



unitar

United Nations Institute for Training and Research

Learner Guide

Local Water Solutions for Global Challenges e-Learning Course



Acknowledgements

This course is implemented by the University of Strathclyde, Gaia Education and the Social Development Programme of the United Nations Institute for Training and Research (UNITAR).

The content of the modules is based on original materials developed for Hydrogeology and Water Resources Education at the University of Strathclyde and is supported by students who take part in the Vertically Integrated Project (VIP) Water, Sanitation and International Development.

Welcome

Welcome to the Local Water Solutions for Global Challenges course and thank you for joining us. This is a self-paced course for you to manage and distribute your workload as per your convenience. The course will be open for 5 weeks, from the 22th March until the 26th April 2022. This Learner Guide will provide you with all the necessary information to understand the design and structure of this course.

Course Background

Water is essential for life and for sustainable development, and well-managed water services contribute to poverty reduction, economic growth and environmental sustainability. Increasing human population, the impacts of climate change and unsustainable growth all place pressures on water demand, water quality and water availability.

As the successors to the Millennium Development Goals (MDGs), the Sustainable Development Goals (SDGs) are interwoven and provide targets to be met for different water challenges by 2030. The declared purpose of SDG 6 is to “ensure availability and sustainable management of water and sanitation for all”. SDG 6 builds upon the MDG focus on drinking water and sanitation to include the water cycle as a whole, including management, wastewater and ecosystem resources. Since water is fundamental to sustainable development, SDG 6 has strong linkages with the other SDGs, and meeting SDG 6 will contribute hugely to the entire sustainable development agenda for 2030.

Course Goals and Outline

The goal of the course is to build capacity on sustainable water resource management and treatment. It is intended to provide a solid understanding of water governance, within the framework of the newly adopted Sustainable Development Goals. The training also introduces key technologies and techniques to build water resilience, and explores the close interactions between water, energy, food and climate change.

By the end of the course, participants will be able to:

- Conceptualise Integrated Water Resource Management Challenges;
- Understand the linkage between SDG6 (Water and sanitation) and other SDGs;
- Conceptualise Water treatment technologies within Integrated Water Resource Management Challenges;
- Identify how water treatment plays a role in increased water resilience;
- Differentiate transboundary from national Integrated Water Resource Management Challenges;
- Grasp the importance of the science-policy interface;
- Conceptualise Integrated Water Resource Management Challenges within a Food-Water-Energy Nexus.

The course is comprised of 4 modules that will be covered over 5 weeks:

- Module 1: Global Water Challenges
- Module 2: Water and Wastewater Treatment Technologies
- Module 3: Water Governance
- Module 4: Water Energy Food Nexus

Content and Learning Objectives

Module	Content	Learning Objectives
Module 1 Global Water Challenges	<ul style="list-style-type: none"> • 2030 Agenda for Sustainable Development • Sustainable Development Goals • Hydrological cycle • Water scarcity • Over-abstraction • Pollution • Climate change • Water properties • Urban water sector • Urbanisation • Water security • Water demand 	<ul style="list-style-type: none"> • Gain an understanding of: <ul style="list-style-type: none"> ○ The goal and targets of SGD6 ○ The link of water with other SDGs ○ The physical and chemical properties of water ○ The basics of water pollution ○ The cross-sectoral importance of water • Identify and understand: <ul style="list-style-type: none"> ○ The different challenges on water availability and water quality ○ The specific challenges affecting the urban water cycle ○ Low cost alternatives ○ Real case studies • Research about: <ul style="list-style-type: none"> ○ Characteristics and challenges affecting their local water resources.
Module 2 Water and Wastewater Treatment Technologies	<ul style="list-style-type: none"> • Surface water treatment • Wastewater treatment • Coagulation • Flocculation • Sedimentation • Aeration • Filtration • Disinfection • Aquifer • Abstraction • Desalination • Groundwater remediation • Biological treatments • Resource recovery • Water reuse 	<ul style="list-style-type: none"> • Gain an understanding of: <ul style="list-style-type: none"> ○ Water and wastewater treatment technologies, ○ Groundwater contamination. ○ The benefits and drawbacks of water treatment technologies ○ Alternative low cost treatment technologies ○ Real case studies. • Have the ability to: <ul style="list-style-type: none"> ○ Conceptualise how water and wastewater treatment plays a role in solving global water challenges. ○ Think about water and wastewater treatment technologies at a local level • Research about: <ul style="list-style-type: none"> ○ Treatment technologies ○ Public awareness of the water treatment technologies
Module 3 Water Governance	<ul style="list-style-type: none"> • Brundtland Report • Millennium Development Goals • Sustainable Development Goals • Water Governance • UN Watercourses Convention • Draft Articles on Transboundary Aquifers • UNECE Water Convention • International cooperation • Protection and control of pollution • Case studies 	<ul style="list-style-type: none"> • Gain an understanding of: <ul style="list-style-type: none"> ○ The historical evolution to the current sustainable development goals framework ○ General principles in global water governance ○ The key challenges for transboundary water resources management ○ The major global watercourse instruments • Have the ability to: <ul style="list-style-type: none"> ○ Grasp the importance of the science-policy interface ○ Explore transboundary interactions, ○ Recognise the historical milestones of sustainable development • Research about: <ul style="list-style-type: none"> ○ International policy and Law ○ International water related agreements and conflicts ○ Previous water governance principles

