

CICLO DI EVENTI PER LO SVILUPPO SOSTENIBILE DEI TERRITORI E DELLE COMUNITÀ - 2024



Educazione alla sostenibilità



Salute e benessere



Clima e adattamento



Economia circolare



Politiche abitative



Biodiversità

REGIONE PUGLIA

Assessorato all'Ambiente



Strategia per lo sviluppo sostenibile
REGIONE PUGLIA



USO DELL'ACQUA IN AGRICOLTURA E ADATTAMENTO AL CAMBIAMENTO CLIMATICO

Nicola Lamaddalena
CIHEAM Bari



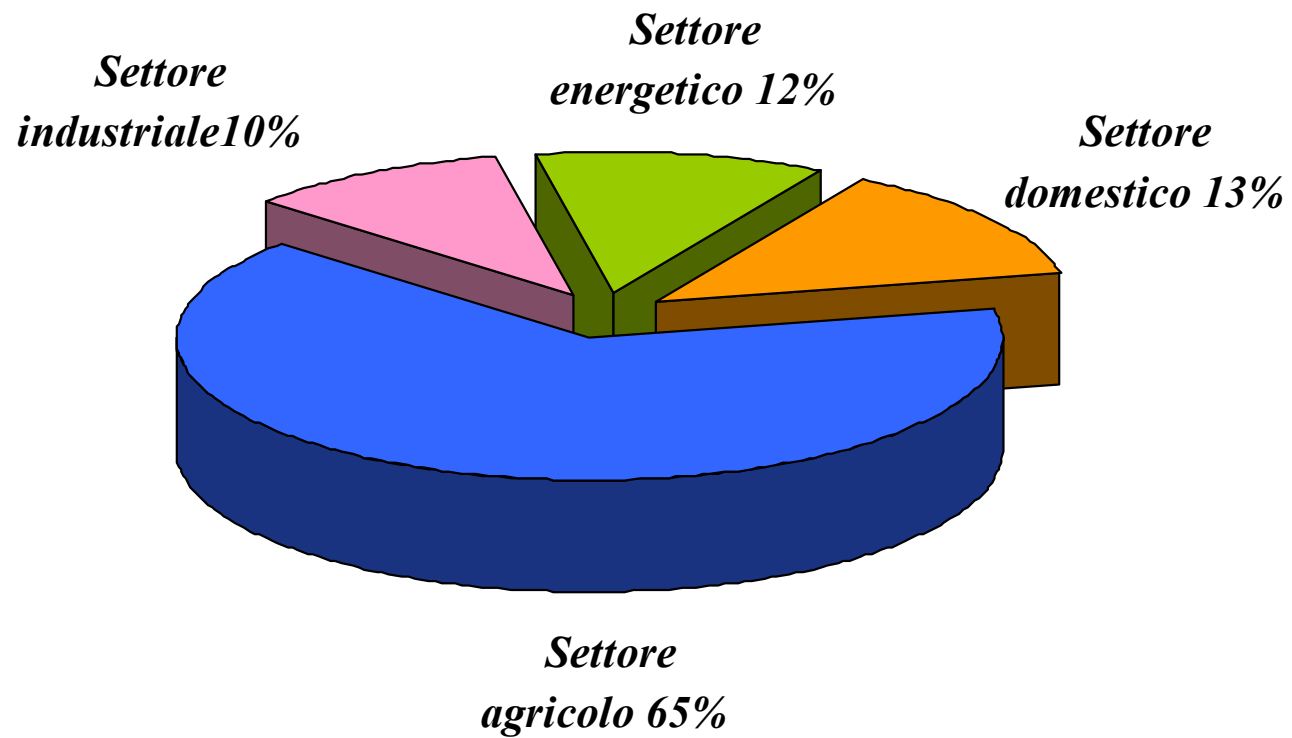
LE ACQUA DELLA PUGLIA – RISORSA AMBIENTALE ED ECONOMICA

Bari 24 luglio 2024 - AqP



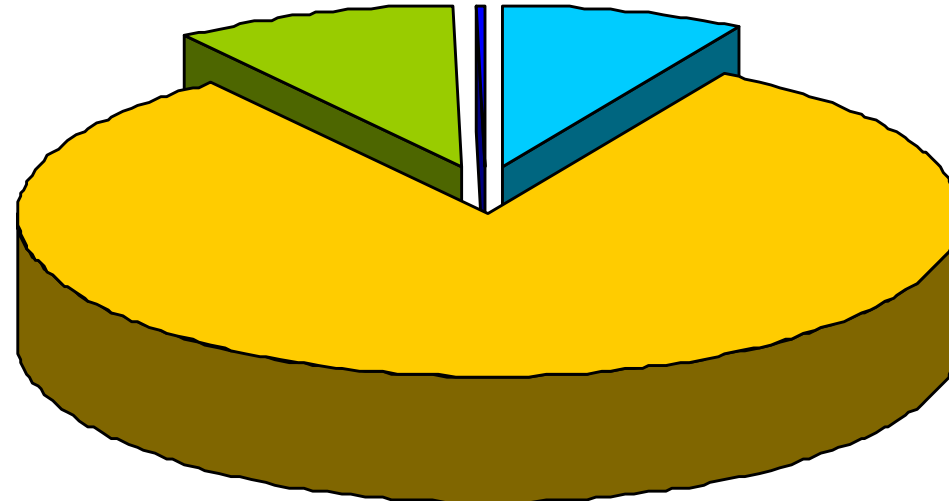
CIHEAM
BARI

WATER DEMAND PER SECTOR IN THE MEDITERRANEAN COUNTRIES



WATER DEMAND PER SECTOR IN SOUTHERN MEDITERRANEAN COUNTRIES

*Settore
industriale 10%* *Settore
energetico 0%* *Settore
domestico 8%*



*Settore agricolo
82%*

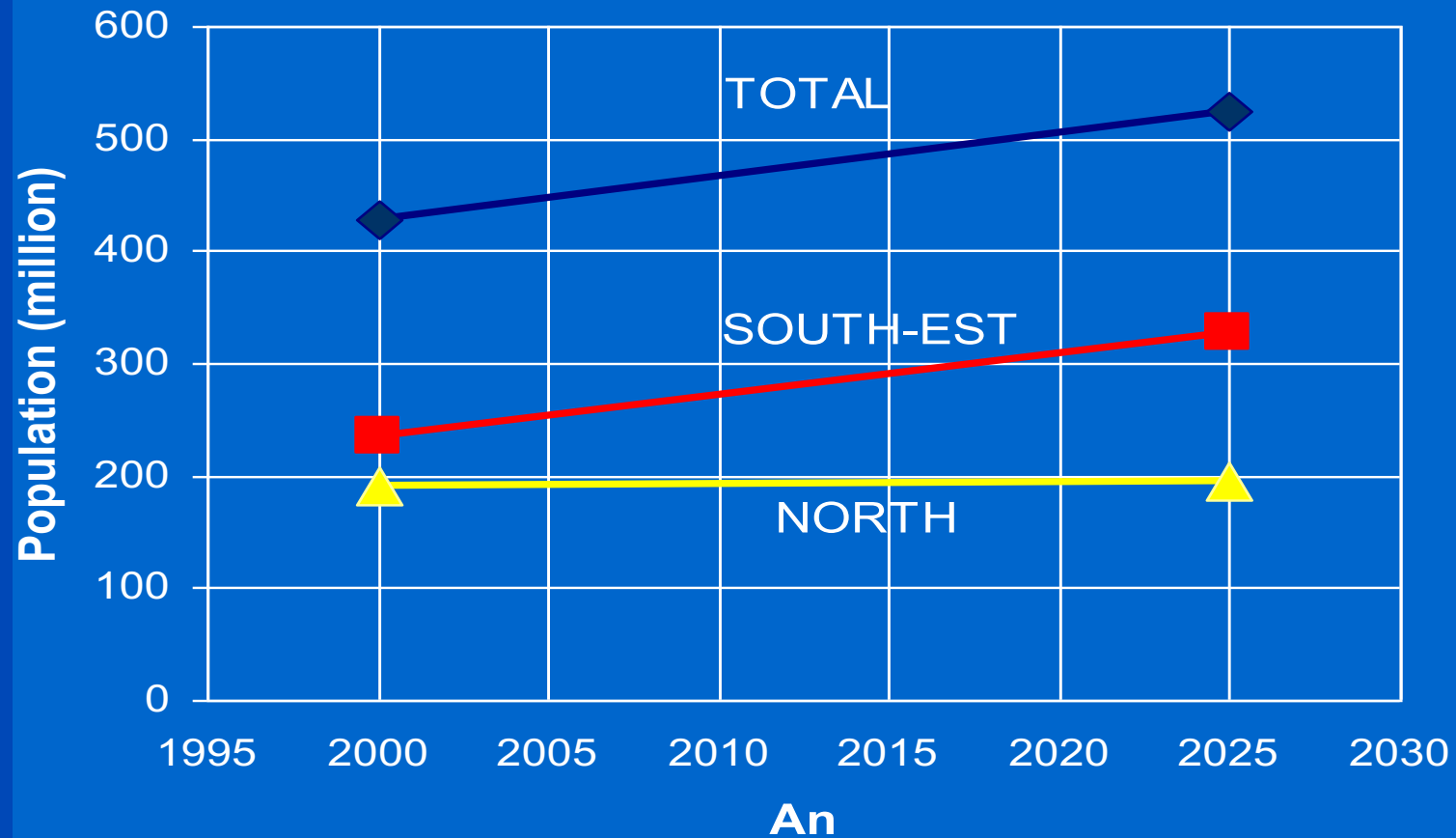


DRIVERS OF WATER DEMAND

1. Population Growth



POPULATION IN THE MEDITERRANEAN COUNTRIES



ELABORAZIONE: CIHEAM/IAMB

SOURCE:
PLAN BLUE, 2005

2. Urbanization

3. Changes in dietary preferences



Product	(m ³ per Kg)
Beef meet	15
Sheep meet	10
Pork meet	6
Chicken meet	2.8
Cheese	5.3
Milk	0.9
Cereals	1.5
Fruit	1
Legumes	1



