**INTRODUCTION**

**RIECE FIELDS**

- Indonesia has approximately 10.90 million ha of harvested area (BPS, 2018), in which 66% of area (7.23 million ha) is categorized as the irrigated paddy field, covering 33,210 schemes. About 15% of the total areas of irrigated paddy field is supplied from reservoir. In addition, another paddy fields consist of tidal lowland, non-tidal lowland, groundwater, and rain-fed paddy fields.

**PROBLEMS**

- Global issues in the last decade
  - Less of food production
  - Limited energy availability
  - Weakness in water resources management

- Indonesia issues
  - Increasing population
  - Land degradation and conversion
  - Climate change
Indonesia BLUE CIRCLE Paradigm

- Water productivity in Indonesia is relatively low (0.50 kg grain rice equals to 1 m³ of water).
- In general most Irrigation scheme in Indonesia is managed and operated under existing technology and management. (“Indonesia Blue Circle Paradigm”)
- Indonesia Blue Circle Paradigm was described in term of relation of water availability, infrastructure and irrigation water management respectively

Existing irrigation was conducted in the procedure of irrigation operation in the system. The procedure of operation as stated in PUPR Ministerial Regulation No. 12/PRT/M/2015 on exploitation and maintenance

Definition of Modernization

- ICID Congress in Mexico October 2017
  - Process of Upgrading infrastructure, operation and management of irrigation and drainage system to sustain the water delivery service requirement of farmers and optimize production and water productivity.
  - Requirements:
    - Process (continuous) exercise
    - Align with Government development and Budgetary time frame and system
- Indonesia Modernization Irrigation
  - An effort to actualize a participative irrigation system that is oriented on irrigation service level compliance effectively, efficiently and sustainably in order to support water and food security through improvement
  - Irrigation water availability
  - Infrastructure
  - Irrigation water management
  - Institution
  - Human resources

FLOW CHART OF EXISTING IRRIGATION WATER MANAGEMENT

RELATION OF FIVE PILLARS OF IRRIGATION AS BASIS OF IRRIGATION MODERNIZATION

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### STEPS IMPLEMENTATION OF IRRIGATION MODERNIZATION

1. Setting up of regulation on modernization,
2. Setting up tool to measure readiness irrigation system to proceed irrigation modernization,
3. Implementation of IMRI in selected typology irrigation system,
4. Public consultation, Development of system planning and detail design, and
5. Program implementation.

### CASES

#### Serayu Irrigation Scheme
- Central Java
- Government authority (BBWS Serayu Opak)
- APEMASI:
  - online based application which provided an open information to irrigation stakeholders
  - web-based application in water distribution
  - Paperless, replacing operation forms into digitalization

#### Wadaslintang Irrigation Scheme
- Central Java
- Government authority (BBWS Serayu Opak)
- SIMASI:
  - A DSS for irrigation operation
  - web basis
  - Paperless
  - Model-based for crop water requirement and scenario-based for

### LOCATION OF SERAYU AND WADASLINTANG IRRIGATION SCHEMES

#### APEMASI ARCHITECTURE

- WATER USER ASSOCIATION
- WATER MASTER
- SIMASIZ

- WATER MASTER: Allocate and distribute to entire area
-線上線下, TIME WASTE ALLOCATION

### APEMASI OUTPUT

- Improvements of irrigation management due to APEMASI:
  - Improve transparency (accessible by stakeholders)
  - Simple operation process
  - Transformed bulky storages into simple database
  - Reduced time steps from semi-monthly planning into real time.
1. Storage of historical data on hydrology and crop and model are automatically update by data stored
2. Management users and their authority to access the system
3. Sharing data among stakeholders in different level
4. Prediction water availability in the future by using artificial neural network model
5. Computation of crop water requirement using Penman Monteith model
6. Module of annual water balance computation
7. Provision of annual water balance as platform of dialog between farmers and government in planting pattern determination
8. Computation of short-term water balance to determine water allocation in a certain period

THANK YOU
TERIMA KASIH
MATUR NUWUN
RAHAYU