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ETCP GREECE-ITALY 2007-2013

IRMA

Efficient Irrigation Management Tools for Agricultural Cultivations and Urban Landscapes

Subsidy Contract No: I3.11.06

## **WP4 Survey on irrigation water use**

### **Questionnaires**

1. Administrative organisations (central and local governmental, municipal etc)
2. Irrigation water management organisations
3. End – users farms
4. End – users landscapes



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01

## WP4 Survey on irrigation water use

Interviewers' name:

Number of questionnaire:

Date:

### 1. Relevant public administration units of the region

Important note: Public administration departments that are directly managing irrigation systems (i.e. Municipal Green Spaces Offices which manage urban green infrastructure spaces) should also fill part 2 of this questionnaire.

Reference year: 2013

Administrative Region			
Organization and Department (i.e. Regional Water Office, Municipal Green Spaces Office etc)			
Contact information (Address, Tel, Fax, URL, email)			

Surname		Name	
Title / Position			
email:		Tel./Fax:	

Questions:

1. Overlay of responsibilities with other public administration organizations or departments:
2. Extent of internet use regarding the public services that your organization provides:
3. Public administration databases that your organization is related to, the role, and availability of relevant row data and/or information to the public:
4. Does your organization provide end users (farmers) with advices regarding irrigation, drainage, fertilisation management? If yes, which model does your organisation uses for water needs estimation (Blaney-Cridle, Hargreaves, Penman-Monteith, other)? Do you apply an ordinance for these calculations? Do you use any relevant software like FAO's CropWat for these calculations?
5. Are you aware of web sites that provide agrometeorological information and tools for irrigation, fertilization, etc calculations (name them i.e. <http://www.cimis.water.ca.gov>,

6. Is your organization directly responsible for public water sources (drillings, reservoirs etc)?
7. Have your organization participated, or participate this period, by any means, in any planning activity regarding the implementation of the EU Water Framework Directive - integrated river basin management for Europe (2000/60/EC)<sup>1</sup> or other EU or national relevant activity?
- ☐ Yes
  - ☐ No
8. Are you aware of the local water management plan which is applied in the framework of 2000/60/EC at the hydrological basin of your jurisdiction?
- ☐ Yes
  - ☐ No
9. Regarding water issues, which is in your opinion the most significant of the following:
- ☐ Lack of straightforward strategy regarding water management
  - ☐ Lack or insufficient size of central irrigation systems
  - ☐ Lack or insufficient percentage of modern central irrigation systems
  - ☐ Inefficient water management at basin level
  - ☐ Lack of training
  - ☐ Inefficient water management at end user level
10. Regarding water issues, which is in your opinion the most significant of the following:
- ☐ Drought
  - ☐ Desertification
  - ☐ Salinization
  - ☐ Other, please define it
11. According to your opinion which is the main cause for water shortages in your area?
- ☐ We do not have water shortages in our area
  - ☐ Excess pumping for irrigation by private drillings
  - ☐ Lack of guidance and rules regarding water distribution
  - ☐ Climate change
  - ☐ Other, define

### Optional questions of part 1

Characteristic photos from the organization

Place of organization/department in the organizational structure of public administration (mention all relevant levels above and below):

Area of responsibility:

Internal organizational structure:

Infrastructure (offices, laboratories, IT systems and software, etc):

Number of employees (general)

Employees that are related directly or not with irrigation and drainage issues (number, sex, educational level, specializations, type of relation with irrigation and drainage issues):

<sup>1</sup> <http://ec.europa.eu/environment/water/water-framework/>

Basic relevant legislation that your organization applies:

Administrative responsibilities regarding irrigation and drainage (list):

Have your organization participated, or participate this period, by any means, in any implementation or planning activity regarding R&D projects regarding irrigation and drainage?

☐ Yes, please refer the most significant:

☐ No

Which are your views regarding the future in water management and relevant irrigation and drainage issues?

Do you think that problems maybe faced regarding water supply in the future? How does your dept. plan to overcome them?

Area for general comments:

## 2. Special part for public administration departments that are directly managing irrigation systems (i.e. Municipal Green Spaces Offices which manage urban green infrastructure spaces)

Reference year: 2013

### A. Landscape parcels, water sources and irrigation systems

Water basin:

Total green spaces area (ha):

Surface equipped with fixed irrigation systems (ha):

Surface irrigated with temporary (movable) irrigation systems (ha):

What kind of urban green infrastructure does your dept. manage (parks, vegetation on side of middle road verges, round about circuses squares (plazas), cemeteries, urban forests, athletic fields, allotment gardens, school yards, etc)? Please name them and try to quantify them (if possible)

Please refer the kind of irrigation system that is typically used for the various types of landscapes (if you use more than one systems for the same type of landscape, use all the relevant indications separated by comma and provide the relevant percentage if possible)

Type of landscape <sup>(a)</sup>	Type of irrigation system <sup>(b)</sup>	Comments

a) (G) Turfgrass; (TG) Trees or shrubs on turfgrass; (TP) Trees or shrubs on pavements; (S) Shrubs

b) (N) no irrigation; (PS) Pop-up sprinkler system; (GS) Ground sprinkler system; (GME) Ground microirrigation system with individual emitters, micro-sprinklers etc; (GDL) Ground microirrigation system with drip lines; (SME) Subsurface microirrigation system with individual emitters; (SME) Subsurface microirrigation system drip lines; (O) Other, please specify

How much water is applied for irrigation every year by your dept.?