4. Ecosystem

- Biodiversity
- Environmental services
- Equilibrium maintenance
- Sustainability



5. Bio-fuels

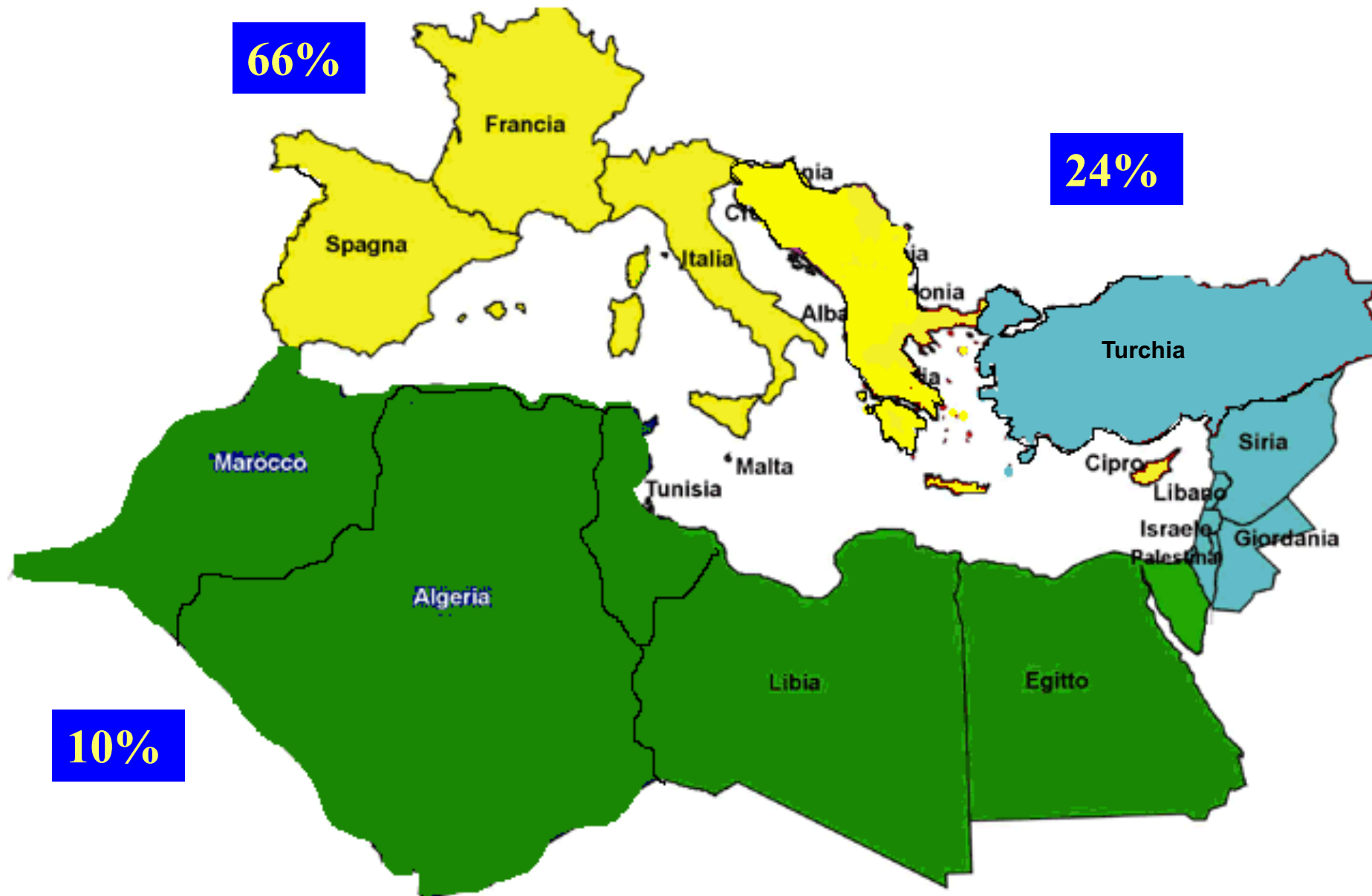
~240 Kg of maize are needed to produce 100 liters of ethanol

Either fill the tank of a SUV or feed one person for a year

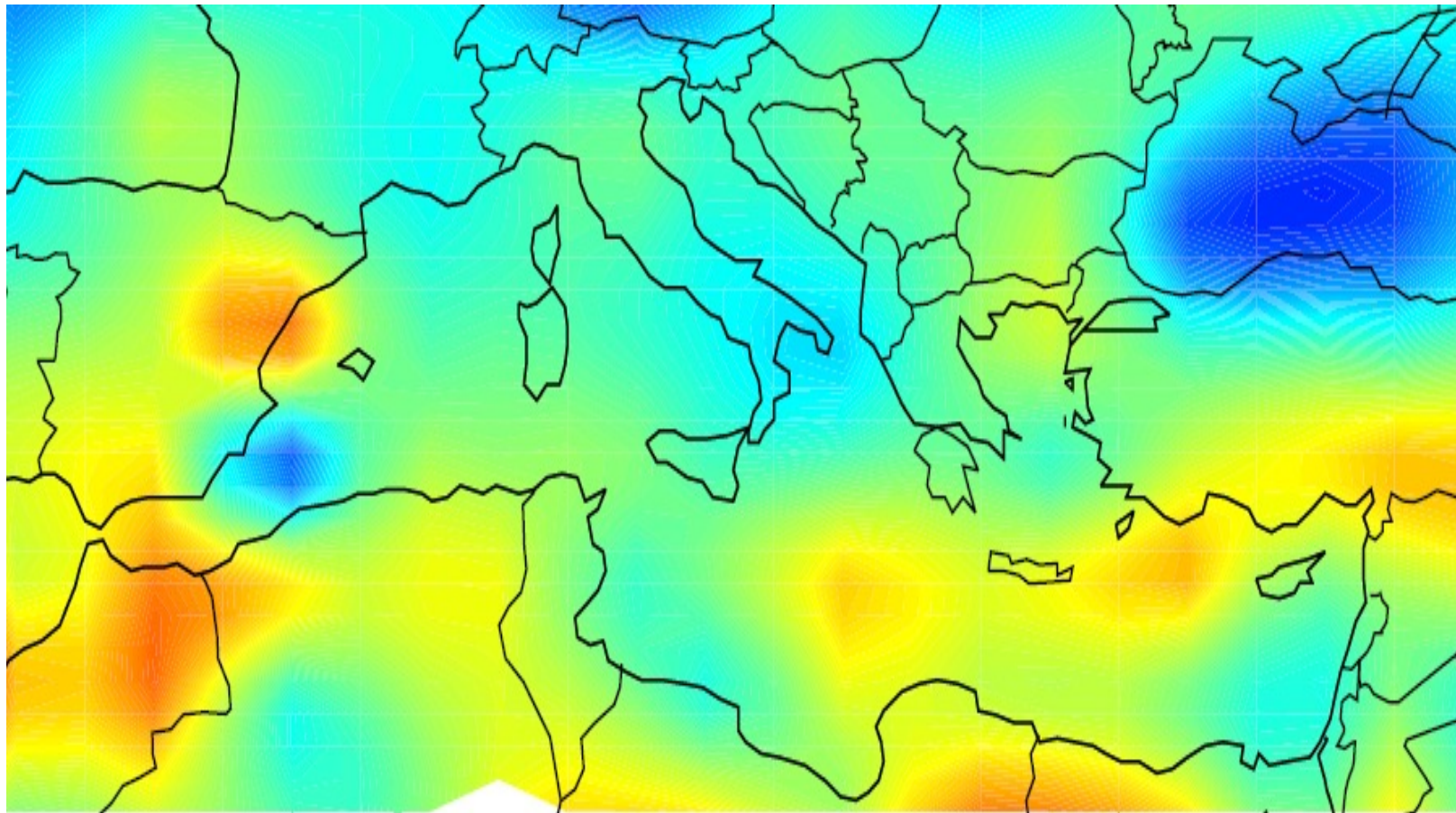


Increase competition for land and water and between use of crops for food versus fuel

