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WATER AND FOOD

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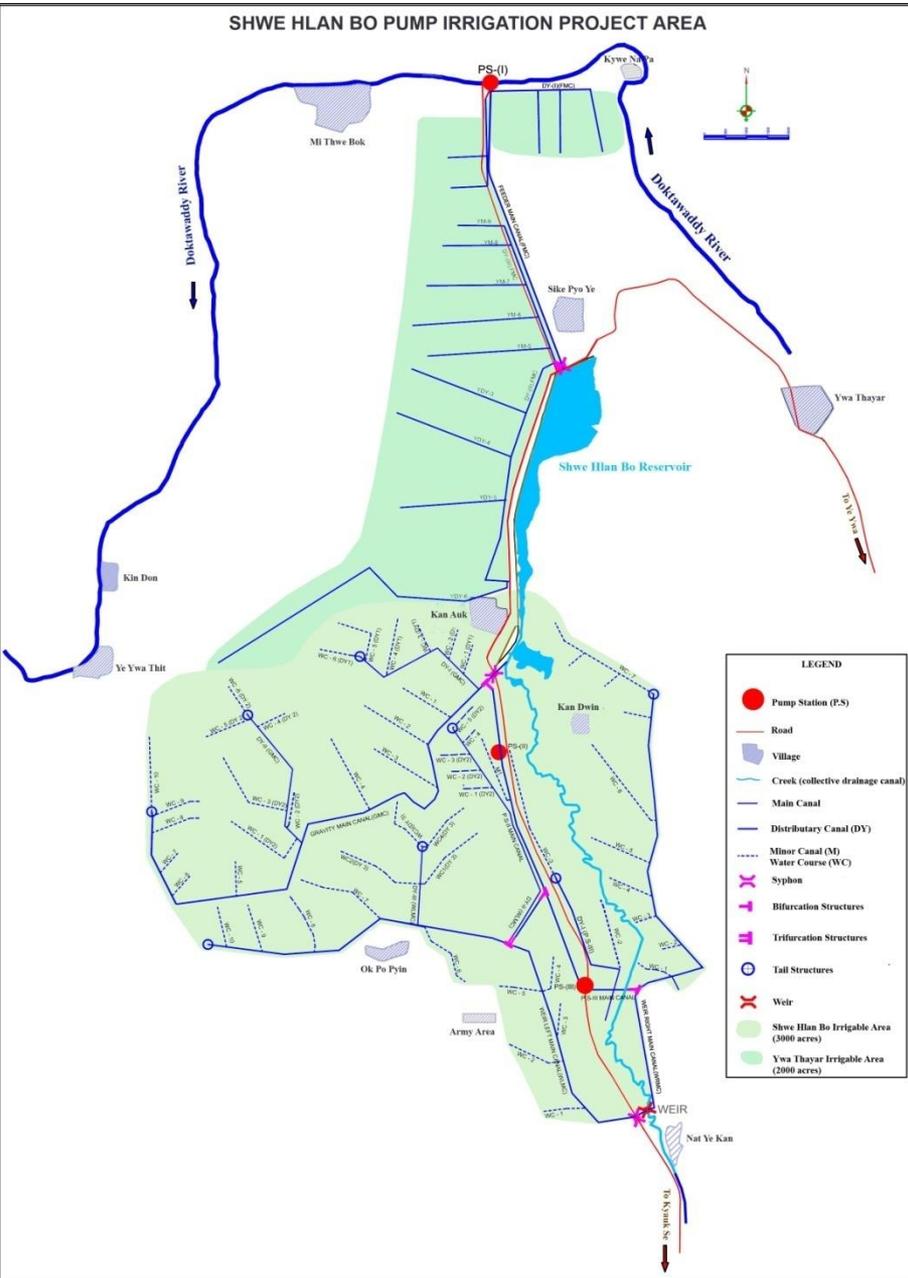
Water for Food

- For food security, increased crop production is important. To increased crop production, sufficient supply of water is the most important factor.
- Irrigated land is twice as productive as rainfed cropland. The one-sixth of the world's crop land that is irrigated, produces about a third of the world's food (FAO Publication, Water for Life). Thus, agriculture depends on how efficiently we use our water resources.
- Spate irrigation is the main source of livelihood for large numbers of economically marginal people in areas as varied as the Near East, Africa, South and Central Asia and Latin America.
- In some areas, spate water and shallow ground water are used together.
- Today, spate irrigation covers more than 3 million hectares across the world. The country with the largest area under spate irrigation is Pakistan. (FAO Irrigation and Drainage Paper No.65)
- Therefore, for Dry Zone areas in Mandalay Division, **“Shwe Hlan Bo Electric Pump Irrigation Combined with Spate Irrigation Project”** will be presented.