Water source	Percentage (%)	Comments
Tap (fresh water)		
Water from rain harvesting systems		
Treated waste water		
Gray water		
Desalinated water		
Saline water		
Other (please specify)		

Please indicate the reasons why public landscape settings in your area are not completely irrigated:

- ☐ water scarcity
- ☐ lack of distribution infrastructure
- ☐ poor quality of water
- ☐ soil properties
- ☐ costs
- ☐ no need for irrigation (use of local plants and xeriscaping techniques)
- ☐ no need for irrigation (use of synthetic turf)
- ☐ no need for irrigation (use of bare soil or other ground cover material)
- ☐ other (please specify):

From what kind of sources does your dept. obtains water? Please indicate their percentage if possible.

- ☐ Land Reclamation Organization Network (specify which) ..... ( %)
- ☐ Public or private (please indicate) drillings/wells ( %)
- ☐ Public or private (please indicate) open or closed tanks/reservoirs ( %)

- ☐ Other like lakes, rivers, streams, ponds, dugouts etc) ( %)

Does your dept. uses tank trucks in order to transport water for irrigation?

If yes, are they used to:

- ☐ Directly apply water to the plants though free surface distribution?  
☐ Directly apply water to the plants though connection to an irrigation system?  
☐ Fill tanks

## **B. Irrigation management information**

Does your dept. develop and apply a guideline regarding green spaces?

If yes:

1. Does it contain specific information regarding irrigation and drainage (plants that need less water, irrigation scheduling advices etc)?
2. How do you disseminate it to any interested party (department staff, landscape subcontractors, citizens, pupils, etc)?
3. Can you provide us with a copy?

Does your dept. apply some kind of resources management system regarding landscape (i.e. Differentiated Management Plan)?

Does your dept. apply some kind of quality system like integrated management, organic cultivation etc?

Has your dept. ever applied or involved in an irrigation ban?

Does your dept. uses water meters in order to monitor water consumption for irrigation? Are you obliged to?

Are the irrigation systems that your dept. administrates easy to manage? If No, please explain why

Does your dept. use some kind of electronics or IT technology for irrigation management (controllers, sensors etc)?

Could you mention your opinion regarding the advantages and the disadvantages of using such technology?

Are the irrigation systems that your dept. administrates easy to maintain? If No, please explain why

Does your dept. perform technical and/or environmental auditing to you irrigation system?

Irrigation at field is usually applied by your depts. employees or by landscape subcontractors?

Are periodic analysis are performed on water and/or soil that is used for irrigation?

- i. If Yes, how often and which parameters are detected for water?
- ii. If Yes, how often and which parameters are detected for soil?

Which is the typical irrigation period (from-to) in your area? Is it defined by an ordinance?

How does your dept. typically decide about this period? Do you use any relevant ordinance?

Does your dept. faces problems regarding water supply in a particular time of year? If Yes, which period (month) and for what reason?

Does your dept. use irrigation schedules which are updated when necessary? If yes,

1. Which model does your organization uses for water needs estimation?
2. Do you apply an ordinance for these calculations?

3. From where do you get relevant data and information?
4. Do you use any relevant software or internet sites which provide agrometeorological information for these calculations?

Does your dept. use irrigation schedules which are updated when necessary? If yes,

Are fertilizers applied using the irrigation system? ☐ Yes ☐ No

Are plant protections substances applied using the irrigation system? ☐ Yes ☐ No

Are run-off, waterlogging and drainage problems exist at your dept's area of jurisdiction?

Do you know where the drainage water ends to?

Which are the major problems that your dept. faces regarding irrigation:

- ☐ Design of irrigation and drainage systems (low-efficiency systems because of age, inappropriate design, etc)
- ☐ Condition of the systems and relevant equipment
- ☐ Excessive need for labor in order to run the system
- ☐ Dept. staff and subcontractors training
- ☐ Water quality (salinity, etc)
- ☐ Other (please specify)

### **C. Economic information**

Costs incurred for the installation or upgrade/modernization of irrigation and / or storage system:

Water cost:

Specific expenses incurred during last year for water. Specify items and amount

Cost items

€

Labor

Maintenance

Electric energy

Fuel

Other (please specify)

Has your dept. receives any subsidies for the installation or modernization of irrigation systems? If Yes, specify the type, year of disbursement, money lender, type of intervention, % of investment financed, disbursed amount.

### **D. Environmental issues**

Which of the following practices does your dept. applied in 2013 in order conserve water or energy?

