

International Master in
SUSTAINABLE WATER MANAGEMENT AND GOVERNANCE
IN NATURAL AND AGRICULTURAL ENVIRONMENTS

CIHEAM Zaragoza (Spain), 2026-2027-2028

PROGRAMME OF THE FIRST YEAR

Unit I. Introduction to Water Management and Governance in Spain

20 contact hours, 30 hours of personal work; 2 ECTS

- Water management and governance: the European Union water acquis.
- Water management and governance of the Government of Spain and regional governments.
- River basin organizations in Spain.
- Water Users Associations, their federations at basin, Spanish and European levels.
- Water management and governance in the Mediterranean

Unit II. Conceptual Aspects of Water Resources Management

40 contact hours, 60 hours of personal work; 4 ECTS

- Infrastructure in the water cycle.
- Water management and water Governance.
- Hydrology, climate and geomorphology.
- Water and ecosystems.
- Water, climate and global change.
- The Water-Energy-Food-Ecosystems nexus.
- Integrated adaptive planning and management of water resources.

Unit III. Water Economy

40 contact hours, 60 hours of personal work; 4 ECTS

- Water as an economic resource.
- Economic assessment.
- Economic valuation.
- Economic and financial instruments.
- Ecosystems-based management.

Unit IV. Water Governance

40 contact hours, 60 hours of personal work; 4 ECTS

- Concepts of water governance.
- Institutional dimension of water governance: international, national and river basin.
- International institutions for water governance.
- Allocation of uses and water resource planning.

Unit V. International Cooperation in Water for Development

40 contact hours, 60 hours of personal work; 4 ECTS

- Theories of development, change and international cooperation.
- The international cooperation system.
- AECID: the Spanish Agency of International Cooperation for Development.
- Management development interventions.

Unit VI. Tools to Support Water Planning and Management

80 contact hours, 120 hours of personal work; 8 ECTS

- Remote sensing for water management.
- Geographic information systems for water management.
- Scenario building, models and decision support systems for water management.
- Digital transformation in water management.

Unit VII. Water Risk Management and Governance: Floods, Droughts and Pollution

40 contact hours, 60 hours of personal work; 4 ECTS

- Concepts of risk.
- Prevention and management of risks associated with floods.
- Prevention and management of risks associated with droughts.
- Prevention and management of risks associated with pollution.

Unit VIII. Water Management and Governance: restoration of aquatic ecosystems

60 contact hours, 90 hours of personal work; 6 ECTS

- River management and governance: ecological restoration.
- Wetland and lake management and governance: ecological restoration.
- Lakes: ecological features, management and ecological restoration.
- Groundwater management and governance: contamination and preservation.

Unit IX. Water Management in Dry/Rainfed Environments

40 contact hours, 60 hours of personal work; 4 ECTS

- Water management in agrarian environments.
- Water management in forests and shrubs.
- Hydrological modelling.

Unit X. Management and Governance of Irrigated Systems: Water Quantity

80 contact hours, 120 hours of personal work; 8 ECTS

- Efficient irrigation water use: general aspects.
- Efficient irrigation water use in fruit trees and greenhouses.

- Microeconomics and institutional aspects of irrigation water use.
- Management and Governance of irrigation modernization.

Unit XI. Management and Governance of Irrigated Systems: Water Quality

60 contact hours, 90 hours of personal work; 6 ECTS

- Generation of non-conventional water resources in Mediterranean agriculture.
- Management and governance of non-conventional water resources for agriculture.
- Management and governance salinity and diffuse pollution in agriculture.

Unit XII. Individual Project

60 contact hours, 90 hours of personal work; 6 ECTS

- A supervisor will be assigned to each student to develop an individual project based on literature review, data analysis and/or computer modelling on the topics of the units above.

TOTAL – 600 contact hours, 900 hours of personal work, 60 ECTS