Interreg V A Greece-Italy Programme 2014-2020

Interreg Greece-Italy
European Regional Development Fund

EUROPEAN UNION

IR$_2$MA

Large Scale Irrigation Management Tools for Sustainable Water Management in Rural Areas and Protection of Receiving Aquatic Ecosystems

CONSORZIO
PER LA BONIFICA
DELLA CAPITANATA

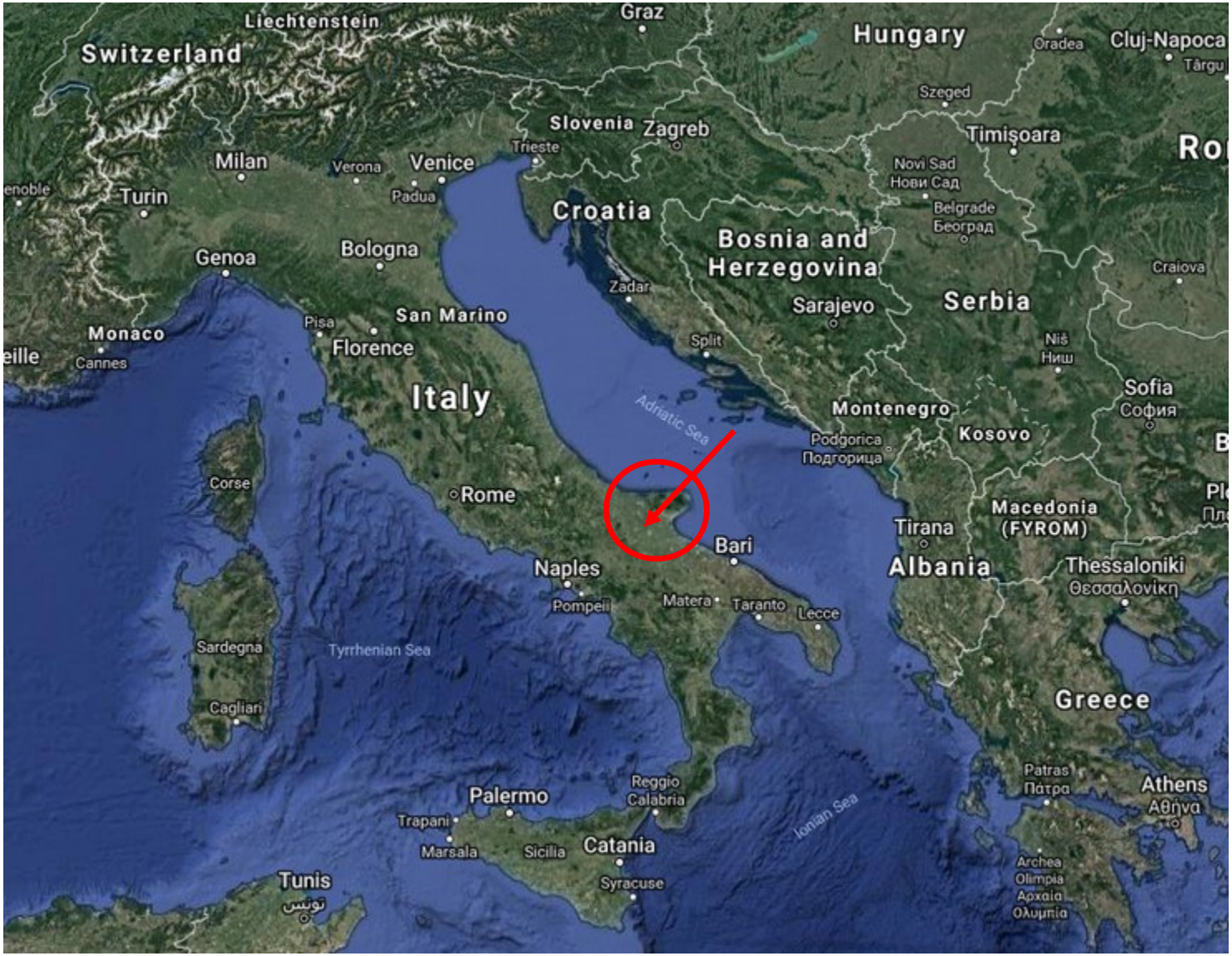
www.consorzio.fg.it

Kickoff meeting

Arta, Greece Monday, May 14, 2018

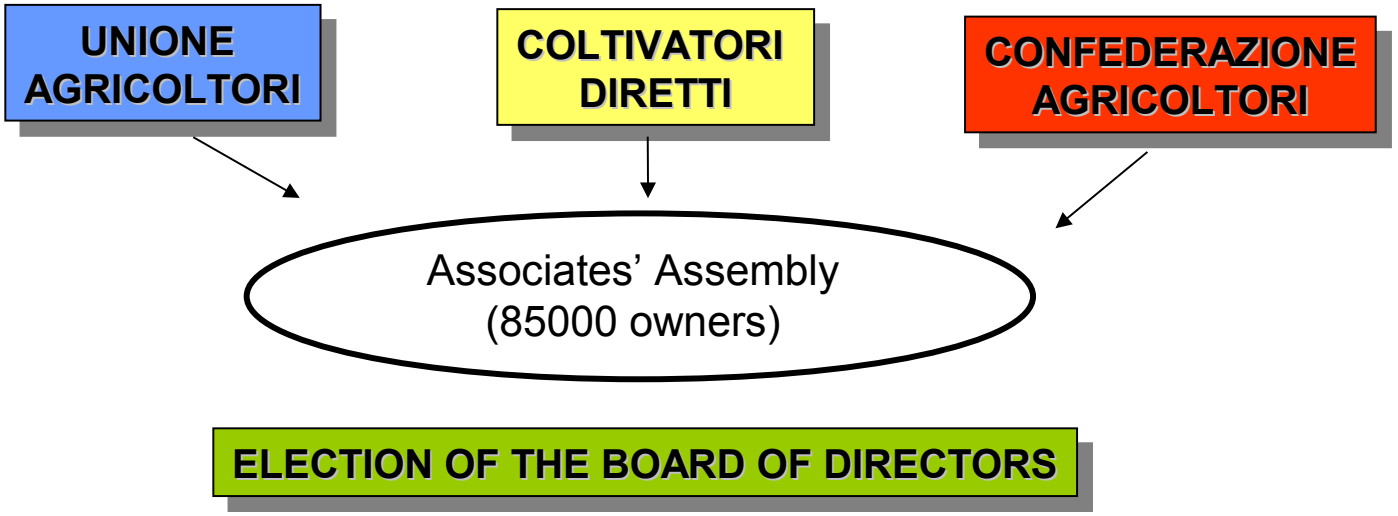
The Capitanata Reclamation Consortia

Geografic localization



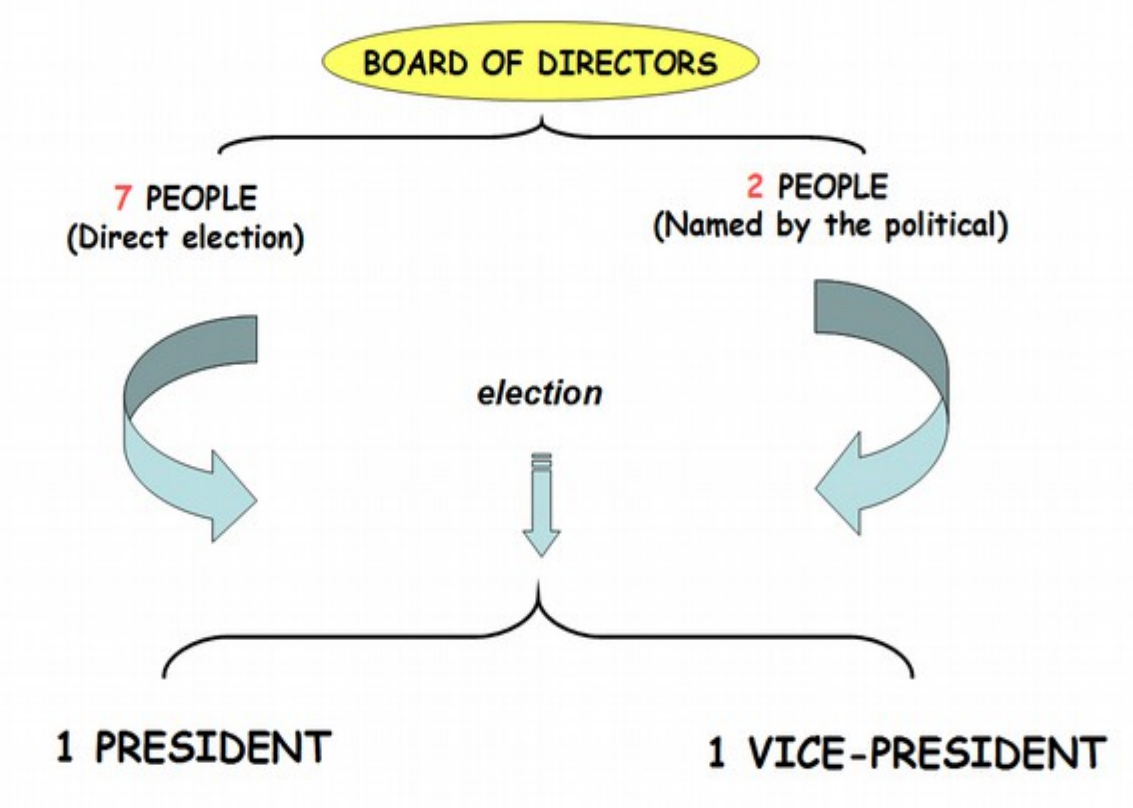
CONSORTIUM ADMISTRATIVE ORGANIZATION

- ✓ *The Consortium has a proper STATUTE that regulates the admistrative structure of the body;*
- ✓ *It is administered by the FARMERS, i.e. those who own lands within the Consortium;*
- ✓ *Farmers are generally members of TRADE-UNION ASSOCIATIONS that represent the common economic and social interests of the farmers with respect to the community;*
- ✓ *The three Trade-union Associations grouping almost the farmers are:*



At present, after the publication of regional law n. 4/2012, the governing organs of the Consortium are:

- ✔ *Board of Directors*
- ✔ *The President and one Vice – President*
- ✔ *Single auditor*



TECHNICAL STRUCTURE

GENERAL DIRECTOR

DIRECTOR OF AGRICULTURAL SERVICE

- WATERSHED MANAGEMENT
- EXTENSION SERVICE
- IRRIGATION

DIRECTOR OF ENGINEERING SERVICE

- BIG WORKS (design, supervision, manteinance, ...

DIRECTOR OF ADMINISTRATION SERVICE

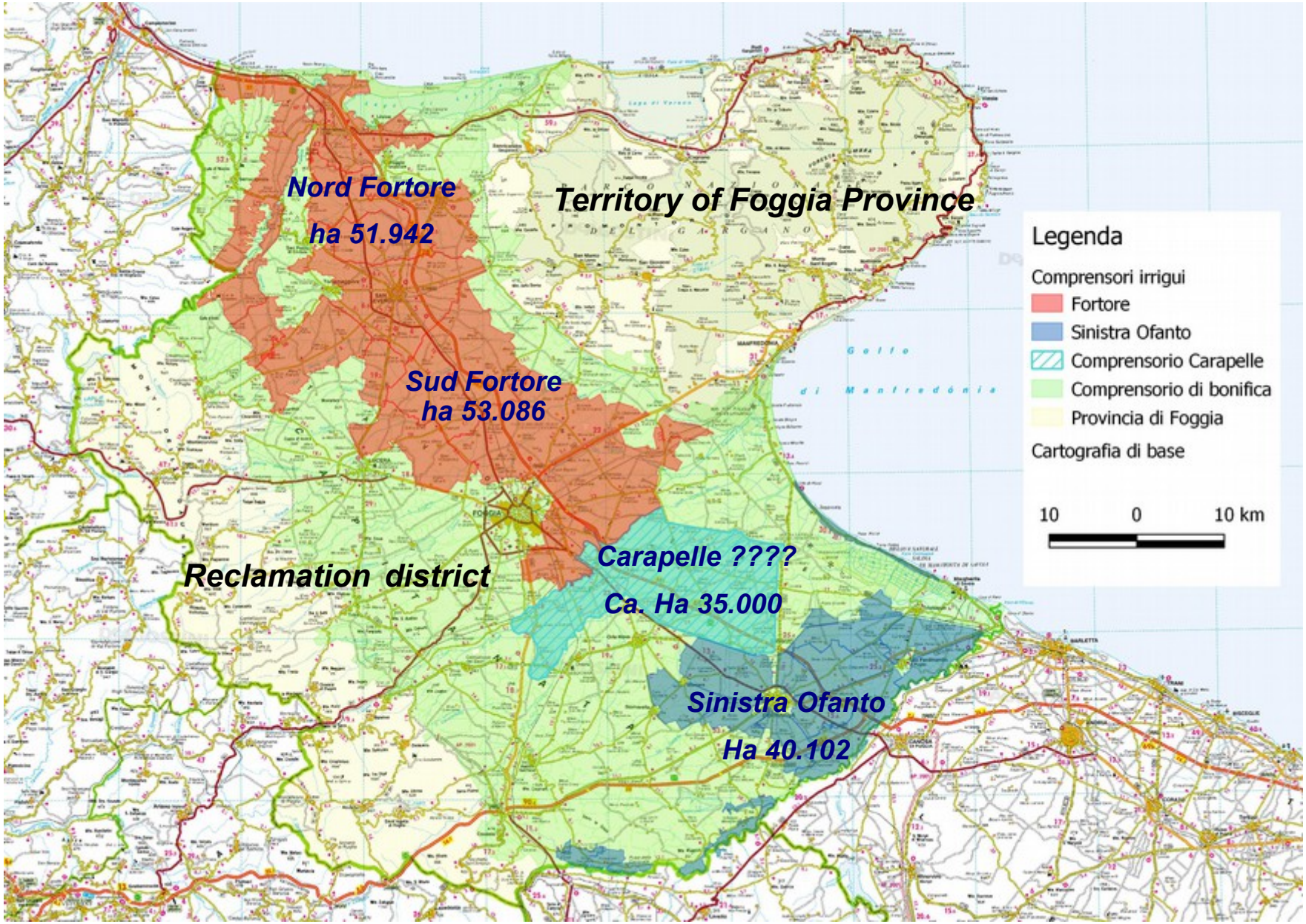
- LEGAL SESSION
- PERSONNEL
- ESPROPRIATIONS
- CONTRACTS
- LAND REGISTRY AND TRIBUTE OFFICE

PERIFERICAL OFFICE (one on each 10 000 - 15 000 ha)
1 head and one assigned at the office job +
3 workers (in charge for repairing) +
2 – 3 groups of two workers (in charge for controlling and maintanance)

- one pick-up for each group of workers
- one truck
- one excavator

The Capitanata Reclamation Consortia

The territory and the works



The Capitanata Reclamation Consortia

Sources of water supply

Occhito Dam
Overall capaciy 250 millions of cubic meters

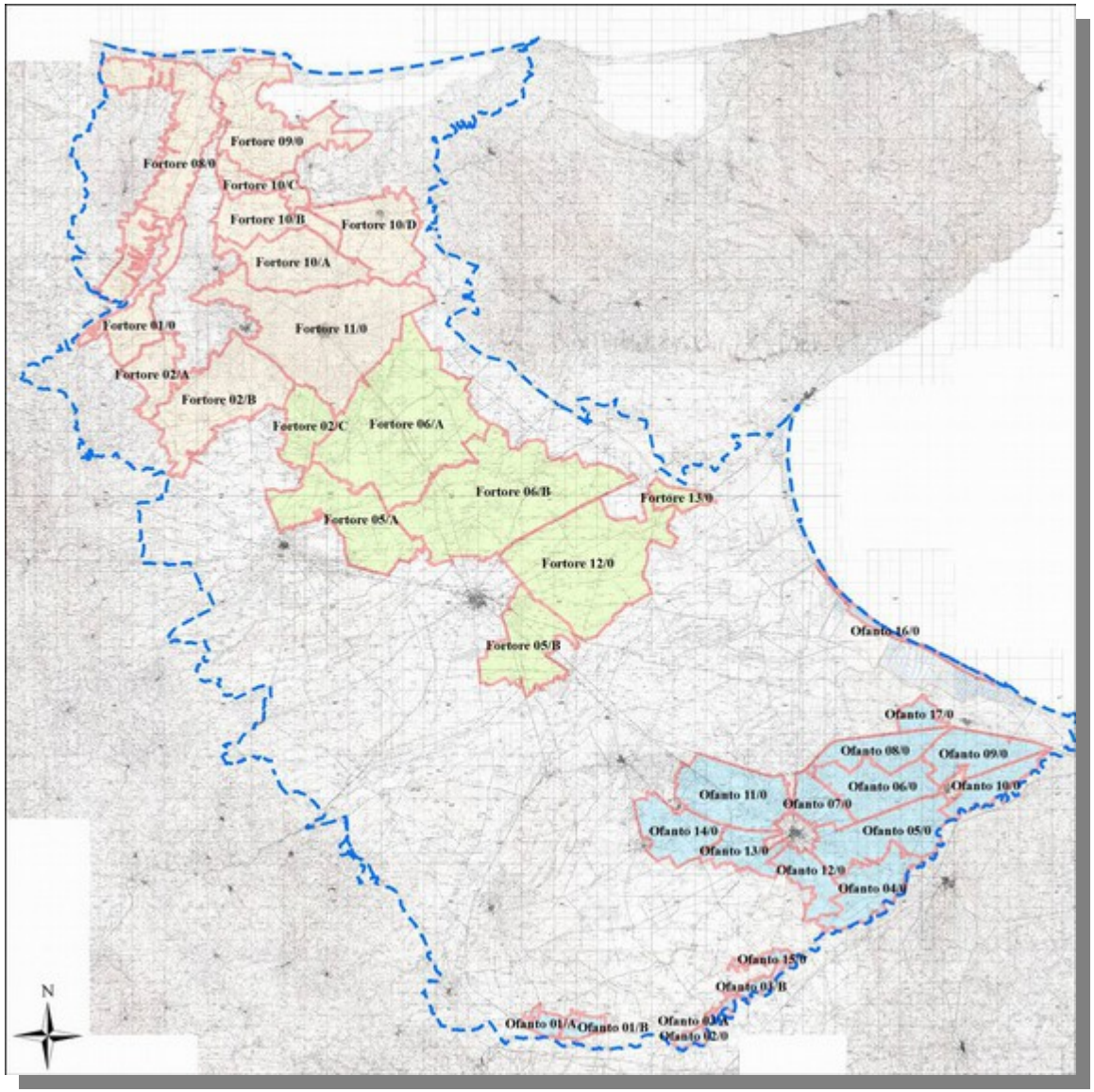
Capacciotti Dam
Overall capaciy 49 millions of cubic meters

