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MODERNISER L'IRRIGATION : CONCILIER LES PRATIQUES DES AGRICULTEURS ET DES GESTIONNAIRES DANS LES PERIMETRES IRRIGUES PUBLICS



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MODERNIZING SYSTEMS: INTERFACING FARMERS AND MANAGERS PRACTICES IN PUBLIC IRRIGATION SCHEMES

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Introduction

- SCP intervention in Jordan and Tunisia:
 - IOJoV project 2001-2012
 - Support to 70 GDA: 2013 -ongoing
- Countries with :
 - Stress on water resources
 - Large Public Irrigation scheme
 - Willingness to adopt water-savings technics



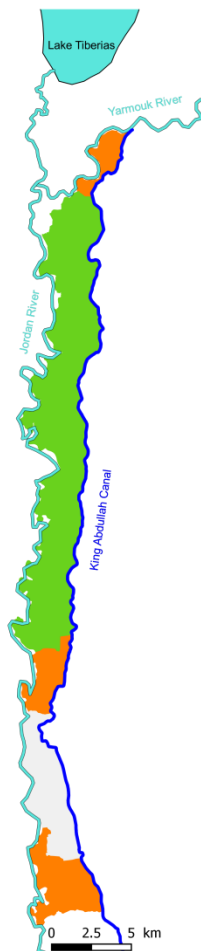


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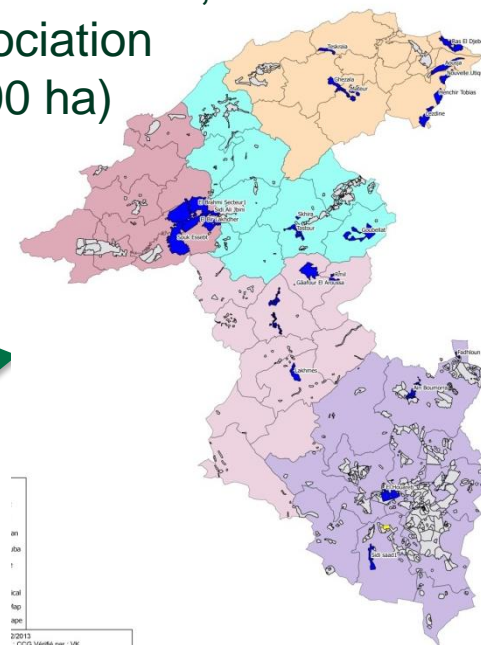
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Location of case studies

- 9 Turn-outs (average area 400 ha each)
- Water source : King Abdallah Canal + Treated wastewater



- 30 public irrigated schemes of Northern and Central Tunisia,
- 70 water users association (average area of 900 ha)
- > 60 000 ha





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Presentation outlines

1. Context of 2 case studies: Jordan and Tunisia
2. Modernizing/rehabilitating large public irrigation scheme in a context of scarce water resources: Will the farmers just follow ?
3. Accounting for diversity when modernizing: from water conveyance to service provision



