



CIHEAM
ZARAGOZA

Sustainable Water Management and Governance in Natural and Agricultural Environments

International Master of Science 2026/2028

120 ECTS



Objective

Water is a natural resource that requires careful management to ensure its availability and quality for future generations. In order to face the challenges of water management and governance in natural and agricultural environments, including efficient irrigation management and water allocation for agricultural production, professionals need to work in an integrated and interdisciplinary manner, involving hydrological, biophysical, agronomic, economic, institutional, regulatory, policy-making and planning efforts.

The main objective of this Master is to train future professionals responsible for decision-making in the field of water management and governance, and irrigation in agriculture, equipping them with the required blend of skills from an interdisciplinary and integrating vision.

The master's degree enables participants to:

- make decisions and act in accordance with good water governance practices, aware of the importance of society's participation in decision-making;
- know and analyse the legal and economic framework and regulations in force, weighing opportunities and constraints;
- contribute to the sustainability, better use, and conservation of water resources and aquatic systems;
- gain experience in the application of modelling, new information and communication technologies and digitisation to increase the efficiency of services and improve risk prediction and management; and
- support cooperation and development of the rural environment by promoting rational water management and irrigation in agriculture, with prospects for economic growth, social development and respect for the environment.

Organisation

The Master is organised by CIHEAM Zaragoza (Mediterranean Agronomic Institute of Zaragoza), with the collaboration of Spain's Ministry for Ecological Transition and the Demographic Challenge (MITECO), the Spanish Agency for International Development Cooperation (AECID), Spain's Ministry of Agriculture, Fisheries and Food (MAPA), the Tragsa Group, the *Sociedad Mercantil Estatal de Infraestructuras Agrarias* (SEIASA), the International Center for Agricultural Research in Dry Areas (ICARDA), and the National Institute for Agricultural and Food Research and Technology of the Spanish National Research Council (INIA-CSIC).



Training the visionary professionals responsible for the governance and strategic decision-making of our world's water resources

Why choose this Master of Science?

1. Advanced Governance and Institutional Expertise. Gain a high-level understanding of water governance across international, national, and river basin dimensions. You will study the European Union water acquis and the specific organisational structures of river basin authorities and water users associations.

2. Specialist Skills in International Cooperation. Acquire the specific knowledge and attitudes required for engaging in international cooperation development projects. The programme includes dedicated training on theories of change, the international cooperation system, and management of development interventions in collaboration with AECID.

3. Mastering the Digital Transformation of Water. Gain intensive experience in the application of modelling, new information and communication technologies, and digitisation. This includes 8 ECTS of specialised training in remote sensing, geographic information systems (GIS), and decision support systems.

4. Advanced Irrigation Management and Efficiency. Develop specialised expertise in modern irrigation planning, management, and optimisation. You will acquire a comprehensive understanding of irrigation performance, water-use efficiency, and the integration of technological solutions, including precision irrigation, smart monitoring systems, and data-driven decision-making. The programme emphasises sustainable irrigation strategies adapted to water scarcity, climate variability, and agricultural resilience.

5. Integrated Vision of the Water-Energy-Food-Ecosystems Nexus. Develop an interdisciplinary perspective to face the challenges of water management in natural and agricultural environments. You will master the "Nexus" approach, ensuring that water planning considers the interconnected needs of energy, food security, and ecosystems.

6. Leadership in Environmental Restoration. Become an expert in the governance and ecological restoration of aquatic systems. The curriculum covers river, wetland, and lake management, as well as the preservation and contamination control of groundwater resources.

7. Expertise in Global Water Risk Management. Prepare to manage and predict critical risks, including floods, droughts, and pollution. You will learn to apply prevention and management strategies to increase the efficiency of services and improve community resilience.

8. Circular Economy and Non-Conventional Resources. Lead the transition toward sustainable irrigation and the use of non-conventional water resources. You will learn the management and governance of salinity, diffuse pollution, and the modernisation of irrigation structures for sustainable food production.



Programme

1st year of the Master (60 ECTS)

Unit 1: Introduction to Water Management and Governance in Spain (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 organisations in Spain
- Water Users Associations, their federations at basin, Spanish and European levels
- Water management and governance in the Mediterranean

Unit 2: Conceptual Aspects of Water Resources Management (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 3: Water Economy (4 ECTS)

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

Unit 4: Water Governance (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 5: International Cooperation in Water for Development (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 6: Tools to Support Water Planning and Management (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 7: Water Risk Management and Governance: Floods, Droughts and Pollution (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 8: Water Management and Governance: Restoration of Aquatic Ecosystems (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 9: Water Management in Dry/Rainfed Environments (4 ECTS)

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

Unit 10: Management and Governance of Irrigated Systems: Water Quantity (8 ECTS)

- Efficient irrigation water use: general aspects
- Efficient irrigation water use in orchards and greenhouses
- Microeconomics and institutional aspects of irrigation water use
- Management and governance of irrigation modernisation

Unit 11: Management and Governance of Irrigated Systems: Water Quality (6 ECTS)

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

Unit 12: Individual Project (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.

2nd year of the Master (60 ECTS)

Unit 13: Introduction to research (30 ECTS)

- Soft skills (6 ECTS)
- Practicum (24 ECTS)

Unit 14: Master's thesis (30 ECTS)

The second year of the Master consists of tutored initiation to research or to professional activity in collaboration with governmental institutions, universities, research centres, NGOs, associations and firms. CIHEAM Zaragoza will provide information about the activities of the centres where students will carry out their projects. Students will choose a topic of their interest. They may also propose a project upon agreement with the host centres.

In collaboration with:



Admission

This Master of Science programme is designed for graduates holding a degree in agricultural science, agricultural engineering, forestry engineering, environmental engineering, environmental sciences, as well as other engineering disciplines, biology, geography, geology, chemistry, or biochemistry. Applications are also welcome from candidates with academic backgrounds in social sciences, economics, law, and information and communication technologies (ICT).

The programme is delivered in English. Applicants should accredit a minimum B2 level of English.

Registration fees are approximately 1820* euro for each academic year of the Master. This amount covers:

- Cost of credits enrolled
- Administration fee

(*) This fee will be updated according to the new official rates of the Government of Aragon for the corresponding academic year.

Candidates must apply online at the following address:

www.admission.iamz.ciheam.org

Dates and deadlines

The first year of the Master will be held from October 2026 to June 2027. The second year will begin in September 2027 for a duration of 10 months.

Application deadlines are as follows:

- Candidates requiring visa*: **10 May 2026.**
- Candidates not requiring visa:

1st deadline: **14 June 2026.** Candidatures presented by this deadline will have preference

2nd deadline: **13 September 2026.**

(*) Non-European candidates should be aware of visa application deadlines.

Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Türkiye), and from the priority Arab countries of the Spanish Cooperation Programme Masar Al'an (Algeria, Egypt, Jordan, Morocco, Mauritania, Palestine, Syria and Tunisia), may request scholarships awarded by **CIHEAM Zaragoza** covering registration fees, a monthly assignment, and medical and accident insurance. Candidates from countries that do not belong to CIHEAM may request a '**CIHEAM Zaragoza - INIA-CSIC**' scholarship covering registration fees, a monthly assignment, and medical and accident insurance. This scholarship may also include a contribution to travel expenses.

These two types of scholarships are administered by CIHEAM Zaragoza and will be awarded based on academic merit. Priority will be given to candidates from low and middle-income countries according to the World Bank classification.

Degrees

- Postgraduate Specialisation Diploma awarded by CIHEAM (60 ECTS)
- Master of Science awarded by CIHEAM (120 ECTS)

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More info:

