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Efficient Irrigation Management  
Tools for Agricultural  
Cultivations and Urban  
Landscapes

# IRMA

## Irrigation practice survey in Apoulia, Epirus & Western Greece

WP4, Action 4.2. Del. 4.2.3

LP support activities



[www.irrigation-management.eu](http://www.irrigation-management.eu)



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Epirus | Greece

## IRMA info



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## European Territorial Cooperation Programmes (ETCP)

### GREECE-ITALY 2007-2013

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## Efficient Irrigation Management Tools for Agricultural Cultivations and Urban Landscapes (IRMA)



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## IRMA partners

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**LP, Lead Partner, TEIEP**

**Technological Educational Institution of Epirus**

<http://www.teiep.gr>, <http://research.teiep.gr>



**P2, AEPDE**

**Olympiaki S.A., Development Enterprise of the Region of Western Greece**

<http://www.aepde.gr>



**P3, INEA / P7, CRA**

**Istituto Nazionale di Economia Agraria**

<http://www.inea.it>



**P4, ISPA-CNR**

**Consiglio Nazionale delle Ricerche - Istituto di Scienze delle Produzioni Alimentari**

<http://www.ispa.cnr.it/>



**P5, ROP**

**Regione di Puglia**

<http://www.regione.puglia.it>



**P6, ROEDM**

**Decentralised Administration of Epirus–Western Macedonia**

<http://www.apdhp-dm.gov.gr>

## WP4

### Deliverable 4.2.3.

## Interviews and report of the survey outcomes on irrigation practices

Involved partners:



TEI of Epirus (LP)

Team members:

Konstantina Fotia

Place and time: Arta, 2015

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## Contents

Introduction .....	7
Sources of statistical data .....	9
International .....	9
National Greek .....	11
National Italian .....	12
Good practices.....	13
Organisation of WP4 and the work of LP in its framework .....	14
Special WP5 project meeting, Italy .....	16
Questionnaires and sample.....	17
Special WP5 project meeting, Greece .....	18
Implementation of survey.....	19
Results analysis and presentation .....	19
Feedback channel .....	19
References .....	21

## Tables

Table 1 Expected application efficiency for agricultural applications (Brouwer and Prins, 1989).....	8
Table 2 Actions of WP4.....	14
Table 3 Deliverables of WP4 .....	14

## Figures

Fig. 1 The IRMA project area (Google Maps).....	7
Fig. 2 TEIEP at WP4 meeting at Bari (Nov 2013) .....	16
Fig. 3 Typical page of the questionnaire .....	17
Fig. 4 TEIEP participated at WP4 meeting at Ioannina (June 2014).....	18
Fig. 5 Recommended form of link to the IRMA forum for providing feedback regarding the surveys.	19
Fig. 6 Screenshot of the special for the survey page at IRMA's forum.....	20



## Introduction

The IRMA project is applied in the Region of Apoulia (Italy) and the Regions of Epirus and Western Greece (Greece) (Fig. 1).

In Greece, the total area of arable land and permanent crops is about 3 and 3.5 Mha (EEA, 2014; FAO-Aquastat, 2015a) and almost 40% of it is irrigated (FAO-Aquastat, 2014a) consuming about 7,000 hm<sup>3</sup> (70-80%) of water per year (OECD, 2008; FAO-Aquastat, 2014a). These facts do not include irrigation of urban and recreational landscapes. According to the literature findings (Karamanos et al., 2005), surface irrigation methods cover about 7% of the irrigated area while sprinkler and drip irrigation covered 49% and 44% respectively.

In Italy, the total area of arable land and permanent crops is between 9 and 9.5 Mha (EEA, 2014; FAO-Aquastat, 2014b). One third (2.7 Mha) of the total agricultural area is irrigated (Bartolini et al., 2010; Lupia, 2013). In 2007 the most used irrigation method was the sprinkler one covering about 37% of the total irrigated area of Italy, while surface irrigation (borders, furrows) ranged at the second place covering about 31% of that area and micro-irrigation in the third place covering 21.4% of the total irrigation area. However, in the southern regions of Italy like Puglia, where the climate is dry, micro-irrigation covered more than 50% of the irrigated area (Lupia, 2013; Massarutto, 2013).



