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**Irrigation management by water users associations: case studies in
 the regions of Apulia, Epirus and Western Greece**

Silvia Vanino^(1,*), Simona Capone⁽¹⁾, Pasquale Nino⁽¹⁾, Stefano Fabiani⁽¹⁾, Pantelis Barouchas⁽²⁾,
 Demetres Maretas⁽³⁾

(1) Council for Agricultural Research and Economics, via Nomentana 41, Roma, Italy

(2) Technological Educational Institute of Western Greece, Dept. of Agricultural Technology,
 27200 Amaliada, Greece

(3) Technological Educational Institute of Epirus, 47100 Arta, Greece TEI of Epirus, Dept. of
 Agricultural Technology, 47100 Kostakii Arta, Greece

(*)Corresponding author E-mail: vanino@inea.it

Abstract:

Application of good agricultural practices is one of the key factors for achieving the objective of good ecological status of European waters under the Water Framework Directive (WFD). In Greece and Italy, FAO's Aquastat, recorded that more than 80% and 50% respectively, of the available freshwater resources are used for irrigation purposes. In Greece and Italy both central and local public authorities are responsible for the development, implementation and application control of irrigation and drainage legislative framework. The management of irrigation and drainage systems is locally done by Land Reclamation Consortia (or Water Users Associations (WUA)), mainly when surface water bodies are used as water sources, while most of drillings are private. In the frame work of IRMA project a number of tools has been developed for the improvement of irrigation efficiency in the regions of Puglia in Italy where 400.000ha of agricultural land is equipped for irrigation and for the regions of Epirus and Western Greece in Greece, where the relevant area is 51.000 and 150.000ha respectively. One of these tools was the in depth registration of irrigation practices in the project's area. This was expected to significantly assist all relevant stakeholders to draw their future irrigation strategy. A set of questionnaires was developed to support the survey. The present study focuses on the analysis of the results regarding WUA's. This questionnaire was distributed to irrigation associations that collect the relevant information about water and energy costs, crops, economic data and main perception and issues related to climate change and environmental problems. The reality of WUAs in the study areas of Greece and Italy are presented, highlighting differences and similarities of water management in agricultural area, understanding what are the major issues related with the environmental, economic and social sustainability of agricultural livelihoods in the study area. The results of this study helps to understand the reality of study area and provide guidance to stakeholders to improve water management and be in line with WFD.

Keywords: *Water management, Water Users Association, (maximum 5 keywords)*

Theme: *Environmental, social and economic aspects of water management*



IRRIGATION MANAGEMENT BY WATER USERS ASSOCIATIONS: CASE STUDIES IN THE REGIONS OF APULIA, EPIRUS AND WESTERN GREECE



Silvia Vanino^(1,*), Simona Capone⁽¹⁾, Pasquale Nino⁽¹⁾, Stefano Fabiani⁽¹⁾, Pantelis Barouchas⁽²⁾, Demetres Maretas⁽³⁾

Contact person: vanino@inea.it
1 CREA
2 TEI of Epirus
3 TEI of Western Greece



Key words: collective irrigation, water and energy costs, agriculture sustainability

1. SUMMARY

Inside the project IRMA, it was been conducted a survey on local irrigation and drainage practice in 3 study area in Greece and in Italy: Epirus, Western Greece and Apulia Regions.

Information collected about:

