Innovation and Technology transfer for a better water resources management

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Building Climate Resilience in the Western Mediterranean: Water and Climate Change Adaptation Nexus
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CIHEAM
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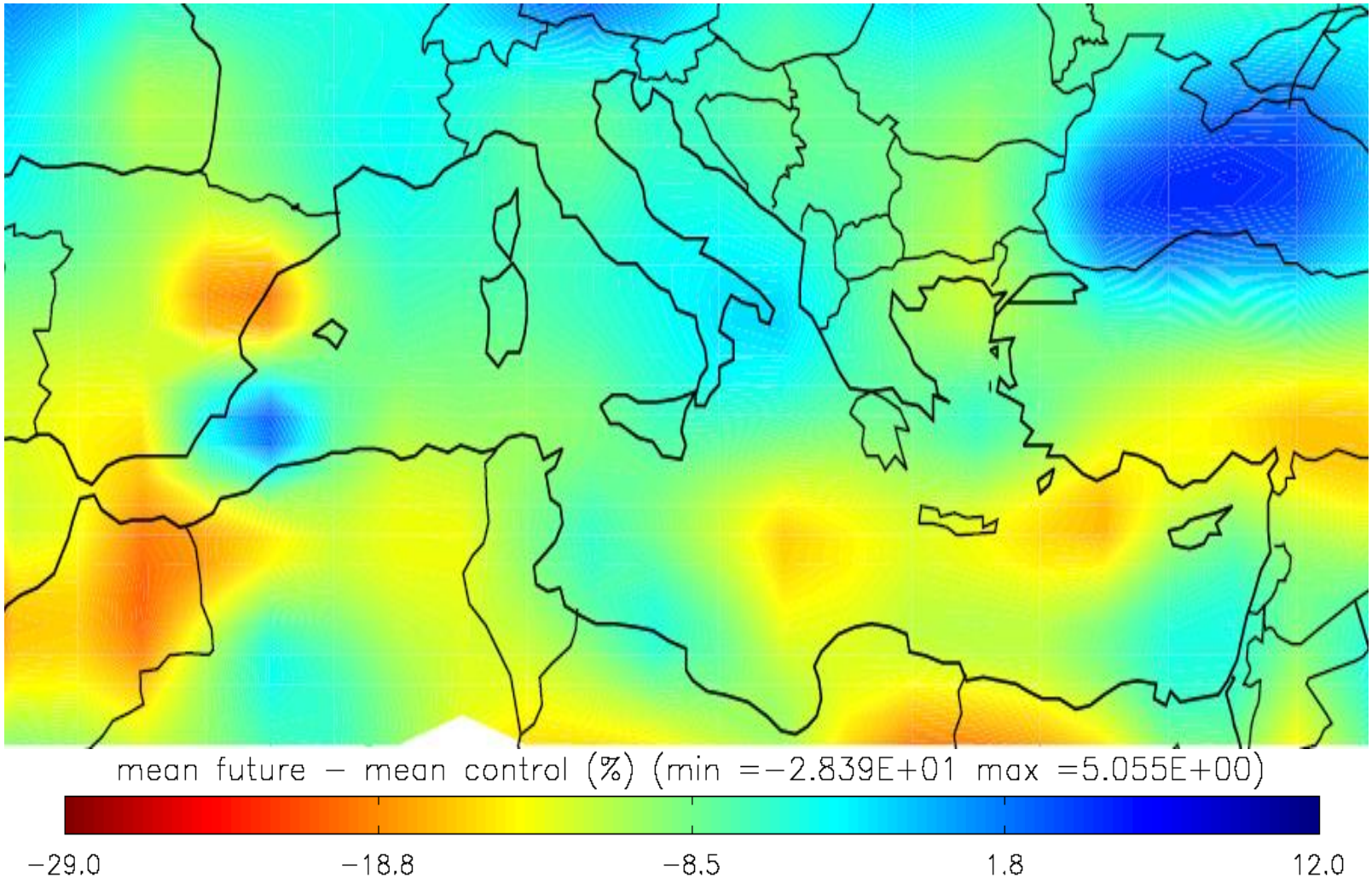
Raising key points and comments on the importance of knowledge and innovation to improve water management to increase the resilience to climate change of the agricultural water sector in the Western Mediterranean.

- How the latest innovation and technological progresses help increase agricultural water efficiency and productivity in the context of climate change in the region?
- How have research and innovation allowed to develop alternative water resources for agriculture?
- What are the main challenges and obstacles to improve scientific
knowledge and its transfer to water professionals and the agricultural sector in the Western Mediterranean?
- What are the needs in terms of capacity-building?