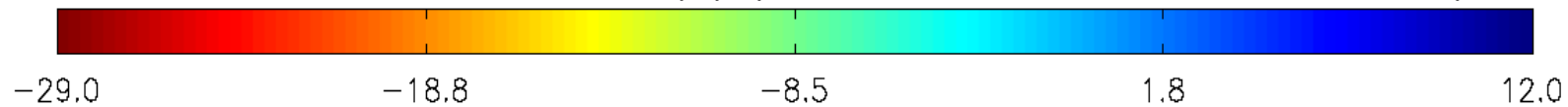
DISTRIBUTION OF WATER RESOURCES IN THE MEDITERRANEAN REGION



Variation of annual average precipitation in the next forty years (A2 scenario)



mean future - mean control (%) (min = -2.839E+01 max = 5.055E+00)

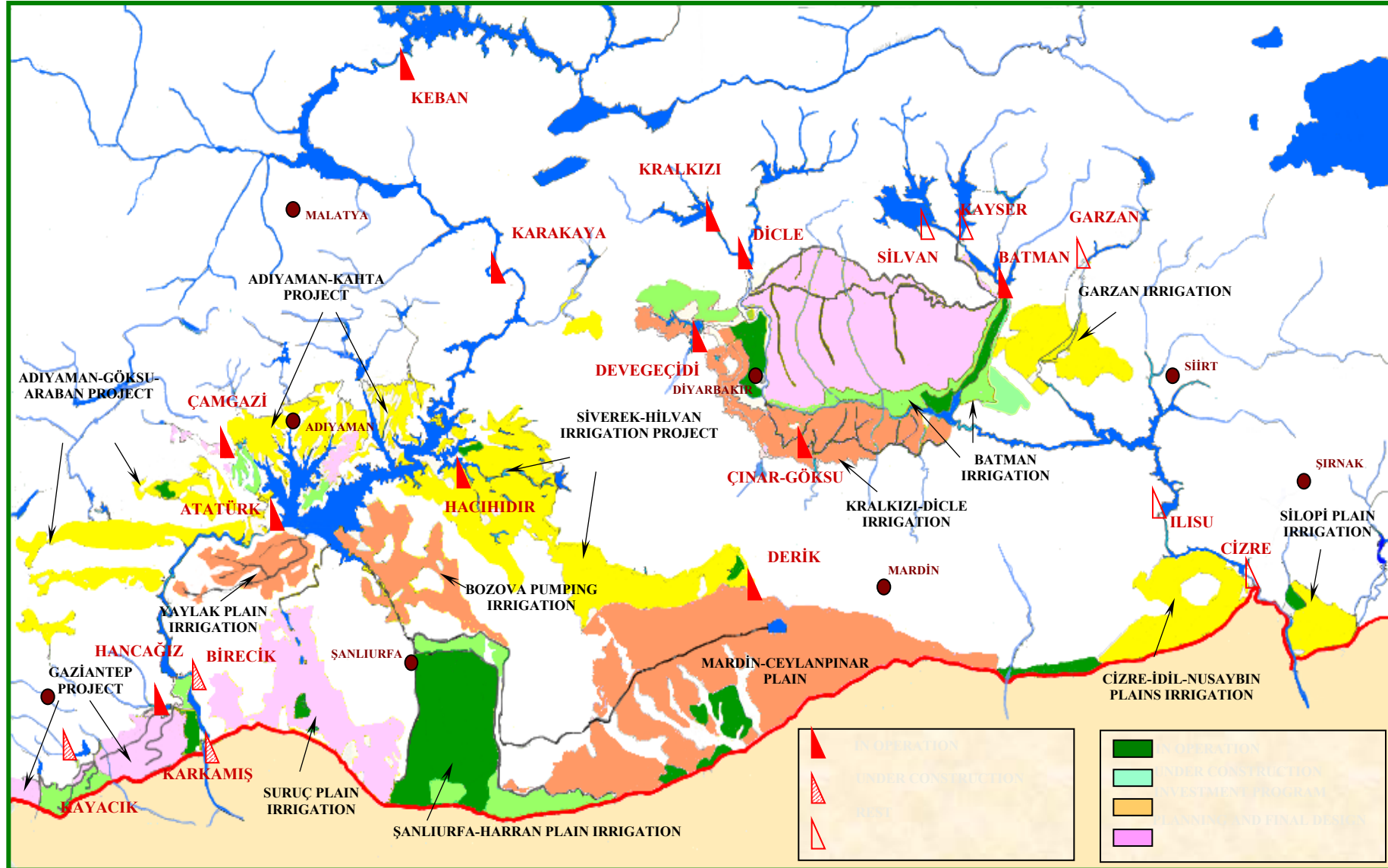




THE CHALLENGE



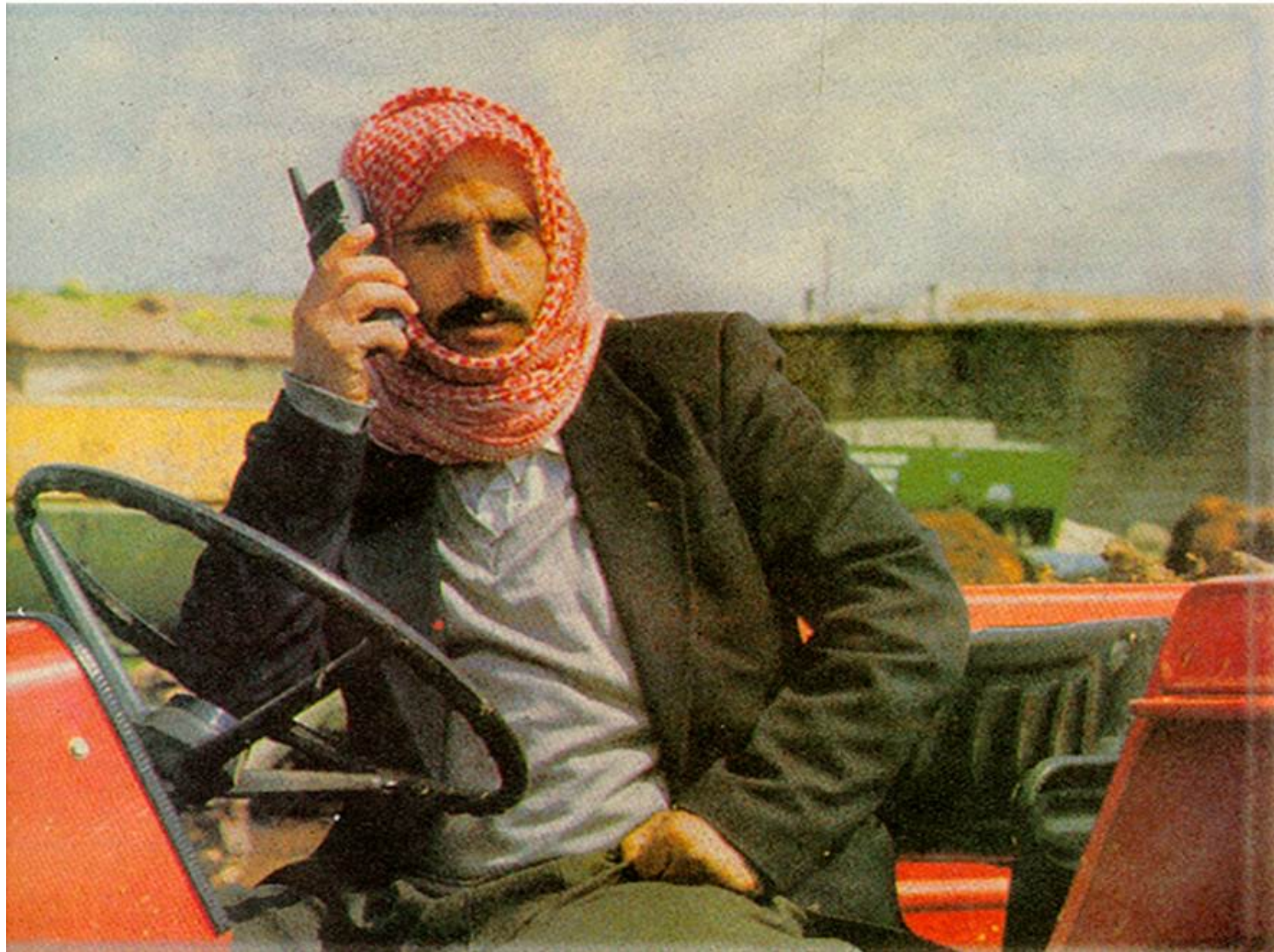
Turkey (project GAP) Water Distribution plan



