

# **Effective Measures for Sustainable Operation and Maintenance of (Irrigation) Water Management in Myanmar**

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# Sustainable Operation and Maintenance of (Irrigation) Water Management

- ❖ Main responsibility of the Irrigation and Water Utilization Management Department (IWUMD)
- ❖ Governmental organization under the Ministry of Agriculture, Livestock and Irrigation (MoALI)
- ❖ Another responsibility of IWUMD is operation and maintenance of flood protection embankments and polders system all over the country
- ❖ IWUMD operates, maintains and manages 581 irrigation facilities and 479 flood protection and drainage facilities in the country



## Irrigation Structures by IWUMD in Myanmar

	Particular	Quantity (No.)	Beneficial Area (Million hectares)
1	Dam	235	0.7345
2	Weir	107	0.1581
3	Tank	71	0.0439
4	Sluice Gate	168	0.1946
	<b>Total</b>	<b>581</b>	<b>1.1311</b>

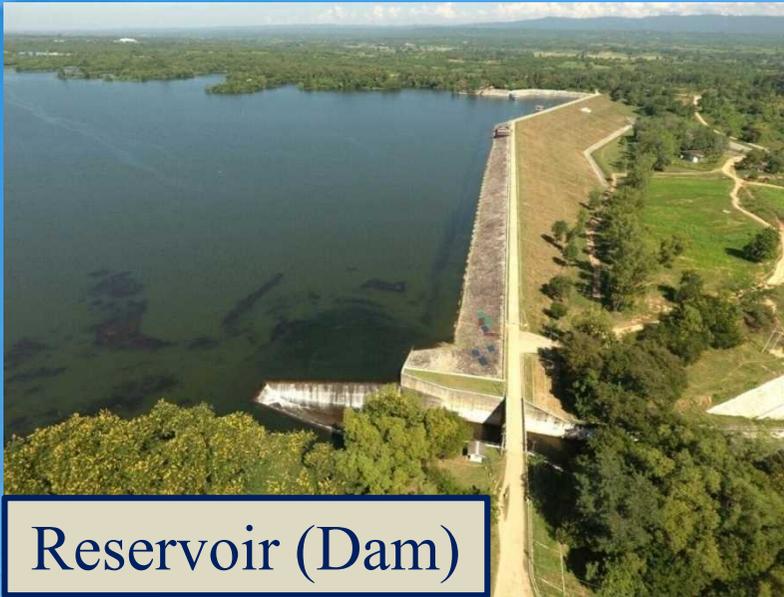
## Flood Protection & Drainage Structures by IWUMD in Myanmar

	Particular	Quantity (No.)	Beneficial Area (Million hectares)
1	Flood Protection Embankment	102	0.8106
2	Protection of Sea Water	119	0.2638
3	Drainage Channel	258	0.3886
	<b>Total</b>	<b>479</b>	<b>1.4630</b>
	<b>Grand Total of Beneficial Areas</b>		<b>2.5941</b>