Fig. 1 The IRMA project area (Google Maps)

The application of modern irrigation systems and their efficient management is of great significance regarding the preservation of water resources. Table 1 provides generic values of end-users efficiencies. A number of relevant tables can be found in the literature (i.e. Howell, 2003). In some cases, these values are very optimistic (i.e. Greek State / GMA Gov. Gaz. (1989) states that the efficiency of surface, sprinkler and drip systems are 75%, 85% and 90% respectively).

**Table 1 Expected application efficiency for agricultural applications (Brouwer and Prins, 1989)**

<b>Irrigation methods</b>	<b>Maximum field application efficiency</b>
Surface irrigation (border, furrow, basin)	60%
Sprinkler irrigation (any type)	75%
Drip irrigation (surface or underground)	90%+

In the framework of WP4 of IRMA project which regards the analytical survey of irrigation systems and their management in the project area, TEIEP is committed to collaborate with the partners (P2-AEPDE, P3-CREA/INEA and P6-ROEDM) which will apply the survey in their areas (Apoulia, Western-Greece and Epirus respectively) and provide scientific support to the survey teams.

## Sources of statistical data

### International

For general facts regarding irrigation and drainage the following statistical data and information providers are considered a good source. Data from these providers could be used for setting the general framework and organization of the survey and come up with an idea of what is expected to be found.

The recommendations are:



<http://ec.europa.eu/eurostat>

Eurostat is the statistical office of the European Union situated in Luxembourg. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions.



European Environment Agency provides among other, water and irrigation specific data and reports (like Mean water allocation for irrigation in Europe: <http://www.eea.europa.eu/data-and-maps/indicators/mean-water-allocation-for-irrigation>). Also valuable statistical data can be found at the specific for WFD 60/2000 web page of the agency: [http://ec.europa.eu/environment/water/water-framework/index\\_en.html](http://ec.europa.eu/environment/water/water-framework/index_en.html)



The World Bank got the message that current demand is stressing river basins and aquifers, with water scarcity driving a rapid rise in groundwater use in agriculture. Given rising populations and more unpredictable rainfall patterns, demand for water in agriculture is expected to grow. In this framework it monitors irrigation and provides relevant data and information:

<http://www.worldbank.org/en/topic/irrigationdrainage>



The Food and Agriculture Organisation of UN, provides rich databases and maps regarding irrigation and drainage facts:

- FAOSTAT: <http://faostat.fao.org/>
- Aquastat: <http://www.fao.org/nr/water/aquastat/main/index.stm>
- AQUAMAPS: [http://www.fao.org/nr/water/infores\\_databases\\_aquamaps.html](http://www.fao.org/nr/water/infores_databases_aquamaps.html)

## National Greek



The Hellenic Statistical Authority (<http://www.statistics.gr/portal/page/portal/ESYE>) is the official statistical data provider for Greece. It monitors agriculture and in this framework also irrigation and drainage and provides tabularized information regarding:

- Irrigated areas per crop type and regional unit (and region)
- Number of agricultural machines for irrigation per regional unit



HELLENIC REPUBLIC  
Ministry of Reconstruction of Production,  
Environment and Energy  
Rural Development

The Greek Ministry of Agriculture runs a special statistics unit (<http://www.minagric.gr/index.php/el/xrisimewplirofories-2/statistika-politi>) which provides information that could be found useful in the framework of an irrigation survey.



The Special Secretariat for Water of the Ministry of Reconstruction, Production, Environment and Energy is responsible for the development and implementation of all programs related to the protection and management of the water resources of Greece and the coordination of all competent authorities dealing with the aquatic environment. The implementation of the Water Framework and the Marine Strategy Directives as well of the related daughter Directives fall within the scope of the activities of the Secretariat. It provides information that are linked to the managerial plans that have been developed in the framework of WFD 60/2000 (data, reports, maps etc.). It also run the national registry of water sources (drillings etc.)

