**Drought management for monitoring and early warning**

**About this course**

Droughts have deep, widespread, and often underestimated impacts on societies, ecosystems and economies and are a complex hazard. While drought is a recurring and natural climatic phenomenon, climate change is increasing temperatures and evaporation as well as disrupting rainfall patterns, increasing the frequency, severity and duration of droughts in many regions. There is a need to increase understanding and promote more effective management of drought risks to reduce the potential harm to lives and livelihoods now and in the future.

To move away from a reactive, crisis-oriented approach to drought, a proactive, integrated approach to drought management is essential. Three pillars need to be considered to ensure a successful drought policy and implementation: 1) monitoring and early warning, 2) vulnerability and impact assessment, and 3) preparedness, mitigation and response.

**Objective**

This course presents the definitions, life cycle and common impacts of drought, introduces the three pillars of integrated drought management, before focusing in more detail on monitoring and early warning. Access to data is key to drought monitoring and early warning processes. Indicators and indices are used to describe drought conditions and provide the basis for conducting drought assessments. By learning how to select indicators and indices that are relevant to their regional context, the course is a practical introduction to the available tools and products that can be used for drought monitoring and forecasting, as well as impact assessment.

The course has been developed by the Integrated Drought Management Programme (IDMP) in collaboration with several IDMP partners as a contribution to the project “Integrated flood and drought management and early warning for climate change adaptation in the Volta Basin”. While the course content pays particular attention to drought in West Africa, the tools and approaches can be applied in any global context.

**Learning Objectives**

The course will enable participants to:

* Explain the drought phenomenon and how climate change affects it
* Understand the “three pillars approach” of proactive integrated drought management
* Demonstrate how integrated drought management is related to international processes, including the Sustainable Development Goals (SDGs), Paris Agreement, Sendai Framework for Disaster Risk Reduction 2015-2030, and UNCCD.
* Identify which components and parameters of the water cycle impact drought monitoring
* Assess current drought risk using historical hazard and impact data
* Outline the elements of a drought early warning system
* Assess, select and interpret regionally relevant drought monitoring indices and triggers
* Analyse relevant indices with a focus on agricultural impacts
* Create a drought intensity map from data and indicators using the tools presented in this course

**Course Structure and Content**

The course contains the following modules:

1. Drought concept and risk management approaches
2. Introduction to indices and indicators for drought monitoring
3. Selecting relevant indices and indicators for your region
4. Practical application of drought monitoring and forecasting tools

Each module consists of mandatory readings complemented by additional resources: videos, web sites and suggested reading. Participants are invited to share their experiences and questions through dedicated discussion forums in each of the modules. Answering multiple-choice questions at the end of each module is a prerequisite for completing each module and advancing to the next module.

Course participants will find valuable and updated readings, videos, suggested websites, real world examples, and interact with their peers in rich forum discussions to connect the course contents with their own experiences and challenges. A complementary webinar will be organized with the regional climate centre AGRHYMET in April 2022 (date to be confirmed).

**Course Contents:**

Content is based on the revised training manual [**Drought Risk Reduction in Integrated Water Resources Management**](https://www.unepdhi.org/wp-content/uploads/sites/2/2020/09/Cap-Net_DRR_Manual.pdf)

Among other reading suggested in the manual, participants will be introduced to:

* Global Assessment Report on Disaster Risk Reduction: Special Report on Drought 2021
* IDMP Handbook on Drought Indicators and Indices
* UNCCD Drought Toolbox

**Participants:**

The course is open to participants representing various stakeholder groups working with drought management who are interested in taking the course and completing all modules. This includes:

* Meteorological and hydrological experts from climate departments, climate service providers, environmental and disaster risk reduction agencies, agriculture experts and policy-oriented professionals
* Stakeholders and professionals forming part of water management, civil society, river basin or international organizations; development programmes and members of UN organizations; and representatives of the private sector
* Sustainable Development Goals focal points and facilitators within national governments
* Decision-makers, policymakers, resource managers and high-level professionals and managers active in governmental bodies
* Capacity developers active in the fields of Drought Management, Integrated Water Resources Management, Climate Action, among others.

Gender balance is very important for all course partners; we especially encourage women to participate in this course.

**Assumed knowledge/prerequisite knowledge:**

Participants are expected to have previous knowledge of the basic science behind climate change and the water cycle.

**Time requirements**

Estimated 2 hours per module, including attendance and preparation. Participants who wish to read other suggested readings and related videos will require additional time.

**Course approval criteria**

60% correct responses on the set of multiple-choice questions in each module. Participants who complete all modules receive a certificate from the course organizers.