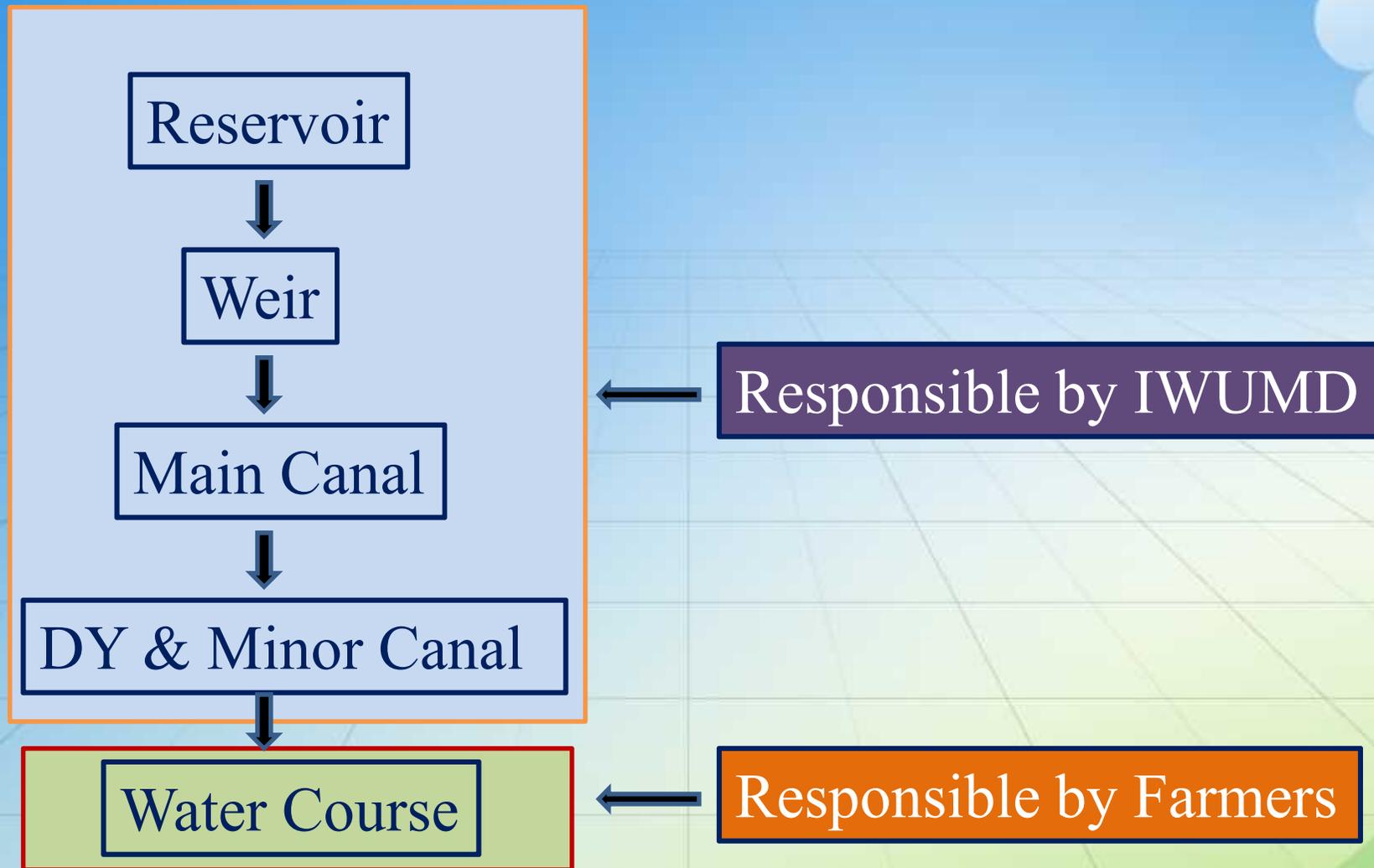


# **Effective Measures for Sustainable Operation of (Irrigation) Water Management**

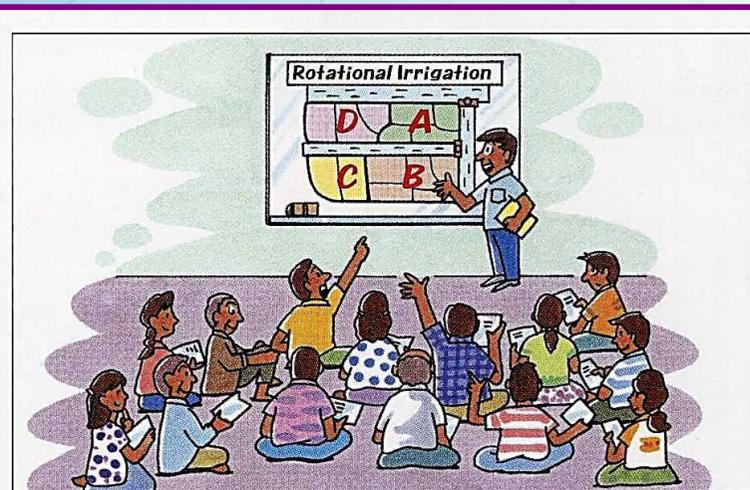
# Irrigation Facilities



# Facilities Management and Responsibility



- # Based on the storage water availability and irrigation water requirement for intended crop, irrigable crop area has to be estimated
- # Inform to Regional Agricultural Development Committee and discuss
- # Make consultation with local farmers in that area