Capaccio Dam
Overall capaciy 17 millions of cubic meters

San Pietro Dam
Overall capaciy 14 millions of cubic meters

The Capitanata Reclamation Consortia

Irrigated districts



IRRIGATED DISTRICTS (Nord Fortore – Sud Fortore – Sinistra Ofanto)

SURFACE	Ha	145.131
ASSOCIATED FARMS	n°	42.000
USERS	n°	49.688
DISTRECTS	n°	38
SECTORS	n°	986

HYDRANTS:

MECHANIC	*n° 13.694*
ELECTRONIC	*n° 13.513*

HYDRANT PIPES *n° 49.500*

WATER DELIVERY NETWORKS km 5.915:

STEEL	*0,62%*
ASBESTOS CEMENT	*56,79%*
POLYETHYLENE	*0,79%*
PVC	*41,73%*
FIBERGLASSN	*0,07%*

VEHICLES:

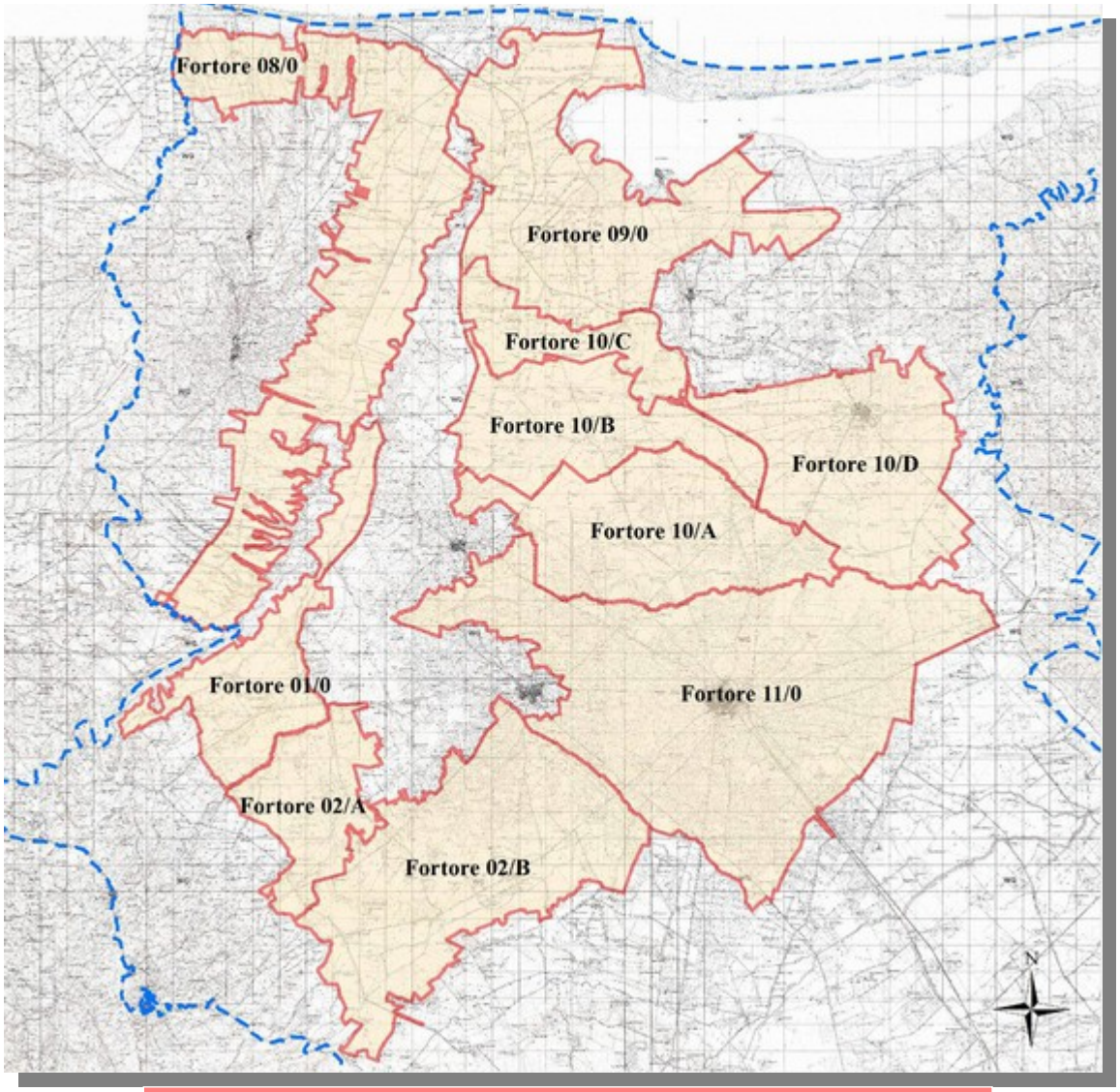
CARS	*n° 23*
MOTOR BIKES	*n° 5*
PICKUP TRUCKS	*n° 63*
LIGHT TRUCKS	*n° 18*
RUBBERIZED BACKHOE	*n° 16*

STAFF

SECTOR LEADERS	*n° 4*
HEADQUARTER TECHNICAL STAFF	*n° 8*
RESPONSIBLE DISTRICTS AND COADJUTORS	*n° 34*
AUXILIARY STAFF T.I.	*n° 85*
AUXILIARY STAFF T.D.	*n° 42*

The Capitanata Reclamation Consortia

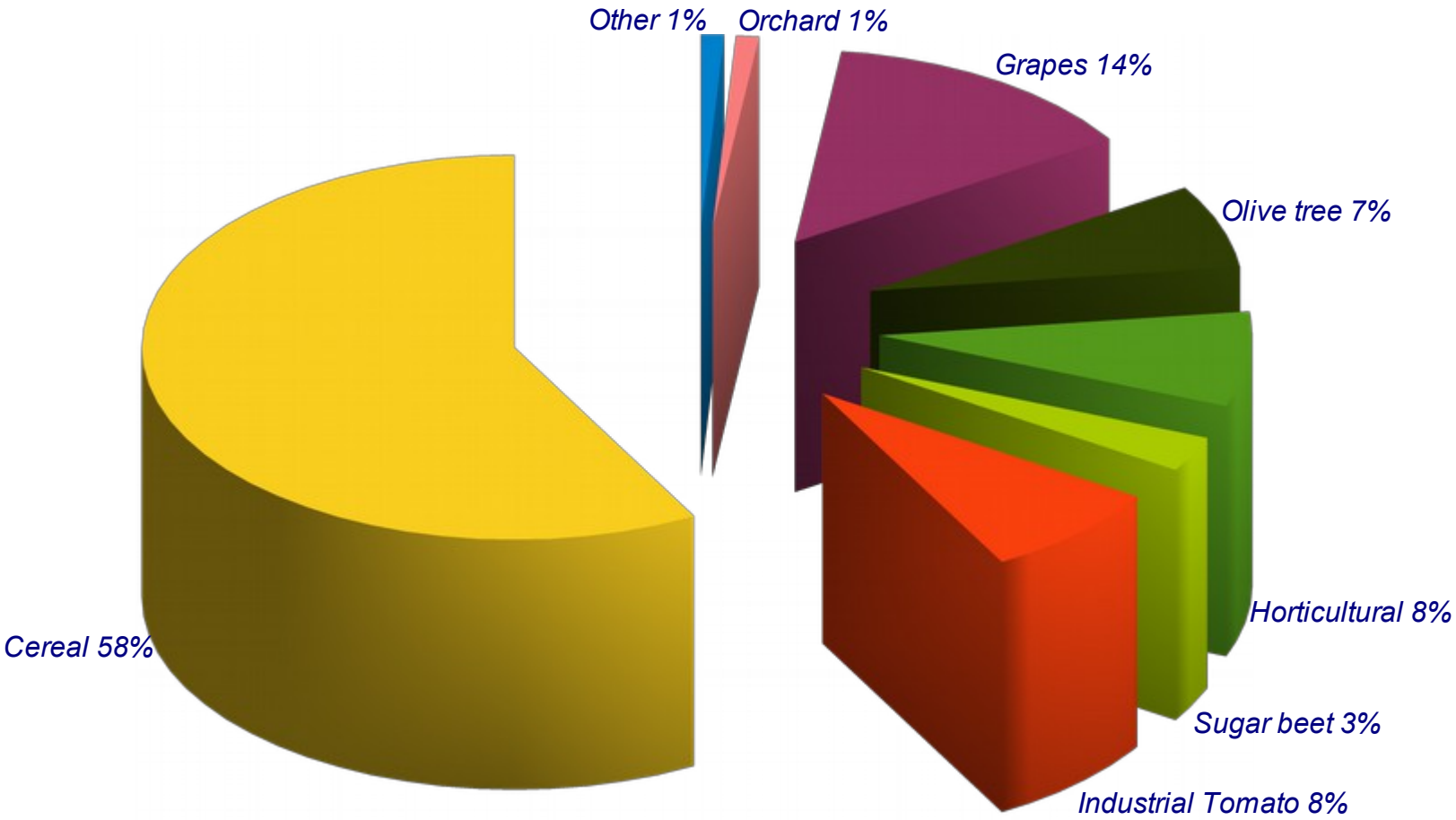
Nord Fortore irrigated districts



EQUIPPED SURFACE: Ha 51.942
USERS: n. 18.314

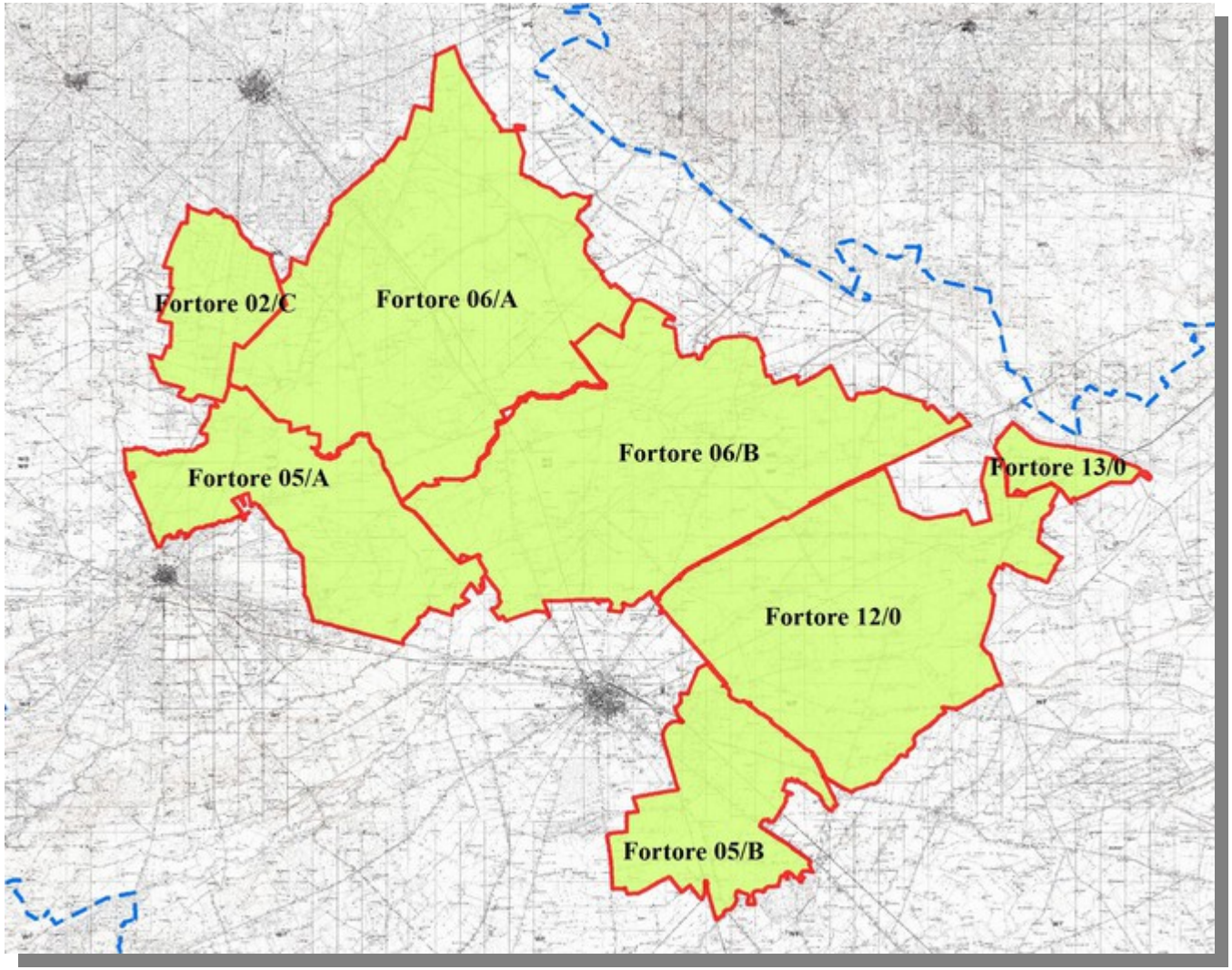
Nord Fortore irrigated districts

Distribution of crops compared to equipped area (51.942 ha)



The Capitanata Reclamation Consortia

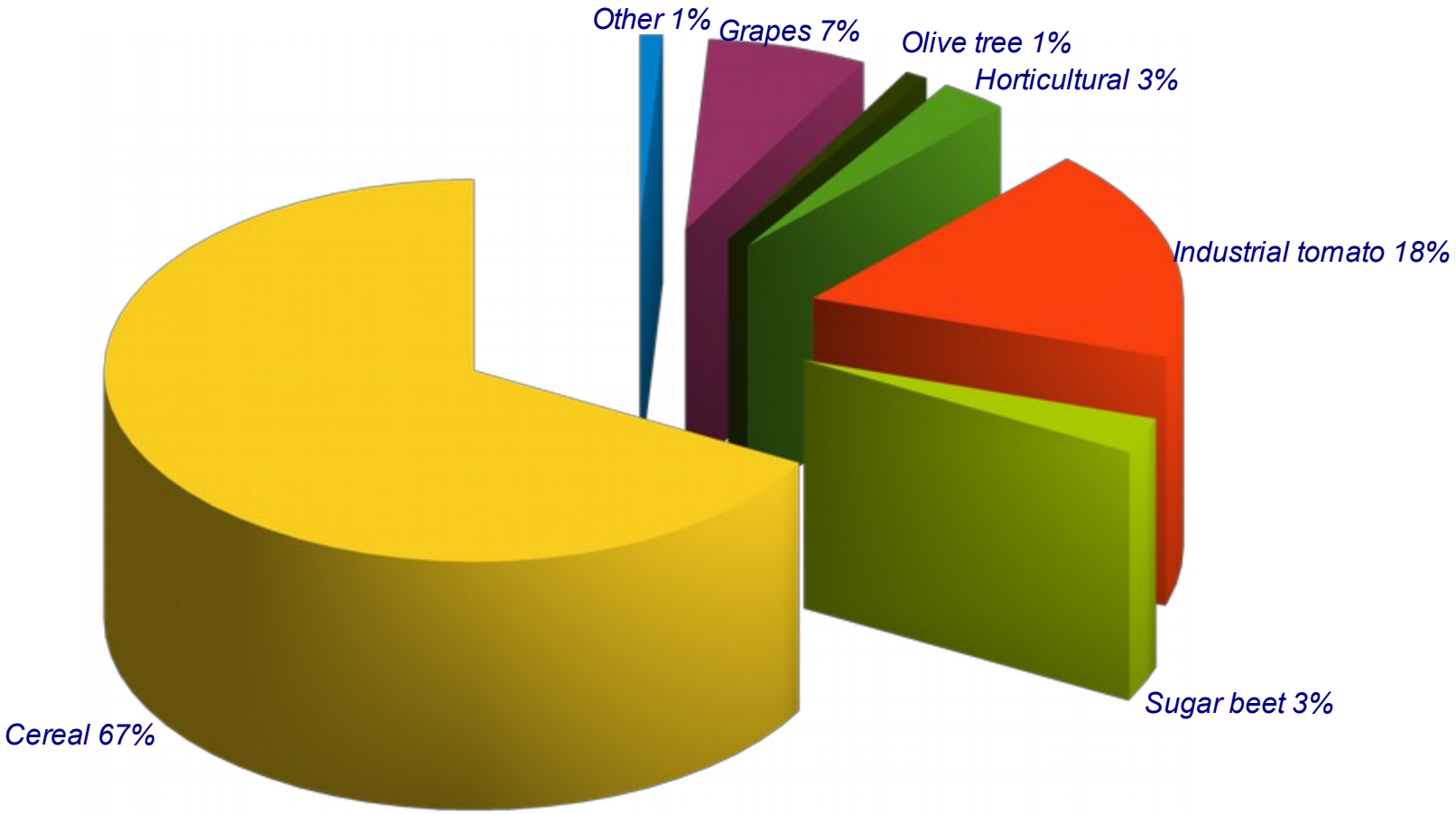
Sud Fortore irrigated districts



EQUIPPED SURFACE: Ha 53.086
USERS: n. 8.044

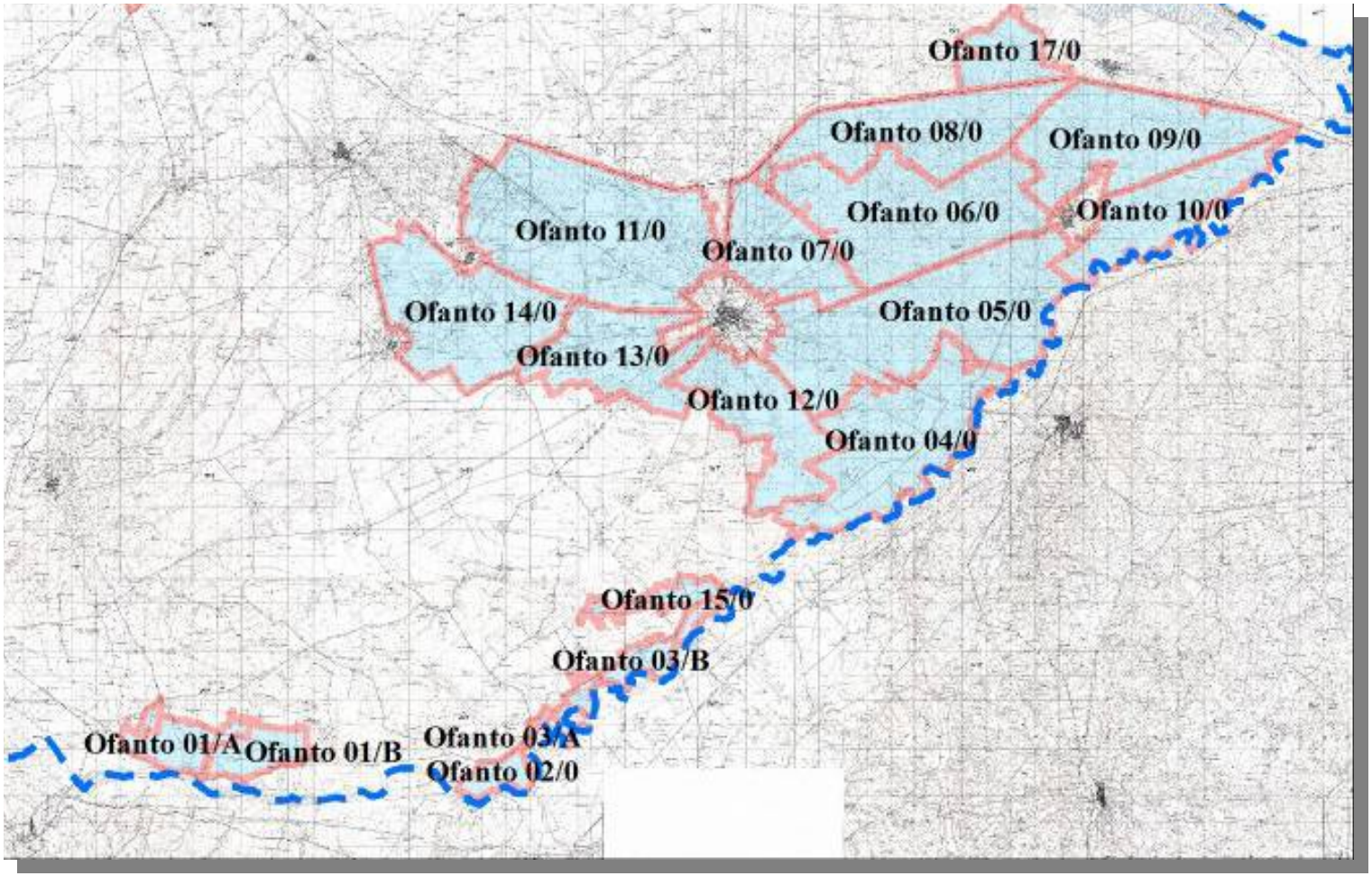
Sud Fortore irrigated district

Distribution of crops compared to equipped area (53.086 ha)