- ☐ Installation of central and/or local electronic control systems and sensors
- ☐ Elaborated irrigation schedules (best possible estimation of water needs, use of soil characteristics, frequency, duration, time of application etc)
- ☐ Replacement of less by more efficient systems (modern sprinklers, microirrigation systems, subsurface systems etc)
- ☐ Auditing and more frequent maintenance
- ☐ Groundcover / mulching
- ☐ Using soil amendments in order to ameliorate it's water retention ability
- ☐ Replacement of plants that have great water needs by local plants or in general plants with less water needs
- ☐ Use of alternative water for irrigation (rain harvest, saline, treated, gray etc)
- ☐ Information dissemination and training regarding these issues
- ☐ Other water or energy saving methods or devices
- ☐ No practices used

Does your dept. links irrigation and drainage management decisions with the protection of other water bodies (ground water, rivers, lakes, wetlands, sea etc) directly or indirectly affected?

## Optional questions of part 2

Characteristic photos from urban infrastructure projects that are managed by the department:

1. ....
2. ....
3. ....
4. add lines if more

Please provide information regarding the drillings/wells that you dept. uses:

X , Y (a)	Year of installation	Depth of the drilling	Diameter of drilling suction pipe	Type of pump, pump power, year of purchase	Average discharge flow rate (m <sup>3</sup> / hour) at head (bar of m H <sub>2</sub> O)	Type of energy source	Filters and filtering problems (b)

a) Specify coordinates if possible

b) Sand, centrifugal, disk, screen etc

Has your dept. ever created/distributed or just distributed some kind of informative material (leaflet, special web page etc) regarding irrigation and drainage? If yes could you provide us with copies?

Has your dept. ever organized or cooperated in the organization of any kind of training / educational event for department staff, landscape subcontractors, citizens, pupils etc?

Does your dept. has an easy to reach way (i.e. help desk, call center, web page form etc) for citizens to report problems regarding irrigation and drainage (water run-off on pavements or roads, leakages, waterlogging) and propose solutions?

1. If yes, which are the most common problems, comment, proposals that your dept. receives?
2. If no, why your dept. have not done this?

Which is your opinion regarding xeriscaping, urban meadows and synthetic grass?

By whom irrigation and drainage systems for public spaces of your dept.'s area of jurisdiction are designed?

Which projects regarding irrigation and drainage does your dept. runs or are ready to begin this period?

Which projects regarding irrigation and drainage are running or are ready to begin this period by other public authorities in your dept's area of jurisdiction?

Have relevant proposals been submitted by your dept. or other public authorities which are waiting for evaluation?

Do you think that problems maybe faced regarding water supply in the future? How does your dept. plan to overcome them?

Area for general comments:





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## **WP4 Survey on irrigation water use**

Interviewers' name

Number of questionnaire:

Date:

### ***2. Local Organisations for Land Reclamation***

Reference year: 2013

Administrative Region			
Water distric			
Watersheds included			
Name of irrigation scheme / organisation			
Contact information (Address, Tel, Fax, URL, email)			
Staff of Land reclamation Organisation		Personnel involved in technical management	
Foundation year			
Total area (ha)			
Irrigable surface (ha)			
Irrigated surface (ha)			

	Total	Male	Female
Members (end-users)			

Surname		Name	
Title / Position			
Mail:		Tel:	

Brief description of the irrigation and drainage network and the infrastructure of the organization (pumping stations, canals or pipe length and relevant material, laboratories for soil and water analysis etc)	<i>If you have a ready relevant text you can just provide us with it</i>
Could you provide us the most recent top view plan of the system	<i>The copy will be scanned and returned</i>

Period of water availability (irrigation period):	
How do you define it each year? Do you use an ordinance?	

With which means are these adjustments made in your system (manually, centrally using electrically operated gates etc)?

Volume delivered (mean of last 3 years) Mm3	
Percentage of the above volume delivered by gravity system:	
Percentage of the above volume delivered by pressurized system:	

Irrigated area for the 5 major crops (reference year 2013):

Crop	Surface pressure	Surface gravity	Volume delivered pressure	Volume delivered gravity

Could you provide us with an estimation regarding the percentage of type of systems (flood, sprinkler, micro-irrigation) for each one of the major cultivations in your area:

Type and number of irrigation water sources:

System	Irrigation	Reclamation	Both
Number of water sources in general (drillings, etc)			
Installed power (kW)			
Electric energy consumption per year (KWh)			
Use of alternative energy sources or production of energy (from water, wind, sun etc)			
Water raised (m3):			
Average pressure at the hydrants (bar or m H <sub>2</sub> O):			

Do farmers in your area use in parallel private sources of water (wells, drillings, reclaimed water etc) for irrigation purposes?

Do you know if there is a process to register those? Do you have access to the relevant database?  
Which percentage of those are legal according to your estimation?

Type of pricing and cost	
Type of pricing (per area, per m3, etc)	
How do you calculate the water price? Does the type of cultivation is taken into account when the price is set?	
Water price to consumers:	
Energy costs (€/year):	
Personnel costs involved in technical management:	
Costs related to the ordinary maintenance of distribution systems:	
Costs related to the extraordinary maintenance of distribution systems:	

Number of extraordinary maintenance in last 3 years:	
Fleet vehicle costs (fuel/maintenance/rental):	
Cost of water supply:	

Is the distribution system equipped with monitoring devices (water meters etc)?	
Do you use more sophisticated methods to monitor the water consumption by the system (special satellite images etc)?	
Do you use more sophisticated methods to estimate cultivation's water needs (meteorological stations and calculation of evapotranspiration etc)?	
Is the distribution system subjected to performance and environmental audits and how often?	