ATATÜRK DAM – Completed in 1990







Fiume Kabur - 1975



Fiume Kabur - 2006



Sorgente Kebrit - 1999



Sorgente Kebrit - 2006

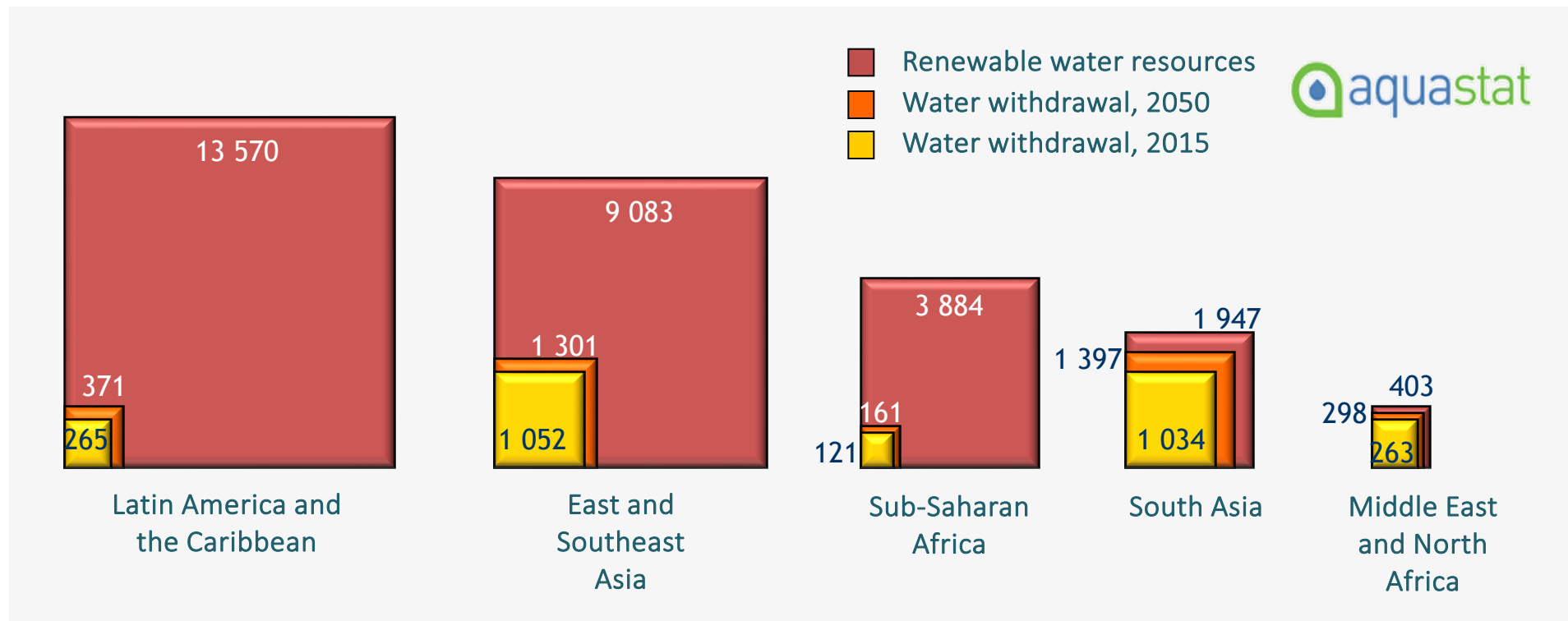


Sorgente Kebrit - 2007





Freshwater resources: current (2015) and predicted (2050) water withdrawal (km³)



PRESENT STRATEGIES

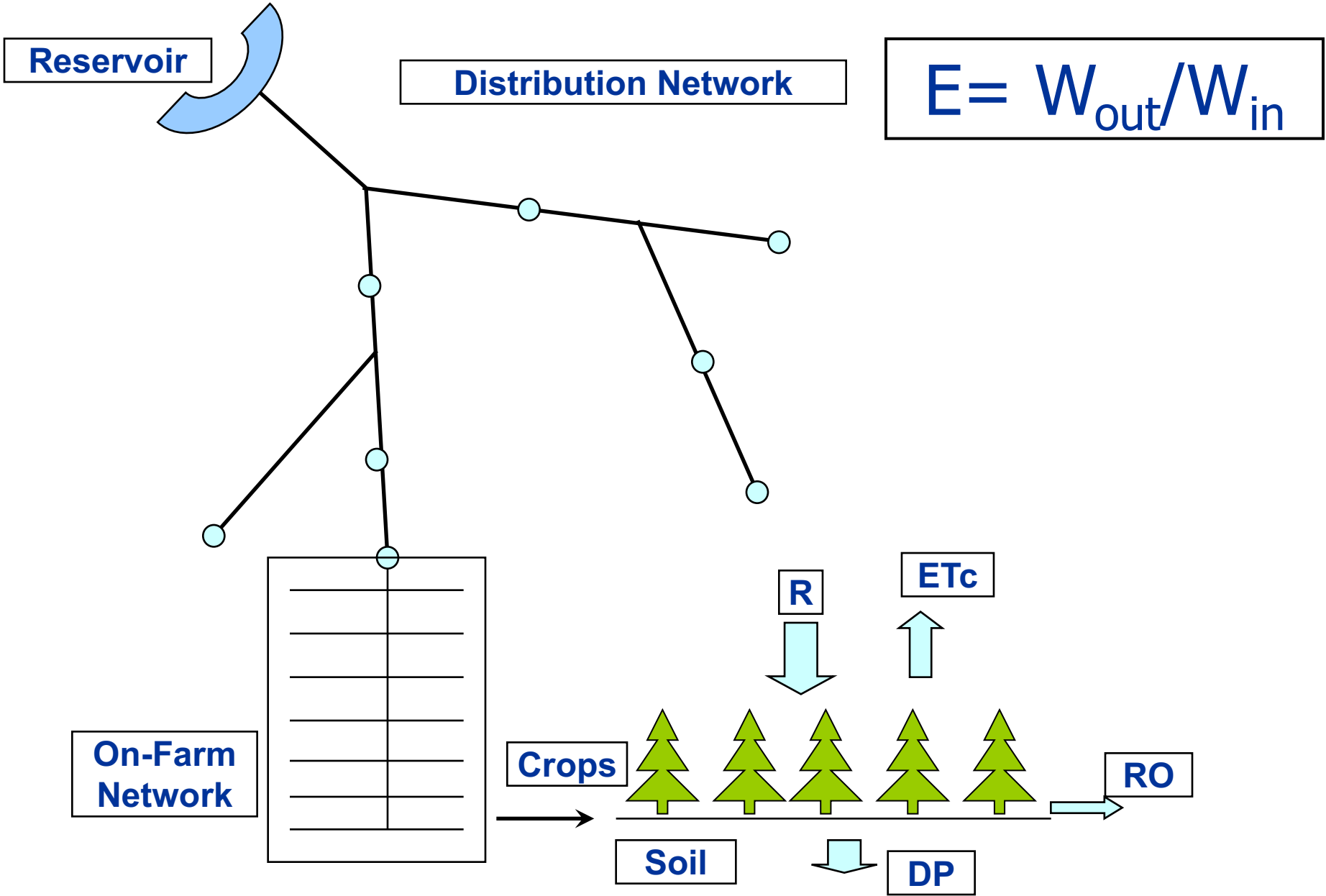
- The current policy choices highlighted the importance of Operation, Maintenance and Management activities (DEMAND MANAGEMENT)
 - Technical approaches (improving WUE at the whole chain of the system, use of unconventional waters, use of new technologies,)
 - Institutional approaches (PIM, Capacity Building, Governance, ...)

Water Efficiency

In general terms **Water Efficiency (e)** refers to the ratio between water consumed by a 'user' for a give purpose to the water applied to that same user

$$\text{Irrigation Efficiency (e}_i\text{)} = \frac{\text{water volume, out}}{\text{water volume, in}}$$