**Facilitators**

**Bertrand Richaud**

Bertrand Richaud has more than 10 years’ experience working in integrated water resources management (IWRM), hydrology and drought risk management. Through several projects he has supported countries, transboundary basins, and international organizations to design and implement digital tools to support decision-making, including drought monitoring and early warning systems. He has also been involved in numerous capacity-building activities in the form of trainings or webinars with a focus on IWRM and Drought Risk Management. Bertrand led the development of the UNEP-DHI portal, which is one of the key components of Pillar 1 of the UNCCD Drought Toolbox.

**Lisbet Rhiannon Hansen**

Lisbet Rhiannon Hansen has over seven years’ experience working with climate change adaptation, disaster risk reduction and IWRM. She has worked at the community level on climate change adaptation, and with governments and international organizations during negotiations that led to the Paris Agreement and the Sendai Framework. Since 2015, Lisbet has worked on the implementation of IWRM projects in sub-Saharan Africa financed by bilateral and multilateral donors. At UNEP-DHI, Lisbet is working to develop tools, knowledge products and online training courses that promote action to achieve the SDGs.

**Katrin Ehlert**

Dr Katrin Ehlert is an environmental scientist with more than eight years’ experience in environmental research and engineering in the field of soil protection in the context of agricultural usages, soil and water quality assessments and environmental impact studies. At WMO she works on topics related to agricultural meteorology to support national meteorological and hydrological services and she provides technical and scientific support to the WMO Service Commission’s Standing Committee on Agriculture. Katrin is part of the Integrated Drought Management Programme (IDMP) technical support unit (www.droughtmanagement.info). IDMP is a WMO- and Global Water Partnership-led programme which – together with a wide range of partners such as FAO, UNCCD, UNDRR and UNDP – supports stakeholders globally and on all levels to develop drought early warning systems and drought policies.

**Course Partners**

**UNEP-DHI Centre on Water and Environment**

The UNEP-DHI Centre on Water and Environment is a United Nations Environment Programme (UNEP) centre of expertise, dedicated to improving the management, development and use of freshwater resources from the local to the global level. The Centre has been in operation since 1996 and has been co-funded by UNEP, Danida and DHI since 2001. The Centre is hosted by DHI, an independent, international advisory and research organization established in Denmark with more than 50 years’ experience in water resources management in more than 140 countries. DHI operates as a not-for-profit foundation and is an approved Technological Service Institute. The UNEP-DHI Centre operates by drawing on DHI’s technical expertise in water and project implementation to support UNEP in delivering on its mandate in freshwater environments. Activities are typically carried out in collaboration with a broad network of complementary partners from a range of organizations. The UNEP-DHI Centre has attained global recognition for its work in promoting sustainable water resources management and supporting the water-related SDG targets.

**IDMP**

The Integrated Drought Management Programme (IDMP) works with a wide range of partners with the objective of supporting stakeholders at all levels by providing them with policy and management guidance through the globally coordinated generation of scientific information and the sharing of best practices and knowledge for integrated drought management. IDMP is a contribution to the Global Framework for Climate Services (GFCS) with regard to the GFCS priority areas of disaster risk reduction, water, agriculture and food security. It especially seeks to support regions and countries to develop more proactive drought policies and better predictive mechanisms.

**WMO**

The World Meteorological Organization (WMO) is a specialized agency of the United Nations. It is the United Nations system’s authoritative voice on the state and behaviour of the Earth’s atmosphere, its interaction with the land and oceans, the weather and climate it produces and the resulting distribution of water resources. WMO has a membership of 193 Member States and Territories.

**GWP**

The Global Water Partnership (GWP) is a global action network with over 3,000 partner organizations in 183 countries. The network has 86 Country Water Partnerships and 13 Regional Water Partnerships. The network is open to all organizations involved in water resources management: developed and developing country government institutions, agencies of the United Nations, bilateral and multilateral development banks, professional associations, research institutions, non-governmental organizations, and the private sector. GWP’s action network provides knowledge and builds capacity to improve water management at all levels – global, national and local. GWP does not operate alone. Its networking approach provides a mechanism for coordinated action and adds value to the work of many other key development partners.

**Cap-Net UNDP**

Cap-Net is an international network for capacity development in sustainable water management. It is made up of a partnership of autonomous international, regional and national institutions and networks committed to capacity development in the water sector. At global level, Cap-Net works with 23 regional and country level capacity development networks with about 1,000 member organizations in 120 countries, and numerous international partners. Cap-Net UNDP delivers training and education to water professionals in Asia, Africa, the Middle East, Latin America and the Caribbean.