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JORDAN and TUNISIA

CONTEXT OF 2 CASE STUDIES

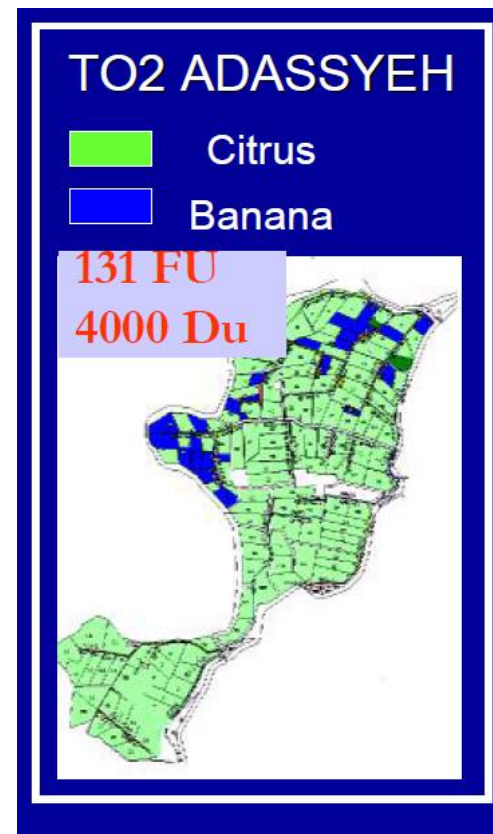


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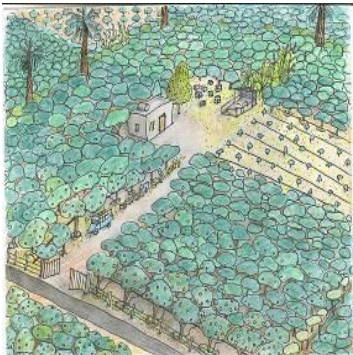
Jordan Valley irrigation schemes : brief history

- **Large gravity Irrigation scheme:**
 - 1950's : Diversion of Yarmouk river in King Abdallah Canal to irrigate 30 000 Ha in the Jordan Valley
- **Objective:**
 - Settling Palestinian populations
 - Food security in the Kingdom of Jordan
- **Jordan Valley Authority JVA manages the area**
 - Gravity canals
 - Farm Units average 3,5 ha : ranges from family farms to agri-business farms
 - Development of fruit trees (citrus and bananas), cereal and fodder crops and vegetables



Diversity of farming systems

- Type of Crops : Bananas, Citrus, vegetables, cereals and fodder crops
- Capacities to invest : from family to entrepreneurial farms
- Climate, market, access to technological package :
Drip irrigation prior to modernization of the networks :
pool + pump + drip



IS DRIP IRRIGATION THE WINNING
FORMULA?

Tunisia PPI : a national scale engineering program to develop irrigated agriculture

- **65 000 ha irrigated in 1956 => 400 000 ha in 2015**
- Mostly **pressurized schemes** for sprinkler irrigation
- On-demand functioning
- Diversity of land ownership in one irrigation scheme
- Planned economy for Agricultural development and marketing chains

Zone d'intervention de GDA Si

2 sociétés (SMVDA) : 1150 ha

- La société TUSALCO
- La société AZIZA ----> OTD

143 agriculteurs répartis sur 3 zones : 470 ha

- Zone Sidi Mansour : 22 agriculteurs
- Zone Slaymia : 45 agriculteurs
- Zone Kharbouche : 76 agriculteurs