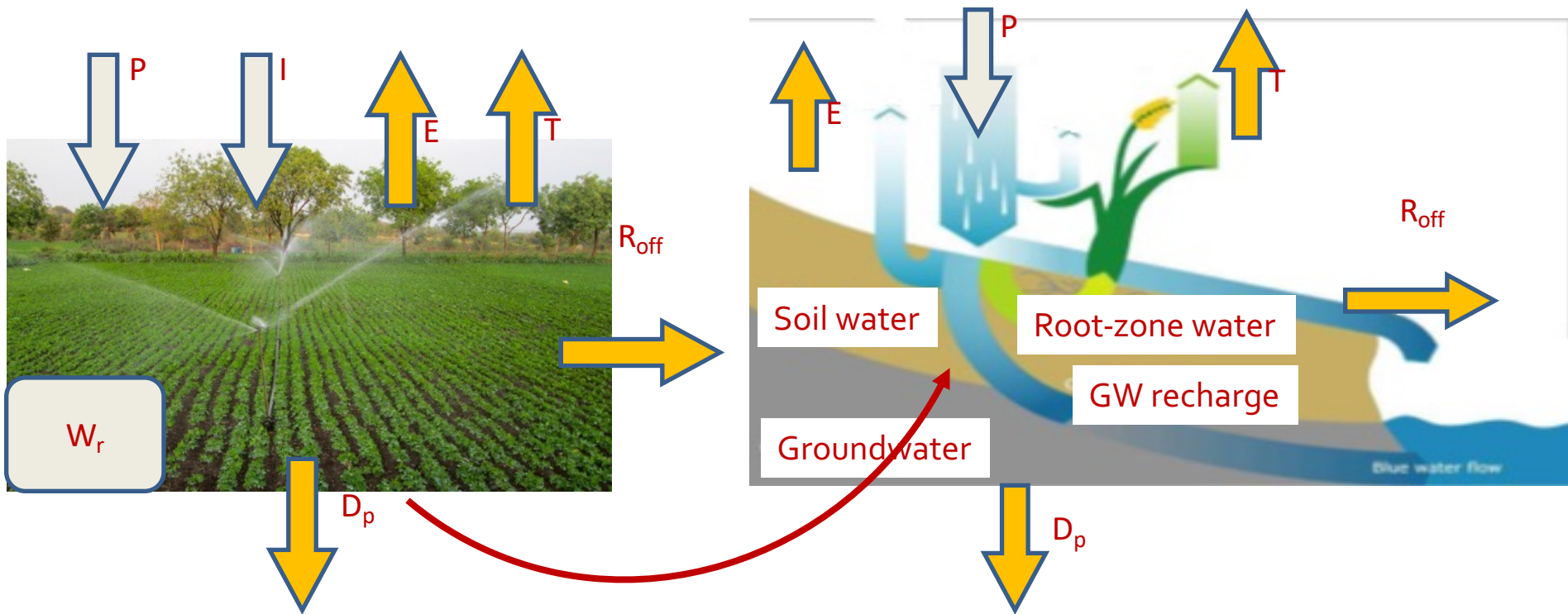
e_i is **a-dimensional** and has 'theoretical limits' **0-1**



