

Pond Renovation Project (Reuse of Treated liquid waste water of ponds)

Department of Water Supply & Sanitation

Govt. of Punjab

By : Mohd Ishfaq

Village Ponds in Punjab – Past Perspective

- Village ponds in the Punjab State have great importance and these were considered as the gift from mother nature to the mankind.
- During Earlier times, ponds were used for storing the rain water, . These were good source of ground water recharging.
- In present times ponds don't bear the same rosy picture as in early times.
- Earlier the village pond was a place of recreation and rain water harvest & recharge structure .
- In present times Ponds are choked and filthy .They have become source of nuisance causing insanitary and unhygienic conditions.

Dirty Ponds in the Villages of Ludhiana



Village Birk Block Sidhwan Bet



Village Baddowal Block Ludhiana I

Dirty Ponds in the Villages of Ludhiana



Village Rurka Block Sudhar



Village Baddowal Block Ludhiana I

Waste Stabilization Pond

- Water Supply and sanitation department has taken the initiative to renovate choked village ponds using Waste Stabilization technique
- Pond renovation technology was selected from the booklet titled as “ **Technical Note on Solid and Liquid waste management in Rural area** “ issued by Govt. of India and Unicef .
- Under this technology pond is emptied , de silted and divided in to 3 to 4 compartments by using earthen embankments .

Pond Renovation Technology

- The grey water collected via drainage system is passed to large shallow basins or ponds excavated at suitable land site and placed serially as a stabilization system in which grey water is stabilized.
- Its pathogenicity is reduced and the stabilized water becomes useable.
- In this system, the collected grey water is stabilized by natural processes involving algae, bacteria and natural oxidation processes. Hot climate is very suitable, solar radiation and light is good for efficient functioning of this system.

Components of the Renovated pond

1. Anaerobic cum Sedimentation tank :

The depth of water in the Pond is kept at 10 feet for the sedimentation of suspended solids and decomposition of organic matter under anaerobic conditions to reduce BOD /COD .The surface area of the tank shall be equal to approx 15% area of the existing pond area and having 2-3 days retention time. Depth shall be fixed around 3-5 metre

2. Facultative Pond :

In this tank over flow of anaerobic pond is being discharged and BOD/COD shall reduce under aerobic conditions . Depth of water is kept @ 1.5 meter. The outlet of this tank is fixed at 1.5 mt from the bed of tank to ensure that water depth does not exceed 1.5 meter.