Drawing up a water allocation plan

- # Decide the irrigable crop area based on the outcomes of above mentioned discussions
- # Select the starting date to deliver the irrigation water
- # Announce the irrigation plan, irrigable area, contact staffs and water rotation plan at the head of each canal system



# Farmers' Friend

Farmers' Friend means the informers and sometime person like coordinator for effective water use in irrigation and development of irrigation water between farmers and concerned responsible staffs from IWUMD for operation and maintenance works



## Selection for Farmers' Friend

- Should know well about villages, farmers and this society
- They should be accepted by farm families as farmers' friends
- They should be educated persons and have willingness to support improvement of farmers and farm families
- They should have knowledge especially for how the society can be developed by implementation of agriculture

## Activities of Farmers' Friend

- Inform irrigation schedule as canal wise proposed by farmers to the IWUMD offices
- Urge and remind farmers to do pre-irrigation season maintenance work of canals
- Inform the conditions of irrigation and drainage canals to be repaired and maintained to the IWUMD offices
- Explain and inform irrigation schedule and days of water distribution for irrigation to farmers in canal wise
- Inform reducing and stopping of canal water supply periodically or in emergency due to urgent maintenance and repairing work of canals and irrigation structures to farmers



## Activities of Farmers' Friend

- Urge and advise farmers not to use excess water or to reduce excess water use and inform these conditions to the IWUMD offices
- Organize farmers to repair canals immediately when they found, breakage of canal banks or when they are informed, and then they report these events to the IWUMD offices
- To visit villages and discuss with farmers to their opinion and difficulties in water use and inform to the concerned offices and organizations





# **Effective Measures for Sustainable Maintenance of (Irrigation) Water Management**

# Maintenance

## Purposes

- ❑ to keep system in top operation at all times
- ❑ to obtain the longest life of system facilities
- ❑ lowest possible cost
- ❑ to avoid interruption in water delivering

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graph TD; A[Maintenance] --> B[Dam & Weir Maintenance]; A --> C[Canal System Maintenance];
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**Maintenance**

**Dam & Weir  
Maintenance**

**Canal System  
Maintenance**

# Dam Maintenance

## (1) Regular Maintenance

Daily Visual Inspection for Dam Surveillance

### (a) Dam

- Storage Water Level
- Rainfall in 24 hours
- Crest of Dam
- Upstream & Downstream Facts
- Abutments
- Area of Downstream of Dam
- Landslides/Rockfalls into reservoir

## **(b) Intake Tower**

- Condition of concrete
- Steelwork
- Vibration

## **(c) Outlet Conduit**

- Seepage from contact areas of foundation & embankment
- Vibration along the barrel of conduit

## **(d) Spillway**

- Condition of concrete
- Condition of Stilling basin

## (2) Emergency Maintenance

Repair work of Ngalaik Weir downstream



Repair work of Ngalaik Dam Outlet Conduit Barrel



# Canal System Maintenance

For irrigation system maintenance, it is necessary to review its design, cross section, bed slope, side slope and carrying capacity



# Canal System Maintenance

- To maintain Inspection Path



# Canal System Maintenance

- Repairing and maintaining hydraulic structures



# Annual Plan for Maintenance

- + Register the list of repair works according to priority**
- + Calculate the estimated cost**
- + Propose the budget requirement**
- + Repair maintenance work as per priority depending upon the budget**



# **Issues and Measures to solve for Sustainable Operation and Maintenance of (Irrigation) Water Management**

## Issues & Measures to solve for Dam

Issues	Measures to solve
Insufficient Annual Budget	❖ Propose more budget (government, Loan and Grant )
Not good condition of Access Road	❖ Improve access road
Poor Communication	❖ Need to support new technology and communication devices
Lack of skill labour	❖ Give the training to labours concerning with irrigation technology
Shortage of Staff	❖ Strengthening the staffs in IWUMD

