



Farm Pond: Types and Maintenance

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Water is one of the most important natural resources and all forms of life are dependent on it. It is, therefore, very essential to properly conserve and manage this resource and regulate its use to obtain maximum benefits. Precipitation is the most important source of fresh water and there is a need to manage the rainwater so as to reduce the impact of moisture stress during prolonged dry spells and obtain sustainability in agricultural production. Out of 400 million ha-m precipitation in the country, 70 million ha-m is consumed as evapotranspiration, 215 million ha-m infiltrates into the soil, whereas 115 million ha-m is lost as run-off. Harvesting of one-fourth of this 115 million ha-m run-off water in farm ponds can provide three irrigations to the entire rainfed area, which constitutes two third of cultivated land of the country. Harvesting rainwater through surface storage is one option to combat the situation. Construction of farm ponds in individual farmer's fields or on a community basis for harvesting run-off water when it is in excess and recycling of stored water for irrigation and other purposes when there is a deficiency of water is a very effective and efficient method of facing the challenge of water scarcity in rainfed areas.

Farm ponds have a significant role in a rainfed farming system where annual rainfall is more than 500 mm. It helps in mitigating the ill effect of rainfall variability as it stores water from rainfall excess and provides for utilization during prolonged dry spells by means of supplemental/protective irrigation. It also helps in pre-sowing irrigation of *rabi* crop. In high rainfall semi-arid regions of India, a farm pond can be used for multiple uses such as protective/supplemental irrigation, fish culture, and duck farming integrated with poultry.

Types of Farm Ponds

Farm ponds can be classified into two types i.e. embankment type and excavated or dugout type.

Embankment Type: These type of farm ponds are constructed across the stream or watercourse and consist of an earthen dam. The dimension of the embankment is determined based on the required storage. These ponds are suitable for areas having gentle to moderately steep slopes and also where stream valleys are sufficiently depressed to permit a maximum storage volume with least earthwork.

Excavated or Dugout Ponds: These types of farm ponds are small dug-out structures with well-defined shapes and sizes. These structures have provisions for inlet and outlet. Farm ponds are constructed at the lower portion of the farm and generally stored water is used for irrigation. In some places, farm ponds are used for recharging groundwater. However, for recharging groundwater, high-capacity structures located in highly permeable soil are more suitable. These structures are also called percolation tanks (Reddy et al. 2012). Dugout ponds are constructed by excavating the soil from the ground and the excavated soil is used to make embankments around the pond. The pond could either be fed by surface runoff or groundwater wherever aquifers are available. The depth and size of the pond depend upon the

volume of water to be stored. This type of pond is more featured in an individual farm. Dug-out ponds can be grouped into the following four categories:

1. Excavated or dug out ponds
2. Surface ponds
3. Spring or creek fed ponds and
4. Off stream storage ponds



Site Selection for Farm Ponds

Selection of a suitable site for the pond is important as the cost of construction as well as the utility of the pond depend upon the site.

1. The site should be such that the largest storage volume is available with the least amount of earth-fill. A narrow section of the valley with steep side slopes is preferable.
2. Large areas of shallow water should be avoided as these will cause excessive evaporation losses and also cause water weeds to grow.
3. The site should not cause excessive seepage losses.
4. The pond should be located as near as possible to the area where the water will be used. When the water is to be used for irrigation, gravity flow to the areas to be irrigated is preferable.

The capacity of Farm Pond

The volume of the farm pond can be determined using the equation as follows:

$$V = \frac{A+4B+C}{6} \times D$$

Where, V is the volume of excavation (m³); A is the area of excavation at the ground surface (m²), B is the area of excavation at mid-depth point (D/2) (m²); C is the area at the bottom of the pond (m²) and D is the design depth (m).

Maintenance of Farm Pond

Proper maintenance of the pond can ensure good life and service as it prevents expensive repair costs. A pond, no matter how well planned and built, must be adequately maintained if

its intended purpose is to be realized throughout its expected life. The pond should be inspected periodically. Care should be taken when heavy rains occur for the damages if any in a farm pond. Initially, damage may be small, but if neglected it may increase until repair becomes impractical. Any rills on the side slopes of the pond may be filled and any washes in the inlet spillway must be immediately filled with suitable material with thorough compaction. Care should be taken to keep the water in the pond as clean and unpolluted as possible. Trampling by livestock, particularly dogs and wildlife must be prevented. The drainage from barn lots, feeding yards, bedding ground, or any other sources of contamination will have to be kept away from the pond. Storage of clean water is especially important in ponds which are used for irrigating crops, fish culture, and livestock drinking. Annually, the deposited silt at the bottom of the farm pond must be removed and applied to the nearby fields.

References

1. Michel A. M. 1978. Irrigation: Theory and Practices. Vikas Publishing House Pvt. Ltd. New Delhi. 801.
2. Reddy K. S., Kumar, M., Rao, K.V., Maruthi, V., Reddy, B.M.K., Umesh B., Ganesh Babu R., Srinivasa Reddy K., Vijayalakshmi and Venkateswarlu, B. (2012). Farm Ponds: A Climate Resilient Technology for Rainfed Agriculture; Planning, Design and Construction. Central Research Institute for Dryland Agriculture, Santoshnagar, Saidabad, Hyderabad- 500059, Andhra Pradesh, India. 60p.