The Capitanata Reclamation Consortia

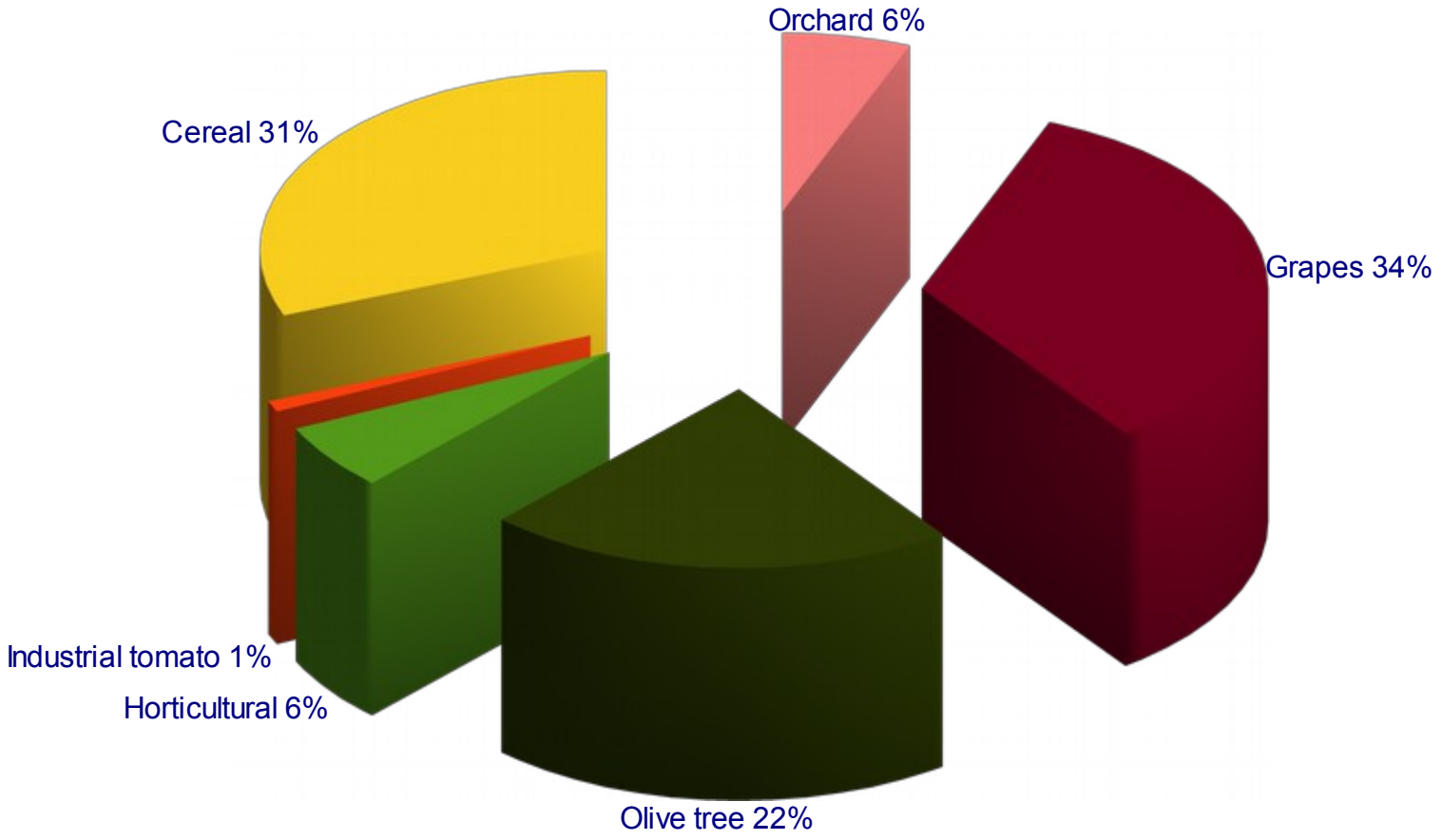
Sinistra Ofanto irrigated districts



EQUIPPED SURFACE: Ha 40.102
USERS: n. 23.330

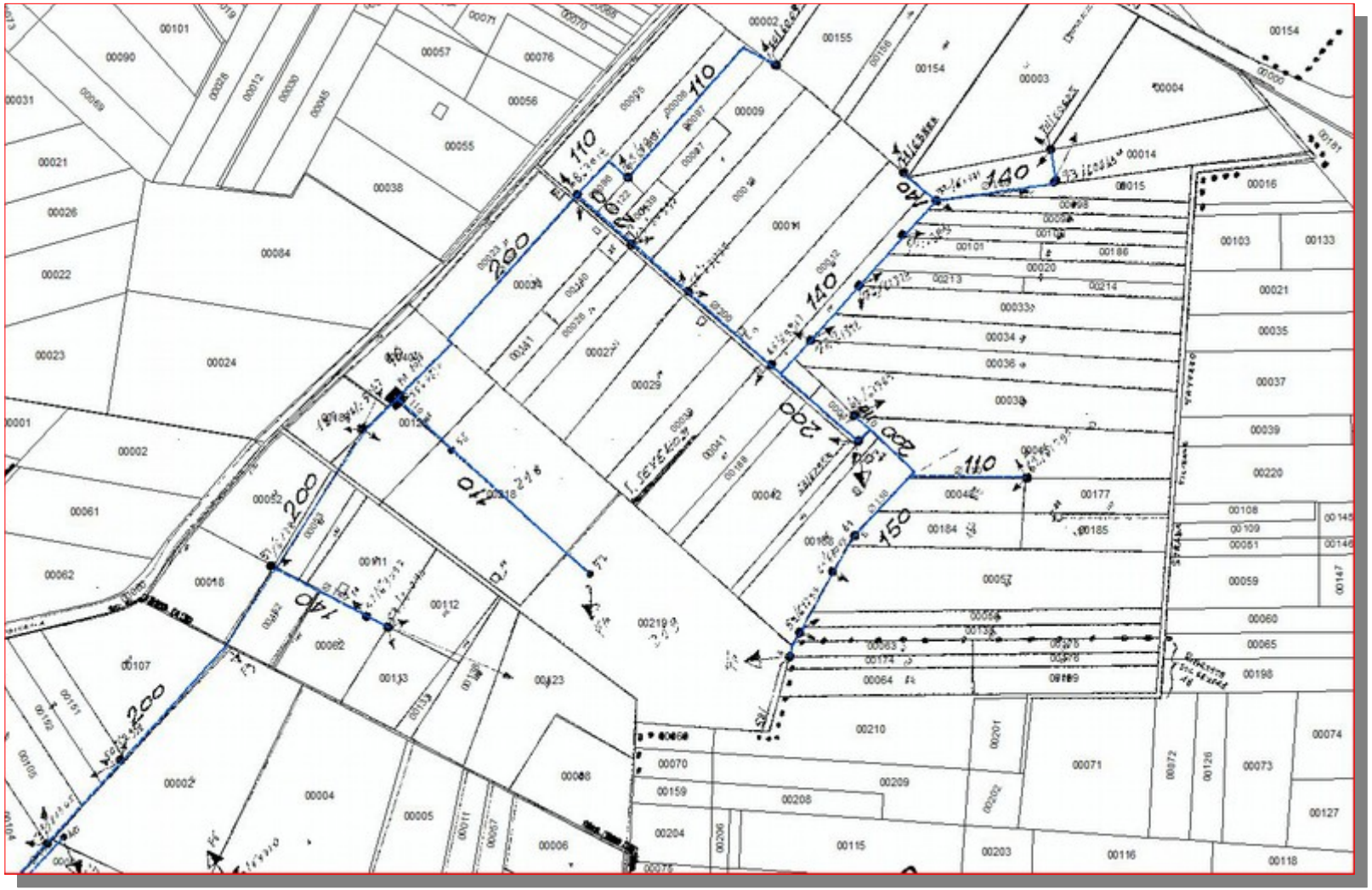
Sinistra Ofanto irrigated district

Distribution of crops compared to equipped area (40.102 ha)