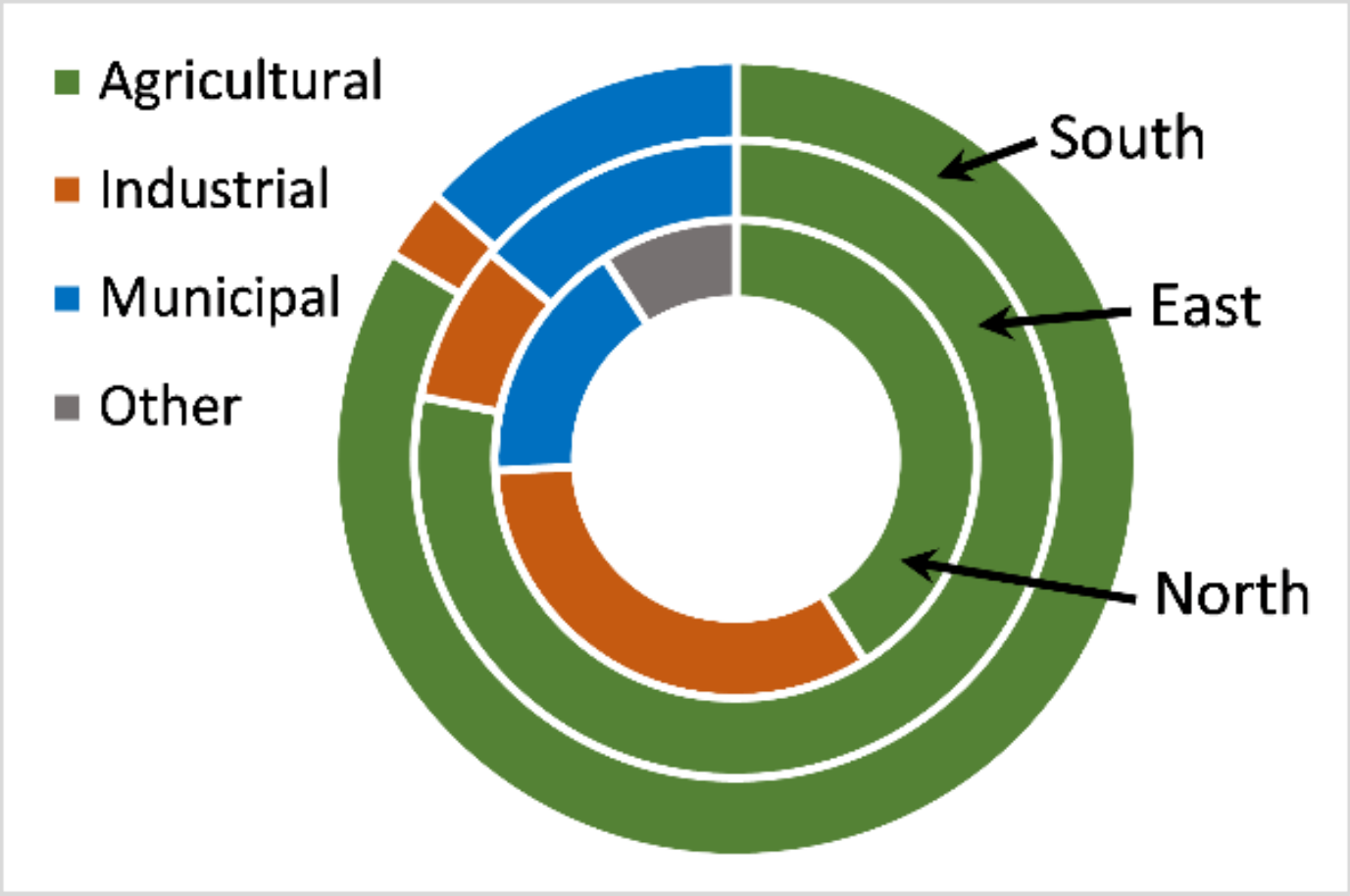
- Two key policy recommendations

THE CHALLENGE

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



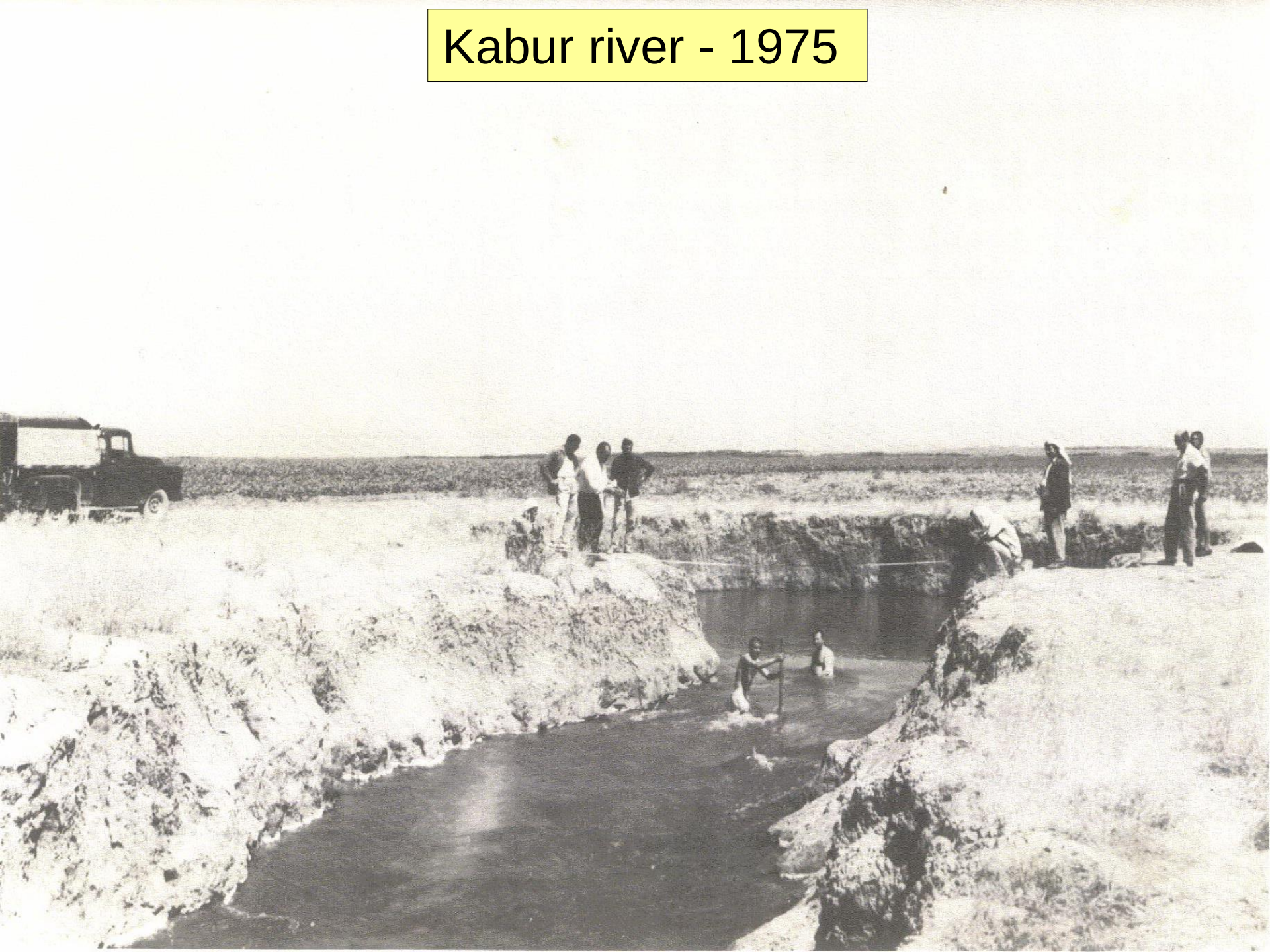
Water Withdrawals by sector

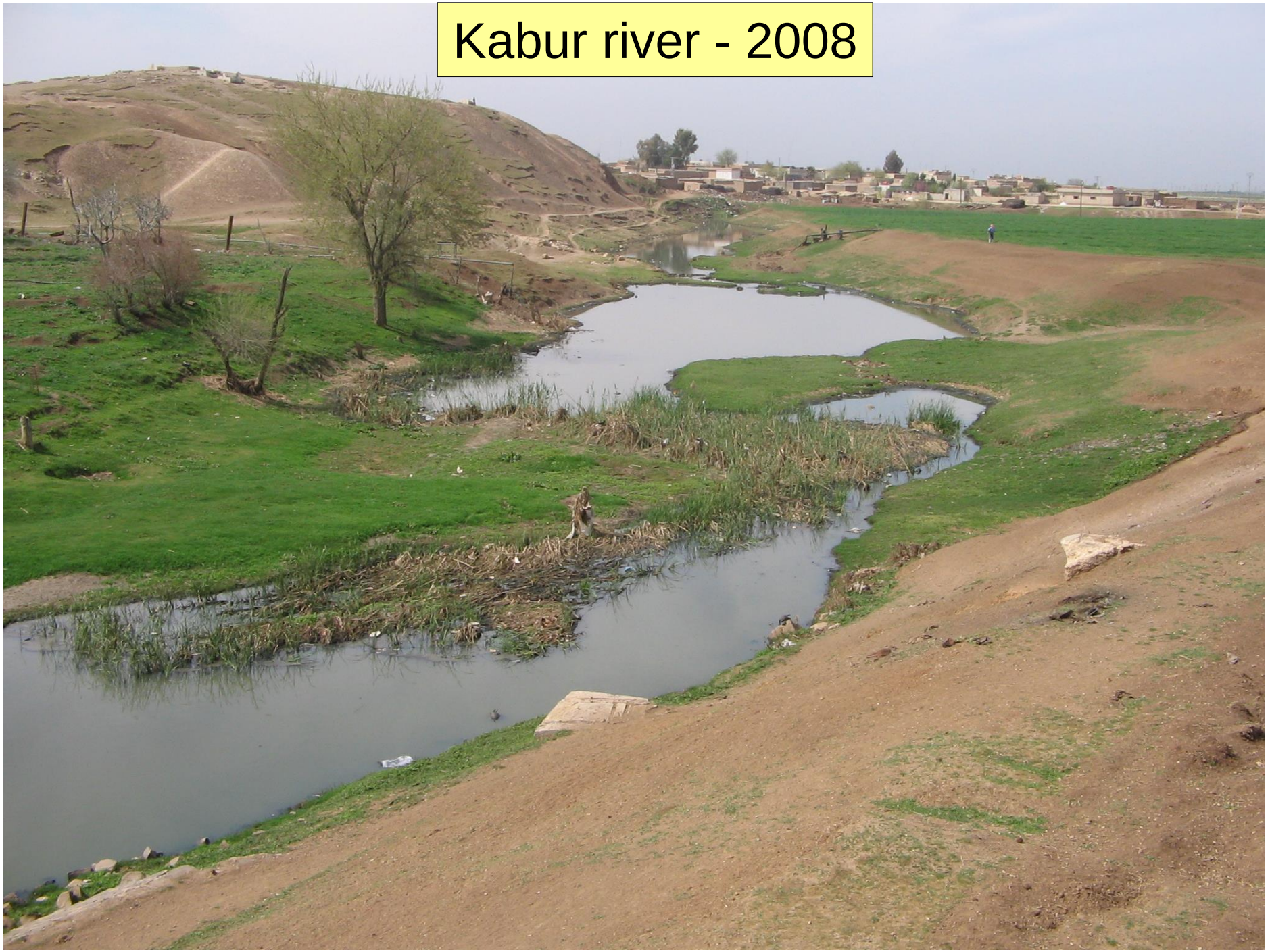


Source: data extracted from Aquastat database. FAO, 2016

1 - OVER EXPLOITATION

Kabur river - 1975




