

Module 5: Water and Ecosystems

Aim:

The aim of the module is to introduce the concepts of ecosystems and its services so that participants will be able incorporate the ecosystem perspective in water resources management.

ILOs: At the end of this module, the participants will be able to:

- Define and discuss on different types of ecosystems, their functions and importance
- Identify the relevance of ecosystems with IWRM
- Calculate/estimate Environmental flow requirements and discuss on the ecosystem services
- Identify the possible environmental issues in operationalizing IWRM

Contents:

Concept of Ecosystem

- Concept and types of ecosystems: River ecosystem, Lake ecosystem, Forest ecosystem, Agricultural ecosystem, Urban ecosystem, Mountain ecosystem, Inland and coastal wetland ecosystem, Coral island ecosystem
- Eco-hydrology, River-floodplain and adjacent upland interaction, River continuum concept, Flood pulse concept
- Assimilative capacity, Food webs, N and P cycles, Values of aquatic ecosystem

IWRM and Ecosystem

- Relevance of ecosystem with IWRM,
- Role of ecosystem in water resources conservation and management,
- Water balance concepts, Blue-green water, Upstream-downstream requirements, Human-ecosystem needs, Quality-quantity issues

Environmental Flow and Ecosystem Services

- Environmental flow requirements,
- Methods for determining environmental flow
- Hydro-ecological data and its analysis
- Assessment of eco-environment quality, Monitoring and maintenance of ecosystems
- Ecosystem services, Functions of ecosystem for human and human for ecosystem

Case Studies

- Successes and failures of integrated approaches (Case Studies)