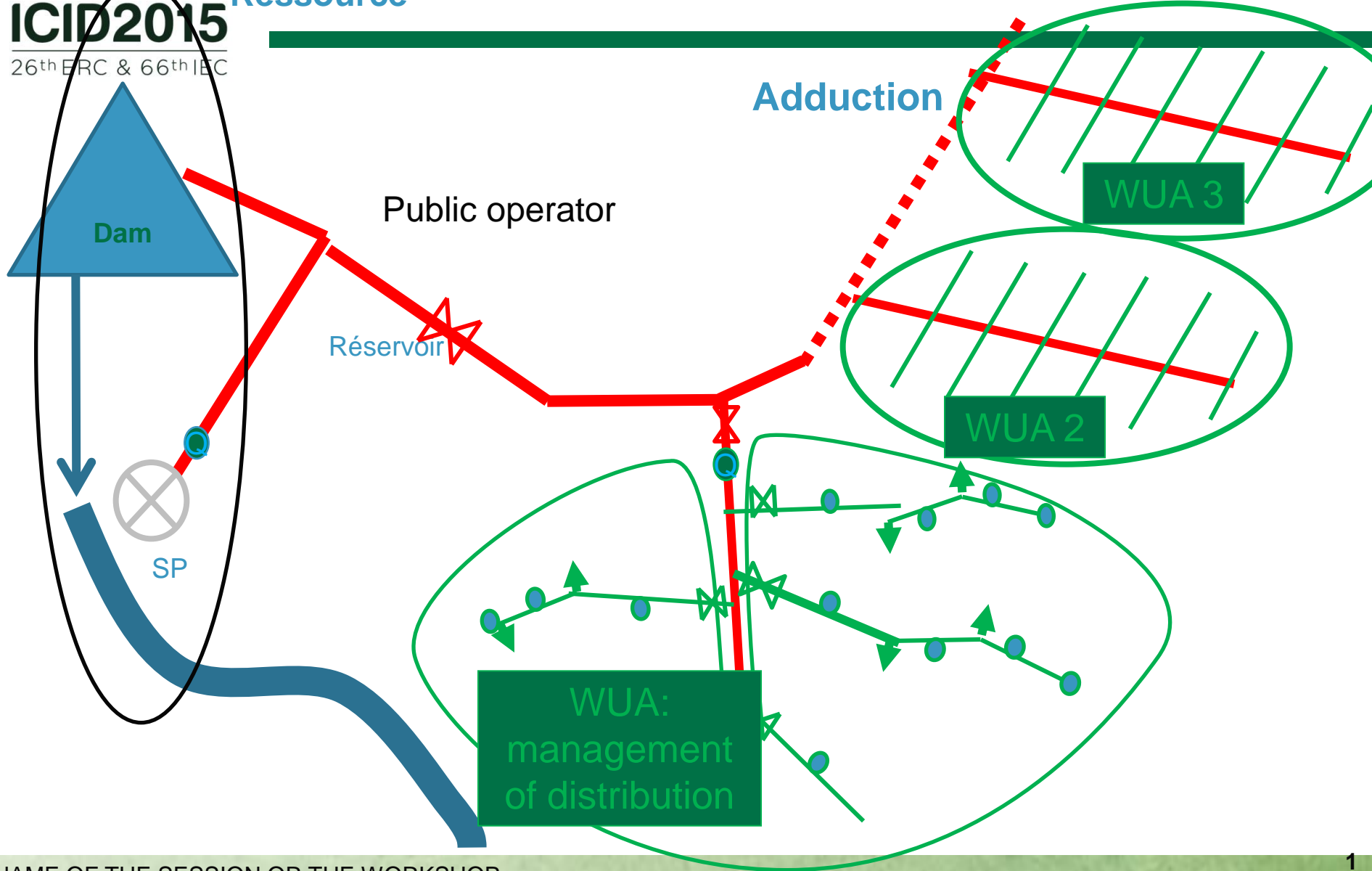
Hiver

Betterave	Blé
Fourrage hiver	Pomme de terre arrière saison

été

Fourrage été	Tomate saison

PPI : large irrigation schemes





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Modernizing/rehabilitating large public irrigation scheme in a context of scarce water resources:

WILL THE FARMERS JUST FOLLOW ?



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Jordan

Modernization : towards water savings?

- From 1980 to 1996, **Modernization of irrigation networks from open channels to pressurized systems**
- **No specific support to on-farm irrigation**
- Progressive involvement of Water User Associations from 2003

TUNISIA

- Since **1995, National program of water savings in irrigation** to support development more efficient irrigation systems such as Drip irrigation
- Progressive involvement of water users since early 1990's. transfer of management still in progress.
- Rehabilitation programs of infrastructures from 2001 to 2015:



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Modernization / rehabilitation of distribution networks

- Modernization / rehabilitation trended by policy makers and engineers
- Design principles : “farmers will follow”
- In best cases : subsidy for equipment, little training to adapt “water saving technics”

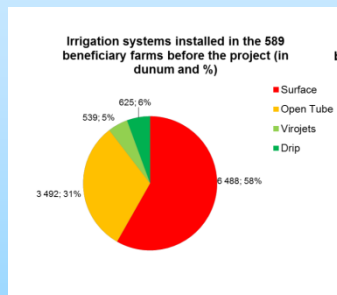


Vicious circle : in Jordan

- Conditions of service never reached :
- Pressure < 1. bars : incapacity to operate on-farm system
- Water turn: frequencies not adapted to the needs of drip irrigation system



- Poor optimization at the farm level : Farmers using surface irrigation remain using surface
- Farmers with Drip irrigation system : keep their on-farm pools and pumpas and do not connect to the network: Pumping twice...



