



## Background Information on Natural Treatment Systems

This online course has been developed by UNESCO-IHE at the request of the SWIM-SM initiative to help build the capacity of SWIM partner countries in natural wastewater treatment systems. The SWIM partner countries targeted for this include Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine territory and Tunisia.

Despite the acknowledgement of the advantages of natural wastewater treatment systems and the actual development of some of these facilities in some SWIM partner countries, there still is a dearth of qualified and experienced people to design and run the infrastructure. It is therefore anticipated that upon the successful completion of this online course, more professionals in the region will be able to: understand the basic principles of natural treatment processes and systems; identify the concepts and functions of the different compartments in the natural systems; know about the performance, operation and maintenance; and understand the basic principles of the design.

Natural wastewater systems are a perfect solution to challenges faced in rural areas and sparsely populated areas due to their low cost and maintenance requirements, water scarcity and climate change concerns. Water is one of the most valuable resources in the SWIM partner countries, yet it is under constant threat due to climate change and resulting drought and waste. One of the most promising efforts to stem the global water crisis is water reclamation and reuse and natural wastewater treatment is an affordable and effective way of achieving that. In water scarce areas such as in the Middle East, wastewater has become a valuable resource that, after appropriate treatment, becomes a commercially realistic alternative for groundwater recharge, agriculture, and rural applications. On the other hand, conventional systems may even be technologically inadequate to handle the locally produced wastewater especially in arid areas such as the Middle East where the wastewater is likely to be up to five times more concentrated in the amount of oxygen demand per volume of sewage in comparison to the US or most of Europe.

Natural wastewater systems are therefore simple, cost effective and efficient methods to purify the growing amount of wastewater produced by communities in rural areas in the SWIM partner countries. They can be allowed as secondary or tertiary purification treatment, allowing the removal of most bacteria, microorganisms and the destruction of the organic matter. Their simplicity in building, operation and maintenance makes the systems competitive with the conventional wastewater treatment systems.

This online course is based on materials developed by world renowned experts in natural wastewater treatment systems most of whom are based at UNESCO-IHE in Delft, the Netherlands.

### Target Group

Participants of this course are expected to have a minimum qualification of a BSc/Technical degree in civil or chemical engineering, environmental technology or an equivalent qualification related to wastewater treatment that is acceptable to UNESCO-IHE. The course is targets participants with

responsibilities of planning, design and technology selection of wastewater treatment in their respective countries. All the applicants should fulfill these criteria and any other requirements that SWIM-SM may deem necessary.