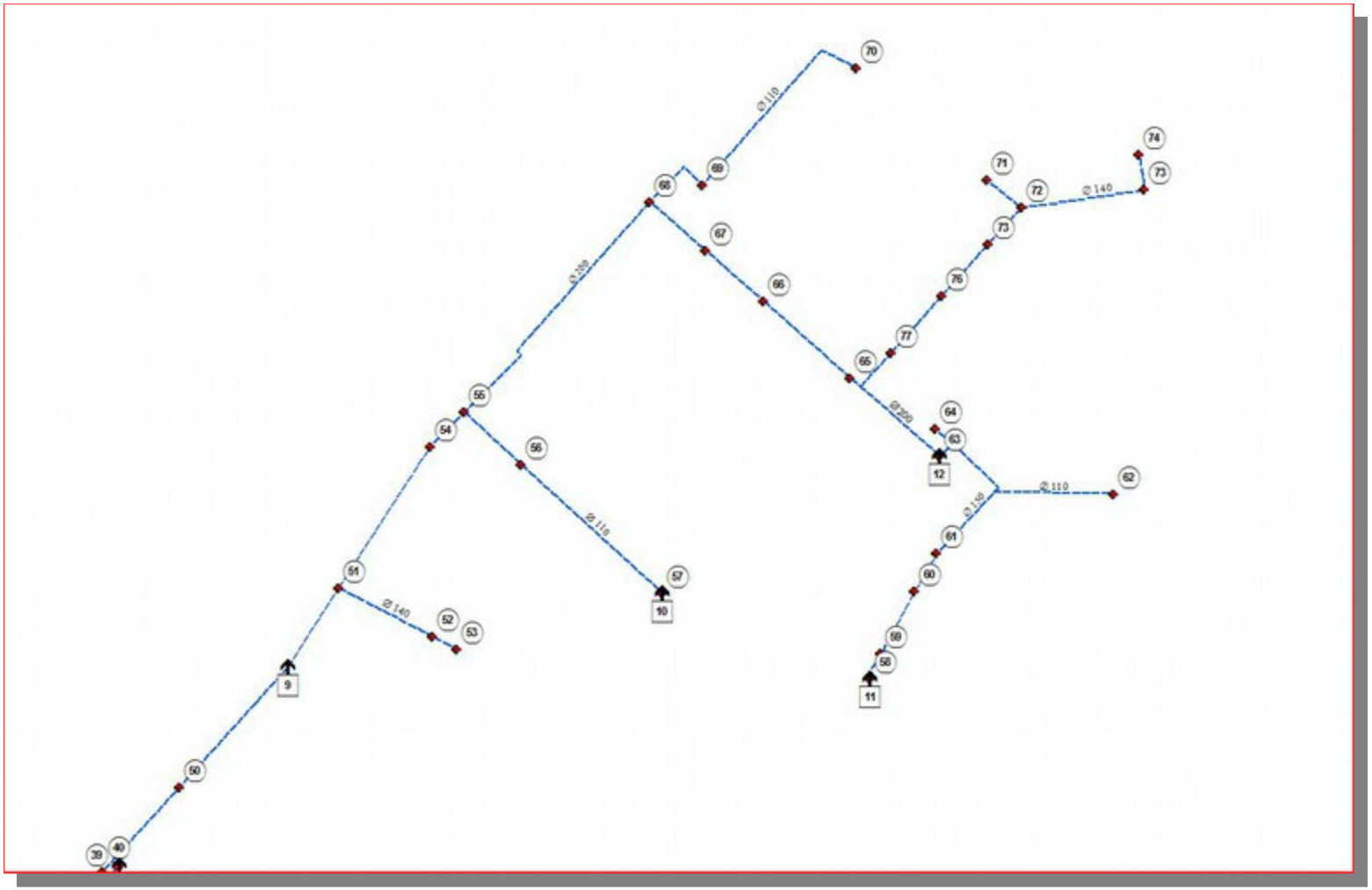
Irrigated networks: digitization

Digitization networks and data acquisition on pipelines and hydraulic equipment



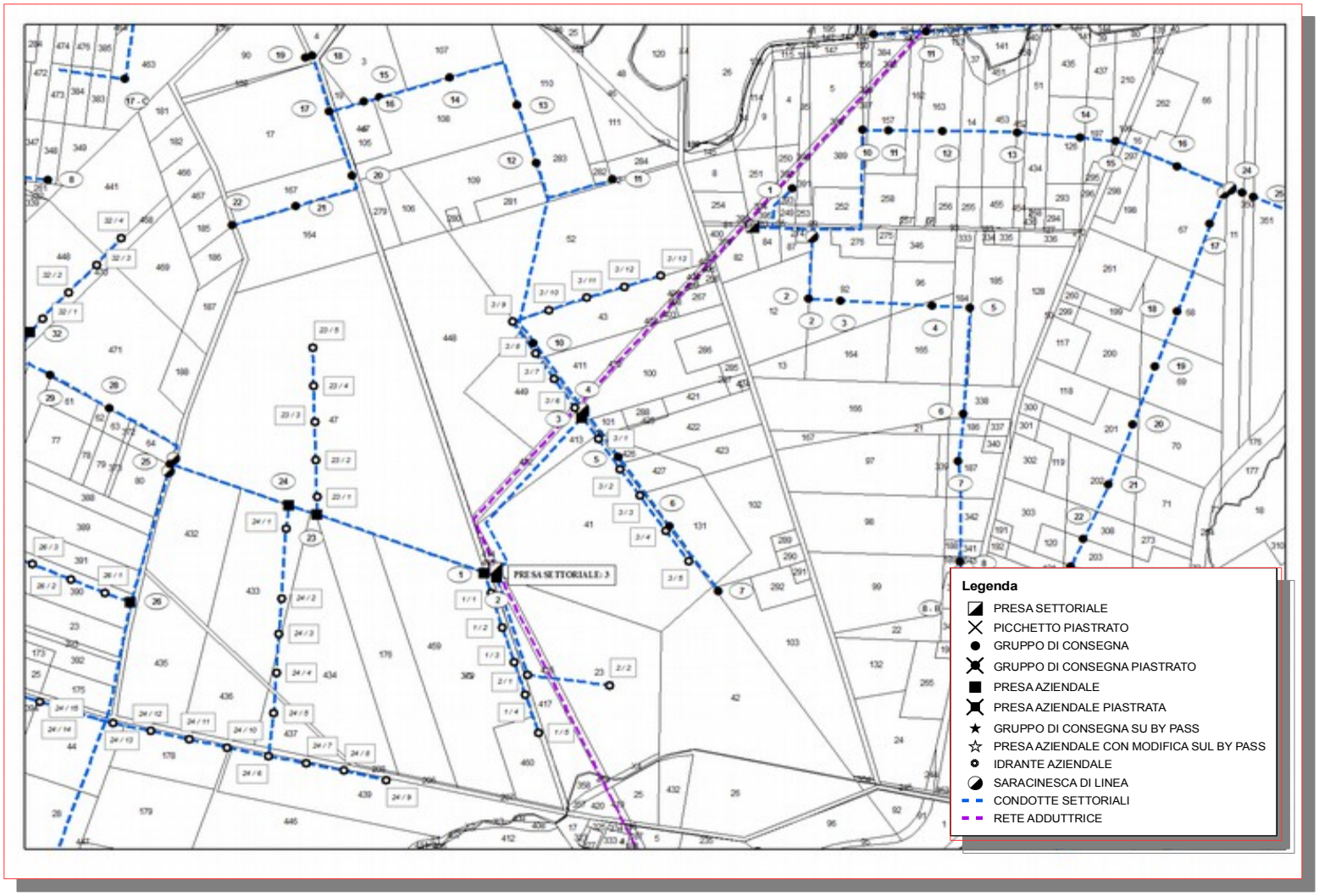
Irrigated networks: digitization

First result: networks and equipment layer



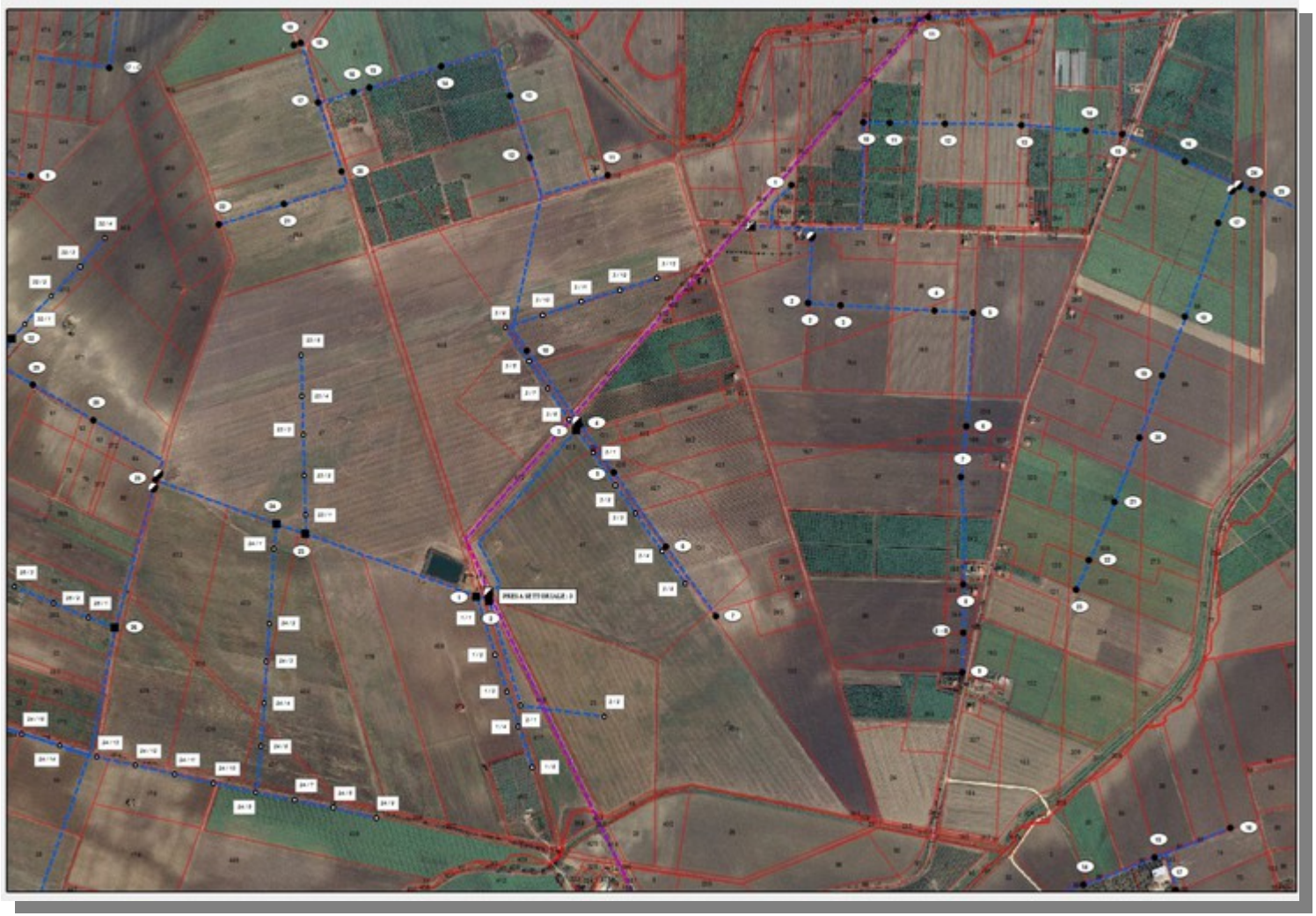
Irrigated networks: digitization

Bounding property and irrigated networks



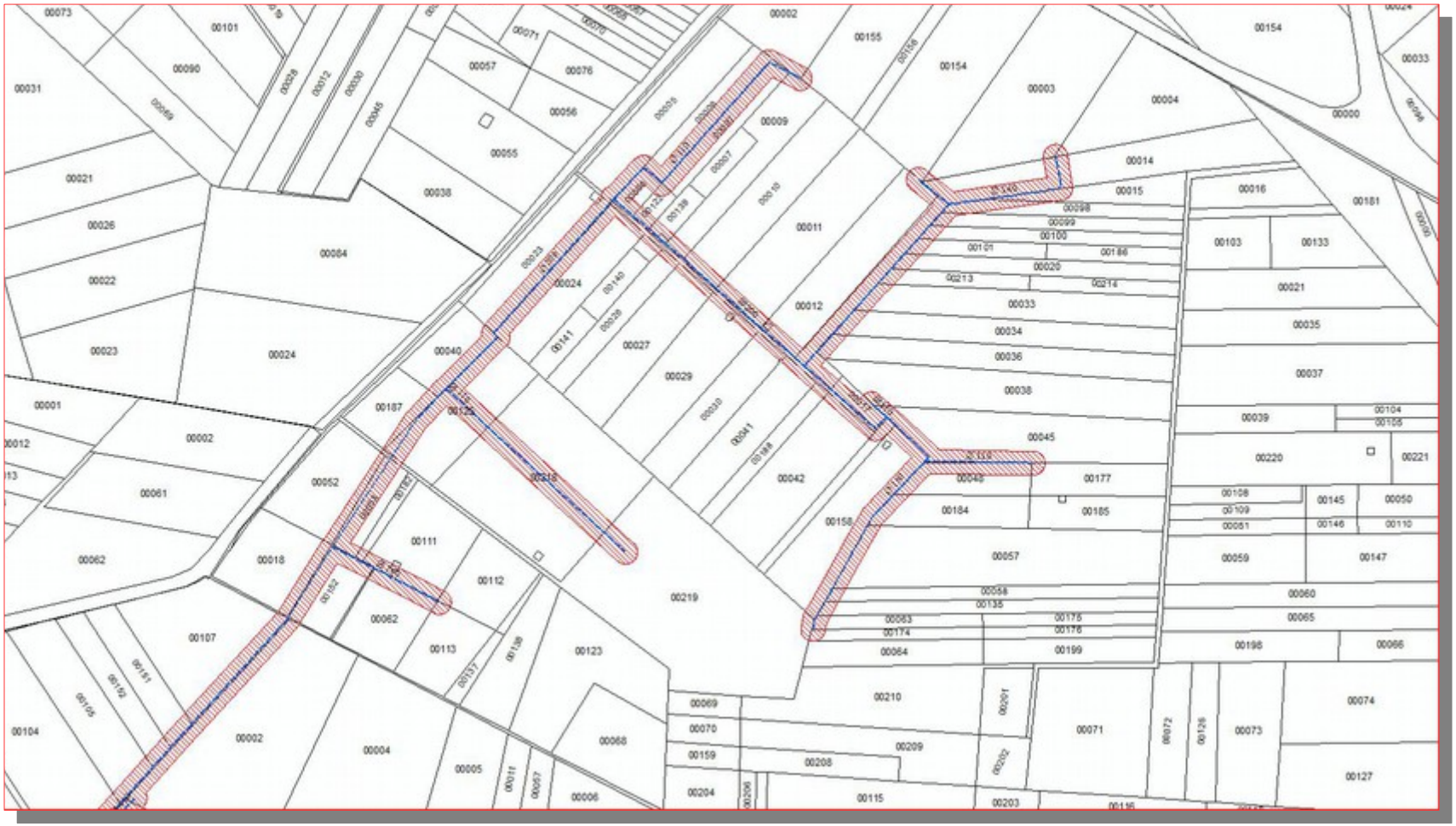
Irrigated networks: digitization

Orthophotos + bounding property + irrigated networks

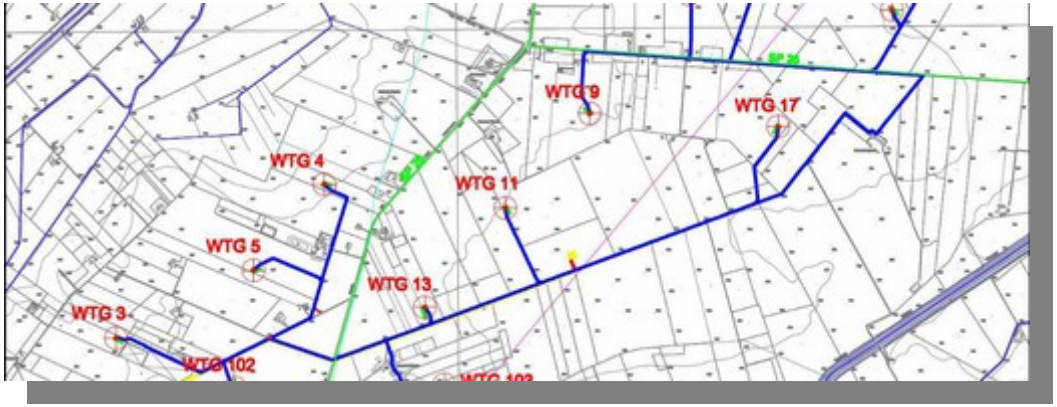


Irrigated networks: digitization

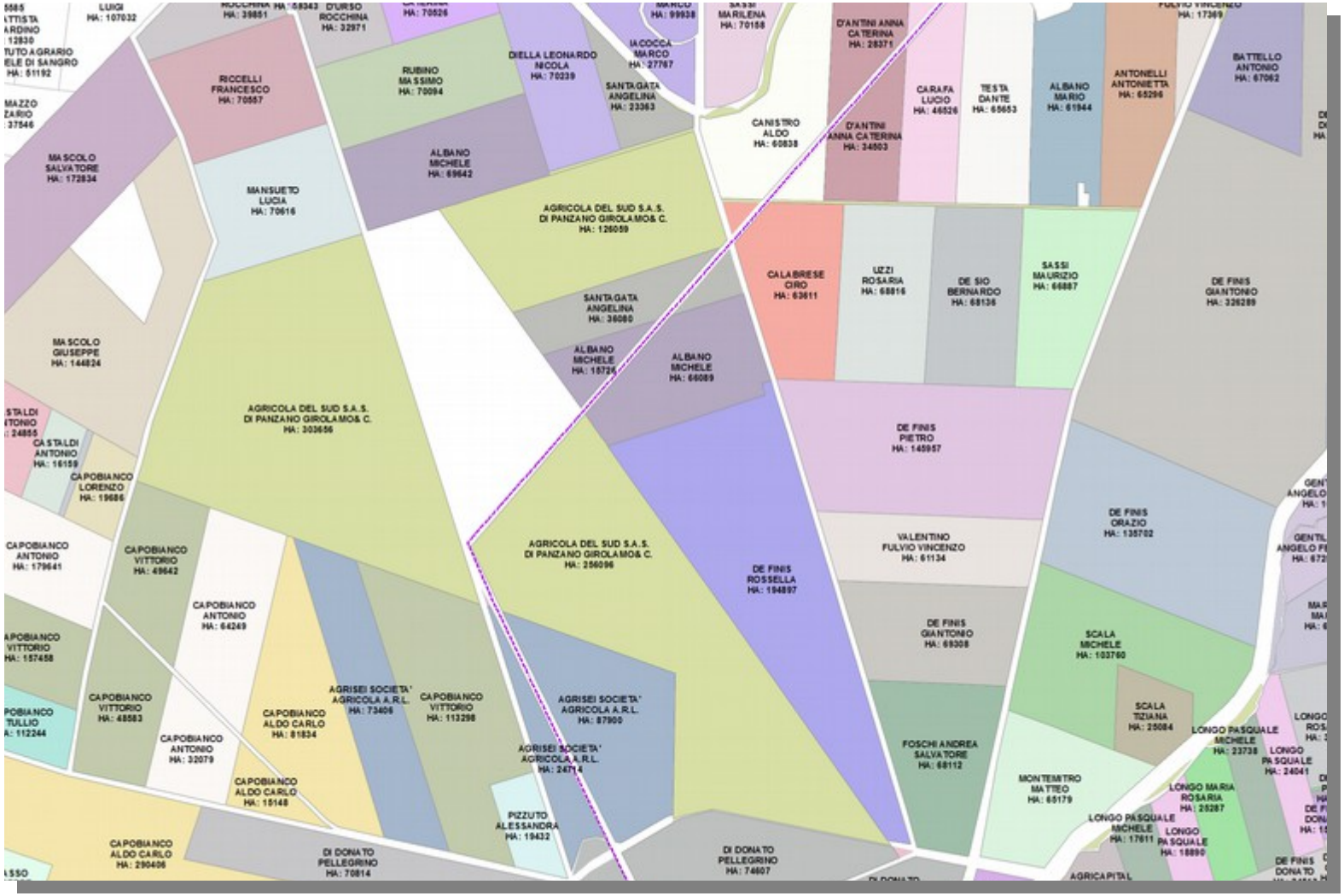
Derivative themes : areas serving public works and related bands of respect



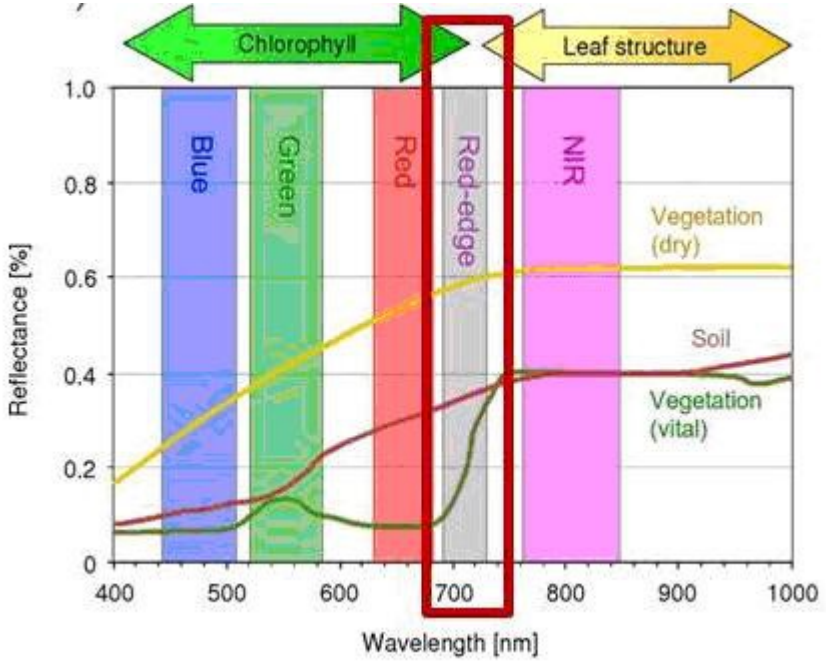
Interference check



Bounding property and cover crops



Satellite data to support irrigation management



Immagini satellitari utilizzate	
Rapideye *Livello 3A*	Dimensione dei pixel (ortorettificati) 5 m
Bande: •*Blu* •*Verde* •*Rosso* •*Rosso profondo* •*Vicino Infrarosso*	 440 – 510 (nm) 520 – 590 (nm) 630 – 685 (nm) 690 – 730 (nm) 760 – 850 (nm)
Data di acquisizione	Seconda decade di luglio