Other sources of information could be the thesis and the published research of Greek and international R&D entities in Greece.

## National Italian



The Italian National Institute of Statistics (<http://en.istat.it/>) is a public research organisation. It is the main producer of official statistics in the service of citizens and policy-makers. It operates in complete independence and continuous interaction with the academic and scientific communities.



The Italian Ministry of Agriculture (Mipaaf, <https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/202>) also provides valuable information regarding irrigation and drainage.



The Italian Ministry of Environment, runs a special department regarding water and the application of WFD 60/2000 ([http://www.minambiente.it/home\\_acqua](http://www.minambiente.it/home_acqua)).

Other sources of information could be the thesis and the published research of Greek and international R&D entities in Italy.

## Good practices

U.S. Department of Agriculture's National Agricultural Statistics Service runs the Census of Agriculture (<http://www.agcensus.usda.gov/index.php>), the leading source of facts and figures about American agriculture. Conducted every five years, the Census provides a detailed picture of U.S. farms and ranches and the people who operate them. It is the only source of uniform, comprehensive agricultural data for every state and county in the United States. Participation by every farmer and rancher, regardless of the size or type of operation, is vitally important. By responding to the Census, producers are helping themselves, their communities and all of U.S. agriculture.

## CENSUS OF AGRICULTURE

The Census includes the USA Farm and Ranch Irrigation Survey (NAAS, 2014) in the framework of which analytical facts regarding irrigation are monitored. This survey goes beyond quantity and tries to also report qualitative issues which could help irrigation and drainage stakeholders of all levels in their decisions.

## Organisation of WP4 and the work of LP in its framework

Among the objectives of IRMA was to conduct a survey regarding the local irrigation practice (legislative framework, administration organization, delivery and distribution systems, applied techniques, application of new technologies on water irrigation management etc.). The survey and the analysis of the findings is the objective of WP4 of the project. The survey was planned for the involved areas (Region of Apulia in Italy and Regions of Western Greece and Epirus in Greece). On site interviews (about 500 per region) were planned using special questionnaires (regarding water sources, irrigation systems design, installation and management) in agricultural and landscape systems. The survey should also include a review concerning legislative framework (policies, laws, water pricing etc.), administration, delivery and distribution systems etc. The survey was considered the road to develop valuable information regarding the irrigation and drainage practice which could help the implementation of the project but also become the basis for a number of initiatives of relevant stakeholders.

Following the organization of the project in work packages, actions and deliverables, WP4 was organized as presented in

**Table 2 Actions of WP4**

<b>WP 4</b>	<b>Survey of irrigation practice</b>
Action 4.1	Literature and legislative review, Development and evaluation of questionnaires
Action 4.2	Survey for registration of irrigation practice
Action 4.3	Final evaluation

**Table 3 Deliverables of WP4**

<b>Action No</b>	<b>Deliv. No</b>	<b>Deliverable Title</b>	<b>Partner No</b>	<b>Partner's Contribution to Deliverable</b>
4.1	1	Special WP5 project meeting	LP	Participation in the meeting and cooperation for the formation of the questionnaires
4.1	2	Special WP4 project meetings (in parallel with WP3 meeting, see 3.1. 1-5)	P5	Organisation of the meetings, invitation of local irrigation stakeholders, translation, catering, participants list, minutes.

<b>Action No</b>	<b>Deliv. No</b>	<b>Deliverable Title</b>	<b>Partner No</b>	<b>Partner's Contribution to Deliverable</b>
4.1	3	Questionnaires for irrigation practice registration	P3	Questionnaires design (IT and ENG languages)
4.2	1	Interviews and report of the survey outcomes on irrigation practices	P2	Field survey (about 500 interviews) and report (GR – ENG Languages) for the Region of Western Greece.
4.2	2	Interviews and report of the survey outcomes on irrigation practices	P3	Field survey (about 500 interviews) and report (GR – ENG Languages) for the Region of Puglia.
4.2	3	Interviews and report of the survey outcomes on irrigation practices	LP	TEIEP members for scientific support of the survey teams (report)
4.2	4	Interviews and report of the survey outcomes on irrigation practices	P6	Field survey (about 500 interviews) and report (GR – ENG Languages) for the Region of Epirus.
4.3	1	Final WP4 evaluation report	P3	Report concerning data analysis and outcomes regarding the legislative framework, the administration organization, the delivery and distribution systems, the applied techniques, the good practices.