Subsidies for the construction/expansion or modernization of the distribution system (Yes/No):	
If Yes, specify the type, year of disbursement, money lender (financing source), type of intervention, % of investment financed, disbursement amount:	

Have you participated, or participate this period, by any means, in any planning activity regarding the implementation of the EU Water Framework Directive - integrated river basin management for Europe (60/2000/60)<sup>1</sup> or other EU or national relevant activity?

Are you aware of the local water management plan which is applied in the framework of 60/2000/EC at the hydrological basin of your jurisdiction?

Does your organisation links irrigation and drainage with the protection of other water bodies (ground water, rivers, lakes, wetlands, sea etc) directly or indirectly affected?

Extent of internet use regarding the public services that your organization provides:

Does your organization provide end users (farmers) with advices regarding irrigation, drainage, fertilisation management? If yes, which model does your organisation uses for water needs estimation (Blaney-Cridle, Hargreaves, Penman-Monteith, other)? Do you apply an ordinance for these calculations? Do you use any relevant software like FAO's CropWat for these calculations?

Are you aware of web sites that provide agrometeorological information and tools for irrigation, fertilization, etc calculations (name them i.e. <http://www.cimis.water.ca.gov>, <http://www.agrometeopuglia.it>, <http://probiosis.teiep.gr>, <http://www.hnms.gr>, <http://www.meteo.gr> etc)

Major problems in the irrigated area

- ☐ Condition of equipment, canals, pipers, reservoirs and other structures
- ☐ Irrigation water adequacy
- ☐ Water use efficiency (leaching, leakages, old application systems etc)
- ☐ Water quality (salinity, etc)
- ☐ Excessive need for labor in order to run the system
- ☐ Soil erosion / desertification
- ☐ Soil quality (pH, nitrates, etc)
- ☐ Drainage problems (waterlogging, system maintenance needs, eutrophication etc)
- ☐ Farmers training
- ☐ Other (specify)

<sup>1</sup> <http://ec.europa.eu/environment/water/water-framework/>

## Optional questions

Characteristic photos from the organization:

Could you provide a copy of the constitution and scheme by-laws as it is today?

Please refer any extra services provided to members (i.e. relevant training, irrigation scheduling advices, irrigation system auditing, etc)

Does your dept. has an easy to reach way (i.e. help desk, call center, web page form etc) for citizens to report problems regarding irrigation and drainage (water run-off on pavements or roads, leakages, waterlogging) and propose solutions?

If yes, which are the most common problems, comment, proposals that your dept. receives?

If no, why your dept. have not done this?

Are analyses of water performed (and how many in space (different points) and time per year) in irrigation and drainage system or your organisation and what problems have occurred?

By whom irrigation and drainage systems in your area are designed and installed?

Which projects regarding irrigation and drainage does your organization runs or are ready to start this period?

Which projects regarding irrigation and drainage are running or are ready to begin this period by other public authorities in your organisation's area of jurisdiction?

Have relevant proposals been submitted by your organisation or other public authorities which are waiting for evaluation?

Which are your views regarding the future in water management and relevant irrigation and drainage issues?

Do you think that problems maybe faced regarding water supply in the future? How does your organisation plan to overcome them?

Area for general comments:



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## WP4 Survey on irrigation water use

Interviewers' name:

Number of questionnaire:

Date:

03

### 3. Irrigation systems at farm level (Farm level questionnaire)

Reference year: .....

#### A. General information regarding the farmer (agricultural enterprise leader)

Full name:		
Nationality:		
Sex:	Male	Female
Age:		
Address:		
Telephone numbers:		
Other contact information (email etc)		
Educational level / qualifications?		
Foreign languages?		
Insurance organisation?		
Parent's profession?		
Relatives, friends or other related people that are professional farmers:		
Age at which started to be occupied professionally with agriculture?		
Farmer as main profession (>50% agricultural income) <sup>1</sup> ?	Yes	No
Other than agricultural income comes from:		
How familiar are you with the use of IT technology?	A lot Enough Fairly	Just a bit Not at all
Do you have a PC/Laptop/Tablet etc?	Yes	No
Do you have a SmartPhone?	Yes	No
Do you use the internet:	Yes	No
Which are the main means you use in order to be informed regarding agricultural issues: <input type="checkbox"/> Counselor from relevant public organisation <input type="checkbox"/> Private agronomic counselor <input type="checkbox"/> Specialised books <input type="checkbox"/> Specialised newspapers, magazines (name some) <input type="checkbox"/> Specialised TV series (name some) <input type="checkbox"/> Specialised web sites (name some)		

<sup>1</sup> 50% is a level that is used Greece, if you want you can keep the moste generic: "The farmer carries out the activities in agriculture: exclusive, predominant, residual"

<input type="checkbox"/> Expositions, Trade fairs <input type="checkbox"/> Professional education workshops <input type="checkbox"/> Conferences, symposia <input type="checkbox"/> Other (specify)		
Did you ever attended an educational/training session specialised in irrigation and/or drainage (organiser, title, hours)?		
Are you satisfied with the knowledge you got from that training? On which issue do you think you need more training: <ul style="list-style-type: none"> <li>• irrigation system maintenance,</li> <li>• irrigation management/scheduling,</li> <li>• new trends and new types of irrigation systems?</li> <li>• other (please specify)</li> </ul>		

## **B. Land parcels and cultivations of the farm**

Reference year: .....