Satellite image - Year 2012

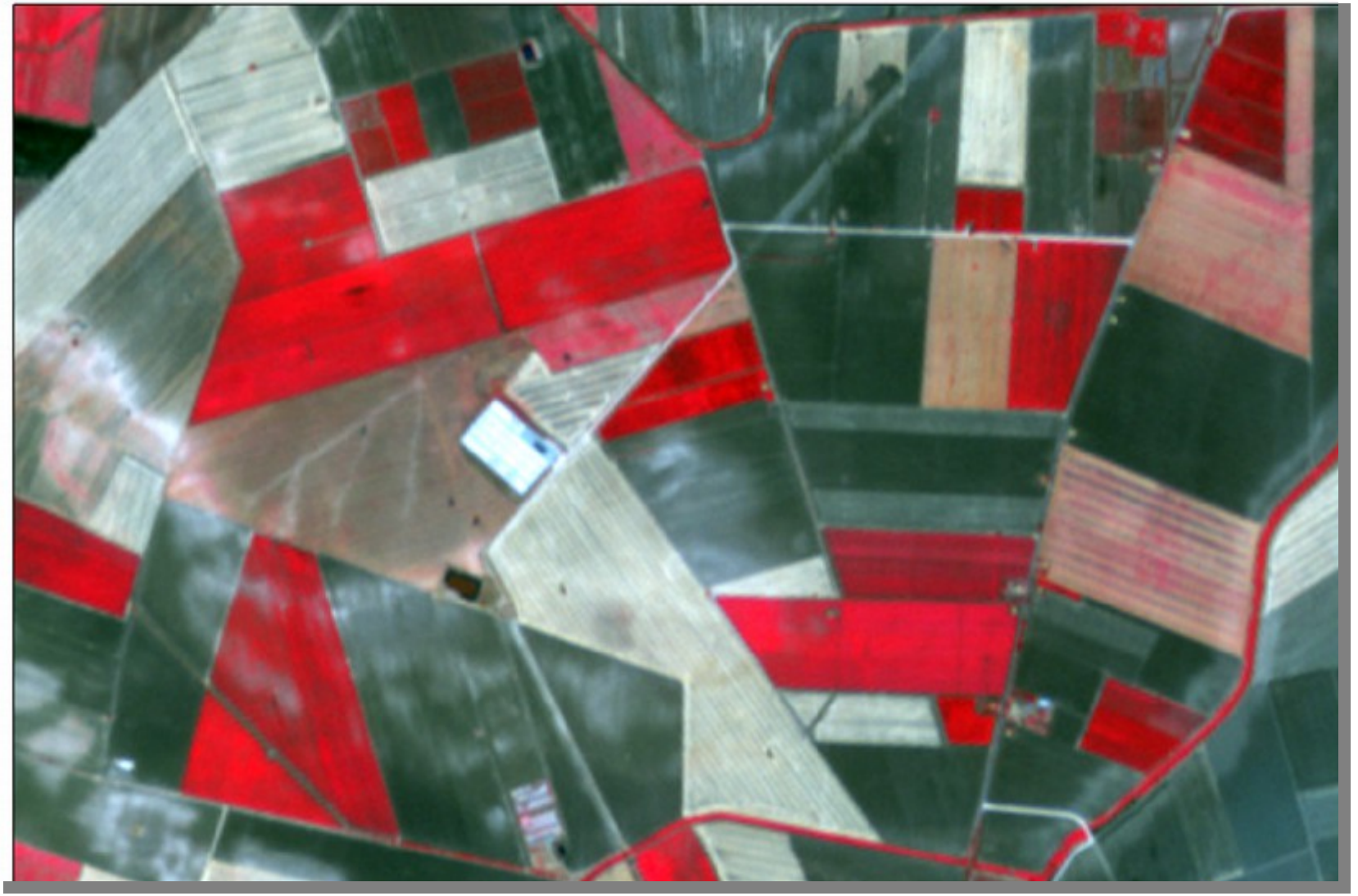
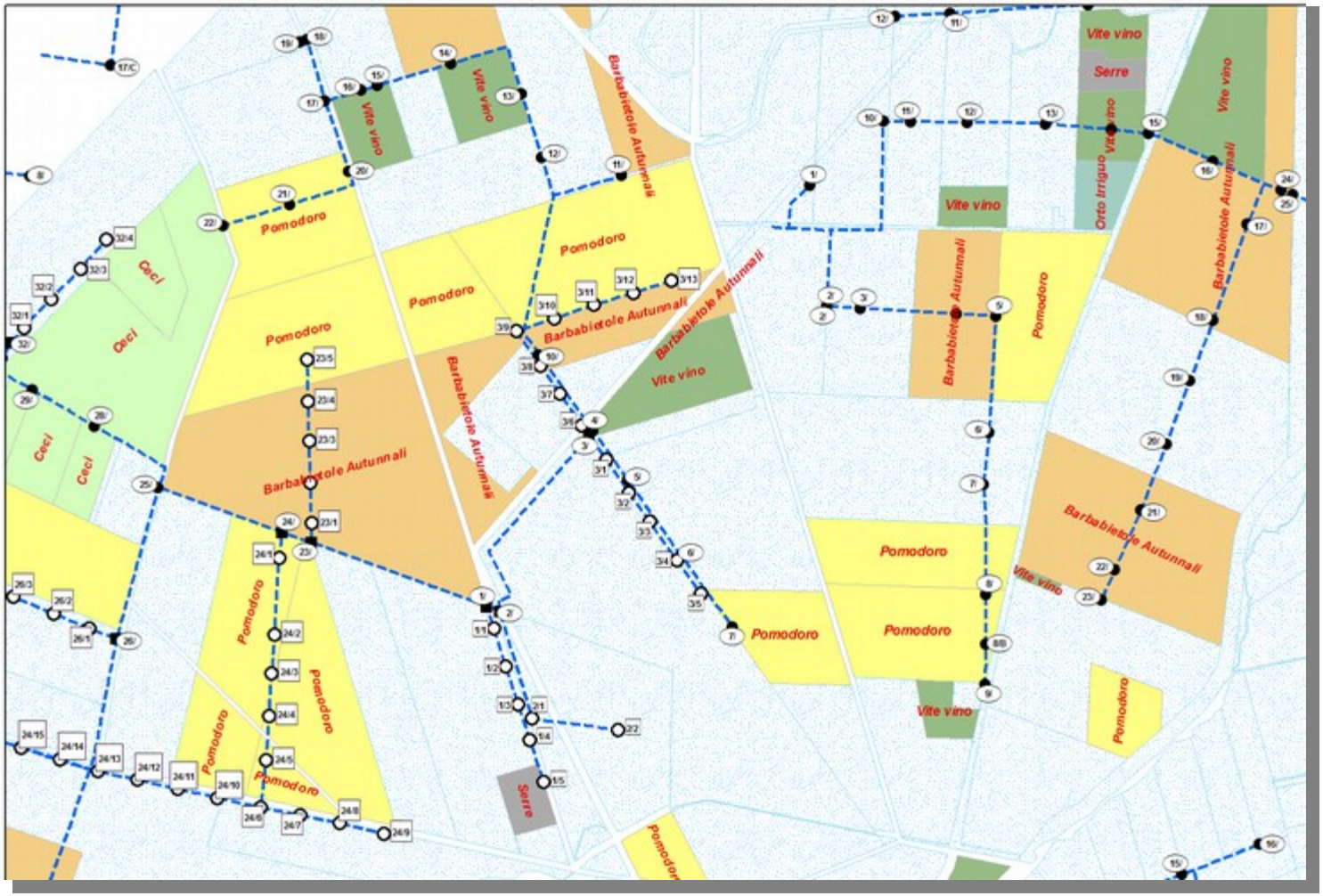
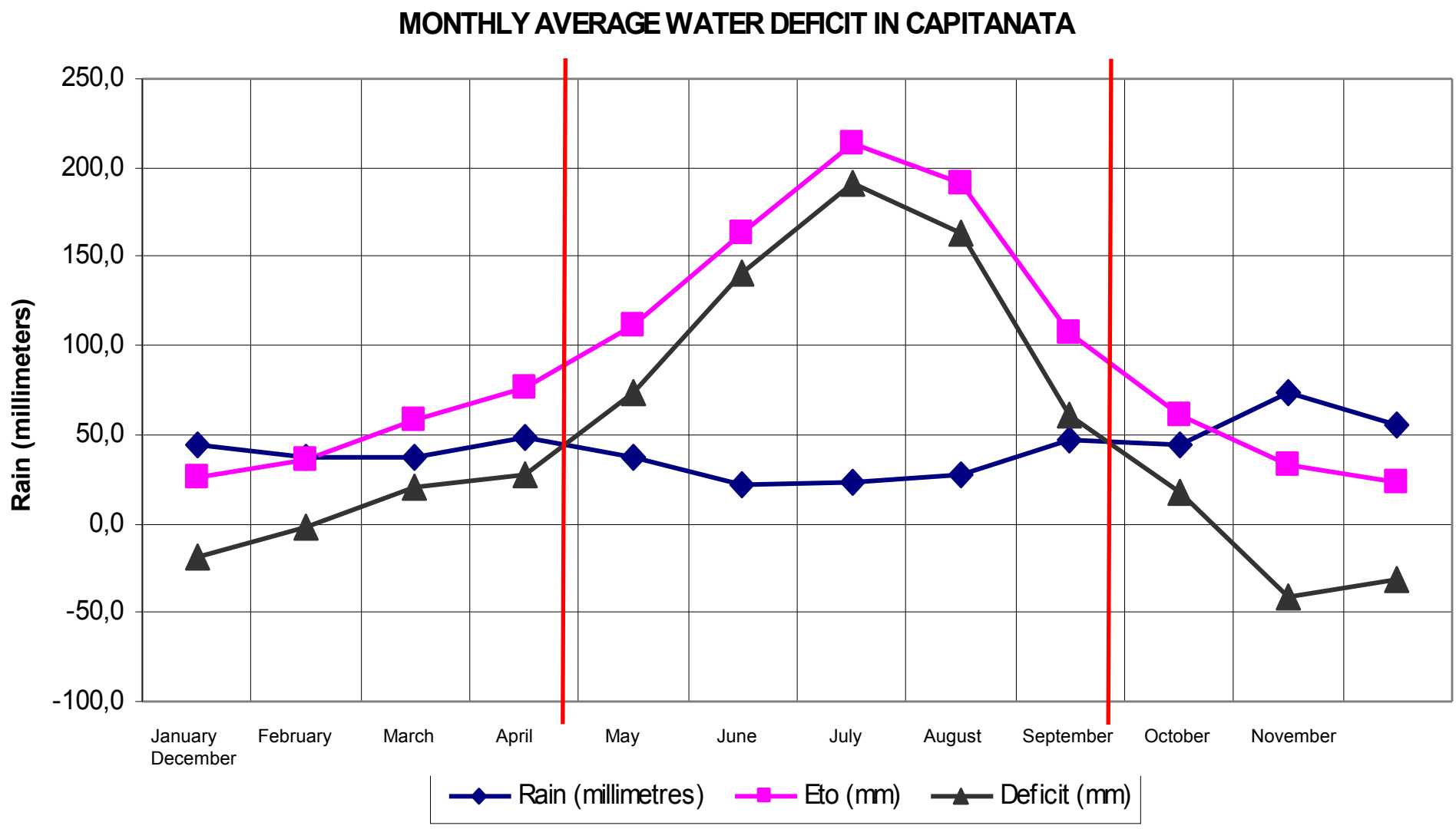


Image processing in false color and crop surveys
Year 2012

Map of irrigated crops and consortium irrigation network

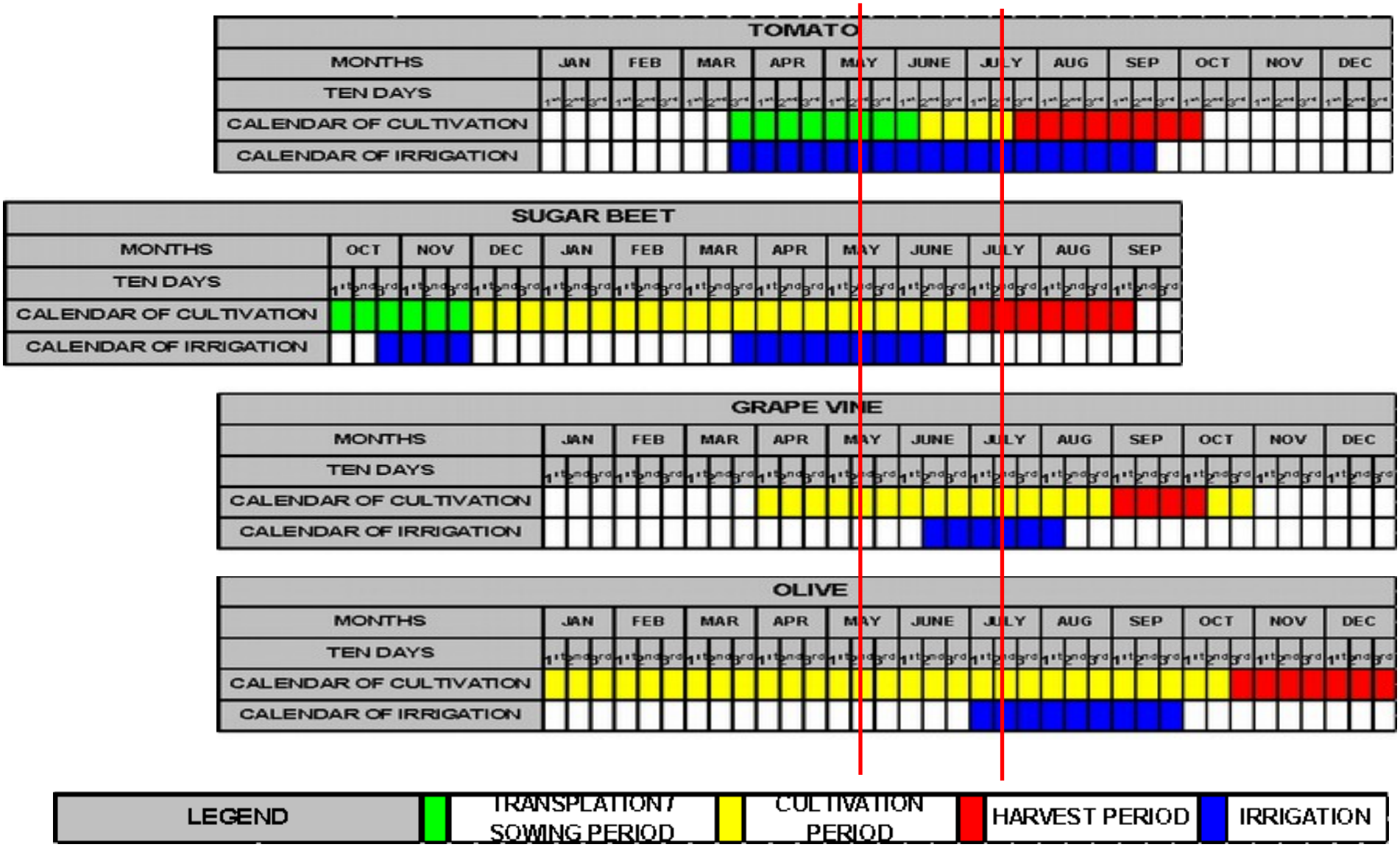


Water is a limited resource that must be safeguarded and used sparingly


MONTHLY AVERAGE WATER DEFICIT IN CAPITANATA
Rain (millimeters)
250,0
200,0
150,0
100,0
50,0
0,0
-50,0
-100,0
January
December
February
March
April
May
June
July
August
September
October
November
Rain (millimetres)
Eto (mm)
Deficit (mm)

The Capitanata Reclamation Consortia

Calendar of cultivation and irrigation



TARIFF RULES

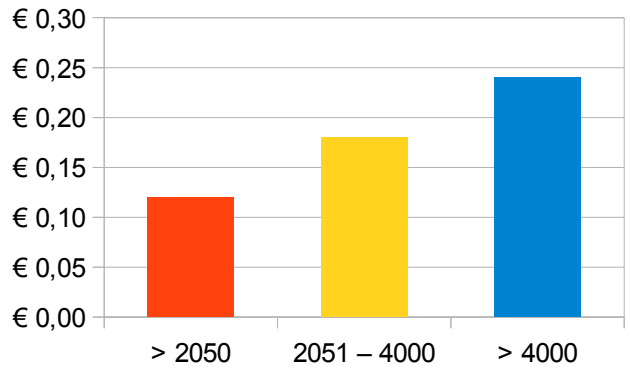
The Consortium is, by law, a **private board of public law**
and it is **non-profit**.
The associated members have to contribute only to the expenses
borne by the management of the activities performed.
So, **it is not a tax they pay to the Consortium but a contribution**.
Such contributions are proportioned
to the direct benefit each user receives from
the activity performed by the Consortium.
Therefore, the first contribution borne by the firm is that for **reclamation**
land it is calculated with respect to the surface.
If the land falls within the Consortium **irrigation** scheme the firm
has to pay also an irrigation water contribution that consists of two parts:
a fixed rate;
a variable rate.

Search for water-saving solutions

Importance of water contribution system

The contribution paid by water users is provisionally calculated in binomial form:

$$C = Q_f + V\ C_u$$



C = contribution of the public irrigation served farms;
Qf = fixed contribution of € 30,00/hectar
for the maintenance of the consortium systems;
V = volume (cubic meter) of water distributed;
Cu= unitary contribution for cubic meter;

€ 0,12 for every cubic meter of water consumed within the base volume of 2.050 m3 to hectare;

€ 0,18 for every cubic meter of water consumed in surplus to the foretold 2.050 m3 until 4.000 m3 for hectare;

€ 0,24 for every cubic meter of water consumed in surplus to the foretold 4.000 m3 for hectare.

Search for water-saving solutions

Importance of the automatic hydrants

Sinistra Ofanto irrigated district was the first in Italy to be equipped with automatic hydrants, that allow to count the irrigation volume, the water hours and the consuption of irrigated water for each user through special cards.

APPARECCHIATURE IDRAULICHE E DI CONSEGNA

Automated hydrants system

Automated hydrant

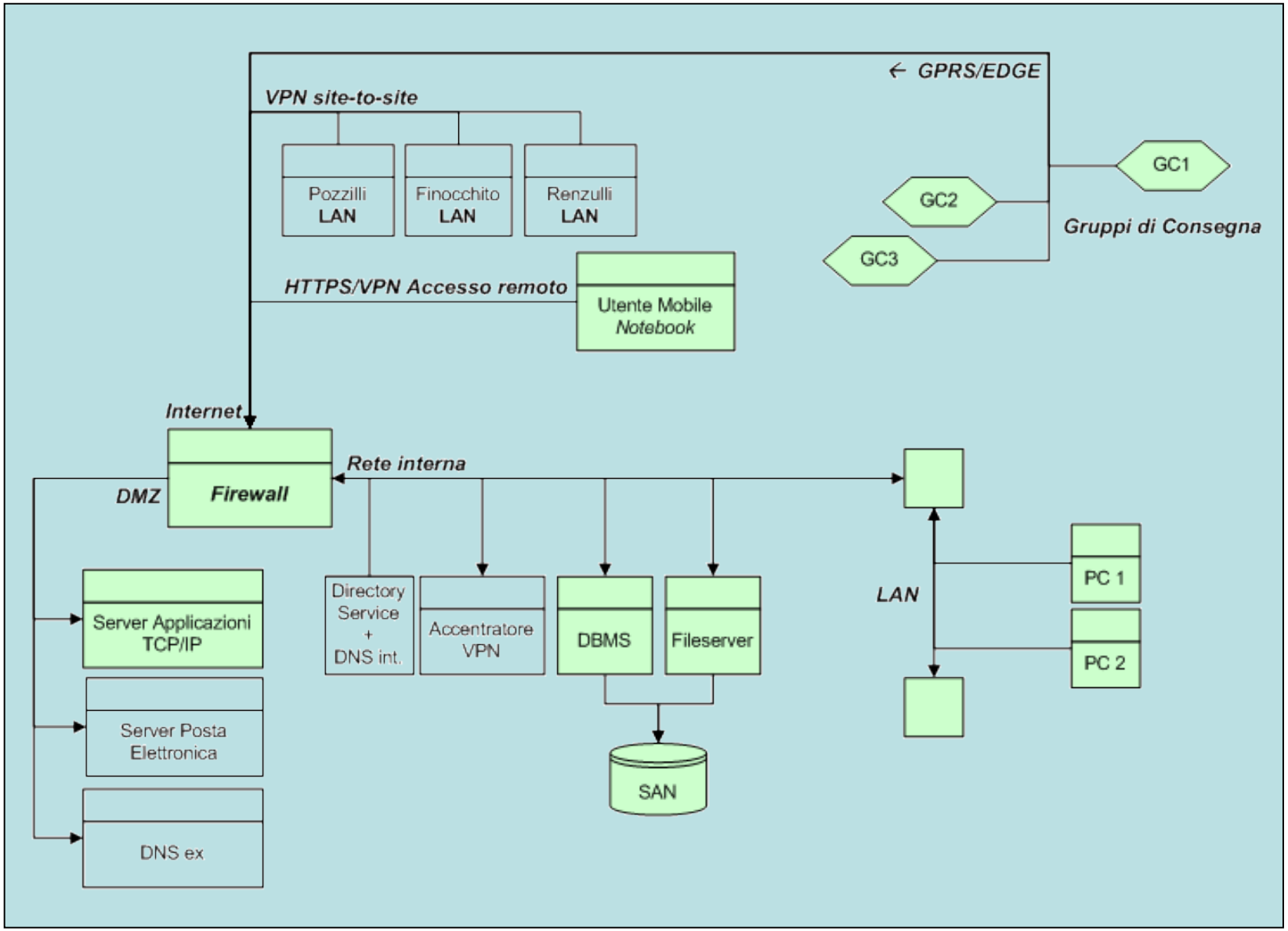
Users card

Control card

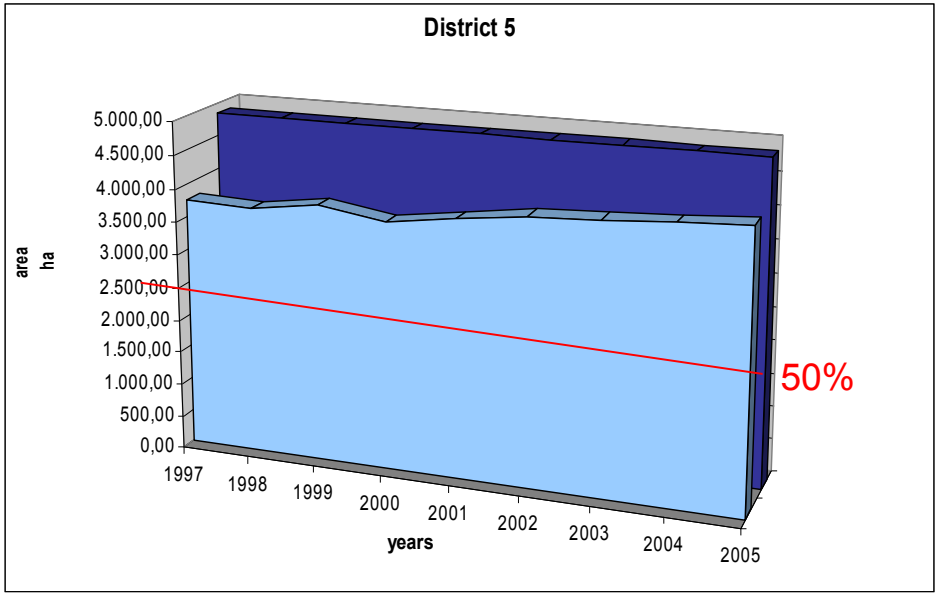
Meter reading

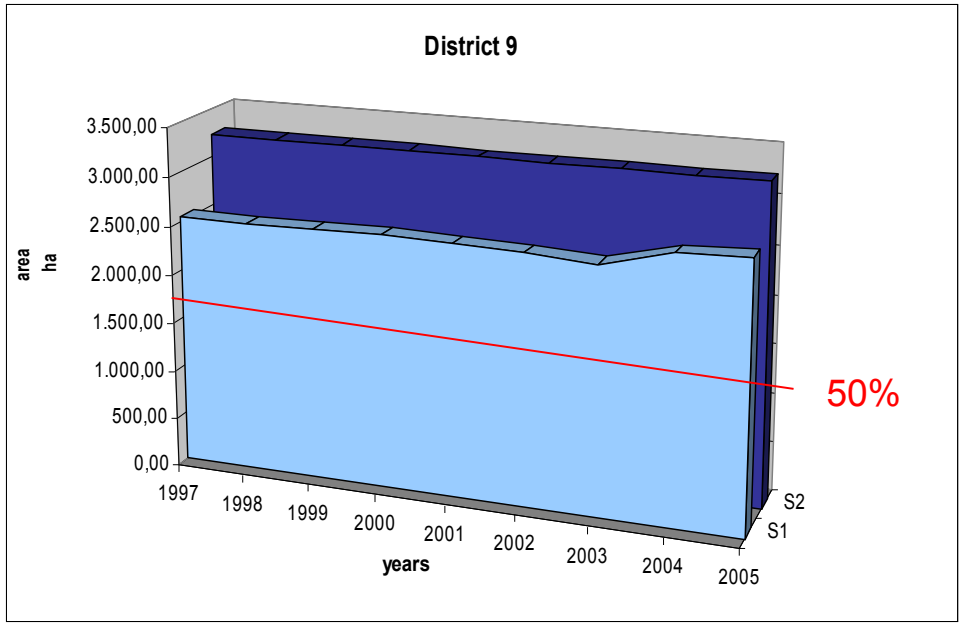
AN INNOVATON OF THE TECHNOLOGY IMPLEMENTED BY THE CONSORTIUM:

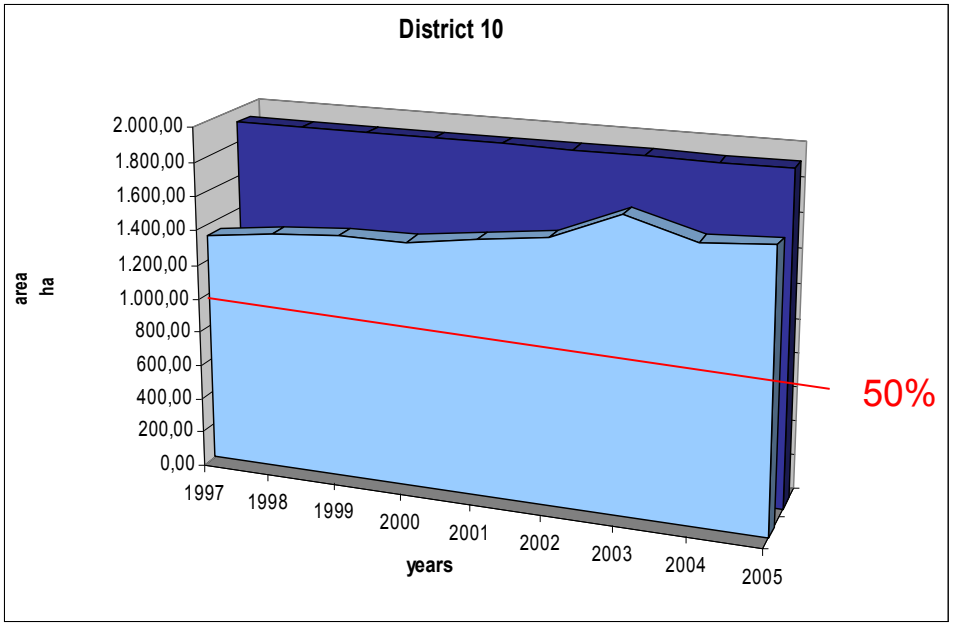
teletrasmission system scheme of delivery groups data and web management of database



Variation of the Consortium irrigated area in comparison to the irrigable one in the sub-districts 5, 9 and 10 of Sinistra Ofanto

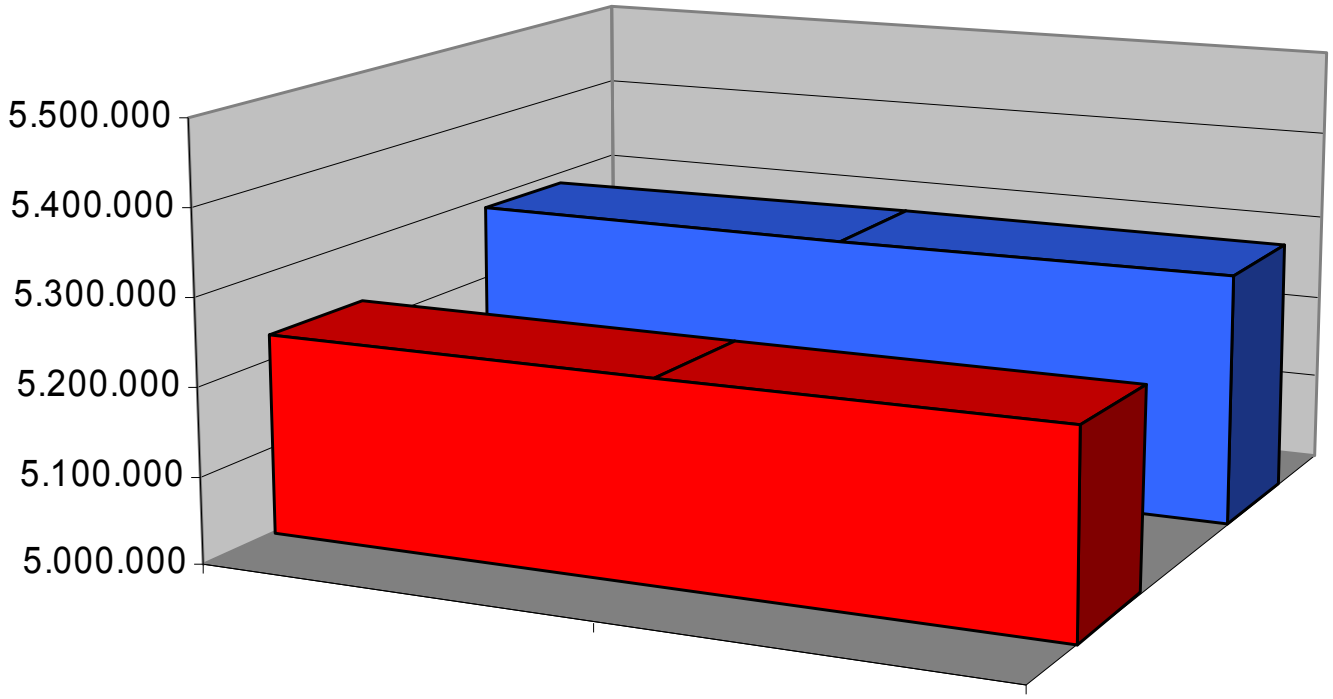






line of "partitioning" irrigated area irrigable area

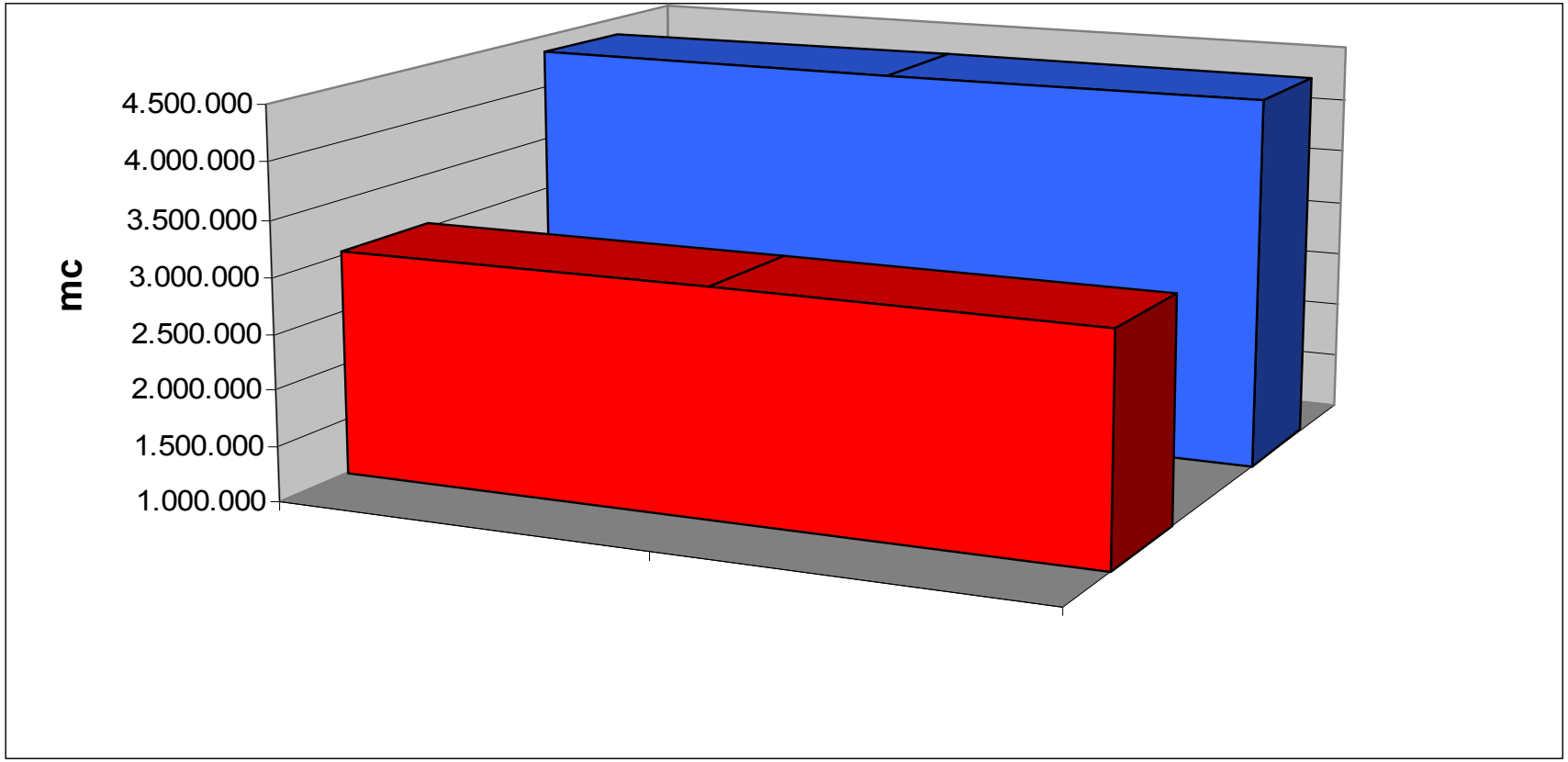
Comparison between the average of water consumptions without automatic hydrants and the average of water consumptions with automatic hydrants in the sub-district 5 of Sinistra Ofanto



- Average of water consumptions in the three years 2000-2002, **before** the installation of automatic hydrants
- Average of water consumptions in the three years 2003-2005, **after** the installation of automatic hydrants

- 59.969 cubic meter!!!

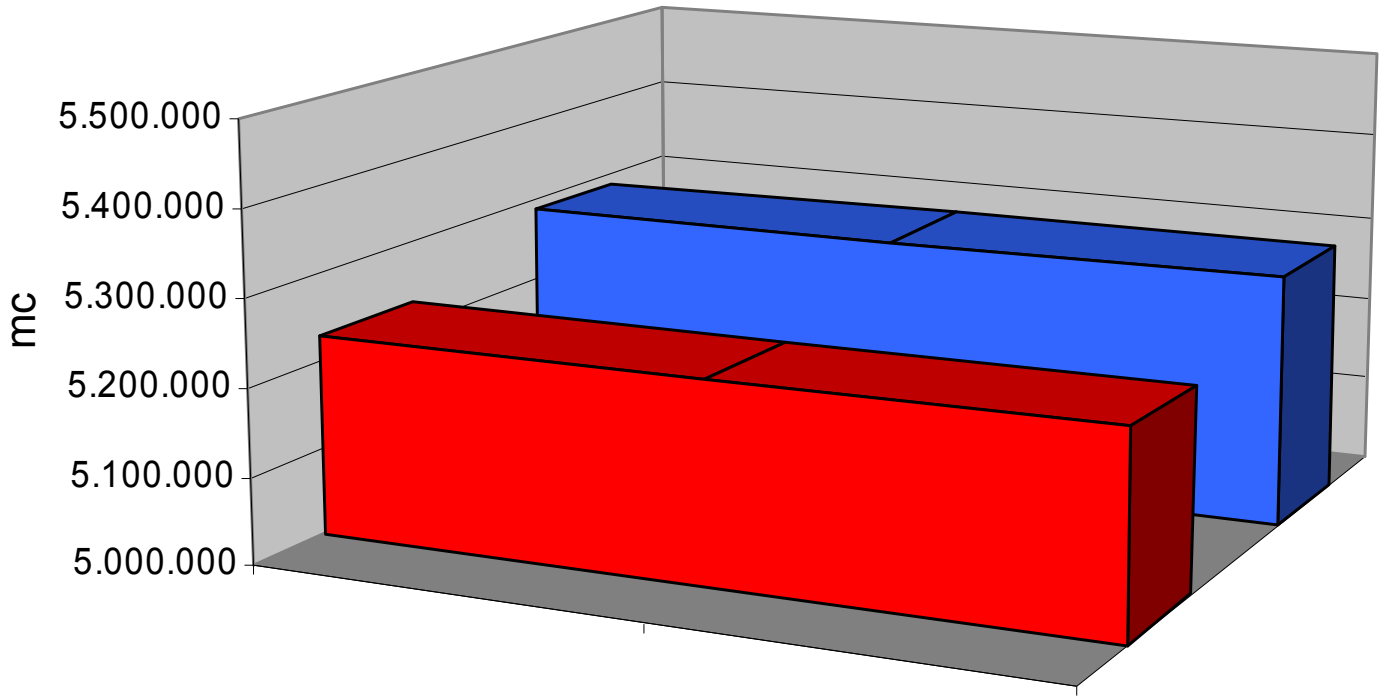
Comparison between the average of water consumptions without automatic hydrants and the average of water consumptions with automatic hydrants in the sub-district 9 of Sinistra Ofanto



- Average of water consumptions in the three years 2000-2002, **before** the installation of automatic hydrants
- Average of water consumptions in the three years 2003-2005, **after** the installation of automatic hydrants

- 1.322.500 cubic meter!!!

Comparison between the average of water consumptions without automatic hydrants and the average of water consumptions with automatic hydrants in the sub-district 10 of Sinistra Ofanto

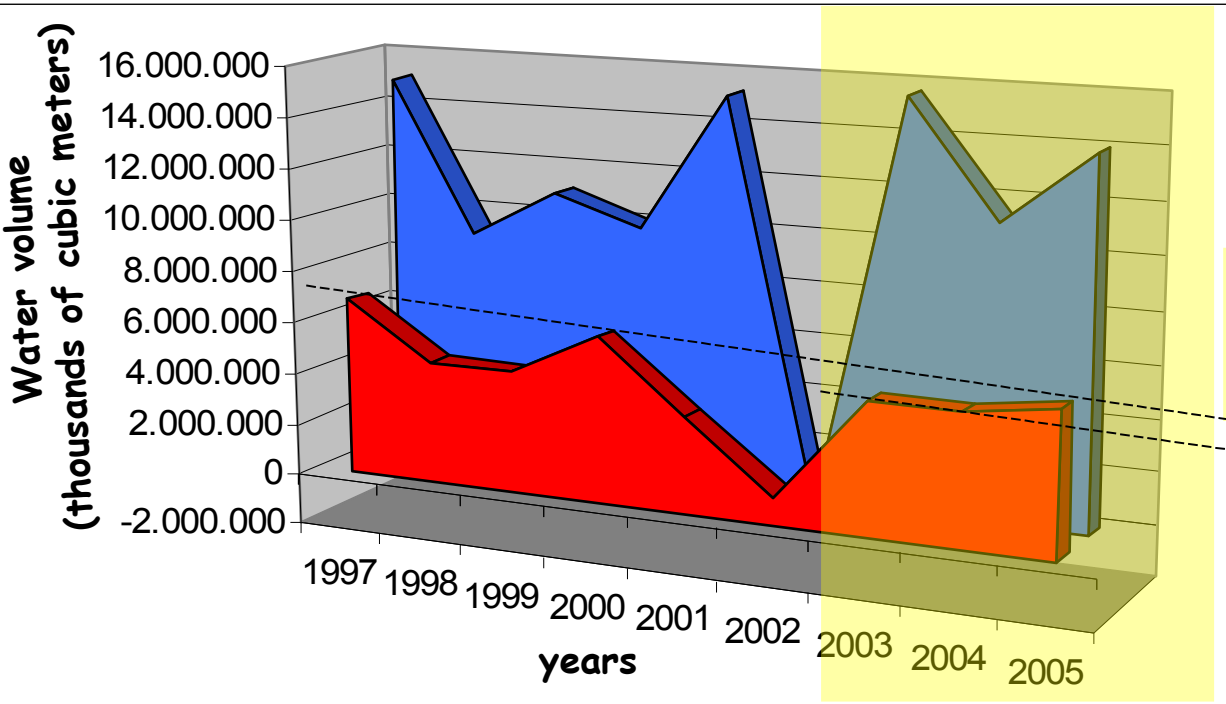


Average of water consumptions in the three years 2000-2002, **before** the installation of automatic hydrants

Average of water consumptions in the three years 2003-2005, **after** the installation of automatic hydrants

- 672.775 cubic meter!!!

