

Farm pond lining a step in water construction

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Ponds are small tanks or reservoirs constructed for the purpose of storing water essentially from surface runoff. Farm ponds are useful for irrigation, water supply for the cattle, fish production, etc. Farm ponds have a significant role in areas of rainfed agriculture. They are used for storing water during rainy season and using the same for irrigation subsequently during the other seasons.

Lining of farm pond includes covering the surface of its water storage area with any impervious material like LDPE or HDPE which can reduce the seepage losses to a bare minimum, practically almost zero. In addition of preventing the water loss due to seepage, it helps in preventing the contamination of stored water, controlling soil erosion and creating a healthy environment for aquatic life.

The total farm ponds dug out in the state of Karnataka with the assistance of Government scheme was around 42. Total lined farm ponds were around 7,030 numbers and the farm ponds integrated with drip irrigation were around 22,540 numbers. Following size of farm ponds were standardized and recommended by the government as per the field conditions. Government scheme provided an assistance of Rs.2.00 lakhs.assisted upto Rs. 2,00,000/-.

Sl.no	Size	Number of farm ponds constructed
1.	21 m x 21 m	18400 (4430)
2.	20 m x 20 m	16110 (1120)
3.	18 m x 18 m	7,700 (1380)
4.	12 m x 12 m	499 (100)

Further the basic data collected from the scheme revealed that infiltration/seepage rates for clay, silt, loam and sand were about 7.0 cm/d, 23.0 cm/d, 29.0 cm/d and 48.0 cm/s, respectively. Due to the HDPE pond lining technology, total saving of water per day is about $1.42 \times 10^6 \text{ m}^3$. For the non-monsoon season (240 days). Total water saving due to pond lining is around $341.56 \times 10^6 \text{ m}^3$ and this water was utilized for the cultivation of crops during non- monsoon seasons.

Advantages:

- Reduced Water Loss:** A pond liner helps minimize water seepage into the surrounding soil, which can be crucial for maintaining a consistent water level, especially in areas with high soil permeability or where groundwater levels are low.
- Improved Water Quality:** By preventing soil and organic matter from contaminating the pond, a liner can help keep the water cleaner and reduce the likelihood of algae growth and sediment accumulation.
- Cost-Effectiveness:** Although the initial installation of a pond liner can be an investment, it can lead to long-term savings by reducing the need for frequent refilling of the pond and lowering water treatment costs.
- Enhanced Ecosystem Support:** With more stable water conditions, the pond can better support aquatic life, including fish, amphibians, and beneficial microorganisms.
- Reduced Maintenance:** Lined ponds typically require less maintenance compared to unlined ponds because they experience fewer problems related to leaks, erosion, and sediment build up.
- Erosion Control:** Lining helps prevent the erosion of the pond's banks, which can be particularly useful in areas prone to heavy rainfall or high water flow.
- Flexibility in Design:** Pond liners come in various materials and can be tailored to fit the specific shape and size of your pond, allowing for greater design flexibility.
- Long-Term Durability:** High-quality liners, such as those made from synthetic materials like PVC or EPDM can offer long-lasting durability and resistance to punctures, UV rays, and chemical exposure.
- Environmental Benefits:** By maintaining a stable water level and reducing contamination, lined ponds can provide better habitat conditions for wildlife and support local biodiversity.

Steps to be followed in laying pond lining material

A. Site Assessment

- Inspect the pond area: Evaluate the pond's shape, size, and existing soil conditions.
- Check for obstacles: Identify and remove rocks, roots, or debris that may damage the lining material.

B. Gather Materials and Tools

- Materials needed: Pond liner (e.g., PVC, EPDM, or HDPE), underlayment (optional), geotextile fabric (optional), and water source.
- Tools needed: Shovel, rake, utility knife, measuring tape, wheelbarrow, and gloves.

C. Prepare the Pond Bed

- Remove debris: Clear out any remaining debris and smooth out the pond bed.
- Level the ground: Use a rake to ensure the pond bed is as level as possible, with no sharp points or high spots.



2. Laying the Pond Liner

A. Measure and Cut the Liner

- Measure the pond: Calculate the dimensions of the pond, including depth and width.
- Cut the liner: Cut the pond liner to size, leaving extra material around the edges to ensure complete coverage.

B. Lay the Underlayment (Optional)

- Place Geotextile Fabric: Lay down a layer of geotextile fabric or underlayment to protect the liner from punctures and improve durability.
- Smooth the fabric: Ensure the fabric is smooth and covers the entire pond bed.



C. Install the pond liner

- Position the liner: Carefully place the pond liner in the centre of the pond, allowing it to drape over the edges.
- Smooth the liner: Gently spread and smooth out the liner, working from the centre outwards to remove wrinkles and air bubbles.
- Secure the liner: Temporarily weight down the edges with rocks or soil to keep it in place.

3. Trimming and securing the liner

A. Trim excess liner

- Cut the excess: Once the liner is in place and smooth, trim the excess liner around the edges, leaving a few inches of overlap.
- Ensure proper fit: Make sure the liner fits snugly against the pond edges and base.

B. Secure the Edges

- Anchor the edges: Cover the edges of the liner with soil, gravel, or rocks to secure it in place and prevent it from shifting.
- Create a smooth transition: Gradually blend the liner into the surrounding landscape to create a natural look.





4. Filling the pond and final checks

A. Fill the pond

- Add water slowly: Start filling the pond with water slowly, allowing the liner to adjust and conform to the shape of the pond.
- Check for leaks: Monitor the pond for any signs of leakage or wrinkles and adjust as needed.

B. Perform final adjustments

- Adjust edges: As the pond fills, make any necessary adjustments to the liner edge and smooth out any remaining wrinkles.
- Inspect the installation: Check the entire pond to ensure the liner is properly installed and secured.

5. Maintenance and care

A. Regular inspection

- Check the liner: Periodically inspect the pond liner for damage or wear.
- Maintain edges: Ensure that the edges of the liner remain secure and properly covered.



B. Repairing the liner

- Patch small holes: Use a patch kit designed for your type of liner material to repair any small holes or tears.
- Consult professionals: For large repairs, consider consulting a professional for assistance.

Conclusion

In conclusion, farm pond lining offers numerous benefits that enhance the pond's functionality, efficiency, and environmental impact. By significantly reducing water loss, improving water quality, and minimizing maintenance, pond liners contribute to a more sustainable and cost-effective water management system. They also help support a healthy aquatic ecosystem and protect against soil erosion, making them a valuable investment for farmers and landowners.

Overall, the advantages of farm pond lining such as cost savings, reduced environmental impact, and improved water stability make it a prudent choice for those looking to optimize their pond's performance and longevity. Careful selection of liner material and proper installation are essential to fully realize these benefits.
