Modernization strategy for national irrigation systems in the Philippines: linking design, operation and water supply

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Outline of the Presentation

1. System characterization
2. Social acceptability
3. Amenability to associated technology
4. Promising local technology
5. Farmers’ vision
6. Modernization options
7. Conclusion
Balanac RIS and Sta. Maria RIS

- Gravity-type system
- Built and first operated in 1960s
- Served 1,000 ha rice areas
System characterization

Balanac RIS

- ROR dam
- Ungated offtakes
- Duck bill, long-crested weir
- 30-km canals, 87% lined
- Ungauged
- Natural drainage
System characterization

Sta. Maria RIS

- ROR dam
- CHO, gated offtakes
- Cross regulators with adjustable vertical gates
- 30-km canals, 77% lined
- Ungauged
- Natural drainage

System objectives
Design coherence

System objectives
- Productive irrigation
- Rice monocropping
- Dry season irrigation
- Equitable supply per ha

Operational objectives:
- **Balanac RIS**
  - Imposed allocation
  - Splitted flow to TU
  - Splitted flow through main system
  - Upstream control; proportional control
  - Direct offtaking
- **Sta. Maria RIS**
  - Imposed allocation
  - Intermittent flow to TU
  - Rotational flow through main system
  - Upstream control
  - Direct offtaking

Physical capacity
Physical capacity

Balanac RIS

Actual vs. Design
Design vs. Need

Division
Storage (canal)
Conveyance
Sediment control
Discharge transfer
Water level control
Flow measurement
Safety
Communication
Water reuse
Transport/access
Diversion (dam)
Storage (dam)
Physical capacity

Sta. Maria RIS

- Actual vs. Design
- Design vs. Need

Social acceptability
Social acceptability

- Lack of vandalism of structures.
- Non-existence of unauthorized turnouts
- Deliveries are NOT taken when not allowed, or at flow rates greater than allowed
- Social "Order" in the Canal System

![Graph showing RAP indicator values for Sta. Maria and Balanac RIS]
Amenability to irrigation technology

AWD (Alternate Wetting and Drying)

➢ Challenge: Lack of flow control structures
  Ungated/open direct offtakes

Photo credit: IRRI
Promising irrigation techniques

- Drainage check structures
- Developing artesian wells
  - tubewells, small ponds
Farmers’ vision

Balanac RIS
- Equitable water distribution
- Strong WUA
- No-leak concrete canals

Sta. Maria RIS
- Strong WUA
- Increased water supply
- Gauged system
- Equitable, orderly water distribution
- Climate proactive management
- Reliable irrigation service
Modernization Options

Balanac RIS

- Climate-proactive, cropping calendar
- Dam desilting
- Repair of dam gates, canal embankments
- Provision of flow control structures
- Consolidation of turnouts
- Flow measurements
- Storage-type dam or downstream ROR dam

Sta. Maria RIS

- Dam desilting
- Repair of dam gates
- Replace non-functional flow control structures
- Consolidation of turnouts
- Flow measurements
- Storage-type dam
- Spring development
- Water reuse structures
Conclusions

❖ Logical coherence among the physical structures, system operation and water supply is crucial for system modernization.

❖ On-farm water management or water saving techniques require flow control structures along conveyance canals.

❖ Technology options and their implications on system operations need to be well-understood by the stakeholders of irrigation systems.