## Special WP5 project meeting, Italy

Members of LP participated to the meetings and cooperation for the formation of the questionnaires. The Special WP3 & WP4 Meeting was held at Bari during November 2013 (<http://www.irrigation-management.eu/communication/events-and-media#event03>). Members of TEIEP team presented the concept of WP4 according to the proposal and their ideas regarding the implementation of the survey.



**Fig. 2 TEIEP at WP4 meeting at Bari (Nov 2013)**

The project team agreed that a survey regarding the local irrigation practice needs a comprehensive questionnaire that covers at least the following aspects:

- General farm information (irrigation and drainage system, system design and maintenance, water source and cost and computer skills).
- Scheduling practices (scheduling methods, scheduling tools used and reasons for use).
- Perceptions (irrigation scheduling, advice and training).

# Questionnaires and sample

The decision was to use “Investigator-administered questionnaires” which lead to a higher response rates. 3 types of questionnaires was decided to be developed. One for state / local administration organisations (Type 01), one for land reclamation organisations (Type 02), one for agricultural irrigation (Type 03; end-users) and one for landscape irrigation (Type 04; end-users).

Regarding the number of questionnaires (about 500 per region) and the sample, it was decided to set as goal 20 questionnaires of type 01 (10-15 of which will need filling of part 2); 30 questionnaires of type 02; 250 questionnaires of type 03 (for these we will take advantage of farmers concentration points (cooperatives, training sessions, seminars, fairs etc.) and 100-150 questionnaires of type 04.

The questionnaires were ready in English before the end of February 2014. All the involved partners, including LP, were involved in their development. The questionnaires are available at: <http://www.irrigation-management.eu/deliverables/Questionnaires.rar>.



Fig. 3 Typical page of the questionnaire

## Special WP5 project meeting, Greece

P6 (ROEDM), organized the “Special WP3 and WP4 partners and irrigation stakeholders meeting in Greece” at Ioannina during June 2014 (<http://www.irrigation-management.eu/communication/events-and-media#event07>). Members of TEIEP team presented the concept of WP4 according to the proposal and their ideas regarding the implementation of the survey in Greece. They need to start the implementation of the survey in Greece was urged.



**Fig. 4 TEIEP participated at WP4 meeting at Ioannina (June 2014)**

## Implementation of survey

P3 (CREA/INEA), translated the questionnaires in Italian and begun the survey during the first months of 2014.

The Greek partners showed a very big delay regarding the implementation of the relevant deliverables. P6 (ROEDM) begun the survey at the end of 2014 and completed it at the end of project (September 2015), while P3 (AEPDE), materialized the survey during the last month of the project implementation (September 2015).

## Results analysis and presentation

LP, assisted all Greek partners and their contractors in the adoption of the questionnaires in their areas, their translation in Greek. Consultation was also provided regarding the analysis of the results.

LP, cooperated with P3 (INEA) for the presentation of the results at IrriMed 2015 (<http://irrimed2015.iamb.it/>).

## Feedback channel

In all three studies a link to the special for this publication page in IRMA's forum will be added. The link will have the form of both a URL and a QRcode.

The recommended form of the link is as follows:

Talk about this study, provide comments and new information.

You are welcome at the special for this publication page in IRMA's forum.