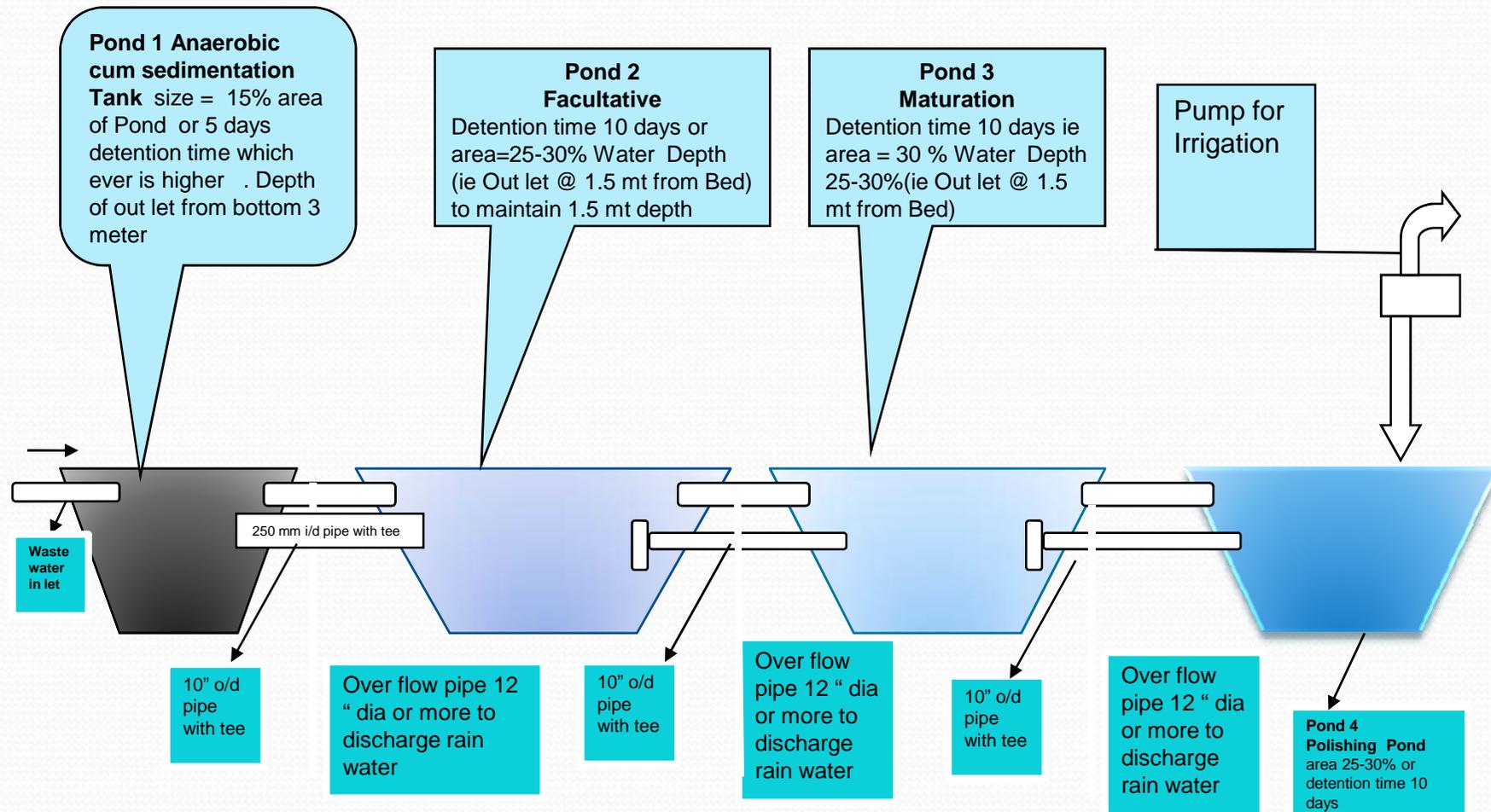
3. Maturation / Polishing Pond : (2 numbers)

- In this tank over flow of Facultative pond is being discharged where pathogen load if any shall be reduced . Depth of water is kept at 1.0 meter. The out let of this tank is fixed at 1.0 mt from the bed of tank to ensure that water depth does not exceed 1.0 meter.