Kabur river - 2008


Kebrit spring - 1999
99 5 14

Kebrit Spring - 2005


Kebrit spring - 2007

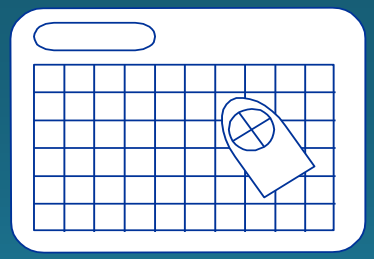
CALIBRATED NOZZLE FOR EGYPT

Pressure (Bars)	Discharge (L/s)
0.15	0.75
0.2	0.8
0.4	0.84
0.5	0.89

HIGHER DISTRIBUTION UNIFORMITY WITH LESS WATER VOLUME

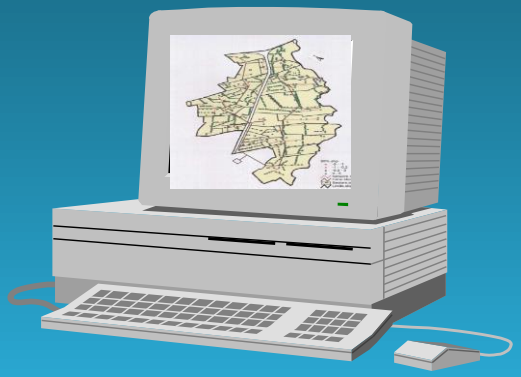
ENERGY CONSUMPTION

ACTION:

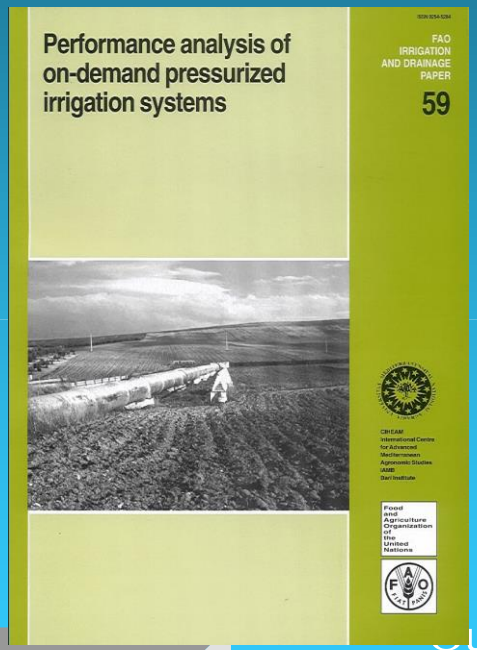


Digitizing

Maps selection and up-dating



ArcView GIS



Data assessment

Input

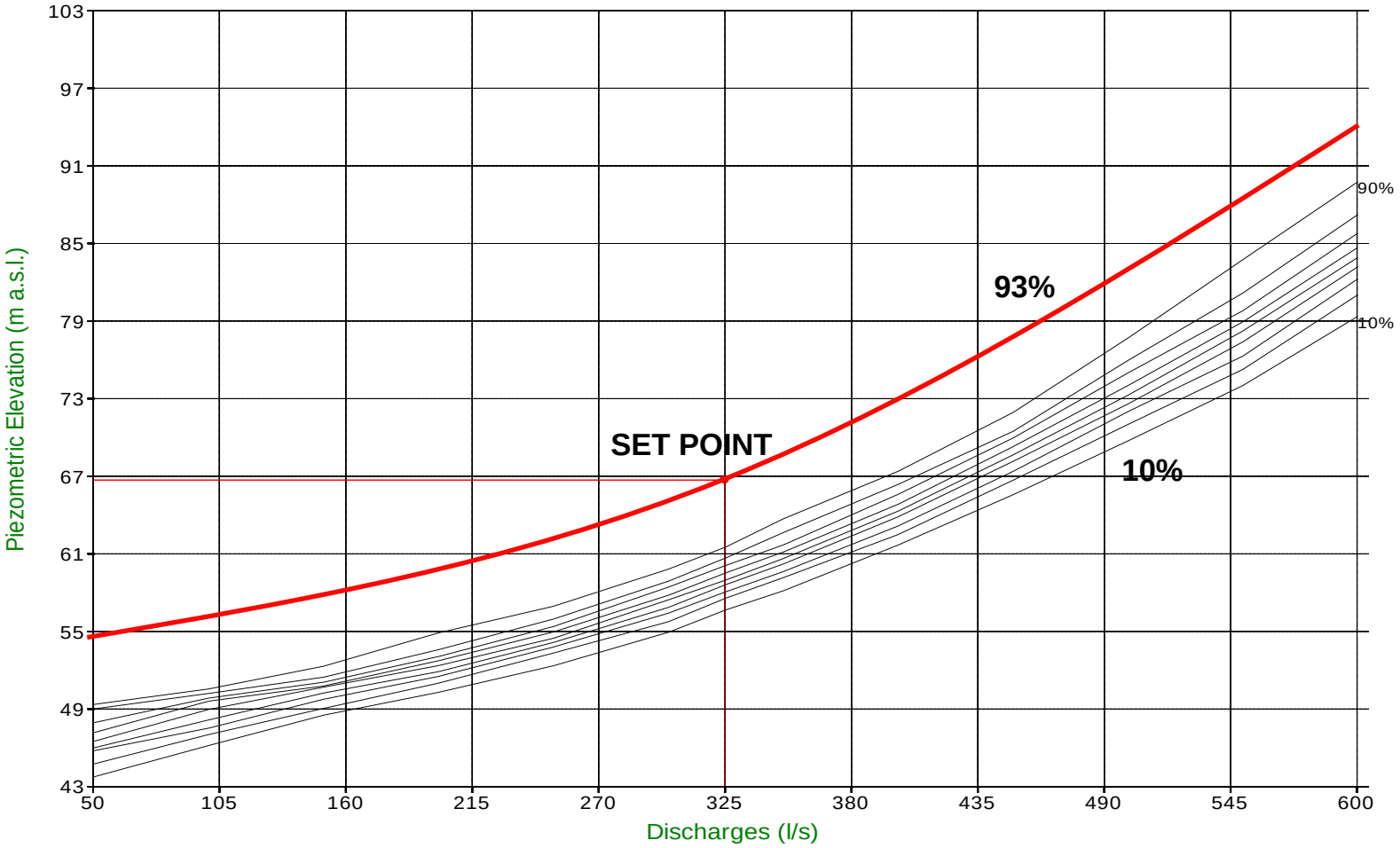
Input Database

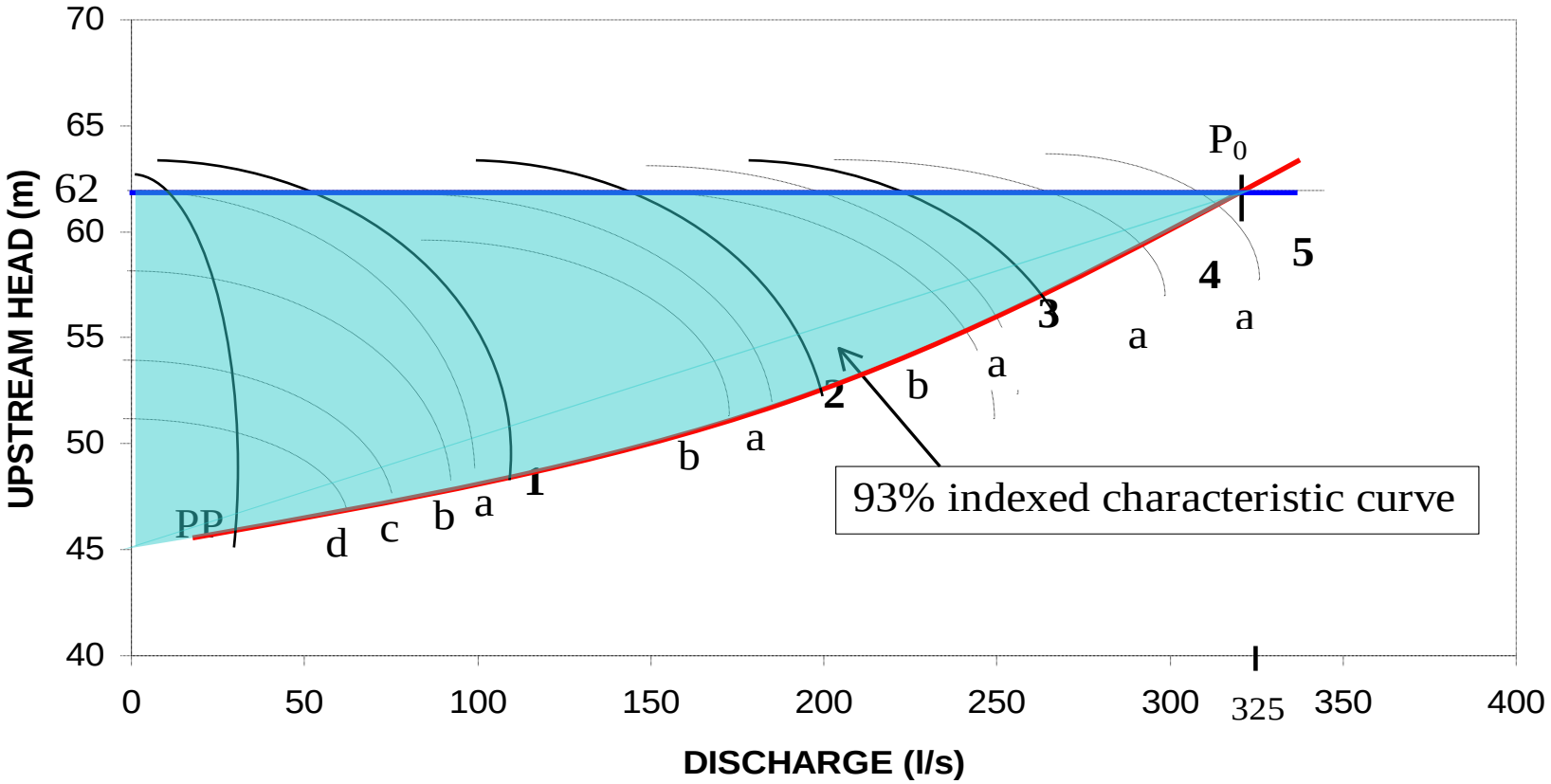
Output

Transformation model

Simulation with AKLA

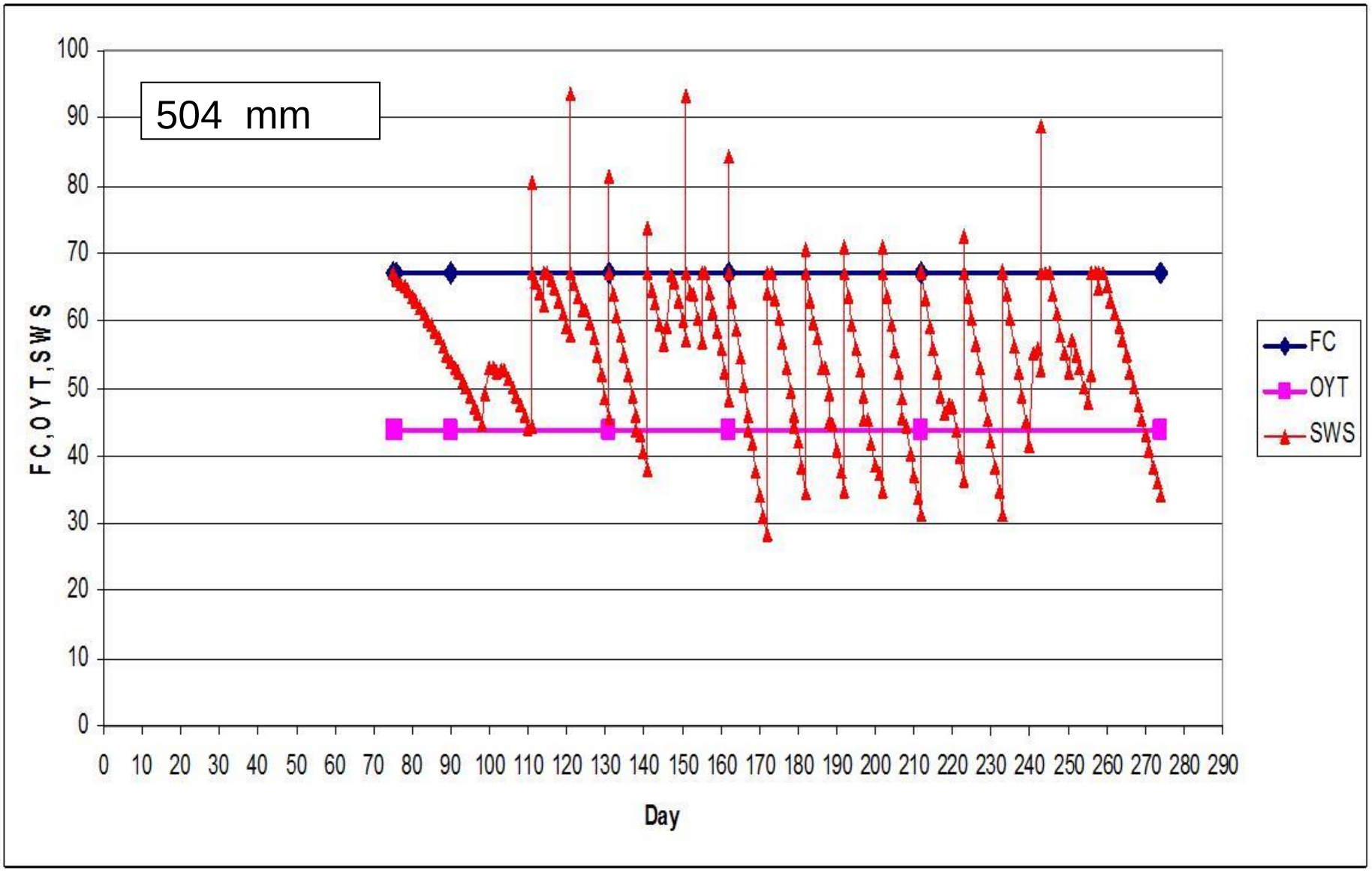