Tunisia : Rehabilitation of system

- Crop water requirements: planned economy calculations though economy has liberalized
- Design for Full coverage sprinkler, though a variety of systems exist
- Little efforts on filtration and water quality

Prévu
APD
1978

Hiver	
Betterave	Blé
Fourrage hiver	Pomme de terre arrière saison

été	
Fourrage été	Tomate saison

Réalisé
2012-
2013

Hiver	
Blé	Blé
Blé	Blé
	PdT
Arboriculture	

été	
Fourrage été	Maraîchage
Arboriculture	



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Rehabilitation of networks without evolution of the hydraulic system

Old FTA

Rehabilitated FTA



No Flow Limiter :

The biggest demand takes it all...

Disadvantage for drip

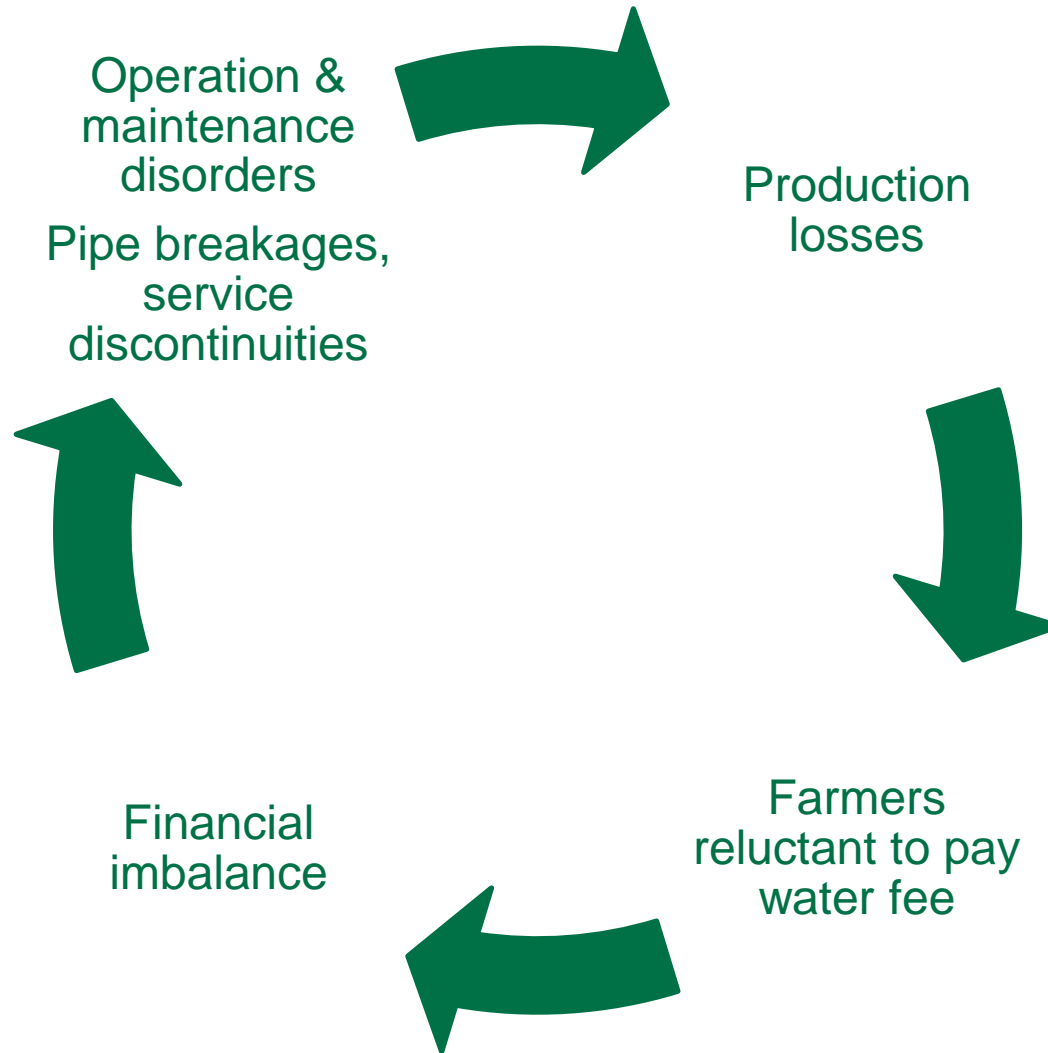
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Vicious circle : in TUNISIA