Insert the following URL to your web browser

<http://www.irrigation-management.eu/forumx/irrigsurv>

or scan the QRcode to get there



Fig. 5 Recommended form of link to the IRMA forum for providing feedback regarding the surveys

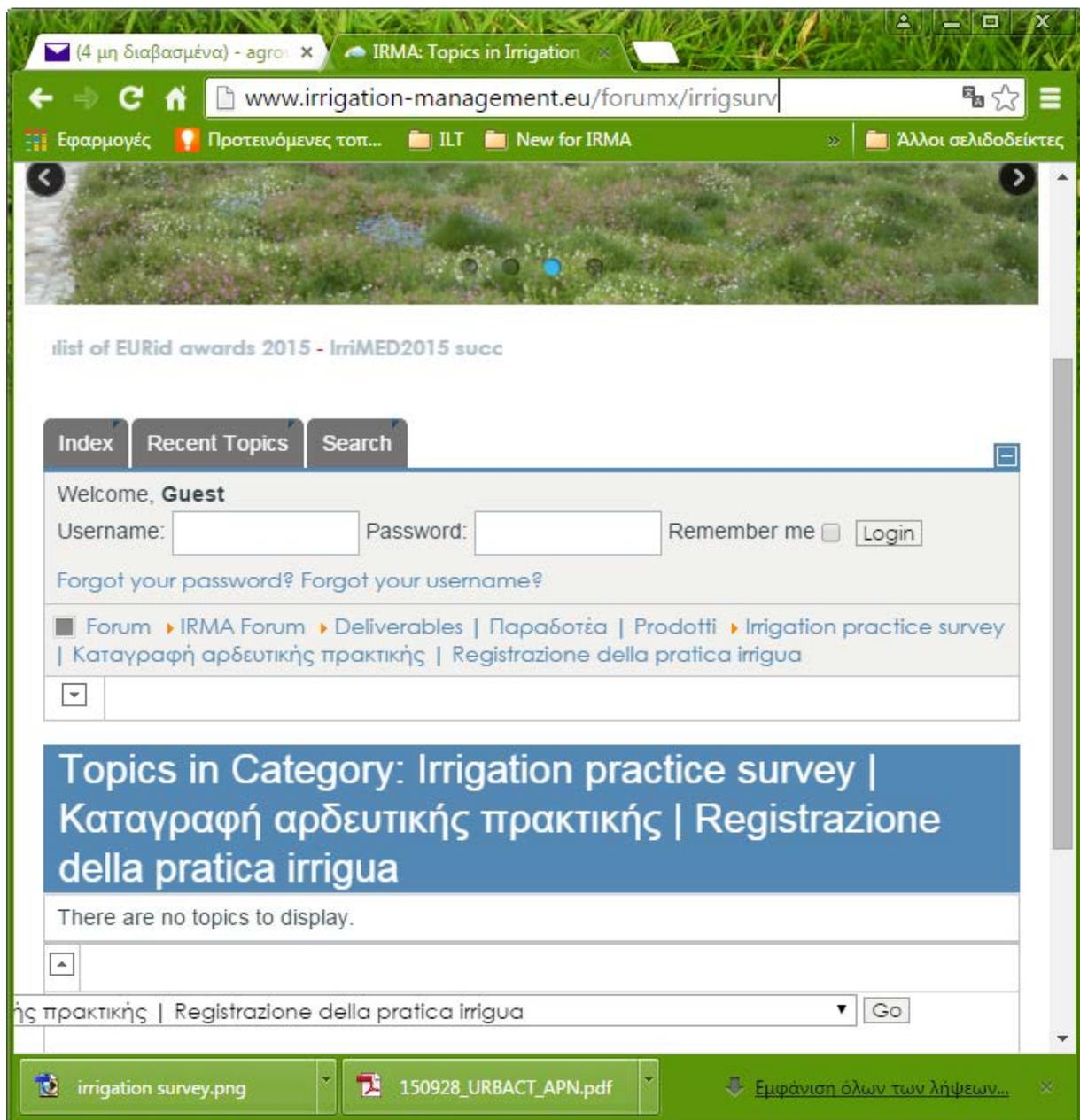


Fig. 6 Screenshot of the special for the survey page at IRMA's forum

Notes

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