Configuration Analysis



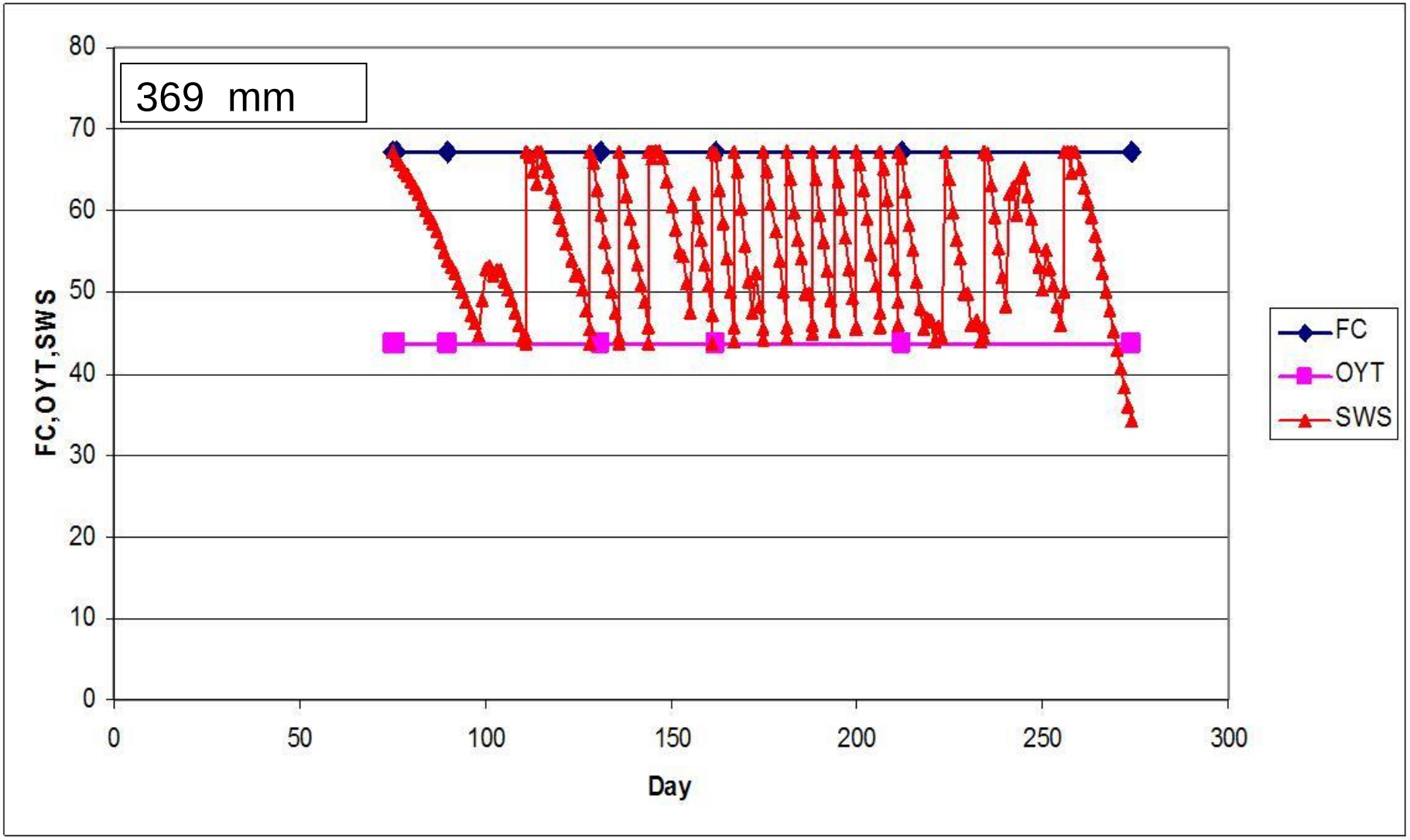

UPSTREAM HEAD (m)
70
65
62
60
55
50
45
40
0
50
100
150
200
250
300
325
350
400
DISCHARGE (l/s)
P0
5
4
a
3
a
a
2
b
a
1
b
a
PP
d
c
b
a
93% indexed characteristic curve

DELIVERY SCHEDULE
(rotation vs on-demand)