<p>Module 4</p> <p>Water Energy Food Nexus</p>	<ul style="list-style-type: none"> • Water-energy-food nexus • Global projected demands • Water footprint • Virtual water • Irrigation • Global trade • SDGs • IWRM • Analytical tools • Case studies 	<ul style="list-style-type: none"> • Gain an understanding of: <ul style="list-style-type: none"> ○ The key challenges for water resources management aligned to food security and energy ○ How to conceptualise water as a linked resource with food and energy ○ The key principals of a Nexus approach to water resource management • Have the ability to: <ul style="list-style-type: none"> ○ Conceptualise Integrated Water Resource Management Challenges within the Nexus ○ Conceptualise the linkage between SDG6 with other SDGs ○ Explore the physical mechanisms of water, food, energy interactions, ○ To review water issue based on case studies. • Research about: <ul style="list-style-type: none"> ○ Global water, energy and food databases. ○ Past, present and future concepts of water resources management.
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Course Design

1. Introduction section:

The Introduction Section on the course main page covers essential course related information.

2. Modules:

The course is self-paced. The lessons are designed in a way that learners are also able to self-assess their understanding and practice certain skills through built-in exercises. Discussion Forums are also provided to offer a space to discuss topics about the module and share ideas.

The modules include:

I. Lessons

They introduce you to the conceptual foundations of the different modules. Each lesson may include 30-50 slides.

II. Discussion Forums

In each module, you can access user-friendly forums to discuss topics initiated by you and other participants. Participants are invited to share their views and ask relevant questions. The purpose of the participation in the forums is to encourage discussion and interaction, provide information, analyze a problem and structure ideas. It also contributes to facilitate the understanding of problems emerging from the discussion and to develop the capacity of respecting different perspectives. It will be facilitated by Pr. Kalin from the University of Strathclyde.

III. The evaluation quizzes

The four evaluation quizzes, corresponding to each one of the 4 modules of the course, will be graded and will account towards your final grade. They aim at evaluating your comprehension of the course content. You can attempt each evaluation quiz as many times as you wish, but **only the first attempt will be graded.**

3. Course Evaluation:

This is where we invite you to tell us your opinion about the course, providing us with valuable feedback on your learning experience. Opinions and inputs will help UNITAR improve the quality of the course.

Study Plan

The course has been designed in a way to give you flexibility to plan your learning progress. Being a self-paced course, it is up to the participants as to how they divide their workload. For reference purposes, the discussions in the open forum remain available as long as the participant has access to the course.

Self-Assessment and Completion

This is a self-paced course. Participants will need to take the lessons and read the case studies. The progress tracking squares to the right of each activity serve to guide you through your progress based on your actions in the system. A solid box can be manually checked to indicate an activity as completed. A dotted-line box is automatically checked once that activity is completed.

Participants who successfully completed and passed all the mandatory activities will be given the opportunity to receive a Certificate of Completion issued by UNITAR for the cost of \$100 USD.

Coordination and Technical Support

You can direct all your queries related to coordination and technical issues to sdp@unitar.org.