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Accounting for diversity when modernizing:

FROM WATER CONVEYANCE TO SERVICE PROVISION

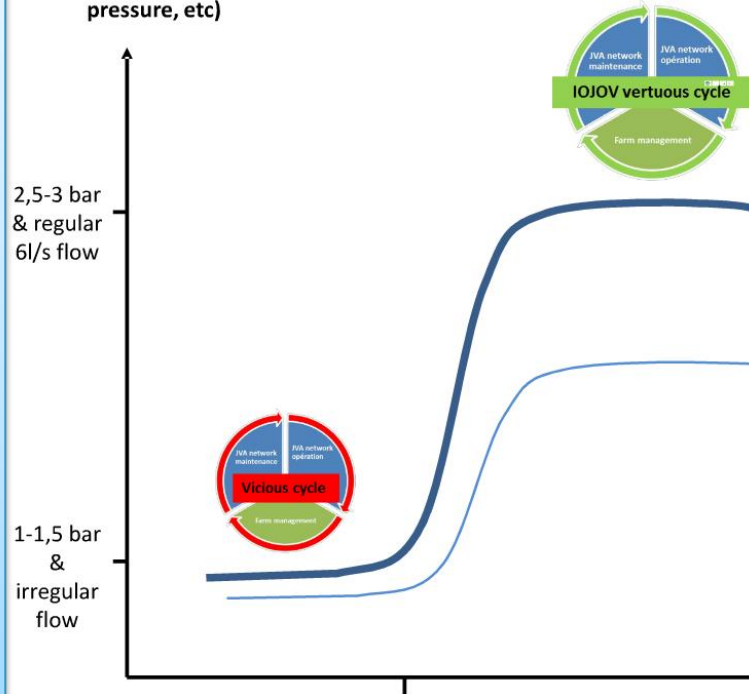
Jordan : Achieve proper conditions of service to allow on farm modernization



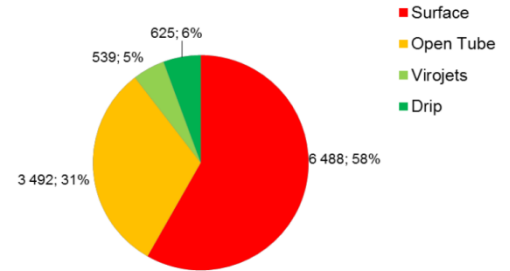
- Rehabilitation
- Operation and Maintenance procedures
- On-farm support and subsidies



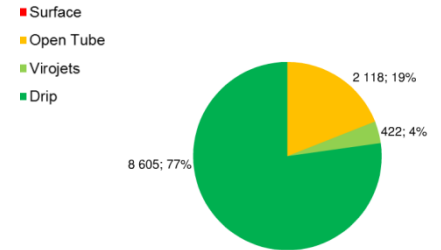
Quality of JVA water service at FTA (flow, pressure, etc)