Examples from open fields

Farm scale

Basin scale





Yield uniformity for wheat in Kafr El Sheik - Egypt

MADFORWATER





MADFORWATER

Pollution of a drainage canal



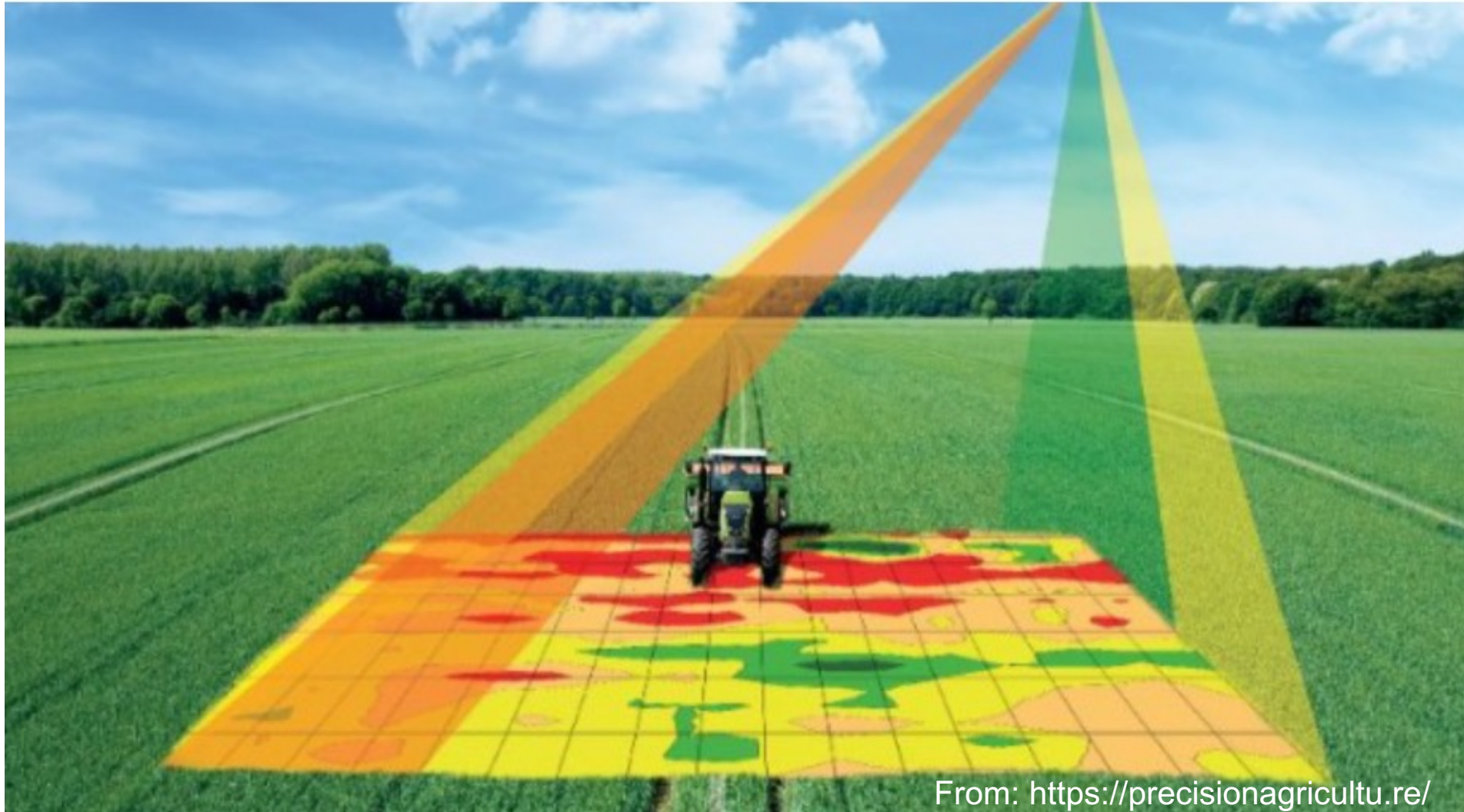








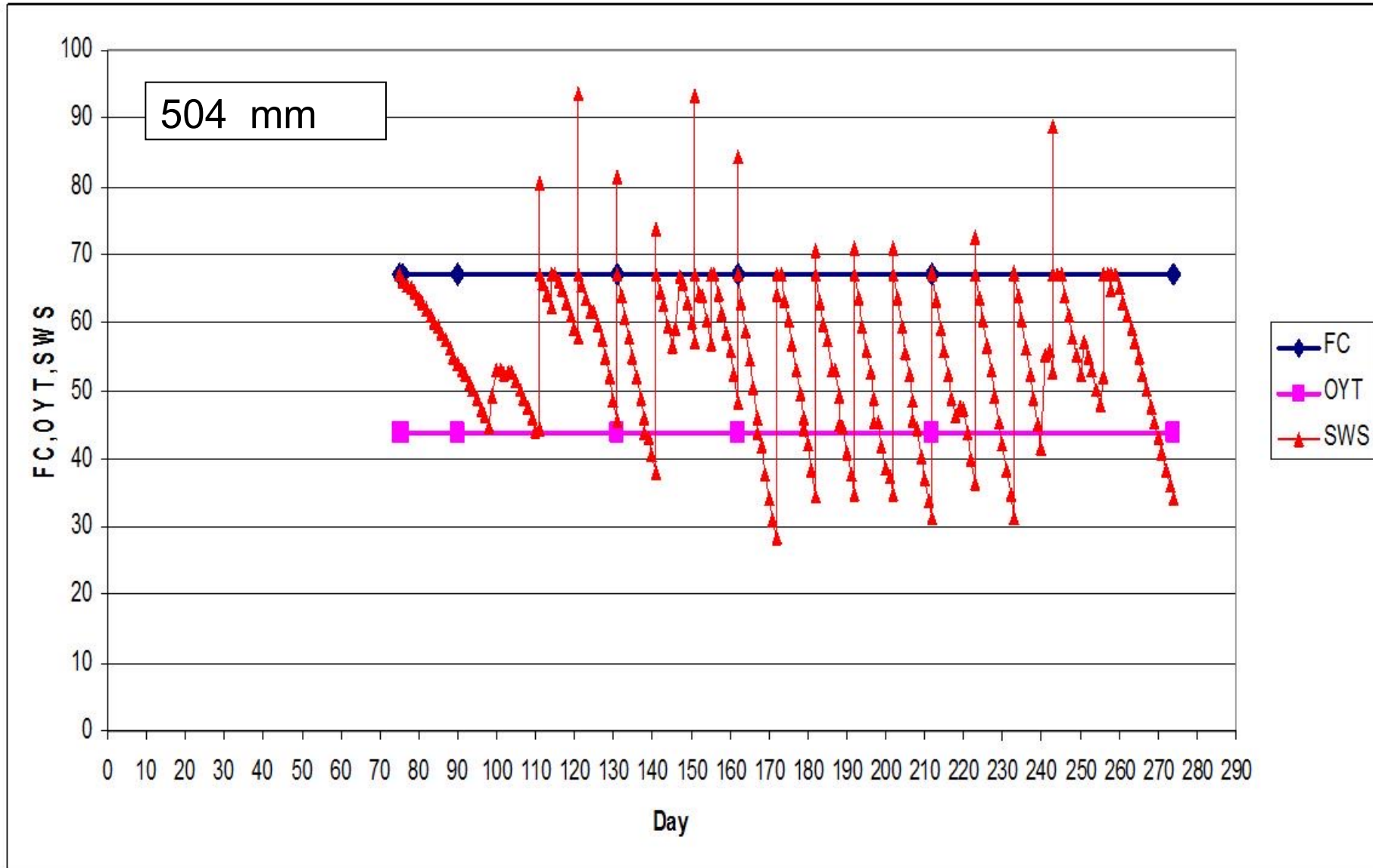
PRECISION AGRICULTURE



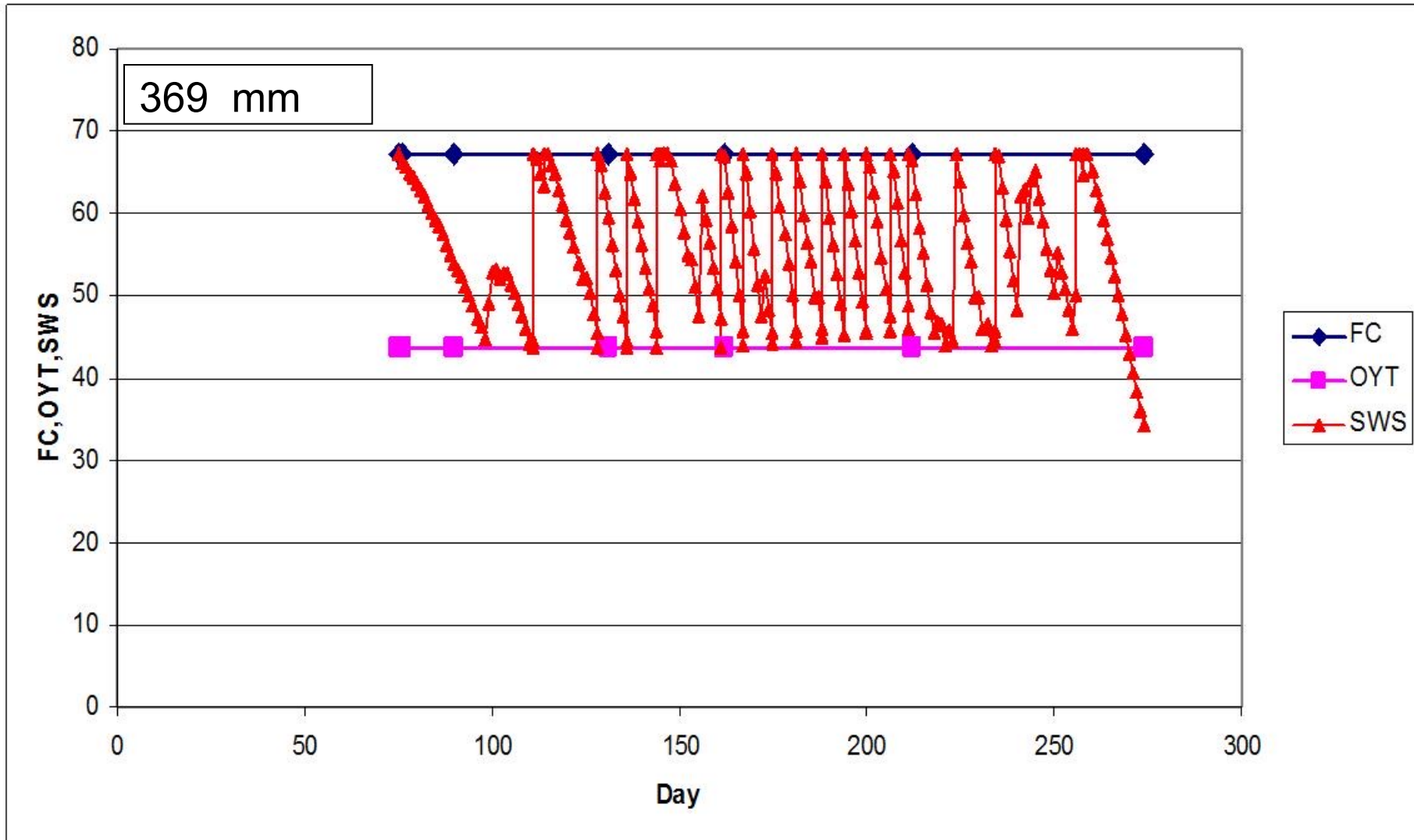
MAIN TECHNOLOGIES TO BE USED

GPS, Mobile devices, Robotics, Sensors, Irrigation, IoT, Weather modeling, Nitrogen modeling,

Simulated soil-water balance for TABLE GRAPES according to the rotational delivery schedule conducted by the Water Users Association



Simulated soil-water balance for Table grapes according to the on-demand delivery schedule