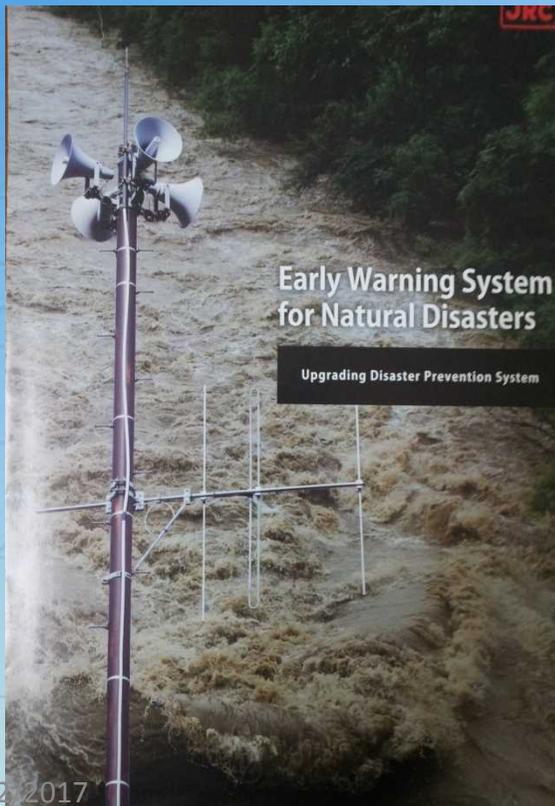
# Issues & Measures to solve for Dam ( Cont; )

## Issues

Lack of modernized measuring devices ( early warning system, computerized controlling system, seepage measuring device, etc., )

## Measures to solve

❖ Install modernized measuring devices



# Issues & Measures to solve Irrigation System

Issues	Measures to solve
Inadequate Budget for O & M	❖ Propose more budget (government, Loan and Grant )
Lack of Water Gates on Minor & Direct Outlet	❖ Install water gates up to minor & direct outlet
Lack of measuring devices	❖ Install measuring devices in irrigation system



Partial Flume Measuring Device

# Issues & Measures to solve Irrigation System

Issues	Measures to solve
Old Infrastructures	❖ Rehabilitate the structures
Water Losses in Canal (earthen canal, plot-to-plot,...)	❖ Construct canal lining ❖ Farmland Consolidation ❖ Discuss and Share the knowledge about water distribution plan to Farmers



# Issues & Measures to solve Irrigation System

Issues	Measures to solve
Weakness in community participation	<ul style="list-style-type: none"><li>❖ Organize Farmers' Friend</li><li>❖ Make more discussions and communication between Farmers and Staffs</li></ul>
Not yet organize Water User Group	<ul style="list-style-type: none"><li>❖ Form WUG in every Irrigation Scheme</li></ul>
Inadequate exposure to new knowledge and techniques in Participatory Irrigation Management	<ul style="list-style-type: none"><li>❖ Give the training to Farmers for PIM</li><li>❖ Give the training to Staffs for (irrigation) water management</li></ul>



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# Issues & Measures to solve Irrigation System

## Issues

Inequitable distribution of water  
(broken gate, illegal intake, broken canal bank,..)

## Measures to solve

- ❖ Maintain the actual canal section
- ❖ Always check and remove blocking temporary structures made by Farmers along the canal
- ❖ Always check and remove the illegal intake
- ❖ Explain Canal Act to Farmers
- ❖ Farmers have to maintain the water course



Cracking down unfair use through mutual surveillance



# Issues & Measures to solve Irrigation System

## Issues

## Measures to solve

Insufficient Drainage Canal

- ❖ More construction of drainage canal
- ❖ Improve natural drainage channel
- ❖ Always check and remove blocking temporary structures made by Farmers along the drainage canal



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# Other

## Reuse of Drainage Water

- To reduce the irrigation water losses
- For equitable water distribution
- Difficulties of water supply up to the tail of canal



# Conclusion

- ✿ For sustainability of irrigated agriculture, it is necessary to construct water storage facilities for water availability and to construct canal network system for proper water distribution. It has to be mentioned that proper operation and maintenance of irrigation scheme should not be overlook to achieve successful irrigation water management.
- ✿ Therefore, department concerned and beneficial farmers should pay equal attention to afore mentioned aspects.



**THANK YOU**

*... Build dam*

*... Construct Canals*

*... Delivery of Water to Paddy Fields & Farms*