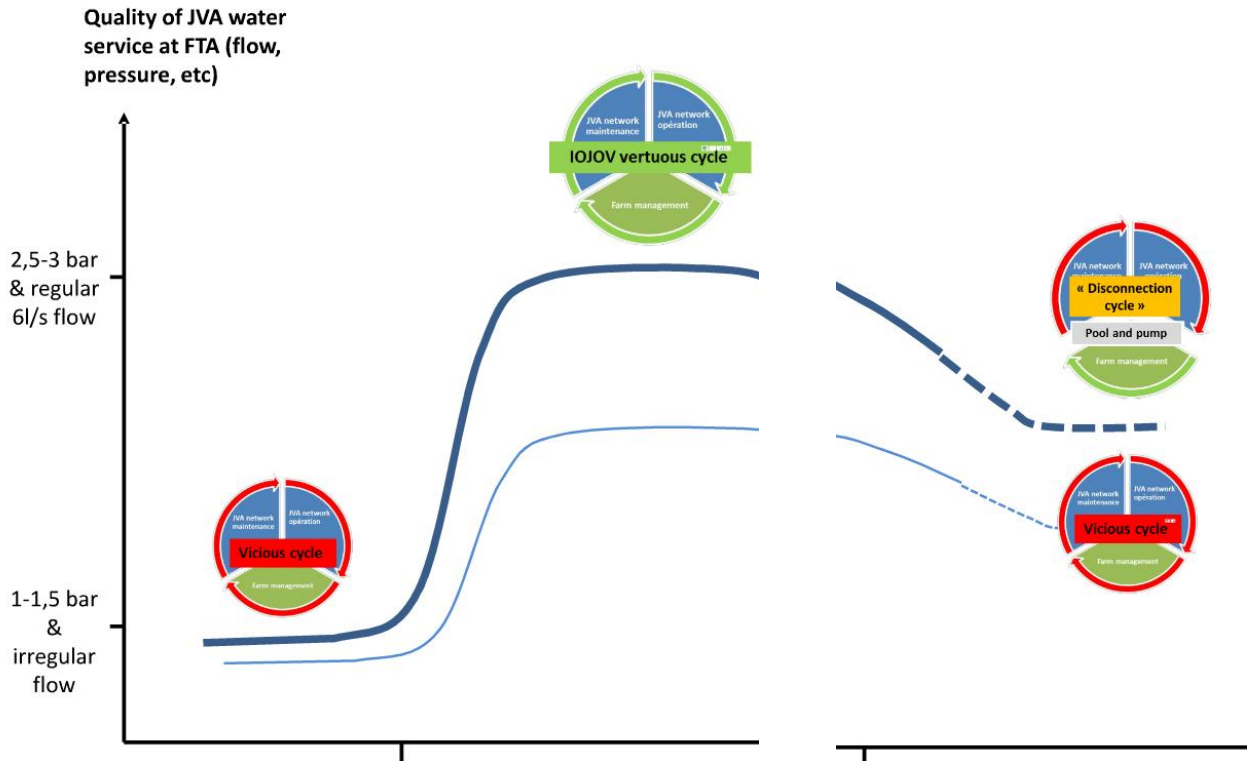
Irrigation systems installed in the 589 beneficiary farms before the project (in dunum and %)



Irrigation systems "installed" in the 589 beneficiary farms after the project (in dunum and %)



Jordan : Achieve proper conditions of service to allow on farm modernization



Difficulty to maintain
in the long run
A paradox...

Pools and pumps
disseminate as lack
of long-run trust
between farmers
and operators



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Some milestones for future design and management ...

- Need to **think network optimization and farmers' practices alongside**
- Define **the end user's needs** : pressure, flow, frequency, quality, equipment evolution
- Irrigation technics are **constantly changing** as well as farmers's priorities and practices : constant evolution of the conditions of services to fit with the demand
- **Some prerequisites** for the operator ...
 - Capacities to analyze
 - Capacities to change operation and maintenance
 - Capacities to Renovate
- **And for the farmers** : Ability and willingness to pay?