictions in order to maximise benefits from the sustainable use of Australia's marine jurisdiction;
5. Providing fundamental geographic information in order to understand the location and timing of processes, activities and changes across Australia to inform decision-making for both natural and built environments; and
6. Maintaining geoscience knowledge and capability in order to maintain an enduring and accessible knowledge base and capability to enable evidence-based policy and decision-making by government, industry and the community.

eWater Australia is a non-profit organization established by Australian Federal and State Governments to support integrated water resources management in Australia through development and implementation of the national hydrological modelling strategy (NHMS). eWater develops and supports a number of software tools for hydrological modelling and have been working closely with the Australian Government and other Governments in the Asia and the Pacific.

Course Coordination

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Course Schedule

02 – 06 April, 2018

Days	02-April (Monday)	03-April (Tuesday)	04-April (Wednesday)	05-April (Thursday)	06-April (Friday)
Time	Sessions	Sessions	Sessions	Sessions	Sessions
9:00-9:15	OPENING: Introduction to Training Programme (ESCAP) [PPT]	Recap of Day 1	Recap of Day 2	Installation of DroughtWatch System (RADI) [Demo + Exercise]	Introduction to DataCube (GA) [PPT+ID]
9:15-10:15	Introduction to Image Processing (UNOSAT) [PPT+ID]	Remote Sensing Data for Drought Monitoring (GISTDA + ESCAP + SERVIR- Mekong) [PPT+ID]	Rice Mapping (RADI) [Demo]	Installation of DroughtWatch System (RADI) [Demo + Exercise]	
10:15-10:30	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break
10:30-12:00	Digital Image Processing Techniques (UNOSAT) [PPT+ID]	Hands-on Exercises based on Case Study (UNOSAT + ESCAP + GISTDA + RADI + SERVIR- Mekong)	Rice Mapping (RADI) [Demo]	Installation of DroughtWatch System (RADI) [Demo + Exercise]	Cambodia Source Model (eWater) [PPT+ID]
12:00-13:30	Lunch	Lunch	Lunch	Lunch	Lunch
13:30-15:00	Satellite Data Processing and Image Interpretation (UNOSAT) [PPT+ID]	Hands-on Exercises based on Case Study (UNOSAT + ESCAP + GISTDA + RADI + SERVIR- Mekong)	Introduction to DroughtWatch System (RADI) [PPT+IA]	Installation of DroughtWatch System (RADI) [Demo + Exercise]	Presentation by Participants (UNOSAT + ESCAP + GISTDA + RADI)
15:00-15:15	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break
15:15-17:00	Regional Drought & Crop Yield Information System (SERVIR-Mekong) [PPT+ID + Demo]	Hands-on Exercises based on Case Study (UNOSAT + ESCAP + GISTDA + RADI + SERVIR- Mekong)	Introduction to DroughtWatch System (RADI) [PPT+ID]	Installation of DroughtWatch System (RADI) [Demo + Exercise]	Short Quiz (15:15- 15:45) Closing Session (15:45-17:00)
17:00	Wrap-up	Wrap-up	Wrap-up	Wrap-up	Wrap-up

Abbreviations

PPT **Power Point Presentation** **ID** **Interactive Demonstration**
Demo **Demonstration**