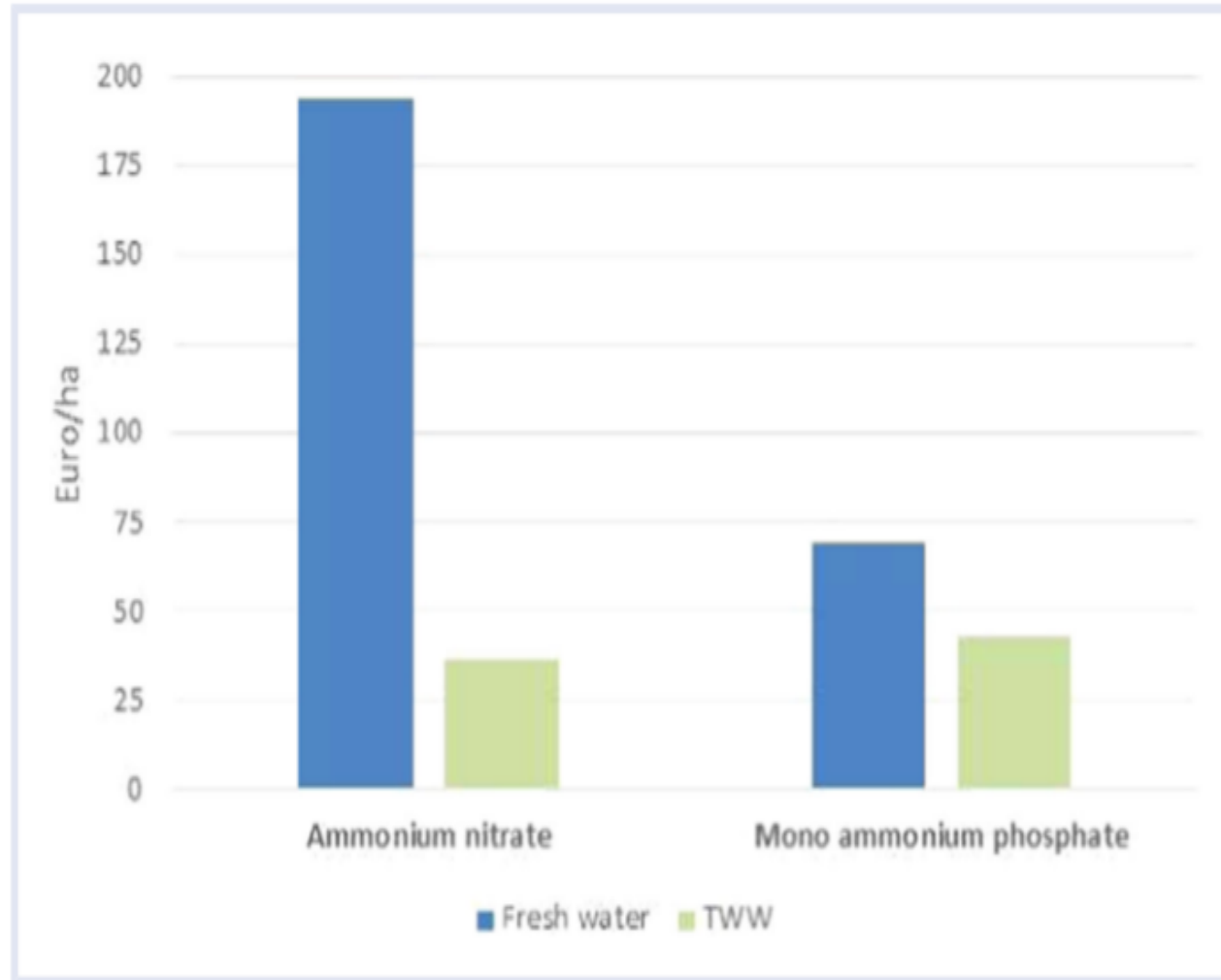
MADFORWATER

THE REUSE OF TREATED WASTE WATER



EU funded Project

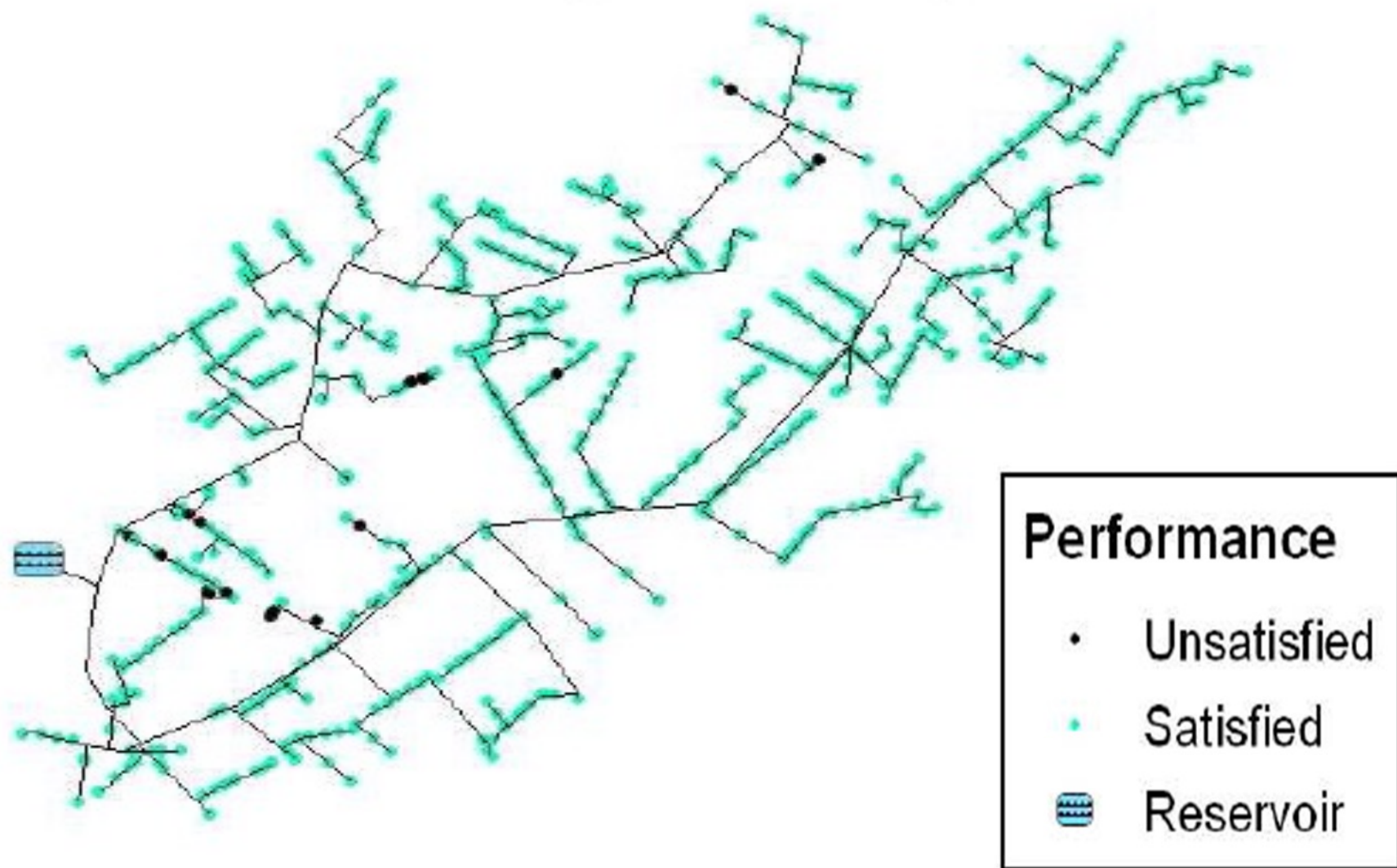
Fertilizers costs and saving for TWW use



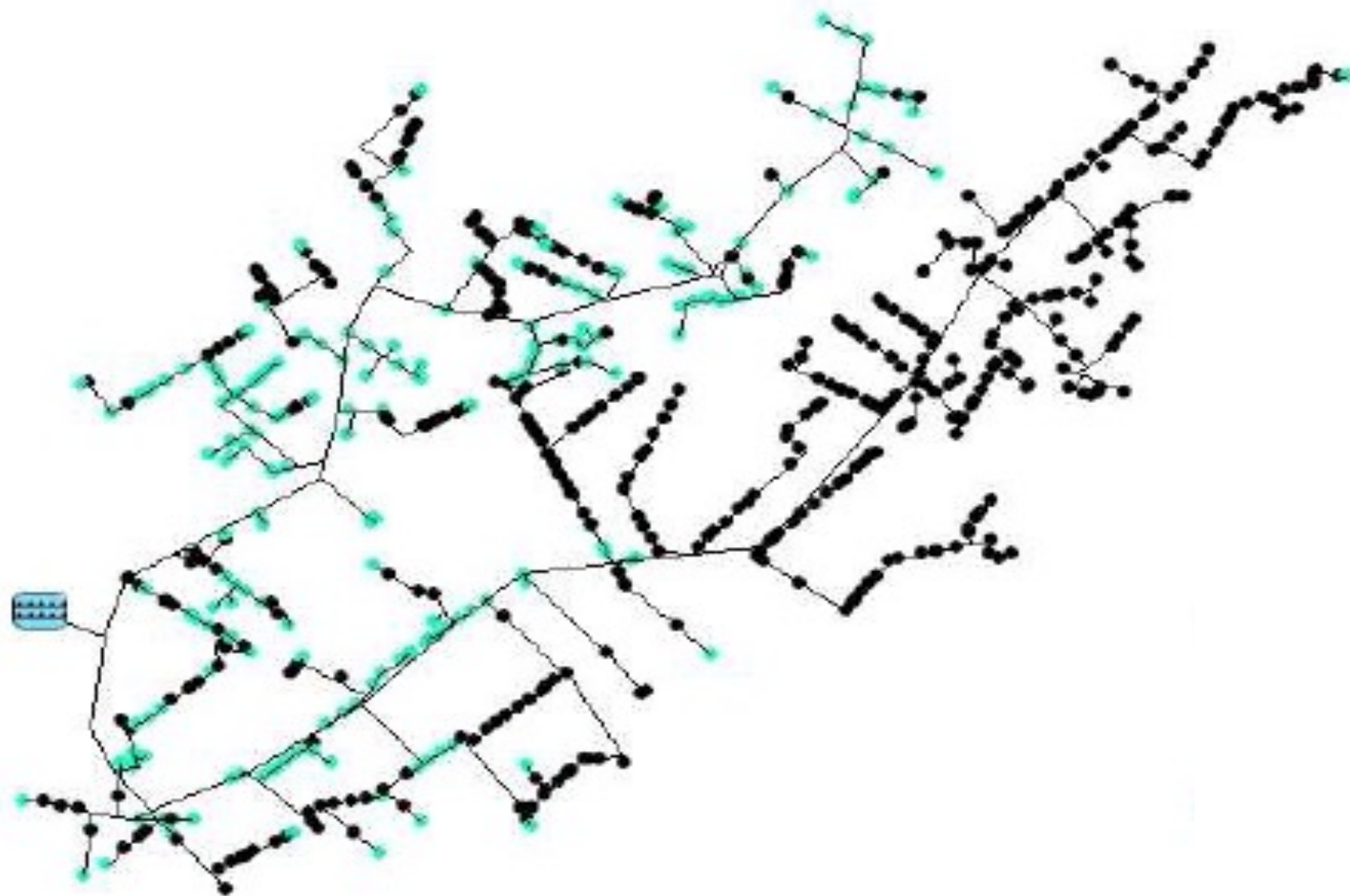


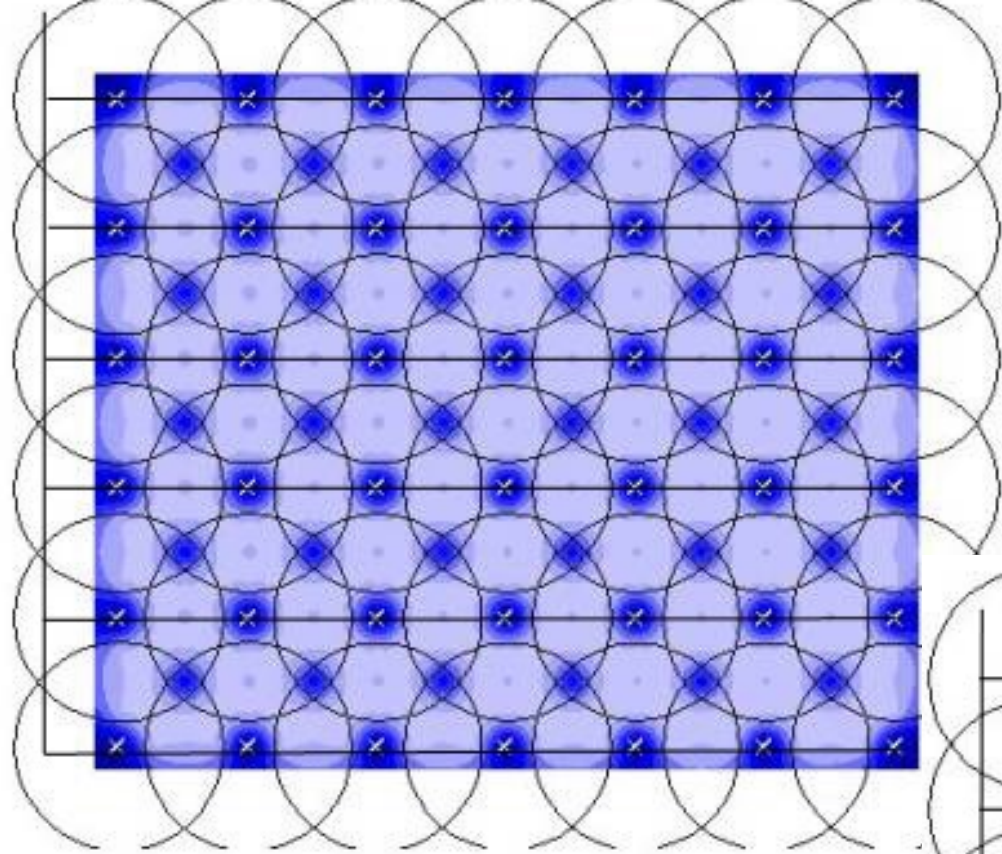


Baseline (1960-1990)