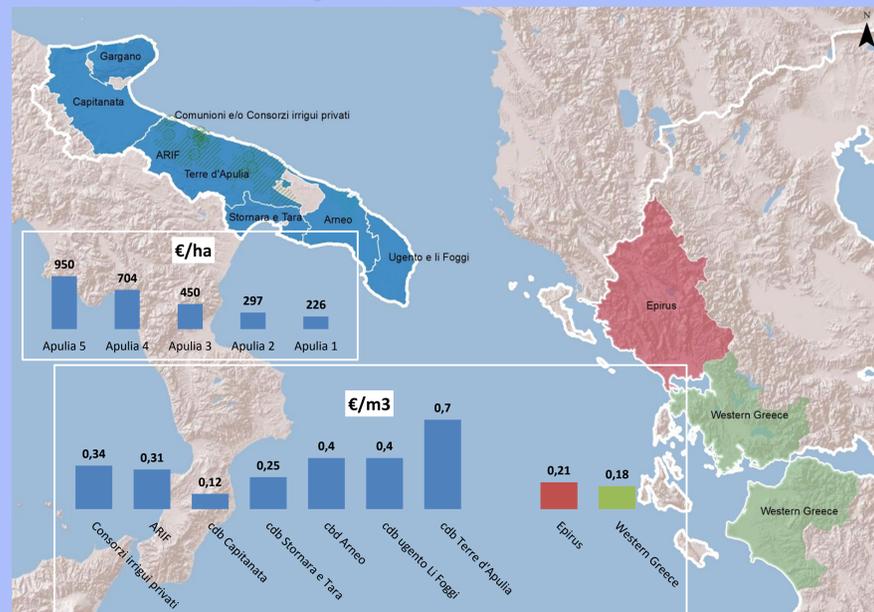
- Water use;
- Quality and water sources used;
- Irrigation methods and practises;
- Water management;
- Water cost;
- Legislative framework.

500 survey per study area divided by:

- ❖ Agriculture
 - Water User Associations (WUA)
 - Farmer (% respect principle crop in the study area)
- ❖ Urban Landscape
 - Local authorities and Managers sports facilities
 - Urban agriculture/private gardens.

The results will help local authorities, consortia and farm operators to gain a better understanding of the demand for water and how it's used.

Water price to consumers



2. WUA'S QUESTIONNAIRE

The reality of WUA in the study areas of Greece and Italy are presented, highlighting differences and similarities of water management in agricultural area, understanding what are the major issues related with the environmental, economic and social sustainability of agricultural livelihoods in the study area.

Questionnaire collected data about water management in WUA and explored the perception of stakeholder about environmental issues, climate change adaption and how is possible to have a sustainable water management.

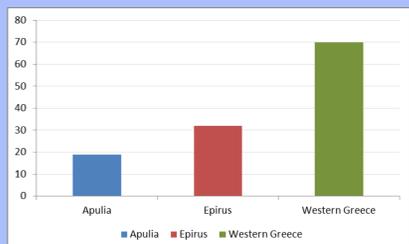


Figure 1. Number of WUA (public and private) in study areas.

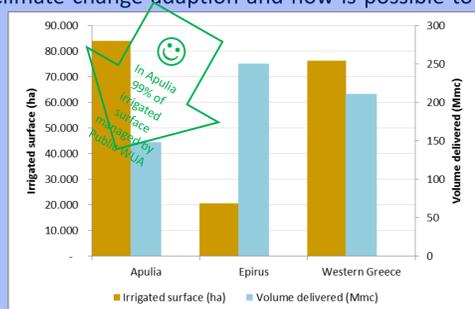


Figure 2. Irrigated area and volume delivered in study areas.