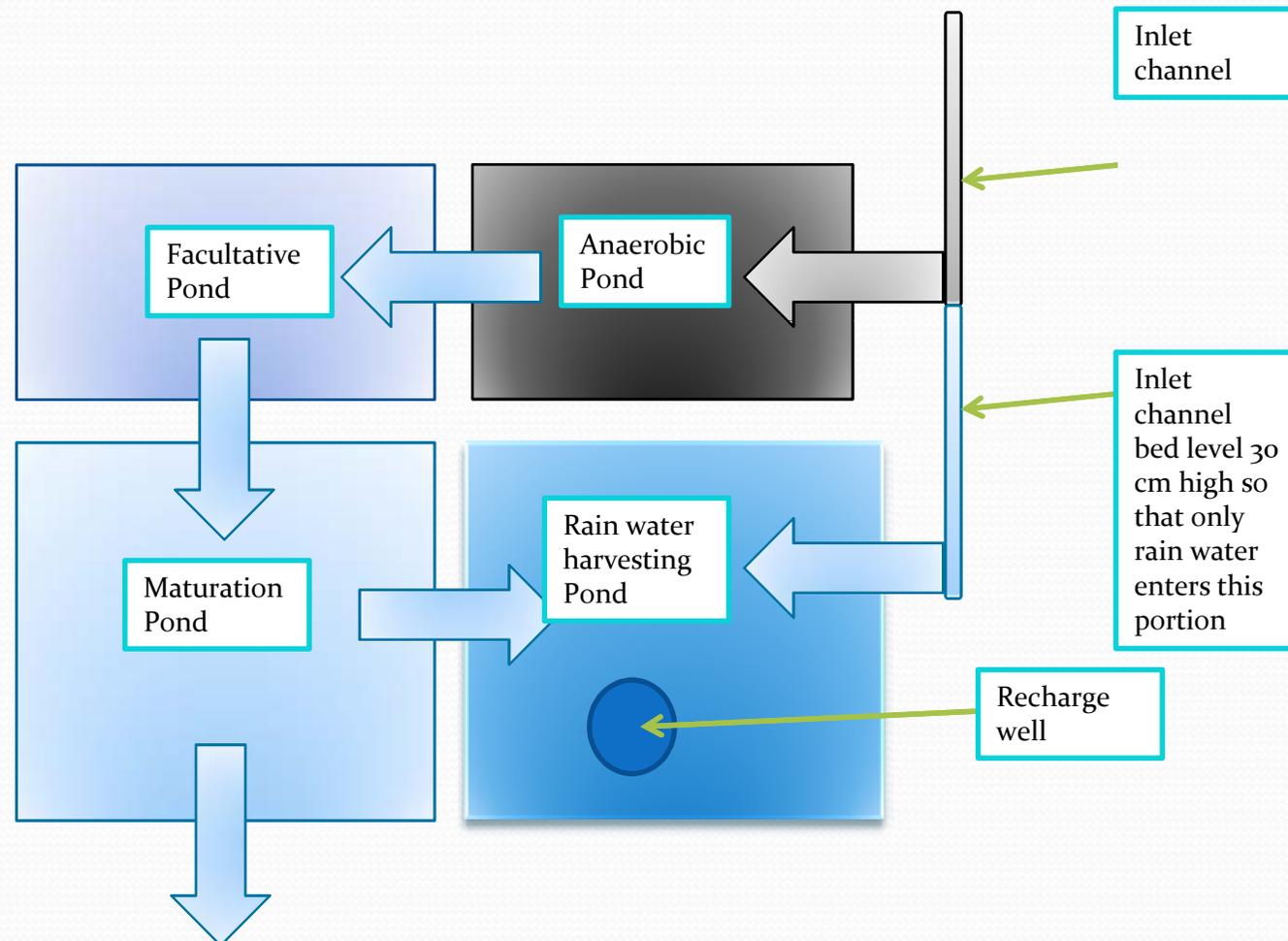
4. Outflow

- Normally in addition to evaporation , treated water is absorbed in the pond. The treated water is also used for irrigation purpose by the farmers .

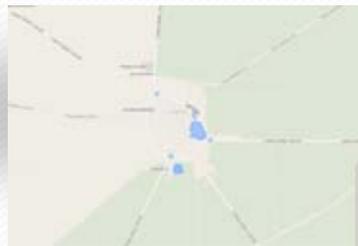
Flow Diagram of Stabilization Pond



Segregation of Rain water and Grey water



Pictures of Rain water Pond where Grey water and rain water has been segregated Village Chakkar Ludhiana



Constructional Guidelines used for Embankments

- Slope of the embankments is kept stable with slope of 1 vertical to 1.5 horizontal preferably 2. slopes can be strengthened by using lime treatment or stone pitching .
- Top surface of the embankments is around 2.5 meter due to big area of pond
- Embankment is properly compacted to make it stable .
- PVC pipe used is of Sn8 grade conforming to BIS 15328 .
- Over flow pipe used is RCC pipe NP2 grade or Upvc Pipe sn8 grade
- **Grass is planted on the top of embankments and slopes to protect against erosion during rains or otherwise .**
- Pucca floor is provided below inlet pipe in all the ponds to avoid soil erosion in the pond .
- **Landscaping.** Trees are planted around the pond .
- **Fencing around pond is required for safety**