Comparison between total yearl crops water requirements and total yearly water consumptions in the sub-district 5 of Sinistra Ofanto



Installation of automatic water delivery groups

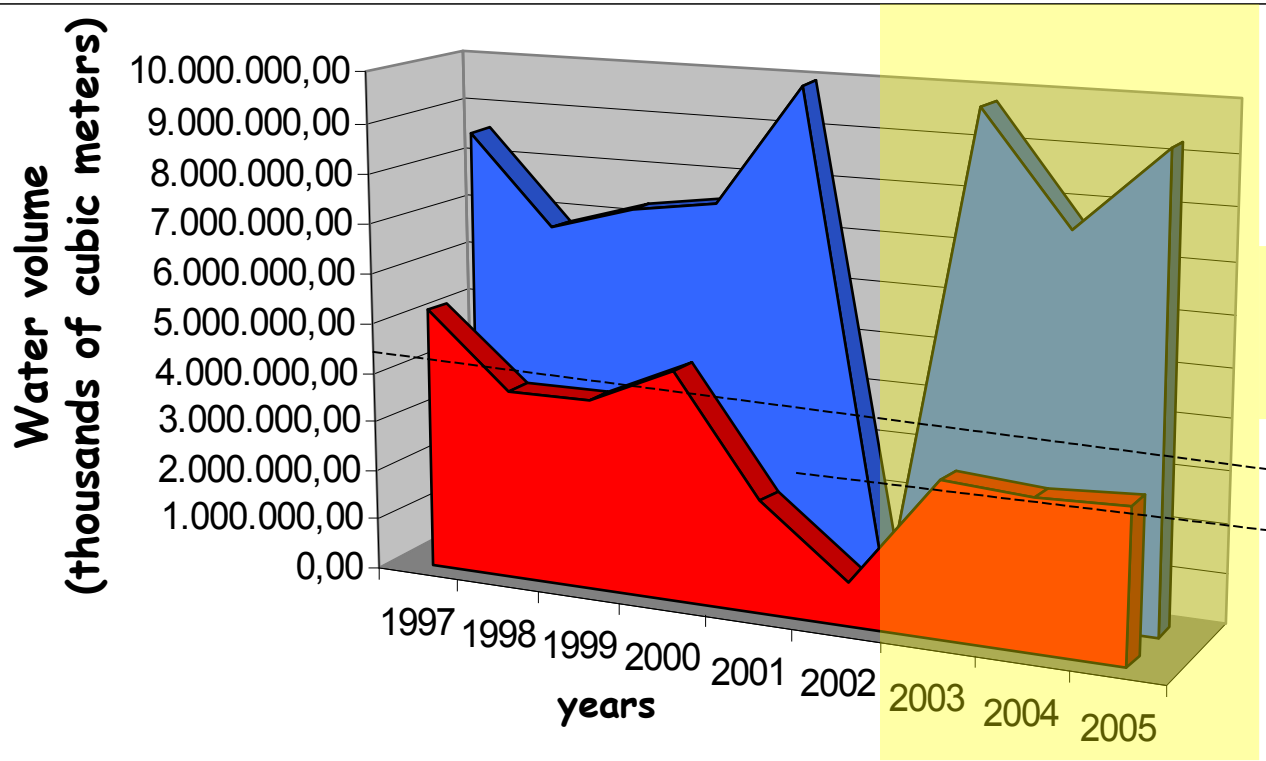
- 59.969 mc

	1997	1998	1999	2000	2001	2002	2003	2004	2005
total yearly water consuptions	6.921.17	4.699.72	4.707.20	6.403.43	3.718.96	1.084.46	5.112.64	5.070.54	5.507.22
total yearly water requirements	14.993.3	9.121.08	10.969.0	9.915.70	15.160.9	-12.771,8	15.568.2	11.245.0	13.959.5

Total district water requirements

Total district water consumption

Comparison between total yearl crops water requirements and total yearly water consumptions in the sub-district 9 of Sinistra Ofanto

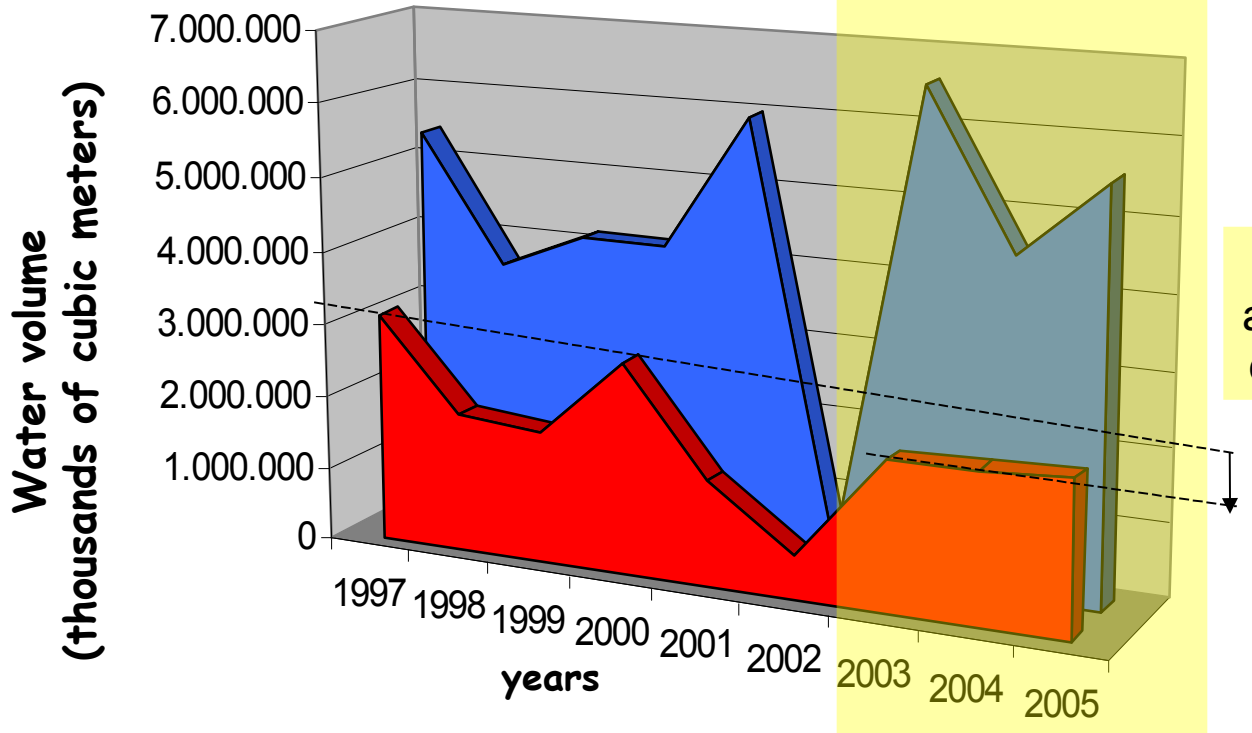


	1997	1998	1999	2000	2001	2002	2003	2004	2005
total yearly water consuptions	5.244.08	3.769.95	3.798.89	4.575.88	2.246.28	889.792,	3.063.24	2.970.58	3.040.40
total yearly water requirements	8.531.46	6.742.00	7.269.65	7.512.45	9.913.00	142.765,	9.746.84	7.569.15	9.233.51

Total district water requirements

Total district water consumption

Comparison between total yearl crops water requirements and total yearly water consumptions in the sub-district 10 of Sinistra Ofanto



	1997	1998	1999	2000	2001	2002	2003	2004	2005
total yearly water consuptions	3.115.90	1.890.72	1.762.89	2.830.59	1.421.75	581.239	2.015.97	2.035.68	2.097.99
total yearly water requirements	5.395.30	3.653.93	4.159.73	4.142.24	5.976.74	339.714,	6.584.72	4.477.67	5.518.29

Total district water requirements

Total district water consumption

The advantages related to the use of automated hydrants with electronic withdrawal card that we use in our system are:

- Equitable distribution of resources and operating costs;
- In cases where the hydrant is shared among several users, the amount of water actually taken by each user is charged, with a significant reduction in conflict;
- Rationing of the volumes supplied to each user in conditions of water shortage;
- Turning of withdrawals between hydrants and not between irrigation sectors;
- Reduction of waste and scheduling of irrigation volumes.

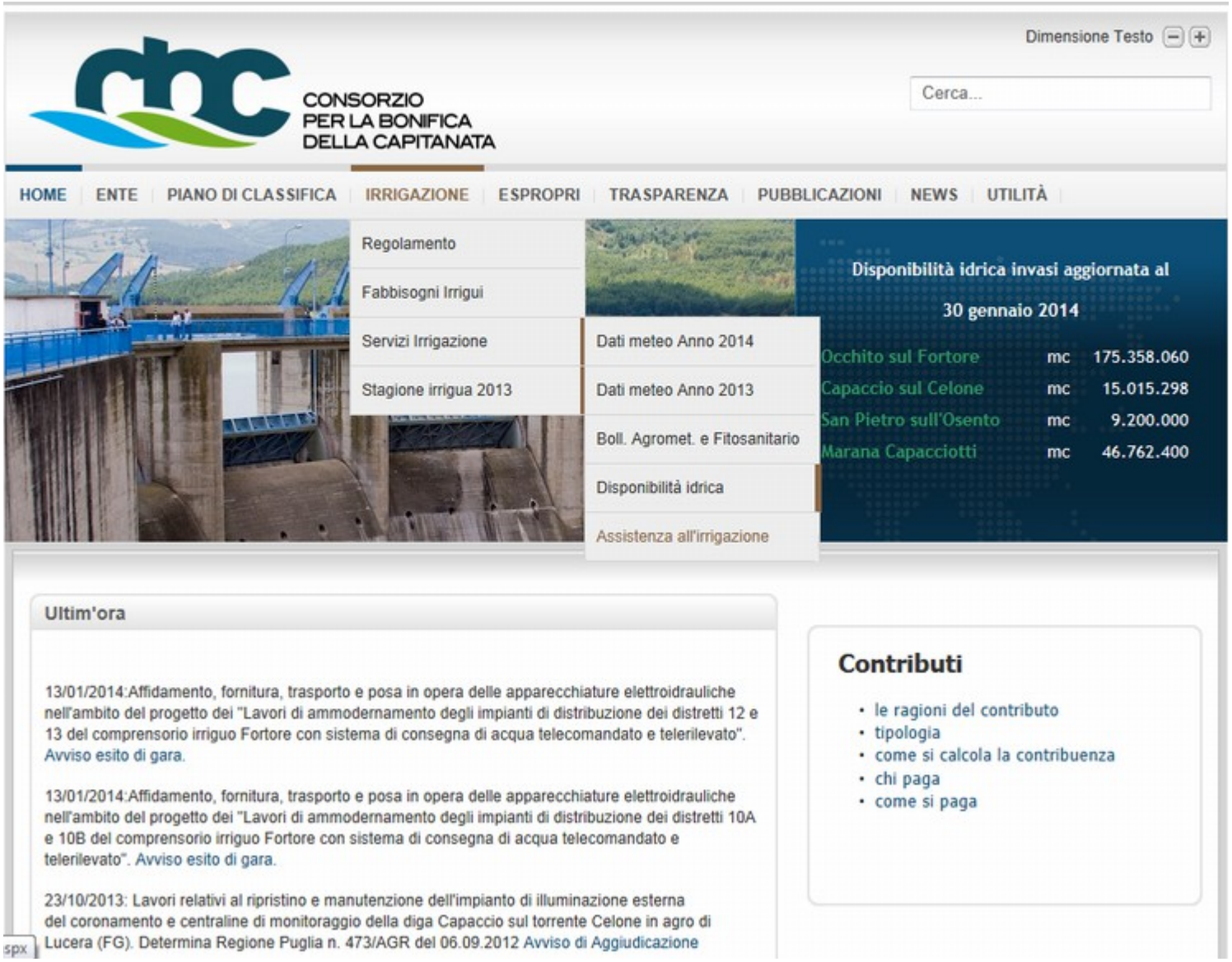
There aren't any functional problems of the hydrants due to the occlusion from suspended solid particles or cloging by derbis.

There are some problems with tampering by users, but these attempts have very limited effects because:

- controls by the consortium staff are frequent and capillary;
- the abuse is automatically signaled through warning signs and alarms generated by anti-burglary sensors;
- the hydrant is equipped with a mechanical meter that continues to record the withdrawal of water in case of malfunction or inactivation of the electronic component.

Experimentation and applications: search for water-saving solutions

Importance of Decision Support System



CRUSCOTTO IRRIGUO di IrriFrame

Il cruscotto permette di tenere sotto controllo le esigenze irrigue di tutti gli appezzamenti registrati e di accedere con pochi click alle diverse funzionalità del sistema

Aziende/Appezzamenti

Creazione guidata nuovo appezzamento/coltura >

La bordatura rossa indica che per quell'appezzamento non sono ancora presenti dati meteo aggiornati e quindi sono stati utilizzati nel calcolo dati storici di stazione che non comprendono eventuali piogge. Per visualizzare l'ultima data aggiornamento meteo cliccare su dettaglio e consultare la sezione "qualità del dato"

*Benvenuto nella piattaforma **Irriframe!***

Questa pagina è il Cruscotto da cui con pochi click puoi gestire tutte le funzionalità di Irriframe

Per cominciare a lavorare registra i tuoi appezzamenti
Gli appezzamenti, una volta creati, possono essere poi aggregati in aziende

L'interfaccia con i suoi help sempre presenti ti guiderà nelle diverse fasi di utilizzo del sistema

Per compiere i primi passi nel sistema si consiglia di leggere questa breve guida

Localizzazione appezzamenti

GESTIONE RISORSE

Appezzamenti

- Nuovo appezzamento >
- Lista appezzamenti >

Aziende/Gruppi di appezzamenti

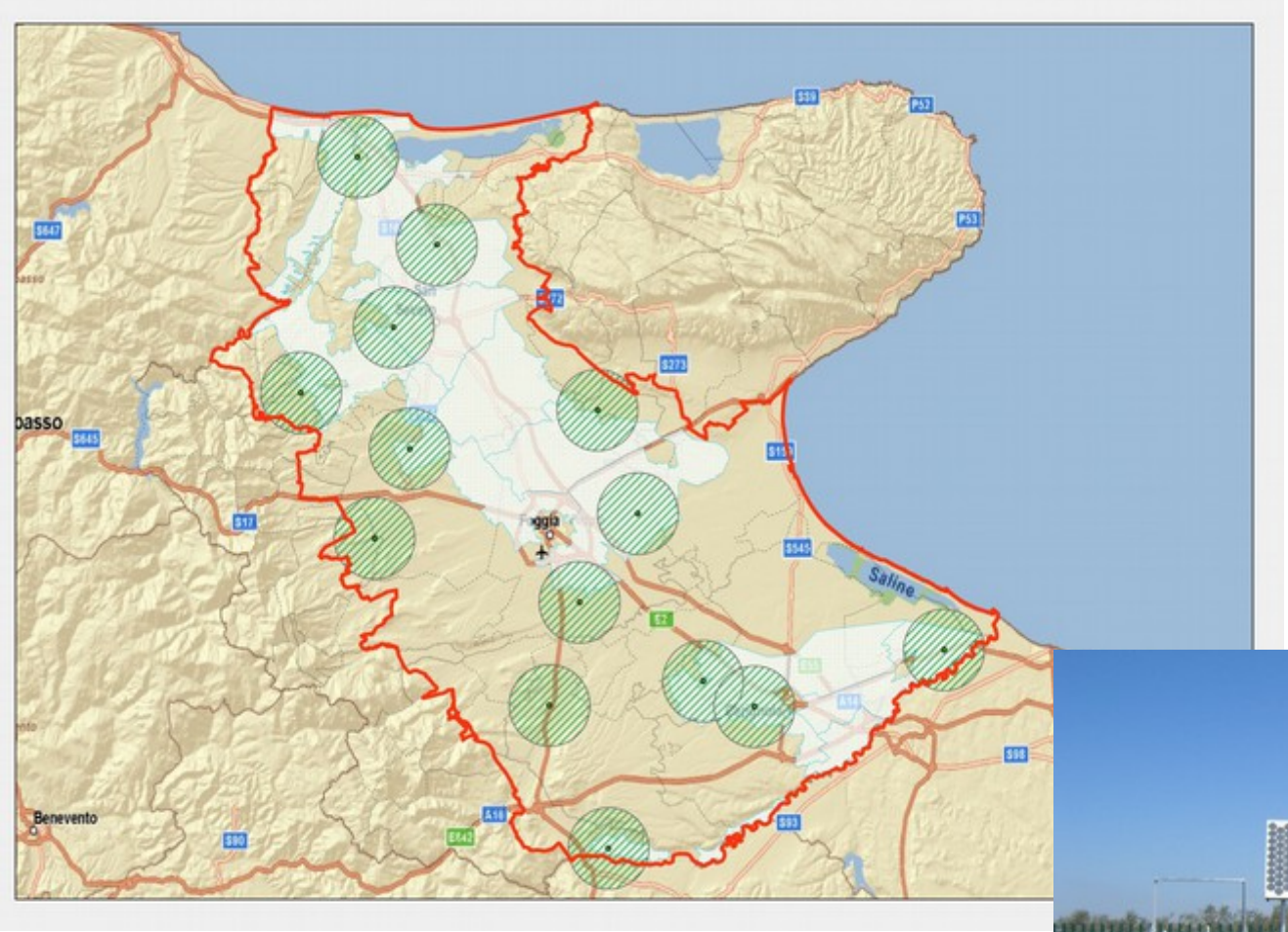
- Nuova azienda >
- Lista aziende >

Strumenti

- Nuovo pluviometro >
- Nuovo freatimetro >
- Lista pluviometri >
- Lista freatimetri >

The Capitanata Reclamation Consortia

n. 15 agrometeorological stations



< Torna al Cruscotto Irriguo
Dettaglio irriguo >
Compilazione guidata dati di base >

Appezzamento 1. NO COLTURA - Oliveto (Distretto alla domanda)

MENU' RIEPILOGO DATI CAMPO IRRIGUO (APPEZZAMENTO)

Dati di base

Questa sezione riguarda i dati di base da compilare al momento della registrazione di un nuovo appezzamento e della relativa coltura che sono comunque sempre modificabili
Il marker indica che mancano dei dati necessari al calcolo del consiglio irriguo. Perchè sia possibile effettuare il calcolo irriguo tutti i marker devono essere

Appezzamento

Descrizione >	*Testo descrittivo dell'appezzamento, superficie ed eventuale riferimento catastale*
Geolocalizzazione >	*Coordinate geografiche che determinano la posizione dell'appezzamento, necessarie per assegnare automaticamente il Consorzio, la stazione meteo, etc..*
Impianto irriguo >	*Tipologia e caratteristiche dell'impianto irriguo con cui è servito l'appezzamento*
Contesto ambientale >	*Stazione meteorlogica, falda e dati del suolo*

Coltura

Crea una nuova coltura >	*Creare sull'appezzamento una nuova coltura oppure sostituire la coltura attiva attuale con una nuova coltura. Possibile il cambio di specie*
Storico colture e STAMPA >	*Successione temporale delle colture nell'appezzamento. Ogni volta che su di un appezzamento viene creata una nuova coltura quella precedente ed i relativi dati dei registri vengono archiviate*

Registro informazioni

Questa sezione permette di salvare e modifcare i dati relativi agli eventi della presente stagione irrigua

Irrigazioni >	*Per comunicare le irrigazioni effettuate è prima necesario creare una coltura*
Nessun pluviometro associato all'appezzamento	*Il pluviometro è necessario se si desidera comunicare piogge locali in sostituzione di quelle della stazione meteo di riferimento* *Per associare un pluviometro a questo appezzamento modificare il Contesto ambientale dell'appezzamento* *Se non si è già creato un pluviometro aziendale è prima necessario andare alla Lista pluviometri e crearne uno*
Nessun freatimetro associato all'appezzamento	*Il freatimetro è necessario se si desidera comunicare la profondità di falda* *Per associare un freatimetro a questo appezzamento modificare il Contesto ambientale dell'appezzamento* *Se non si è già creato un freatimetro aziendale è prima necessario andare alla Lista freatimetri e crearne uno*
Umidità >	*Valore di umidità misurata o stimata in un determinato giorno della stagione irrigua*
ELIMINA appezzamento >	*L'eliminazione dell'appezzamento comporta la perdita irreversibile di tutti i dati eventualmente associati compresi quelli storici. Cliccando su questo link comparirà la lista dei dati che saranno eliminati in caso di conferma.*

Irriframe
IL PORTALE DELL'IRRIGAZIONE

ANBI

Utente **Nicoletta Noviello**
Email **nicoletta.noviello@alice.it** Profilo >

Cruscotto Help Esci

Creazione di nuovo appezzamento

Descriz

Superfi
num.ir
decima

Dati

Com
codi

Sezi

Fogl

Parti

S

Irriframe
IL PORTALE DELL'IRRIGAZIONE

ANBI

Utente **Nicoletta Noviello**
Email **nicoletta.noviello@alice.it** Profilo >

Cruscotto Help Esci

Appezzamento 1 - Oliveto > GEOLOCALIZZAZIONE

< Menù appezzamento

*Per **localizzare** l'appezzamento utilizzare lo zoom e la funzione*

Irriframe
IL PORTALE DELL'IRRIGAZIONE

ANBI

Utente **Nicoletta Noviello**
Email **nicoletta.noviello@alice.it** Profilo >

Cruscotto Help Esci

Appezzamento 1 - Oliveto > IMPIANTO IRRIGAZIONE

Tipo impianto irrigazione -- Seleziona --

Distanza erogatori sulla fila m

Distanza erogatori tra le fila m

Portata singolo gocciolatore l/h

Pluviometria impianto mm/h

Per calcolare la pluviometria oraria del proprio impianto vai al Servizio Tecnirri >

Irrigazione automatica (*)

Salva

< Menù appezzamento

Le informazioni presenti in questa pagina sono relative all'appezzamento e verranno utilizzate per tutte le colture che nel tempo verranno create su di esso
I dati dell'impianto di irrigazione sono necessari per effettuare il calcolo del bilancio idrico con i parametri corretti.