Costs related to water manage in WUA

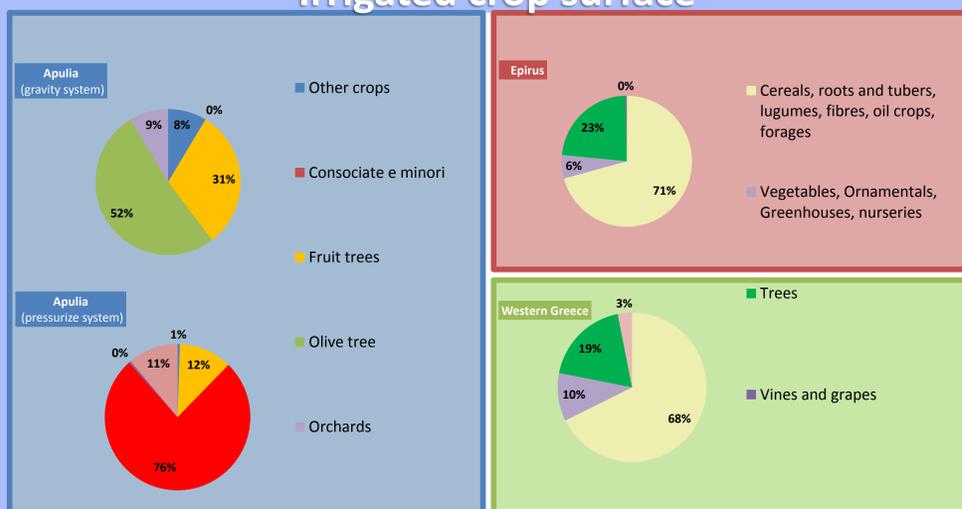
Main source: surface water

- ✓ 35-50% water supply
- ✓ 15% energy
- ✓ 20% personnell

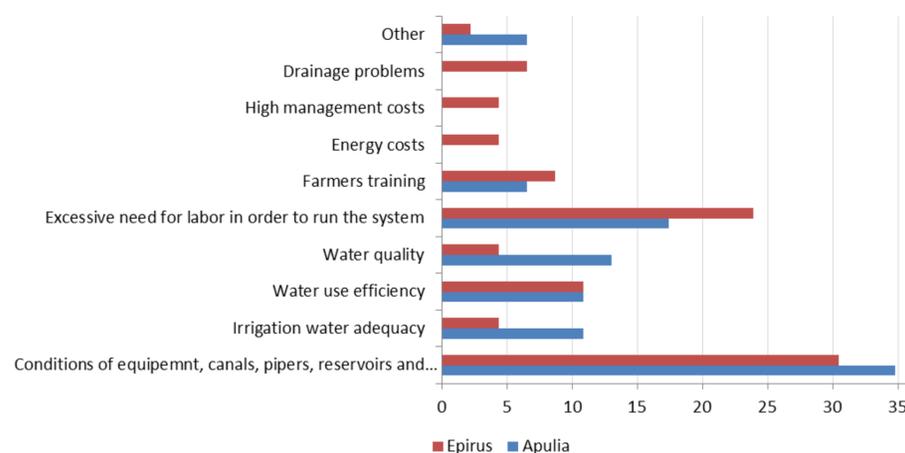
Main source: groundwater

- ✓ 60-90% energy
- ✓ 10% maintenance

Irrigated crop surface



Major problem in the irrigated areas



3. WUA'S OPINIONS

PRESENT IRRIGATION ISSUES



- ✓ 55% old and bad conditions of the distribution system with the consequence that there is a water waste in quantity and also in quality;
- ✓ 18% increasing of numbers of private wells with problems of quality water;
- ✓ 18% high management costs;
- ✓ 9% theft and vandalism.

- ✓ 67% of the WUA believe that modernization of irrigation and drainage systems is necessary;
- ✓ 27% of the WUA believe that irrigation method must be changed (from gravity to sprinkler irrigation)
- ✓ 13% of the WUA believe that reduction of energy cost is necessary

FUTURE SOLUTIONS



- ✓ managing in a better way irrigation water;
- ✓ using treated waste water;
- ✓ ammodernization irrigation network.

- ✓ almost all the WUA plan to overcome water supply problems by addressing to the relevant public services (Municipalities and Region);
- ✓ installation of photovoltaics.

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Contact info: (1)Council for Agricultural Research and Economics, via Nomentana 41, Roma, Italy (2)Technological Educational Institute of Western Greece, Dept. of Agricultural Technology, 27200 Amaliada, Greece (3) Technological Educational Institute of Epirus, 47100 Arta, Greece TEI of Epirus, Dept. of Agricultural Technology, 47100 Kostakii Arta, Greece