Total farm area (ha)<sup>2</sup>:

**Cultivated** area of the farm (ha):

No cultivated area of the farm (ha):

Surface equipped with irrigation fixed systems (ha):

Irrigable area with available water resources (ha):

Irrigated area annually (ha):

Total yearly cost for irrigation and drainage for all the land parcels of the farm:

**Cultivated** land parcels registration:

*If possible for each landparcel the cartographic coordinates (polygon or central point) will be defined (with the Id as description (attribute))<sup>3</sup>*

Id	Region	Province	Municipality	Possession of the land (a)	Area (ha)	Crop type (b)	Cultivation (and variety)	Age of plants (c)	Number of plants	Cultivation system (d)
1										
2										
3										
4										
5										

a) (O) Own property; (R) Rent; Other (please specify)

b) (1) Arable crops; (2) Protected cultivation (greenhouse/tunnel, net house); (3) Arboriculture; (4) Vegetables in open field; (5) Other (please specify)

c) Where applicable

d) (O) Organic or (IM) Integrated Management or (CC) Conventional cultivation

<sup>2</sup> There is the possibility that the total farm area is not equal with the sum of the cultivated land parcels area as some of the farm area could be unutilised.

<sup>3</sup> Digitize the most representative plots on Google Earth (See technical specifications).

Id	Special cultivation type <sup>(e)</sup>	Cultivation layout <sup>(f)</sup>	Groundcover <sup>(g)</sup>	Mean yield per year	Soil type <sup>(h)</sup>	Slope <sup>(i)</sup>	Distance from residence (km)	Electricity (Y/N) <sup>(j)</sup>
1								
2								
3								
4								
5								

e) Tall or short olive trees, palm tree shape etc

f) Co-cultivation (specify crops)

g) In case of trees specify the percentage of ground covered by other crops (0%, bare soil)

h) (S) Sandy; (C) Clay; (L) Loamy

i) (I) Inclined; (H) Horizontal; (C) Combination

j) Probably in order to get permission to use electricity for pumping water you submitted a plan contained the irrigation system layout, the irrigation period, the cultivation water needs and the relevant scheduling. Could you provide us with a copy of it?

Id	Water district	Water basin (river)	Special microclimatic conditions <sup>(k)</sup>	Irrigated (Y/N)
1				
2				
3				
4				
5				

k) i.e. high relative humidity in comparison with the mean of the area

### **C. Irrigation (only for irrigated land parcels)**

Reference year: .....

Id	Place of irrigation water source <sup>(a)</sup>	Irrigation water source <sup>(b)</sup>	Way of transportation in case of off-farm water source <sup>(c)</sup>	Distance of land parcel from the water source	Cost of water <sup>(d)</sup>
1					
2					
3					
4					
5					

a) Specify if the water source is on or off the land parcel

b) Land Reclamation Organization Network (specify which), Private source (drilling, well, open reservoir etc), other public or private (lakes, rivers, streams, ponds, dugouts etc)

c) Off-farm water transported to the farm e.g., via pipeline, canal system or vehicle, including municipal water and any surface water located off-farm

d) From land reclamation organisation or estimation in case of private source (if possible)

Did you have problems with water supply in a particular time of year (you can use the Land parcel id in order to refer to specific land parcels)? If Yes, what period (month) and for what reason?

Drillings

Id <sup>(a)</sup>	Year of installation	Depth of the drilling	Diameter of drilling suction pipe	Type of pump, pump power, year of purchase	Average discharge flow rate (m <sup>3</sup> / hour) at head (bar of m H <sub>2</sub> O)	Type of energy source	Filters and filtering problems <sup>(b)</sup>
1							
2							
3							
4							
5							

a) In case of more than one drilling in a land parcel use a different line to register it

b) Sand, centrifugal, disk, screen etc

If you also use off-farm water for irrigation (you can use the Land parcel id in order to refer to specific land parcels):

Of all the off-farm water used for irrigation in 2013, what percentage (%) came from each of the following?

Tap water

Treated wastewater

Provincial water sources (irrigation district, irrigation project)

Private sources

Other sources, please specify:


Why did you need to obtain water from an off-farm source in 2013?