Usare il carattere virgola (,) per i decimali

***(*) Irrigazione auotomatica:** le irrigazioni consigliate sono inserite automaticamente nel registro irrigazioni senza bisogno della conferma utente. Le irrigazioni inserite in automatico dal sistema possono comunque essere modificate e/o cancellate dall'utente tramite il registro irrigazioni*

Per informazioni sulla pluviometria oraria del proprio impianto vai al Servizio Tecnirri

Irriframe
IL PORTALE DELL'IRRIGAZIONE

ANBI

Utente **Nicoletta Noviello**
Email **nicoletta.noviello@alice.it** Profilo >

Cruscotto Help Esci

CRUSCOTTO IRRIGUO di IrriFrame

Il cruscotto permette di tenere sotto controllo le esigenze irrigue di tutti gli appezzamenti registrati e di accedere con pochi click alle diverse funzionalità del sistema

Aziende/Appezzamenti

Creazione guidata nuovo appezzamento/coltura >

La bordatura rossa indica che per quell'appezzamento non sono ancora presenti dati meteo aggiornati e quindi sono stati utilizzati nel calcolo dati storici di stazione che non comprendono eventuali piogge. Per visualizzare l'ultima data aggiornamento meteo cliccare su dettaglio e consultare la sezione "qualità del dato"

Per vedere i dati inseriti RICALCOLA BILANCIO/AGGIORNA DATI >

Clicca sulla coltura per il menù	Descri	consumo oggi (mm)	data prevista irrigazione	volume irriguo (mm)	durata irrigazione (ore:minuti)

Localizzazione appezzamenti

GESTIONE RISORSE

Appezzamenti

- Nuovo appezzamento >
- Lista appezzamenti >

Aziende/Gruppi di appezzamenti

- Nuova azienda >
- Lista aziende >

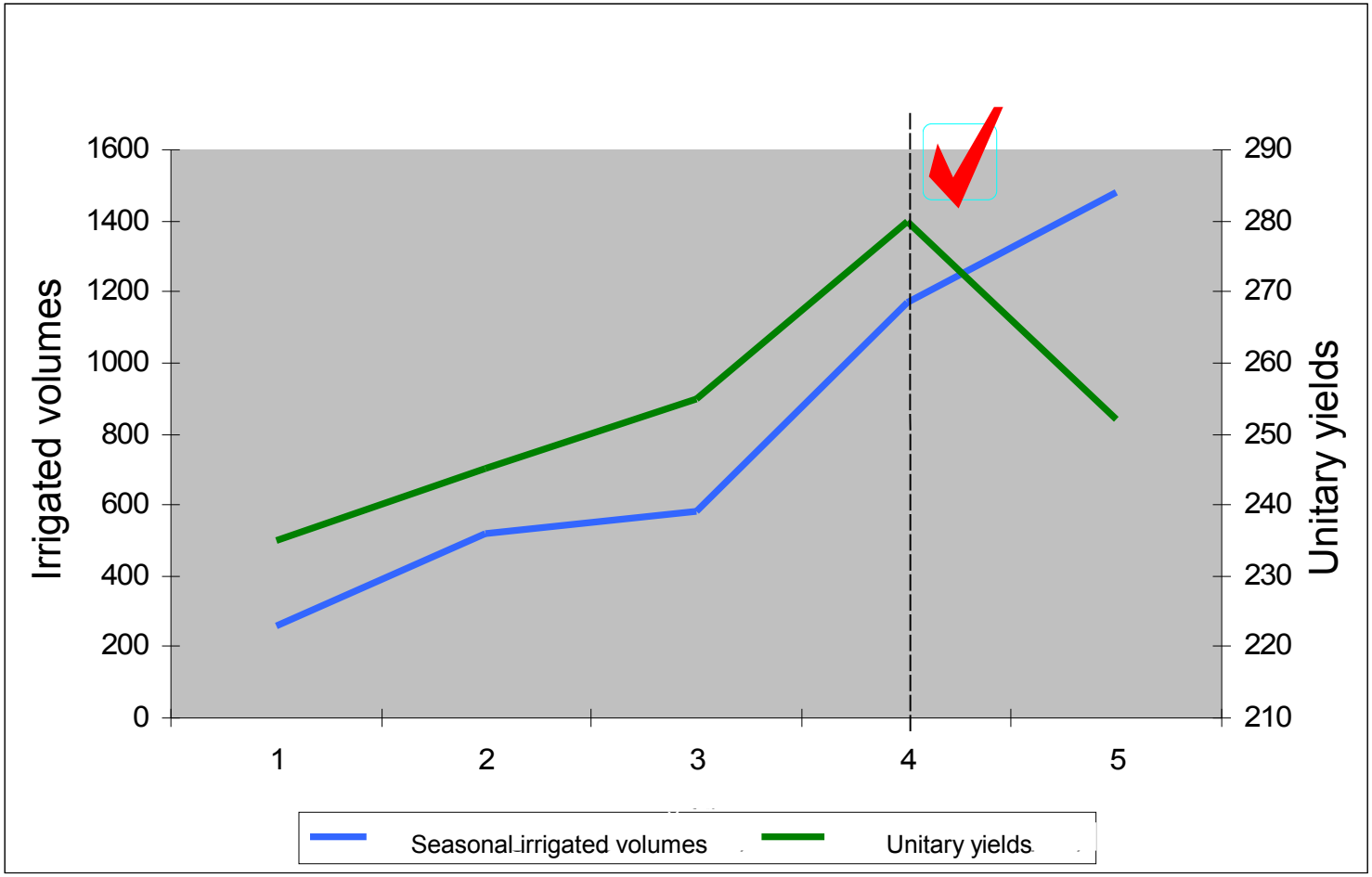
Strumenti

- Nuovo pluviometro >
- Nuovo freatimetro >
- Lista pluviometri >
- Lista freatimetri >

Technical and economic efficiency at farms level

Water production function

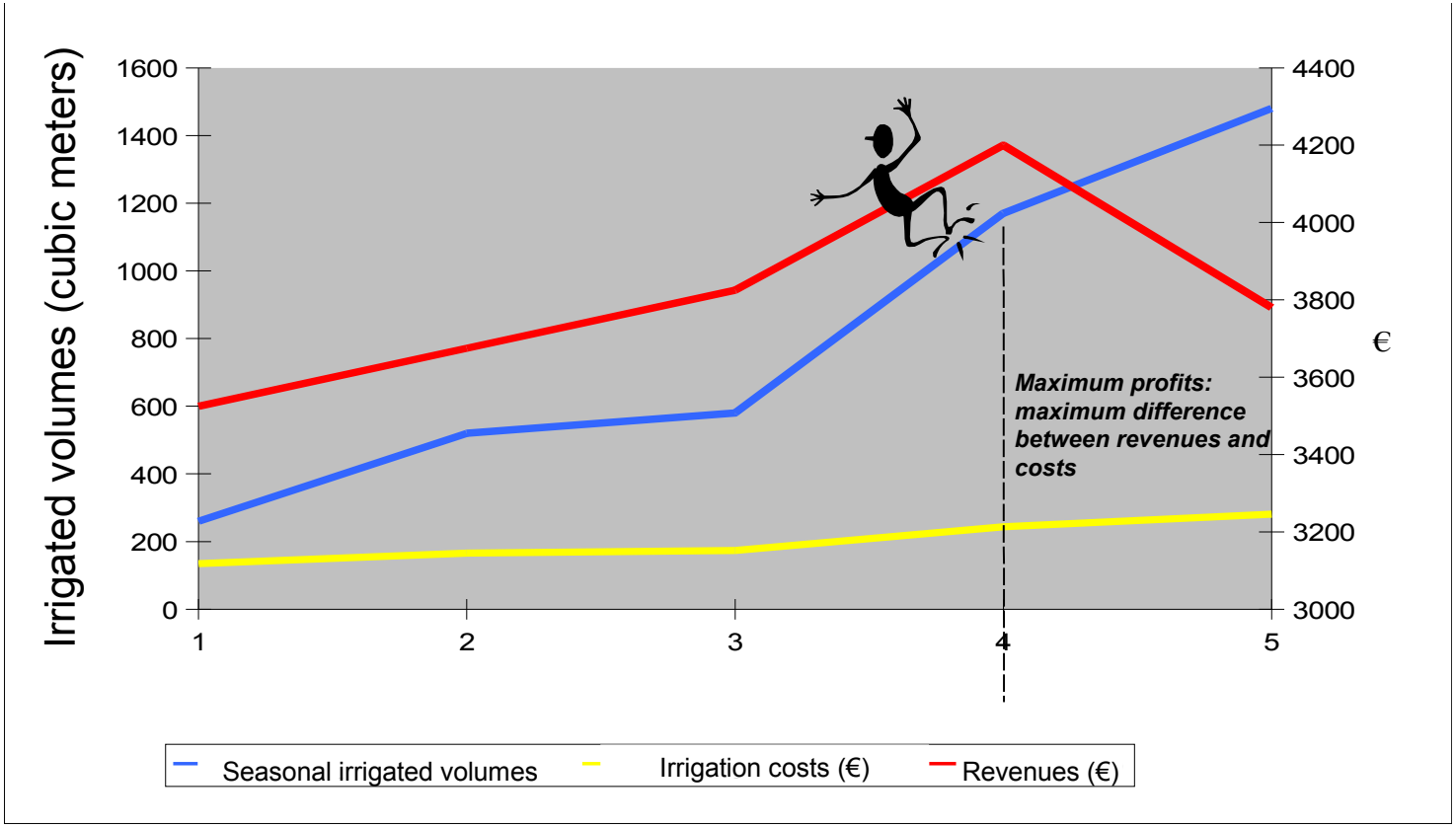
The maximum yields are achieved at sub optimal levels



Technical and economic efficiency at farms level

Optimal crop needs and profit

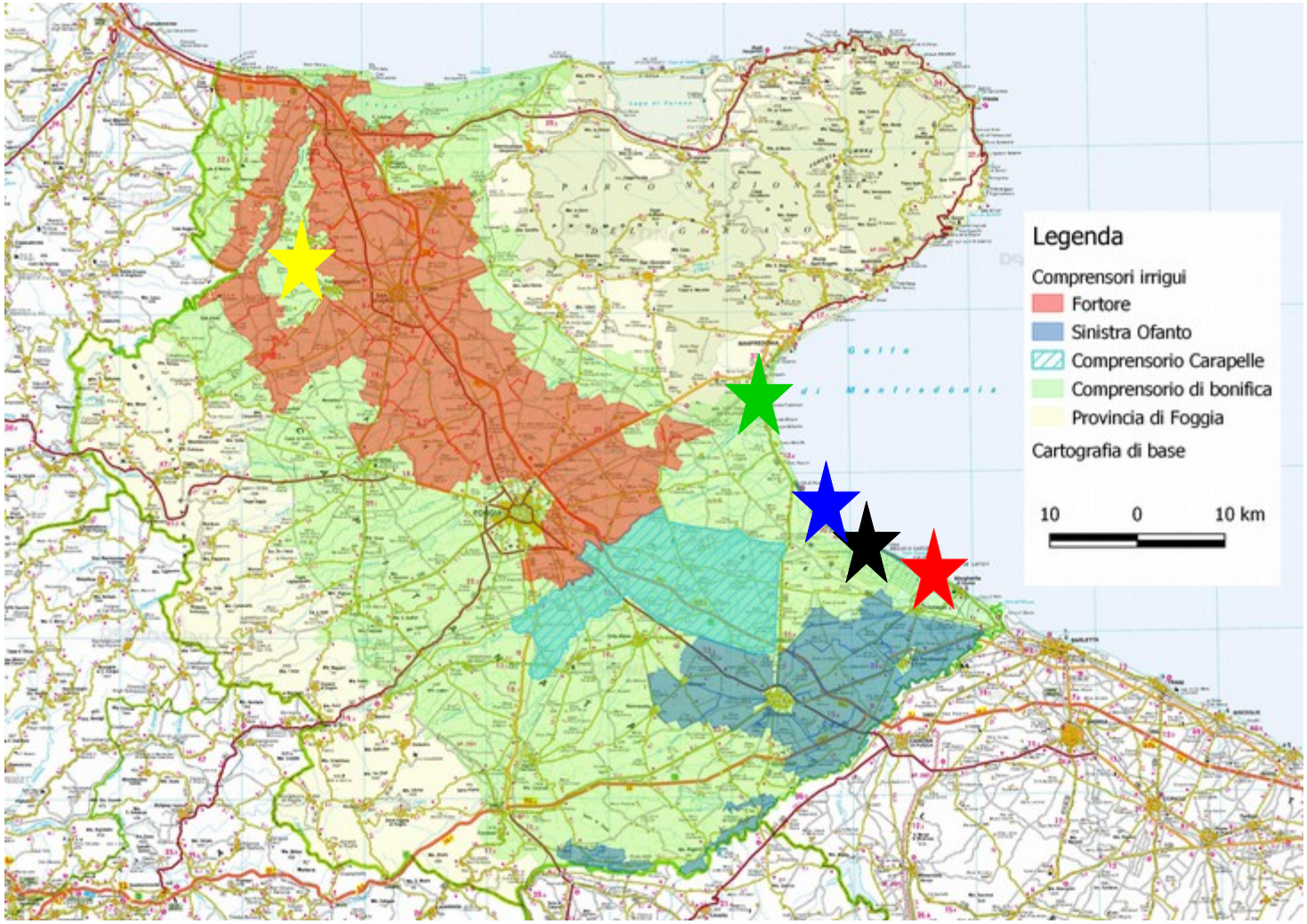
The maximum profits are achieved at sub optimal irrigation volumes



Experimentation and applications: search for water-saving solutions

Importance of waste water for irrigation

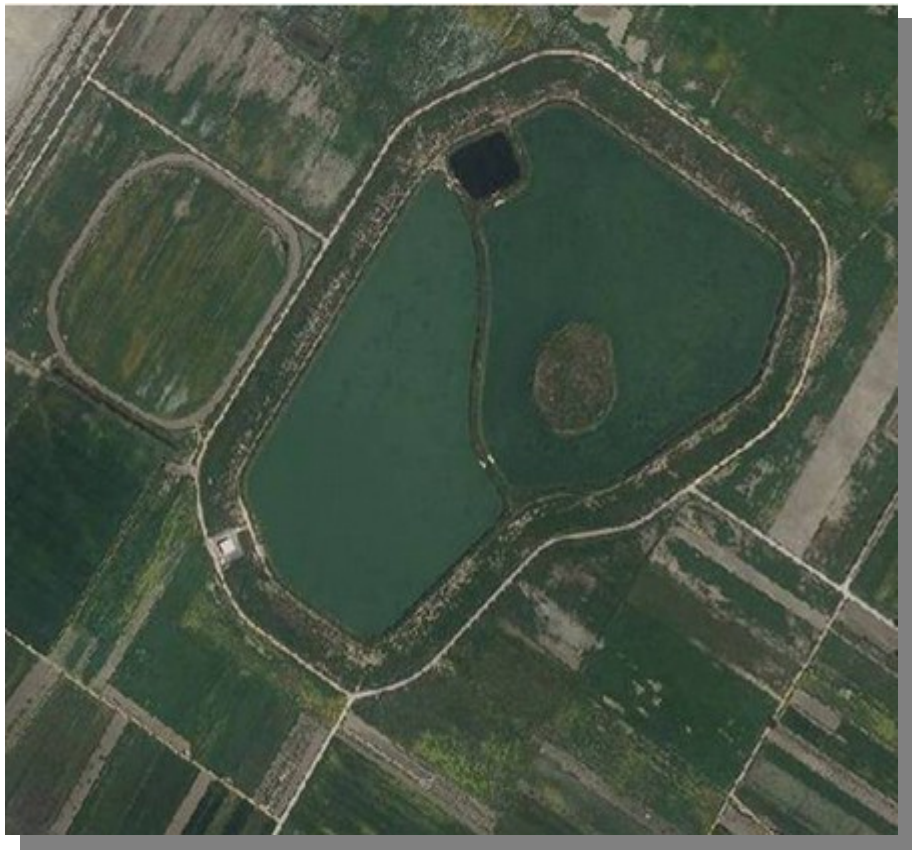
Localization of irrigated district that can be served by waste water in Capitanata area



Experimentation and applications: search for water-saving solutions

Importance of waste water for irrigation

The storage tank of Trinitapoli waste water



Utilization of storage tank:

irrigation of sub-distrect 17 of Sinistra Ofanto

(500 ha)

Overall capacity: 950.000 cubic meter

Experimentation and applications: search for water-saving solutions

Importance of localized irrigation methods


Thank you!!