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

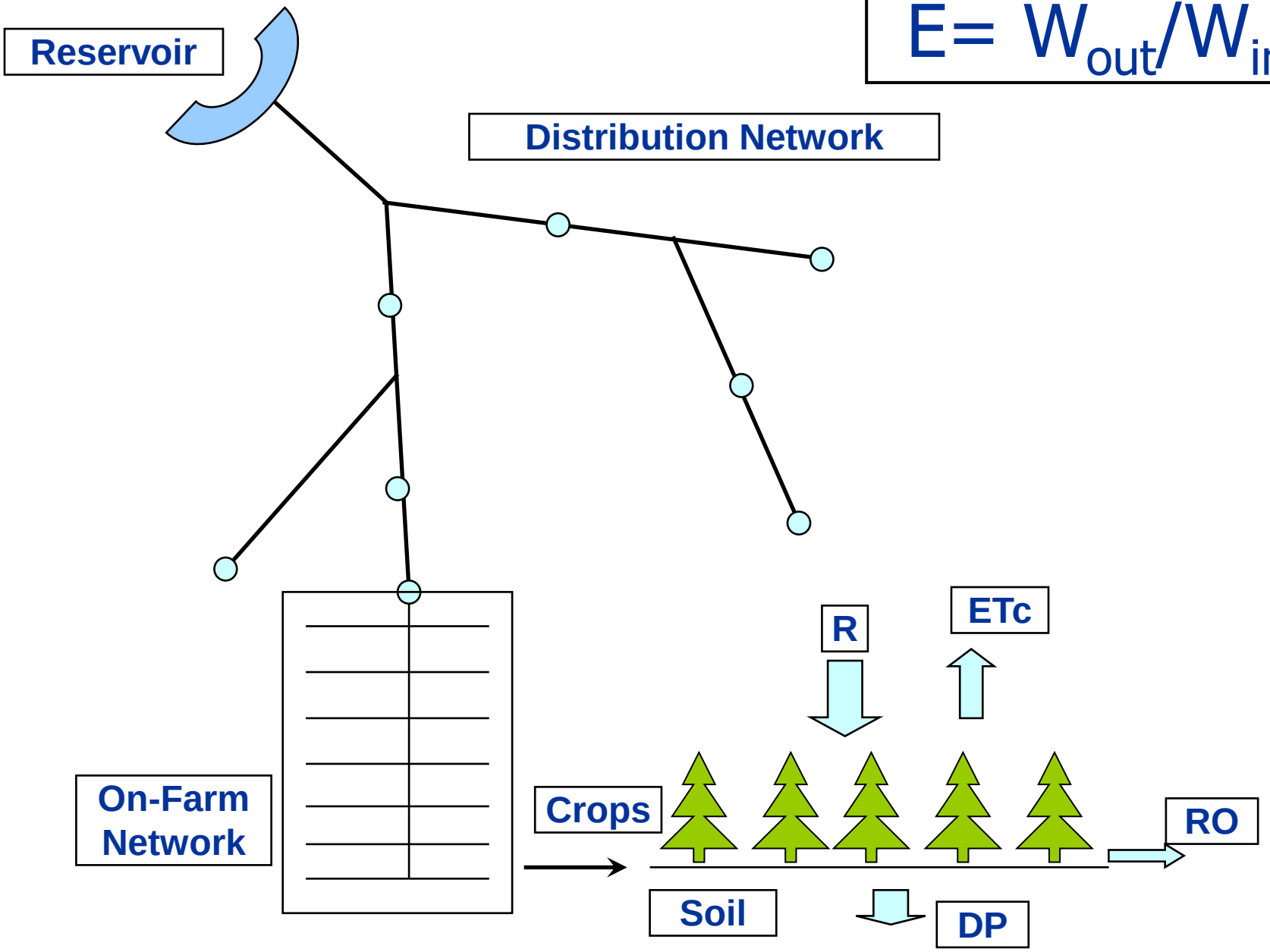


Simulated soil-water balance for Table grapes according to the on-demand delivery schedule



IMPROVE IRRIGATION EFFICIENCY TECHNIQUES IN ALL THE CHAIN

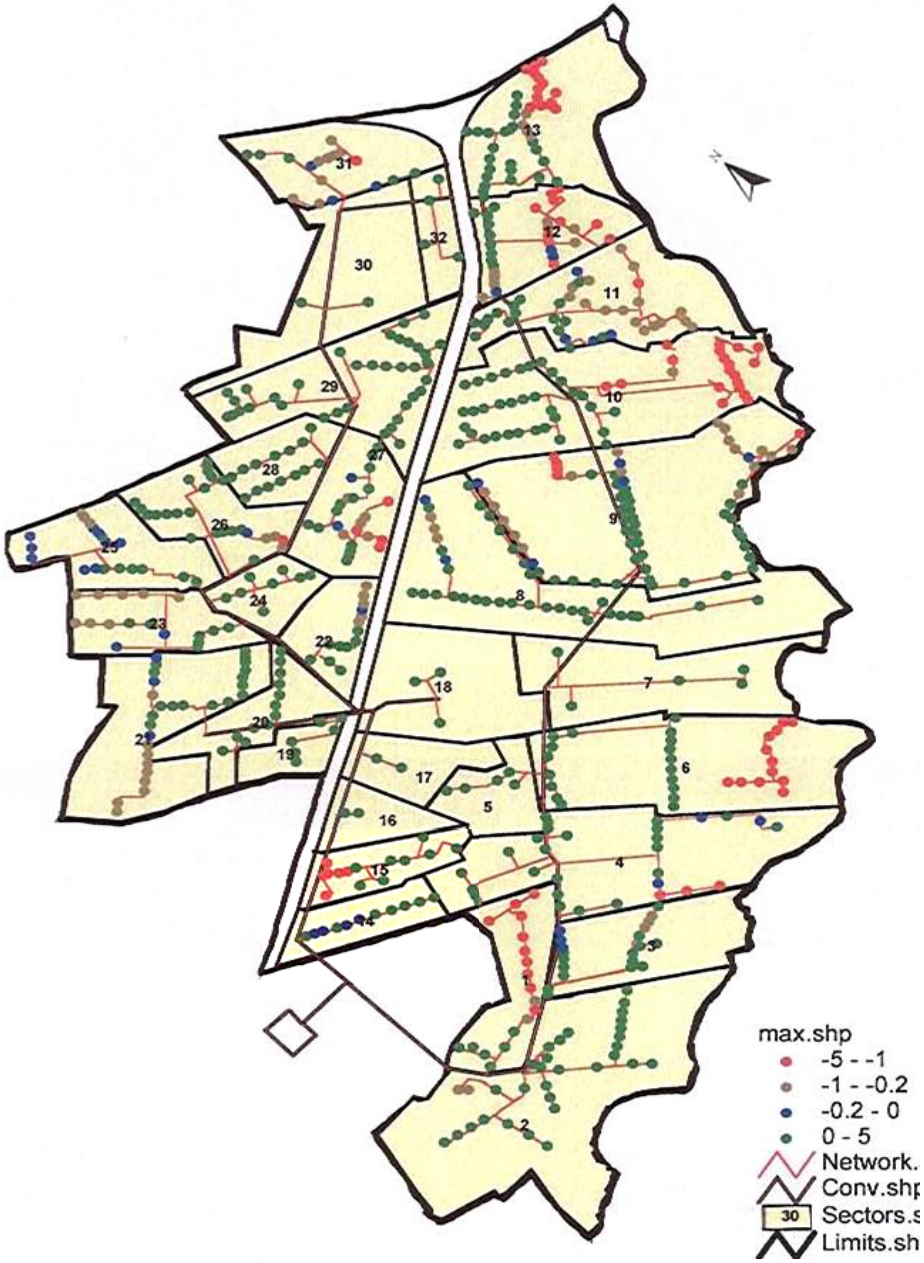
$$E = W_{out}/W_{in}$$


Reservoir
Distribution Network
On-Farm Network
R
ETc
Crops
RO
Soil
DP


Discharge (l/s)
1200
600
Time (hours)