No water or not enough water available on the farm for irrigation

Poor quality of on-farm water for irrigation

Other reasons (please specify):


Id	Irrigation method - Specify <sup>(e)</sup>	Start of irrigation season	End of irrigation season	Number of irrigation events <sup>(f)</sup> (A)	Water volume (liters, m <sup>3</sup> or mm) or run time (min or h) per irrigation event (B)	Total water volume (mm) <sup>(g)</sup> (C)
1						
2						
3						
4						
5						

e) Sprinkler irrigation (solid set, center pivot irrigation system, linear move irrigation system, traveling guns (either cable tow or hard hose traveling sprinkler system)); Micro-irrigation (drip lines, tapes, emitters / drippers, bubblers, micro-sprinklers etc.); Flood (surface) irrigation

f) Number of irrigation events performed during a typical irrigation season

g) Total volume of applied water per season (mm is the same as 10m<sup>3</sup>/ha).

Special questions:

1. Do you have a water meter (are you obliged to? Do you have it order to know the volume of water you use?
2. Do you find the cost of irrigation water reasonable?
3. Does the trunk or the foliage of the cultivation is getting wet during irrigation events?
4. Are the traveling guns manually repositioned?



5. Please indicate the reasons why your farm is not completely irrigated (you can use the Land parcel id in order to refer to specific land parcels)
- management
  - crop rotation
  - lack of distribution infrastructure
  - lack of agrarian settlements
  - water scarcity
  - fragmentation of the farm
  - soil properties
  - ownership and/or distance of water source
  - costs
  - poor quality of water
  - other (please specify):
6. Which of the following practices were used in 2013 to conserve water or energy? (you can use the Land parcel id in order to refer to specific land parcels)
- Wind breaks
  - Leaving stubble on fields (e.g., minimum tillage, direct seeding)
  - Watering at night or in the morning
  - Pressure reduction
  - Water or energy saving nozzles
  - Incorporating compost or other organic material into soil to increase soil water retention
  - Other water or energy saving methods or devices
  - No practices used
7. When (year) did you installed and when was the last upgrade/modernization of the irrigation system (you can use the Land parcel id in order to refer to specific land parcels), can you mention the cost?
8. Do you think that irrigation and drainage systems should be designed and constructed by specifically trained professionals? Would you pay for such a service?
9. In case that your system has been done by a professional did she/he provided you with a study, designs, irrigation scheduling proposal?
10. How much (and when) did you pay for this service?
11. Is your irrigation equipment easy to manage? If No, please explain why
12. Do you use some kind of electronics or IT technology for irrigation management (controllers, sensors etc)?
13. What are the advantages and the disadvantages of using irrigation technologies in your farm?
14. Are you aware of web sites that provide agro-meteorological information and tools for irrigation, fertilization, etc calculations (name them i.e. <http://www.cimis.water.ca.gov>, <http://www.agrometeopuglia.it>, <http://probiosis.teiep.gr>, <http://www.hnms.gr>, <http://www.meteo.gr> etc)?
15. Do you ask for professional assistance regarding the set up of the irrigation schedule you apply?
16. Would you use an automatic advice service regarding irrigation scheduling? Would you prefer that your agronomist/councilor use that service and review the advice before you are suggested to apply it? Would you pay for this service?
17. Do you ask for professional assistance regarding the amount of fertilizers you apply
18. Do you perform periodic analysis on water?
- i. If Yes, how often and what parameters are detected?
19. Do you apply plant protection substances using the irrigation system?
- i. The quality of water is poor, fair or good?
20. Is your irrigation equipment easy to maintain? If No, please explain why
21. Do you perform technical and/or environmental auditing to you irrigation system? Could you provide us with a copy of the most recent one?

22. Do you utilize water for frost protection? Do you use the irrigation system for these or do you have a special system. Describe in detail how you decide when to turn the irrigation system on and off for freeze protection.
23. Do you think that you may face more problems regarding water supply in the future? How do you plan to overcome this?
24. Regarding water issues, which is in your opinion the most significant of the following:
- ☐ Lack of straightforward strategy regarding water management
  - ☐ Lack or insufficient size of central irrigation systems
  - ☐ Lack or insufficient size of modern central irrigation systems
  - ☐ Unefficient water management at basin level
  - ☐ Lack of or support from relevant public administration services
  - ☐ Lack of training
  - ☐ Unefficient water management at end user (farm) level
  - ☐ Other, please specify

#### **D. Soil / Substrate and Drainage**

Id	Last time you performed soil analysis	Fertilization (elements, quantities, months)	Fertigation (elements, quantities, months)	Hydroponic cultivation <sup>(a)</sup>	Do you apply fertilizer during a regularly scheduled irrigation application?	Waterlogging/drainage problems (area affected)
1						
2						
3						
4						
5						

a) Please mention which kind of substrate do you use?

#### **E. Economic information**

- 1) Labor:
- ☐ managed by farmer
  - ☐ managed using family labor (exclusively)
  - ☐ managed using family labor (prevalent)
  - ☐ managed using non-family labor (prevalent)
  - ☐ management using salaried field workers
  - ☐ other (please specify)
- 1) Costs incurred for the installation or upgrade/modernization of irrigation and / or storage system
- 2) Gross Saleable Yield derived from irrigated crops  
% on total Gross Saleable Production  
amount €
- 3) Specific expenses incurred in the last year for water. Specify items and amount  
**Cost items** €  
Purchasing  
Maintenance  
Electric energy  
Fuel  
Other (please specify)
- 4) Have you noticed changes in yield after irrigation was applied?

