Modernization of Management, Operation, and Maintenance of Large Irrigation Systems

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OVERVIEW

• Why modernize irrigation systems?
• Increasingly complex irrigation management
• Irrigation Modernization definition
• Service Oriented Management and operation
• MASSCOTE methodology - elements, framework, application
Modernization to improve performance

Irrigation performance often lower than expected - improvements are critically needed.

Modernization a continuing process that aim to bring about improvements.
IRRIGATION SYSTEM MODERNIZATION

FAO 1997 Definition of Modernization: a process of **technical and managerial upgrading** (as opposed to mere rehabilitation) of irrigation schemes with the objective to **improve resource utilization** (labor, water, economics, environmental) and **water delivery service** to farms.
Service Oriented Management
3 basic flows
WATER - INFORMATION - MONEY

- Service Provider produces SERVICE.
- USER receives SERVICE.
- Measures:
  - Controls the offer
  - Adjusts the demand

- Remuneration:
  - Remunerates

- Financial Flows:
  - Charges
MAApping System & Services for Canal Operation Techniques

Based on FAO experiences in Asia on Modernization of Canal Operation
MASSCOTE elements

- **Focus on Canal Operation BUT Scope on Management**: Canal operation produces the service - Canal examination is critical for the appraisal (canals don’t lie).
- **Service Oriented Management**: the service to users is the central and only goal of Management, Operation and Maintenance of an irrigation system.
- **Heterogeneity of service**: based on the physical constraints, opportunities, demand for service, willingness to pay.
MASSCOTE elements

- **Cost effectiveness**: modernization means for each users the right service at the right cost.
- **Users=payers=decision makers**: Users are the clients, the beneficiaries, the payers and the decision makers.
- **Professionalism !!!**: Management, operation and maintenance of large scale irrigation systems are complex tasks and needs skilled professionals.
MASSCOTE FRAMEWORK

1. Rapid Appraisal Procedure
2. Capacity & Sensitivity
3. Perturbations
4. Water Accounting
5. Cost of Operation
6. Service to Users
7. Management Units
8. Demand for Operation
9. Operation Improvements/Units
10. Integrating SOM Options
11. Plan for Modernization and Monitoring & Evaluation

Vision of the Irrigation System and Future Scenario Building
MASSCOTE FRAMEWORK

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Stakeholder consultation

Vision of the Irrigation System and Future Scenario Building

Food and Agriculture Organization of the United Nations

www.fao.org/nr/water
Example RAP results (1)

Land Productivity 56 systems $/ha

FAO - 56 Systems Survey
D. Renault 2010

Median = 1430 $
Example RAP Results (2)

Water Productivity 56 systems $/m^3

Production $/m^3 of irrigation supply

Median = 0.1 $/m^3

FAO -- 56 Systems Survey

D. Renault 2010
Example RAP results (3)

![Graph showing actual/stated water delivery service for different locations. The graph compares the levels of delivery service against ideal situations.]
MASSCOTE has been used for

- Developing modernization plans for implementation as part of investment projects and programmes (China, India, Kyrgyzstan, Morocco, Pakistan, Sri Lanka)
- Capacity development (Central Asia, East Asia, South Asia, Near East and North Africa)
- As research tools by MSc. students (several from IHE delft)
MASSCOTE family

Mapping systems and services for:

• canal operation techniques - MASSCOTE
• lift irrigation systems - MASSLIS
• fisheries in irrigation schemes - MASSIF
• multiple use systems - MASSMUS
• pressurized irrigation techniques - MASSPRES
THANK YOU