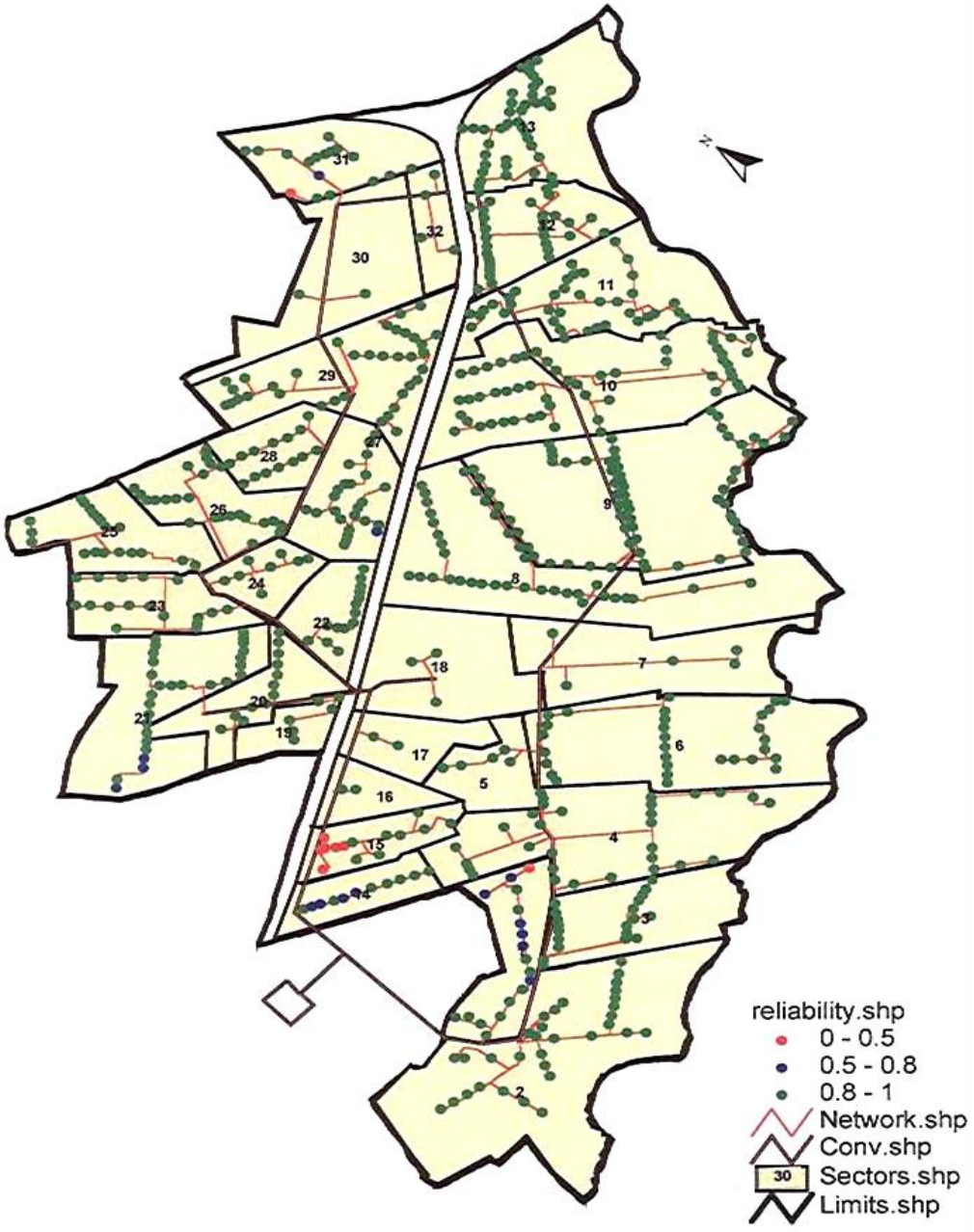
Pressure Deficit:

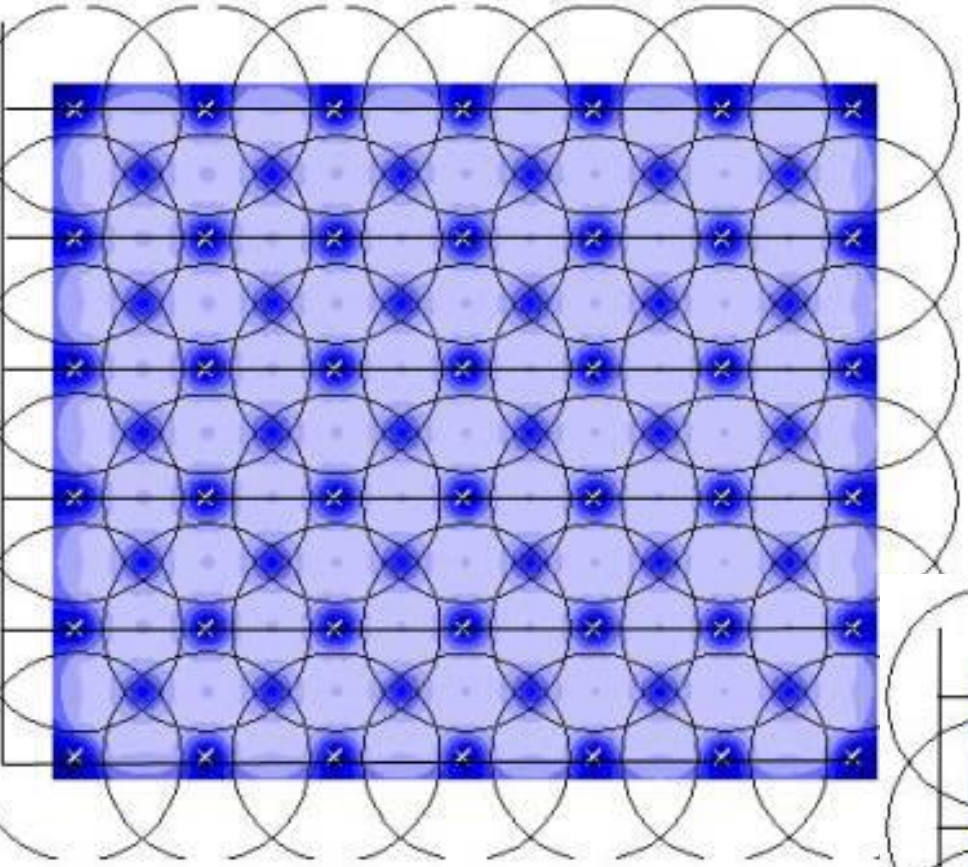
Q = 1200 l/s



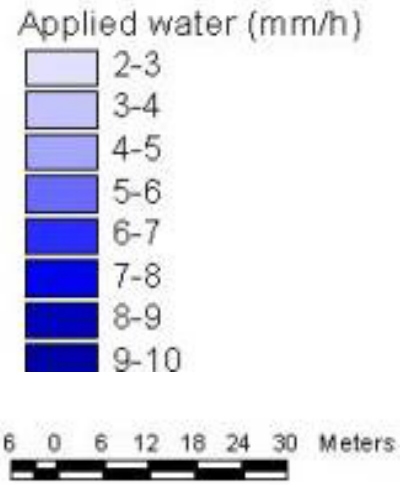
Pressure Deficit:

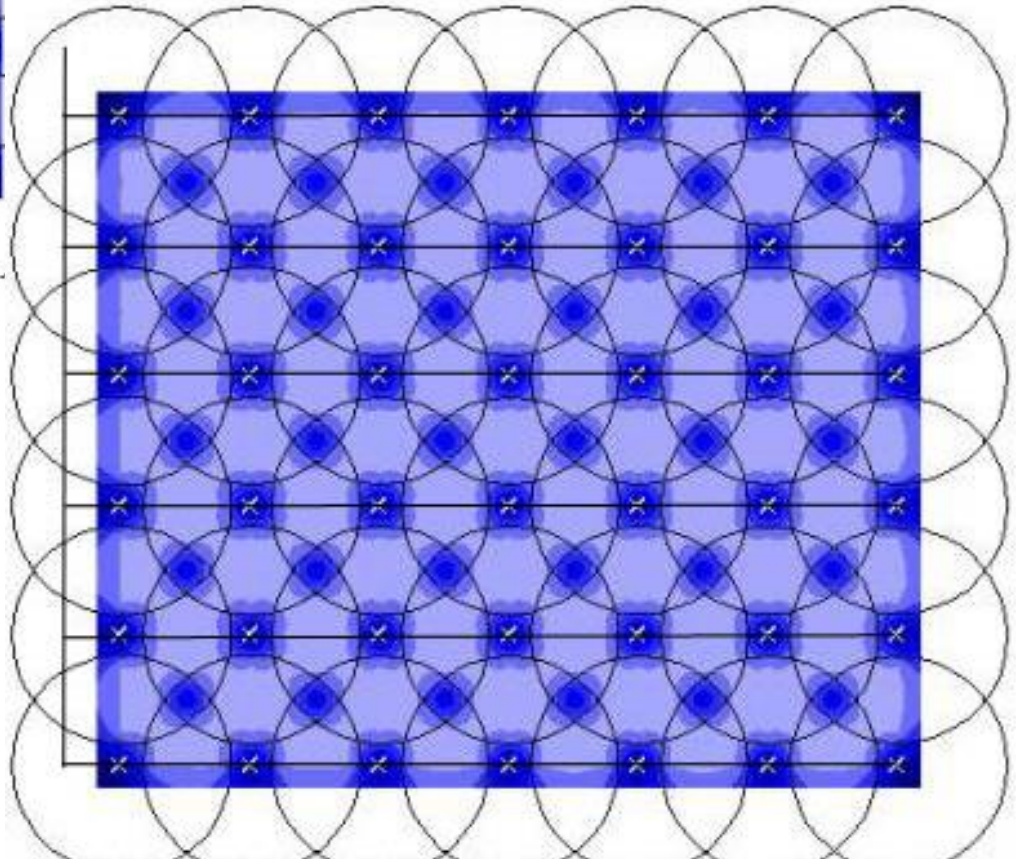
Q = 700 l/s





H= 23 m
CU = 63%
DU = 67%
DE_{90}= 62%
dn_{90}= 3mm/h





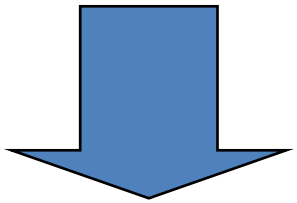
H = 48 m
CU = 74%
DU = 80%
DE_{90}= 80%
dn_{90}= 4.5mm/h

CAS 1:

$$E_{G,1} = 0.95 \times 0.60 = 0.57$$

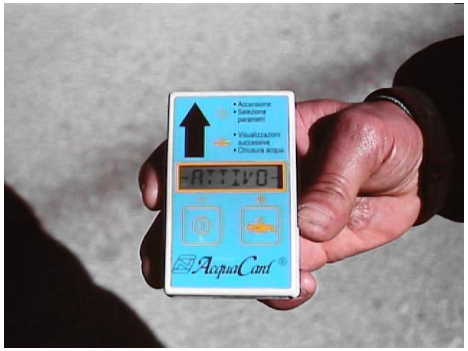
CAS 2:

$$E_{G,2} = 0.95 \times 0.80 = 0.76$$



$$\Delta E = (0.76 - 0.57)/0.57 = 0.33 = 33\%$$


AcquaCard
Nicotra
Sistemi spa - MI

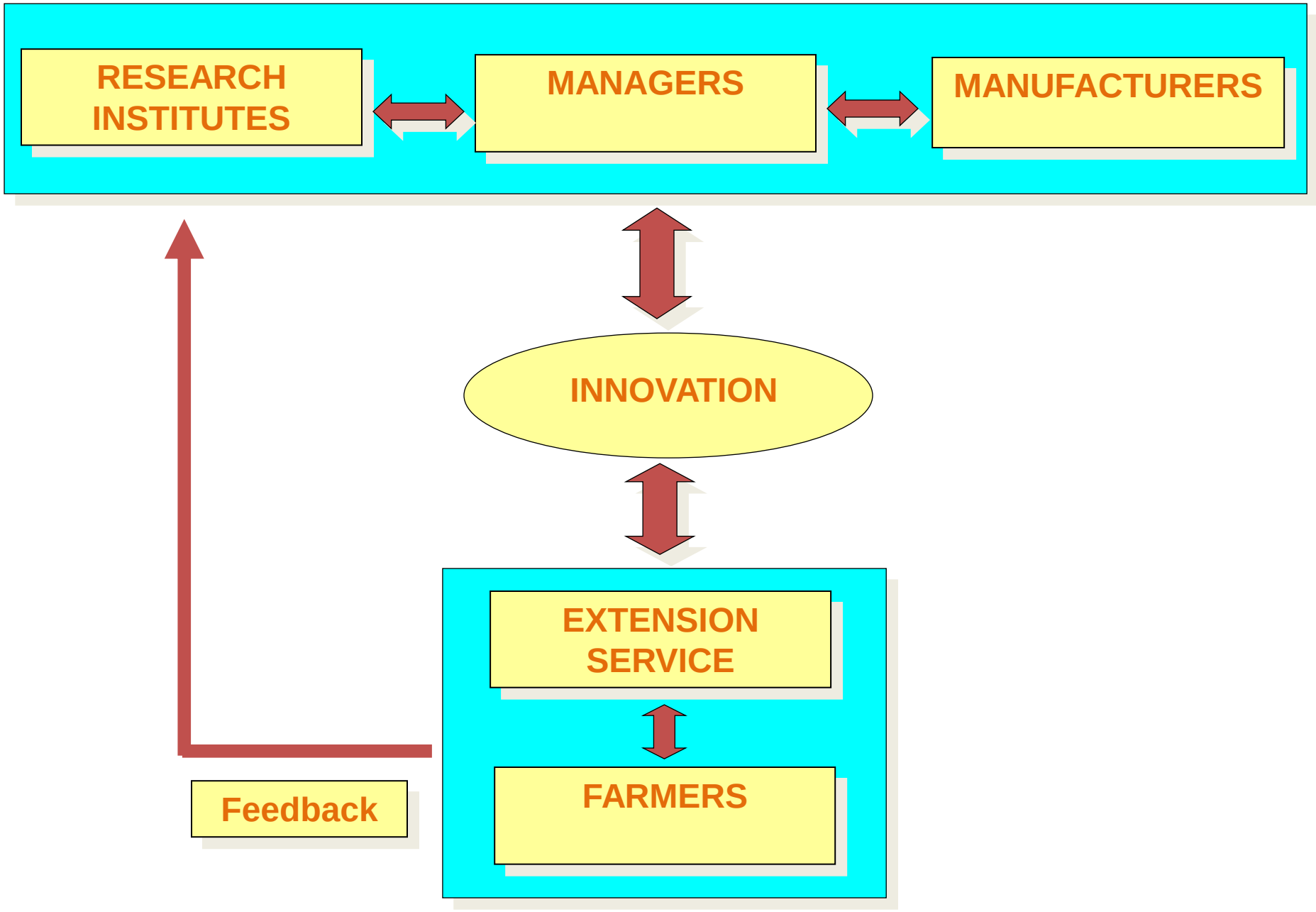

AcquaCard

INSTITUTIONAL APPROACHES

- Set up appropriate Governance models

IMPORTANCE OF THE TRAINING: FROM THE CLASSROOM TO THE FIELD

EXTENSION SERVICE


RESEARCH INSTITUTES
MANAGERS
MANUFACTURERS
INNOVATION
EXTENSION SERVICE
FARMERS
Feedback

POLICY RECOMMENDATIONS

1)Develop and share knowledge, technologies and tools (modeling, software packages, …) for a better water use

2) Encourage relevant stakeholders to join forces, competencies and responsibilities to enhance both an ecosystem approach and a people-centred approach

THANK YOU