Integrated Water Resources Management–IWRM of Shwe Hlan Bo Electric Pump Irrigation Combined with Spate Irrigation Project

- In Dry Zone area of Mandalay Region, Shwe Hlan Bo Pump Irrigation Project was implemented and irrigating 5000 acres (2000 ha) of agricultural land since the year 2012.
- In this project, surface water is used by pumping from Doktawaddy River with Pump Irrigation System for 5000 acres of land.
- A feeder canal was constructed and supplying river water to Shwe Hlan Bo reservoir and irrigating by Gravity System to 1300 acres of land.
- A diversion weir was constructed at upstream of the reservoir and irrigating by Spate Irrigation System for 1700 acres of land.
- Pump irrigation canals are connected with spate irrigation canals and gravity irrigation canals by construction of bifurcation and trifurcation.
- Therefore all canals could irrigate for the whole year, by using river water and rainfall from catchment, and it is the **Integrated Water Resources Management**.

Layout Plan of Shwe Hlan Bo Pump Irrigation Project



- Location Singaing Township, Kyaukse District, Mandalay Region
- Map Index KE 732-475 (UTM)
- Water Source Doktawaddy River
- Average Rainfall 27 inches, 686 mm
- Pumping System Floating Type (Pontoon)
- Pumping Head 132 feet, 40.23 m
- Main Pump PS-1 Head 65 feet
- Relift Pump PS-2 Head 34 feet, PS-3 Head 33 feet
- Beneficial Areas 5000 acres of land
- Project Period
 - (1) Start (2009-2010) Fiscal Yr
 - (2) End (2012-2013) Fiscal Yr

- Shwe Hlan Bo reservoir is situated in this area since the time of ancient Myanmar Kingdom but the water in the reservoir can irrigate only a few acres of land.
- So the water is taken from Doktawaddy River by pumping to fill up the reservoir with feeder canal.
- A diversion weir is constructed in Natyekan stream, upstream of the reservoir, including spate irrigation system.
- It can supply 1200 acres from weir left canal and 500 acres from weir right canal with total area of 1700 acres.
- These areas will be supplied by pumping in the dry seasons and by spate irrigation system from diversion weir in the raining season to reduce the utilization of electric power.
- Water User' Group (WUG) were formed including village authorities, stakeholders and farmers. Participatory Irrigation Management (PIM) is carrying out with WUG's, beneficial farmers and staff from Water Resources Utilization Department (WRUD) of Ministry of Agriculture and Irrigation.



Doktawaddy River and Pump Station-1 (PS-1)



Doktawaddy River and Pump Station-1 Discharge Basin



Feeder Main Canal (FMC)



Syphon in Feeder Main Canal



Small Hydropower at Feeder Canal



Shwe Hlan Bo Reservoir



Pump Station (2) Suction Basin and Pump House



Pump Station (2) Discharge Basin



Pump Station (3) Suction Basin and Pump House



Pump Station (3) Discharge Basin



Nat Ye Kan Weir



Weir Left Main Canal (5' × 5') Slide Gate (3 Nos)



Bifurcation of Gravity Canal and Pump Canal



Bifurcation of Pump Canal and Weir Right Spate Canal



Trifurcation at Weir Left Main Canal, R.D 90+60'



Drop Structure at Weir Left Main Canal, R.D 55+00'



Drainage Crossing at Weir Right Main Canal, RD-13+400'



Drainage Crossing at Weir Left Main Canal, R.D-94+50'



Tail Structure at Weir Right Main Canal, R.D 15+000'



Water Users Group Meeting at Ywabo Village in Shwe Hlan Bo Pump Irrigation Project

Conclusion and Recommendation

- In Dry Zone of Myanmar, variability in water resources and insufficient capacity to manage that variability lies behind much of the prevailing poverty and food insecurity.
- Water scarcity, not just for agriculture, but also for domestic use, is widely acknowledge to be a key constraint to livelihoods and peoples' wellbeing.
- Implementation of an Integrated Water Resources Management approach needs to be started with pilot projects. Learning by doing through these projects is the only way to develop IWRM for Myanmar.
- The following actions need to be taken as soon as possible:
 - (1) A monitoring network needs to be developed, coupled with solid analysis to support decision making especially for existing water resources projects.
 - (2) Considering that Myanmar is a very diverse country, it is advisable to start project in different regions. Good practices from these projects can be implemented through the country.

Continued

- (3) Successful and economical innovative design and implementation should be encouraged morally and physically.
- (4) Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) should be carried out before implementation of the projects.
- (5) Due to climate change, the occurrence of rainfall varies in intensity and time especially in Dry Zone area. Therefore Spate Irrigation is the most effective solution for potential areas and should be investigated and carried out implementation works.
- (6) Completed special river water pumping project in Dry Zone implemented by WRUD, should be studied thoroughly for the use of natural existing stream flow. Feasible sites for the use of existing stream flows, as Spate Irrigation for supplementary water supply, should be investigated and implemented immediately.

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- (7) Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.
- The introduction of irrigation from shallow groundwater in spate-irrigated areas, for instance, is a recent innovation. With the availability of relatively inexpensive pump sets, this technique has become important in some areas.
 - This project is the first kind of the project in Myanmar to irrigate the agricultural land, combined with Pump Irrigation, Gravity Irrigation and Spate Irrigation System.

Thank You for Your Attention