Implementation Arrangement

- DWSS provides the funds and technological inputs .
- Zila Parishad at District level facilitates the identification of the village.
- Project has been executed by Gram Panchyat Water Supply and Sanitation committee of the respective village
- All the activities have been carried out using People Participatory approach

Waste water Treatment Efficiency

- Punjab Agricultural University Ludhiana carried out independent water quality study at village Dewatwal and Chakkar in the month 11/2013 and Jan 2014 .The results are as under
- Village Chakkar

	Untreated	Treated	Untreated	Treated
Chakkar Ludhiana			Dewatwal Ludhiana	
BOD mg/lt	98	12	65	15
COD mg/lt	160	32	140	72
TSS mg/lt	160	332	180	45
Coliform per 100 ml	2400	1200	2400	1100

Construction Activities in Pictures



Dewatering of Pond



Construction of Embankment

Construction Activities in Pictures



Desilting of Pond



Excavation

Renovated Ponds



Pond Under Construction – Embankments completed
but land scaping pending

Renovated Ponds



View of Treated waste water after Pond Renovation

Renovated Ponds



Ariel View of Renovated Pond

View of Pond at Google Maps Village Dewatwal Ludhiana

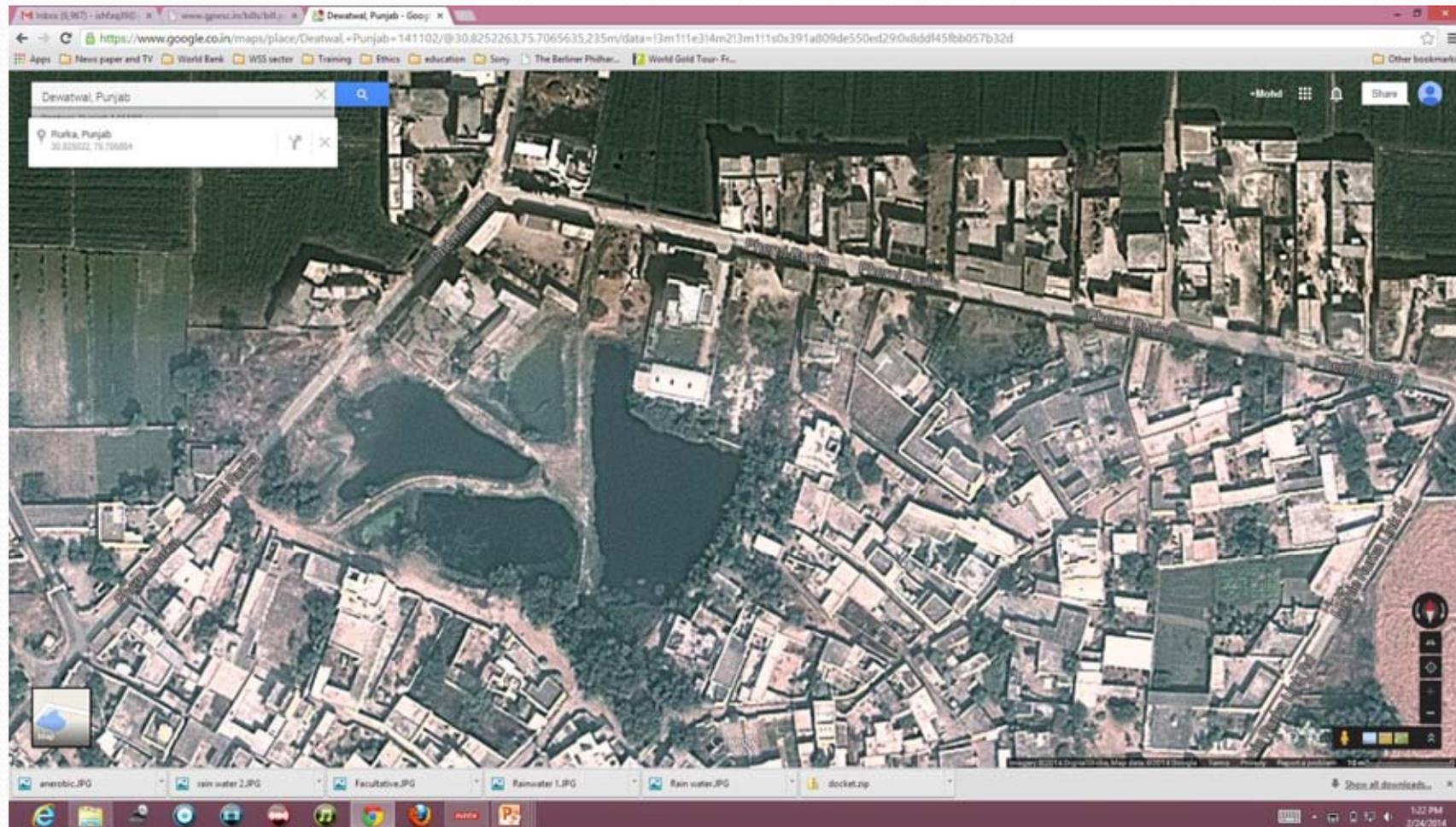


Renovated Ponds



Aerial View of another Renovated Pond- Change in colour of Waster water from Grey to Light green in various portions , indicates treatment of waste water

View of Pond at Google Maps Village Rurka Ludhiana



Renovated Ponds



Migratory Birds Relaxing on the Embankments of Renovated Pond –
Indicating improvement in Environmental Conditions

Advantages of Pond Renovation Technology

- Natural Treatment Process uses Sun light.
- Low Capital and O&M Cost .
- Cost of construction of renovated pond is approximately Rs 4.0 lac per acre. Earlier it was Rs 2-3 lac per acre
- No skilled Supervision Required
- No electricity required for treatment
- Solves Nuisance and Pollution caused by Grey Water
