PROMOTING SUSTAINABLE AGRICULTURAL WATER MANAGEMENT POLICIES IN THE MEDITERRANEAN REGION

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Marseille
CIHEAM
An Intergovernmental Organization since 1962

CIHEAM Paris
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Greece

CIHEAM Chania
Turkey

Portugal
Morocco
Algeria
Tunisia
Malta

435 millions of inhabitants, about 6% of the whole world population

13 MEMBER COUNTRIES
FOUR MEDITERRANEAN AGRONOMIC INSTITUTES

Training areas and research fields

MAI Bari - Italy
- Water resources management
- Protection of fruit crops
- Organic agriculture
- Sustainable development

MAI Chania - Greece
- Food quality
- Horticultural genetics and biotechnology
- Sustainable agriculture
- Environmental management
- Business economics and management

MAI Montpellier - France
- Rural societies and territories
- Public policies
- Rural development
- Chains and actor’s strategies

MAI Zaragoza - Spain
- Plant and animal production
- Integrated rural approach
- Product markets and marketing
- Fisheries and aquaculture
CIHEAM STRATEGIC AGENDA 2025

OUR MISSIONS

- Protect the Planet
- Food Security and Nutrition
- Inclusive Development
- Crises and Resilience

**Combating**
- Triple Waste
  - Knowledge & Know-How
  - Natural Resources & Energy
  - Food Chain

**Boosting**
- Sustainable Agriculture and Food
  - Mediterranean Diet
  - Agro-Ecology
  - Food Safety & Quality
  - Access to Food

**Investing**
- In New Generations and Fragile Territories
  - Youth employability & employment
  - Rural & Coastal Development
  - Gender Equality & Vulnerable Groups Inclusion
  - Agro-Smart Business

**Preventing**
- Risk and Managing Tensions
  - Mobilities & Migrations
  - Climate Change
  - Animal & Plant Health
  - Agricultural Markets

OUR TOOLS
- Education and Training
- Research and Innovation
- Networks and Open Knowledge Platforms
- Projects and Technical Assistance
- Policy Dialogue and Partnerships

OUR APPROACHES
- Holistic vision of Development
- Multilateral Approach
- Bottom-up Collaboration
- Problem Solving Oriented Projects

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CIHEAM-Bari thematic areas

- Education
- International Cooperation
- Applied Research
- Land & Water
- IPM
- Sustainable Agriculture
- Organic Agriculture
- Mediterranean organic agriculture
- Integrated pest management of Mediterranean fruit and vegetable crops
- Sustainable agriculture, Food and rural development
- Land and water resources management
Education to Excellence

- Post Graduate Specialization Diploma: 2862
- ‘MASTER OF SCIENCE’ PROGRAMMES: 842
  - Long duration courses (8 months to 2 years)
- ADVANCED SPECIALIZATION COURSE: 290
  - (3 to 8 months)
- SHORT AND INTENSIVE COURSES: 5675
- DISTANCE LEARNING COURSES: 457
- Support to Doctoral Studies: 92

10,000 STUDENTS

(1962-2016)
The unique character of our courses is based on the participation of worldwide students.
International research and cooperation

**PROJECTS 2011 - 2016**

- **140 projects**
- **100 Million € mobilized**

**COLLABORATING INSTITUTIONS:**
- Ministries and Public bodies
- Universities and research organizations
- SMEs
- Science parks and innovation clusters
- National and regional research and innovation funding agencies
- Intermediary organisations
- National and regional authorities, end-users communities

**DEVELOPMENT** → **40%**
**RESEARCH** → **60%**

**PROJECTS**
- MAE - DGCS: 19
- EU FUNDS: 25
- MIPAAF: 22
- REGIONAL: 30
- OTHERS: 44

International research and cooperation 140 projects 100 Million € mobilized
DISTRIBUTION OF WATER RESOURCES IN THE MEDITERRANEAN COUNTRIES

Source: MEDITERRA, 2009
High Water Quality Severity:

Algeria, Egypt, Lebanon, Morocco, Syria, Tunisia, Jordan, the Occupied Palestinian Territory
IN ADDITION TO POPULATION GROWTH, THE FALL OF WATER AVAILABILITY IS MAINLY THE RESULT OF OVEREXPLOITATION OF MAJOR AQUIFERS

Projected Water Scarcity in 2025

Source: IWMI (2000)
Some Med Countries have recorded 20% reduction of precipitations in recent decades; this phenomenon has been even more evident in the SEMCs.

The trend for the 21st century in the region is towards a rise in temperature between 2.2°C and 5.1°C in 2080-2099 compared with 1980-1999 (Ferragina and Quagliaotti, 2008 a).
FOCUS ON IRRIGATED AGRICULTURE

GLOBAL ESTIMATED WATER WITHDRAWALS

- 65% AGRICULTURE
- 22% INDUSTRY
- 6% RESERVOIR LOSSES
- 7% MUNICIPAL

Source: WB WDI (2002)
FOCUS ON IRRIGATED AGRICULTURE

ESTIMATED WATER WITHDRAWALS IN THE SEMCs

AGRICULTURE 89%

DOMESTIC 6%

INDUSTRY 5%

Source: WB WDI (2002)
IRRIGATION SYSTEMS USUALLY PERFORM WAY BELOW THEIR POTENTIAL

- **WATER USED BY CROPS**: 45%
- **LOSSES IN THE DISTRIBUTION and CONVEYANCE SYSTEM**: 15%
- **LOSSES IN THE ON-FARM SYSTEM**: 25%
- **APPLICATION LOSSES AT FARM LEVEL**: 15%

Elaboration: CIHEAM – BARI

Source: FAO, 2009
To what extent the potential savings from irrigation will meet the growing industrial and potable uses in addition to environmental needs, the role of water use as a factor in socio-economic development depending essentially on the contributions made to development by high water-consumption sectors
Most of national strategies have favored supply-side policies dominated by investments and efforts to increase water storage and conveyance.