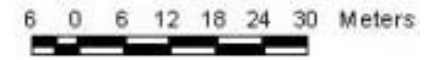
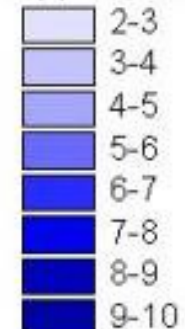
SRES B1 2050



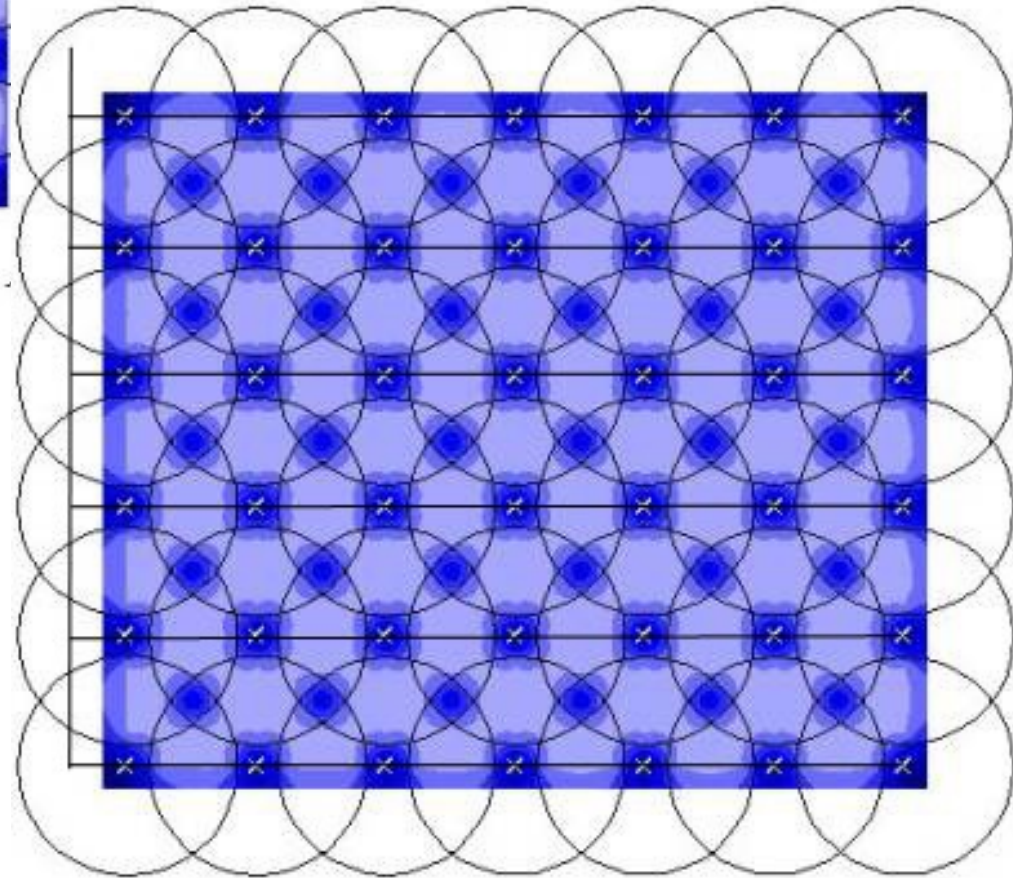


H = 26 m
CU = 63%
DU = 67%
DE₉₀ = 62%

Applied water (mm/h)



H >= 39 m
CU = 74%
DU = 80%
DE₉₀ = 80%



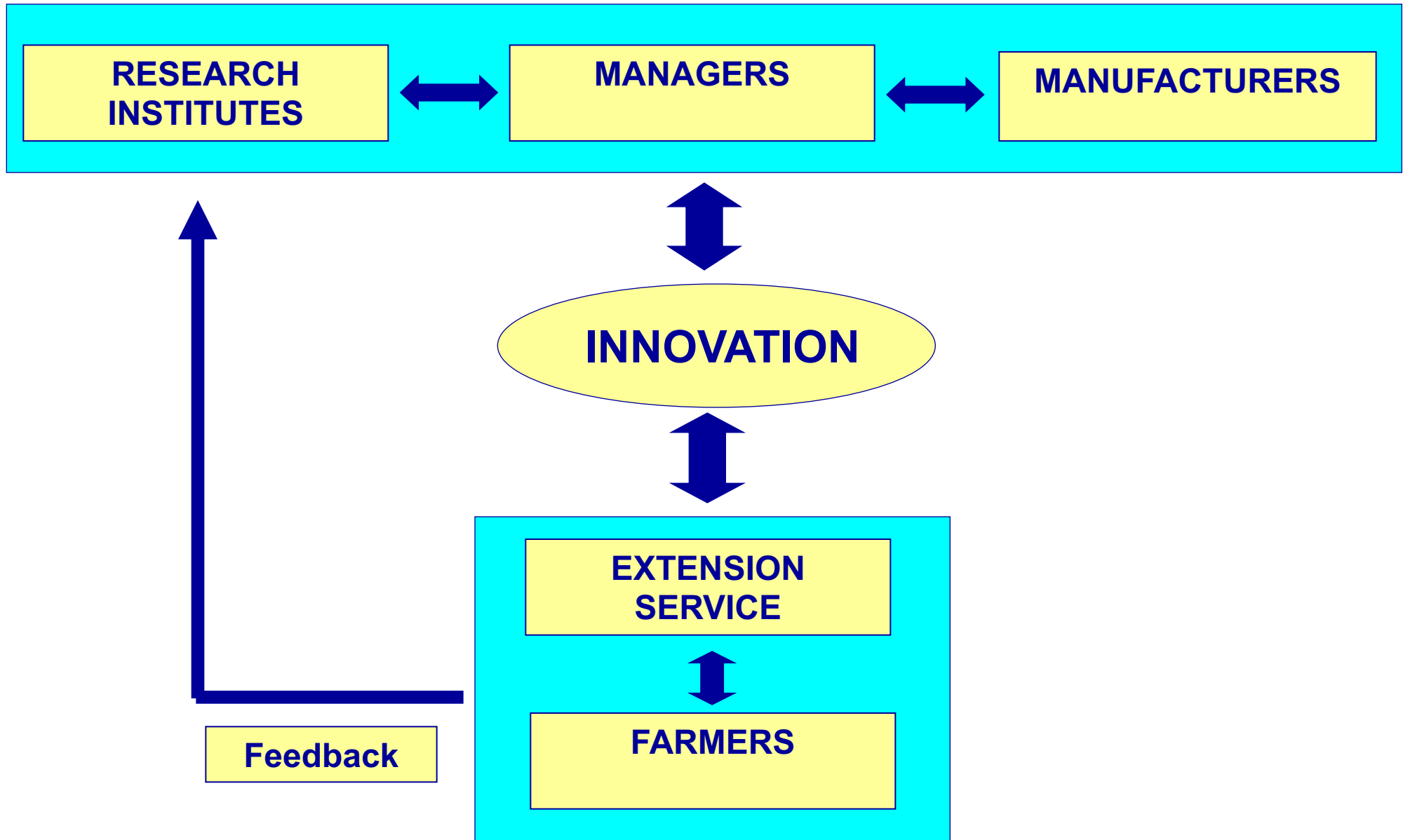
APPROCCI ISTITUZIONALI

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- Mettere a punto modelli di Governance appropriate
- Implementare e valorizzare le attività di assistenza tecnica (extension service)
- Mettere a punto e implementare attività di formazione a tutti i livelli (Capacity development programs)

IMPORTANCE OF THE TRAINING: FROM THE CLASSROOM TO THE FIELD







Grazie per l'attenzione

**REGIONE
PUGLIA**
Assessorato all'Ambiente