- Prevents Ground water Contamination

Benefits of Pond Renovation

- Improved Sanitation in the Village
- Filthy Ponds have become place for recreation
- Acts as Rain water Harvesting structure
- Treated water can be reused for irrigation .
- Extra storage capacity created due to renovated pond harvest excess rain water which prevents flooding of low lying areas of the village

Applicability of Waste Stabilization Pond

- **This technology is very suitable for the use by GP for treating grey water collected from the village via drainage system.**
- **No Electricity is required**

Limitation

- **Availability of open land owned by GP at a desirable spot may be a problem**
- **During rainy season the system is likely to be disturbed and may need renovation after rainy season.**
- **Proper designing and technical inputs are necessary.**

Appreciation of the Project by GOI



**Mrs Rajwant Sandhu Secy GOI
accompanied by S. Manpreet
Singh Ayali MLA Dakha and
Chairman Zila Parishad Ludhiana**



**Visited and Appreciated
by Secy. Planning GOI at
Village Birk**

Appreciation of the Project by GOI

- Sh BK Sinha IAS Secy Ministry of Rural Development GOI inspected renovated Pond at village Dewatwal Block Ludhiana I on 28/9/2010 and he appreciated the effort .
- Sh JS Mathur Joint Secy DWSS GOI appreciated the pond renovation project in the District Monitoring vigilance committee on 28/9/2010 chaired by Hon'ble Minister Rural Development Sh CP Joshi and he desired that it should be replicated in the entire country

Conclusion

- Waste Stabilization Pond technology is suitable to handle Grey water in the village
- It helps in solving sanitation problem in the village
- It helps in rain water harvesting and recharging
- Preliminary survey has been carried out in the entire state and it has been found that pond renovation is required in 10396 villages where pond area is 24904.92 acres . Total funds required for this project is approximately INR 750 crores .