## **F. Environmental issues**

- 1) Do you harvest rain water?
- 2) Do you face erosion problems?
- 3) Refer the pests and diseases that occurred during the year and how much damage had been done?
- 4) Regarding water issues, which is in your opinion the most significant of the following:
  - a. Drought
  - b. Desertification
  - c. Salinisation
  - d. Other, please define it
- 5) According to your opinion which is the main cause for water shortages in your area?
  - a. We do not have water shortages in our area
  - b. Excess pumping for irrigation by private drillings
  - c. Lack of guidance and rules regarding water distribution
  - d. Climate change
  - e. Other, define
- 6) Are you aware of the special environment legislation concerning water and programs that provide funds for environmental friendly practices: i.e. WFD (60/2000 EC), De-nitrification initiative, European Landscape Convention, Natura2000 protection areas etc.
- 7) Do you know where the drainage water ends to?

## **G. Other information**

1. Which public administration organisation/department have you visited in order to settle irrigation/drainage related issues?
2. Which were these issues (i.e. permission for or registration of drilling, permission to use electric supply for pump, etc)
3. How satisfied are you from the relevant transactions?
4. Have you received any subsidies for the installation or modernization of irrigation systems?
  - a. If yes, specify the type, year of disbursement, money lender, type of intervention, % of investment financed, disbursed amount.
  - b. Propensity to new investments in agriculture, particularly in the irrigation sector
  - c. In case of propensity, specify the type of new investments and the amount that you intend to invest on them.

## Optional questions

Characteristic photos from the farm:

1. ....
2. ....
3. ....
4. ....
5. add lines if more

Which are your views regarding the future in water management and relevant irrigation and drainage issues?

Do you think that problems maybe faced regarding water supply in the future? How does you plan to overcome them?

Area for general comments:

### **Technical data regarding selected land parcels**

If you have a relevant study/design, could you provide us with a copy of it?

- 1) Land parcel Id
- 2) Sketch of the system (water supply, layout: mainlines, typical zone pipes and laterals, height differences indication with characteristic dimensions):
- 3) Type of system
- 4) Who designed the system?
- 5) Who installed the system?
- 6) Number of zones and flow need per zone?
- 7) Materials, depth or height (in case of tree hanging) of installation
- 8) Type and characteristic of sprinklers, micro-sprinklers or emitters (flow, pressure)
- 9) Number of water distribution points<sup>4</sup> per tree
- 10) Filters, control valves, pressure regulators, air relief valves and othe components
- 11) Control components and sensors
- 12) Characteristic photos

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<sup>4</sup> Water distribution point: is used as a generic term for every irrigation system components (channel exit points, sprinklers (of any size), emitters (drippers), bubblers, micro-sprinklers etc.



ETCP GREECE-ITALY 2007-2013

IRMA

Efficient Irrigation Management Tools for Agricultural Cultivations and Urban Landscapes

Subsidy Contract No: I3.11.06

## WP4 Survey on irrigation water use

Interviewers' name:

Number of questionnaire:

Date:

04

### 4. Private Landscape /Leisure irrigation Systems<sup>1</sup>

Reference year: .....

#### A. General information regarding the organization/institution/company (when applicable)

Name:		
Address:		
Telephone numbers:		
Other contact information (website, email etc)		

#### B. General information regarding the irrigation manager

Full name:		
Nationality:		
Sex:	Male	Female
Age:		
Address:		
Telephone numbers:		
Other contact information (email etc)		
Educational level / qualifications ?		
Foreign languages?		
Profession?		
How familiar are you with the use of IT technology?	A lot	Enough
	Fairly	Just a bit
	Not at all	
Do you have a PC/Laptop/Tablet etc?	Yes	No
Do you have a SmartPhone?	Yes	No
Do you use the internet:	Yes	No
Are you informed/trained systematically or not by any means regarding gardening issues (including irrigation)?		

#### C. Landscape, irrigation system and irrigation management information

Reference year: .....

Region, Municipality, Town/Village	
Green surface managed (m <sup>2</sup> )	
Green surface irrigated (m <sup>2</sup> )	
Turf grass area (m <sup>2</sup> and type or irrigation system)	
Shrub area (m <sup>2</sup> and kind or irrigation system)	

<sup>1</sup> Academic campus, Institutional park, sport's establishments (golf, football, tennis etc), touristic and leisure set ups, individuals owning private garden etc.

Other areas i.e. synthetic turf, meadows, alternative groundcovers etc (m <sup>2</sup> and type or irrigation system)	
Water supply source (Tap water, well, drilling, rain water harvest, treated waste water other)	
How much water is consumed for irrigation on average per year? (m <sup>3</sup> /year) Is this an estimation or do you have special water meter to measure it?	
In case you use tap water, do you know the cost of water? Are volume consumption levels applied to cost per m <sup>3</sup> in your area? Could you provide us with the relevant bill(s) of last irrigation period (2013)?	
In case you use water from drilling, do you know the cost of energy to pump water? Are energy consumption levels applied to cost per kWh in your area? Could you provide us with the relevant bill(s) of last irrigation period (2013)?	
Total cost of irrigation water (€/year), please specify the percentage of total for water, system maintenance, energy etc.	

