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
• 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
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
JORDAN and TUNISIA

CONTEXT OF 2 CASE STUDIES
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
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 Sidi Saad

2 sociétés (SMVDA) : 1 150 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

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<td>Fourrage été</td>
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PPI: large irrigation schemes

Réservoir: Dam
Adduction
Public operator

WUA: management of distribution
WUA 2
WUA 3
Modernizing/rehabilitating large public irrigation scheme in a context of scarce water resources:

WILL THE FARMERS JUST FOLLOW?
Modernization: towards water savings?

JORDAN

- 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 of 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:
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 bar: 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 pumps and do not connect to the network: Pumping twice…
• 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
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

…
Vicious circle: in TUNISIA

1. **Operation & maintenance disorders**
   - Pipe breakages, service discontinuities

2. **Production losses**
3. **Financial imbalance**
4. **Farmers reluctant to pay water fee**
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)

2.5-3 bar & regular 6l/s flow

1-1.5 bar & irregular flow

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

- Surface
- Open Tube
- Virojets
- Drip

6488; 58%
539; 5%
625; 6%
3492; 31%

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

- Surface
- Open Tube
- Virojets
- Drip

8905; 77%
2118; 19%
422; 4%
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
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?