Not enough attention was given to the large potential for saving water at different scales.
Turkey (project GAP)
Water Distribution plan
ATATÜRK DAM – Completed in 1990
Khabur river

1975

2006
Morocco
(Souss-Massa Region)
The growing water scarcity and the uncertainties which climate change may bring, only reinforce the need to adapt water policies that impact water management in order to meet the needs of people, economic growth, and the environment both today, tomorrow, and beyond.

An appropriate mix of instruments and tools aimed at addressing agriculture resource management issues to ensure the achievement of coherent agricultural, environmental and water policy goals may be used.
The alternative path of achieving greater efficiency in water management

This highlights the importance of improved Operation, maintenance and management activities (demand management)

Viable approaches for more sustainable water management

**Technical instruments**
- Improving WUE along the whole chain of the system
- Application of Innovative Technologies
- Training & Capacity-building

**Institutional instruments**
- A new Governance and Public Awareness/Participation: IMT/PIM/SOM/PPP
- Transparent tarification rules/Service Cost Recovery
- Modernization/Institutions Upgrading
Agricultural management

Water management

Source of water delivery network
Group of sectors

Group of farms

upscaling
downscaling

Plant

Water supply

Canopy

Sector

District

Water demand
Simple calculation:

\[ \frac{W_{\text{reservoir out}}}{W_{\text{reservoir in}}} \times \frac{W_{\text{farm gate}}}{W_{\text{reservoir out}}} \times \frac{W_{\text{field}}}{W_{\text{farm gate}}} \times \frac{W_{\text{root zone}}}{W_{\text{field}}} = \frac{W_{\text{root zone}}}{W_{\text{reservoir in}}} \]

Sample calculation for small improvement in each step (2 – 5 %):

\[ 0.90 \times 0.85 \times 0.72 \times 0.75 = 0.413! \]

Much improvement
CIHEAM Bari - Division of Land and Water Resources Management

- **RESEARCH**: Development & test of technical and management solutions
- **TRAINING**: Transfer of solutions to local end-users in Med. countries
- **COOPERATION**: Support to implementing the solutions in the Med. socio-economic context
The international cooperation and partnership projects aim at the implementation of research findings on the ground and represent the continuation of research programs.

They are realized mainly through the financial support of the EC, Italian Ministry of Foreign Affairs, which Directorate General for Cooperation and Development is MAIB major counterpart.

With the support of national and international institutions and scientific organizations such as ACSAD, FAO, ICARDA, IFAD etc.
*What are the most critical policy measures needed to enhance water-use efficiency?

*To what extent can water prices be increased to fully cover O&M costs?

*How can pro-poor and participatory water governance in irrigation and potable water supply be promoted in rural areas?

*How can cooperation be enhanced in managing water resources?
Most relevant Cooperation Projects in the domain of Water Management & Irrigation

- IFAD-funded Project for IMT and PIM in 4 countries (3 Med. + 1)
- WASAMED Thematic Network on Water Saving in Mediterranean Countries
- SYRIA – Rationalization of Irrigation Systems and Methods in the Ras El Ein rural district
- LEBANON – Rural Development of high-Bekaa Valley
- FAO – MASSCOTE - MASSPRES
- Effects of Climate Change on crop irrigation demand (CEMCC)
- MEDiterranean Science, Policy, Research and Innovation Gateway (MEDSPRING)
Modernisation des périmètres irrigués de la Basse Vallée de la Medjerda-Tunisie

Hydro-Agricultural Development Project of Marjeyoun - Lebanon

Meso-level Eco-efficiency indicators to assess technologies and their uptake in the Water sector (EcoWater)

DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries (MAD4WATER)

New technogies to support the sustainable management of irrigation (HYDRO-TECH)

Adaptation to Climate change of the Mediterranean Agricultural Systems (ACLIMAS)
Countries are at different stages in reforming their water policies; But all countries need to reinforce the monitoring and evaluation of current water policy reform initiatives to ensure that these reforms are moving toward sustainable agricultural water management.
Watershed

Dam

Distribution Network

Hydraulic + Economic Modeling

On-Farm Network

Crops

Soil

R

ETc

RO

plot

Governance

M&E
CONCLUSIONS

Water is the core problem of development and is one of the elements that contribute to social and territorial imbalances.

The problems troubling the Mediterranean region require a new water strategy able to identify strong links and interactions between the environment and development and to launch long-term planning and governance policies.

The differences between territorial gaps, socio-economic development and technological progress create the need for different kinds of intervention.
Changes in national water policies require measures able to affect changing water demands through the introduction of tariffs and rules.

The recovery of an equilibrium that has been broken by a rapid modernization can only be made possible by developing operative and cognitive tools able to integrate old and new water practices and modern and efficient water distribution systems, and by involving water users and the local community to a greater extent.

Better management of water in the Mediterranean region would also require a continuous training process and Capacity Building in the field of water governance.

Source: GWP (2012)
THANK YOU FOR YOUR ATTENTION