Other questions:

1. If you use a drilling could you provide the following data:
  - a. Year of installation
  - b. Depth of the drilling
  - c. Diameter of drilling suction pipe
  - d. Type of pump, pump power, year of purchase
  - e. Average discharge flow rate (m<sup>3</sup>/ hour) at head (bar of m H<sub>2</sub>O)
  - f. Type of energy source
  - g. Filters and filtering problems
2. How often do you perform soil and water analysis?
3. Are you aware of web sites that provide agrometeorological information and tools for irrigation, fertilization, etc calculations (name them i.e. <http://www.cimis.water.ca.gov>, <http://www.agrometeopuglia.it>, <http://probiosis.teiep.gr>, <http://www.hnms.gr>, <http://www.meteo.gr> etc)
4. Do you think that irrigation and drainage systems should be designed and constructed by specifically trained professionals? Would you pay for such a service?
5. In case that your system has been done by a professional did she/he provided you with a study, designs, irrigation scheduling proposal?
6. How much (and when) did you pay for this service?
7. Is your irrigation equipment easy to manage? If No, please explain why
8. Are you aware of web sites that provide agrometeorological information and tools for irrigation, fertilization, etc calculations (name them i.e. <http://www.cimis.water.ca.gov>, <http://www.agrometeopuglia.it>, <http://probiosis.teiep.gr>, <http://www.hnms.gr>, <http://www.meteo.gr> etc)?
9. Do you ask for professional assistance regarding the set up of the irrigation schedule you apply?
10. How do you apply the irrigation schedule, manually? using a controller?
11. If you use a controller how often do you make changes (schedule change, water budget figure change, rain delay change etc) to it?
12. Does your control system use any kind of sensor (rain sensor, soil moisture sensor etc)?
13. Do you think that this kind of technology (sophisticated controller, sensors etc) would lead to significant lowering of water consumption? Would you expect great cost gains from this?
14. Would you use an automatic advice service regarding irrigation scheduling? Would you prefer that your agronomist/councilor use that service and review the advice before you are suggested to apply it? Would you pay for this service?
15. Is your irrigation equipment easy to maintain? If No, please explain why

16. Do you perform technical and/or environmental auditing to you irrigation system? Could you provide us with a copy of the most recent one?
17. Do you ask for professional assistance regarding the amount of fertilizers you apply?
18. Are run-off, waterlogging and drainage problems exist at your garden?
19. Do you know where run-off or drainage water from your garden ends to?
20. Would you interested to change your garden to a more water conservation one, have you heard the term xeriscaping?
21. How frequent do you check you system for leakages, adequate distribution uniformity etc?
22. If you where obliged by the state to change turfgrass by an other kind of ground cover, which of the following would you prefer (put a priority number next to each alternative):
- ☐ Synthetic grass
  - ☐ Full cover meadow
  - ☐ Passing through meadow
  - ☐ Inorganic groundcover (sand, pebble, pine bark etc)
23. Regarding water issues, which is in your opinion the most significant of the following:
- ☐ Lack of straightforward strategy regarding water management
  - ☐ Lack or insufficient size of central irrigation systems
  - ☐ Lack or insufficient percentage of modern central irrigation systems
  - ☐ Inefficient water management at basin level
  - ☐ Lack of training
  - ☐ Inefficient water management at end user level
24. Regarding water issues, which is in your opinion the most significant of the following:
- ☐ Drought
  - ☐ Desertification
  - ☐ Salinization
  - ☐ Other, please define it
25. According to your opinion which is the main cause for water shortages in your area?
- ☐ We do not have water shortages in our area
  - ☐ Excess pumping for irrigation by private drillings
  - ☐ Lack of guidance and rules regarding water distribution
  - ☐ Climate change
  - ☐ Other, define

## Optional questions

Characteristic photos from the landscape project:

1. ....
2. ....
3. ....
4. .... add lines if more

## **Technical data**

If you have a relevant study/design, could you provide us with a copy of it?

- 1) Sketch of the system (water supply, layout: mainlines, typical zone pipes and laterals, height differences indication with characteristic dimensions):
- 2) Type of system
- 3) Who designed the system?
- 4) Who installed the system?
- 5) Number of zones and flow need per zone?
- 6) Materials, depth of height (in case of tree hanging) of installation
- 7) Type and characteristic of sprinklers, micro-sprinklers or emitters (flow, pressure)
- 8) Number of water distribution points<sup>2</sup> per tree
- 9) Filters, control valves, pressure regulators, air relief valves and other components
- 10) Control components and sensors
- 11) Characteristic photos

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<sup>2</sup> Water distribution point: is used as a generic term for every irrigation system components (channel exit points, sprinklers (of any size), emitters (drippers), bubblers, micro-sprinklers etc.