FARM PONDS IN THE CROP LANDS: INTRODUCTION:

Farm pond (also traditionally known as Dabri is some parts of India and Hapa in West Bengal) is a structure constructed on a farmer's land to harvest rainwater, which would otherwise have flowed out of the farm. On flatter land in the village, streams are not very deep, nor do they have high embankments. Thus it becomes difficult to build water harvesting structures like earthen dams. In such flat lands, Farm Ponds are the most effective water harvesting Solution. The main objective of such structures is to provide protective irrigation to the kharif crop. In addition, in West Bengal, Assam, Chhattisgarh, Bihar, Jharkhand and Orissa, Farm ponds are being used to irrigate the rabi crops and also for fish Farming.

ii) SITE SELECTION AND DESIGNING:

a) Farm pond can be made on any and every crop field. It should be made in the farming area, so that protective irrigation can easily be given and the site should be relatively flat. Farm ponds should be constructed in a cluster basis, so that the overall soil moisture regime of the area will be enhanced and water will be available for longer period of time. The catchment area of the site should not be more than 2 ha. In case there is a well on the farm, the pond should be made upstream of it so that the well may benefit from recharge from the pond. The size of the pond needs to be calculated on the availability of runoff water and volume of water requirement.

Image 2-3: Farm Pond

b) If we want to provide 10 cm of protective irrigation to the crop over 1 hectare, we need 1000 cum of water. Volume of water required = Area to be irrigated x depth of irrigation = 1 hectare x 10 cm. = 10,000 sq.m. x 0.1m. = 1000 cum. Pond whose dimension is 25m x 20 m x 2.5 m will yield this amount of water. It will occupy 25m. x 20m. = 500 sq.m. in 1 hectare, i.e., 5% of the area to be irrigated (500/10,000 = 5%).

iii) WHY THIS IS SOMETIMES REFERRED TO AS THE 5% MODEL:

Generally the area of the pond varies 5 % to 10% area of command area as per the water requirement. Farm ponds should generally be made only where there are no appropriate sites for construction of other water harvesting structures such as earthen dams. This is because its storage of water is only in the excavated portion and not against an embankment as in an earthen dam.

iv) ESTIMATION FOR A FARM POND WHICH IS 5% OF PLOT SIZE:

Say plot area is 0.2 hectare. So area of the 5% model pond = (0.2 x 10,000)* 5 % = 100 Sq. mt. considering the size of the farm pond 14mx7.5mx3.6m

Typical Estimation of Farm Pond

ESTIMATION FOR FARM POND							
		Length (m)	**14**	**Breadth (m)**	**7.5**		
		Depth (m)	**3.66**	**Berm (m)**	**0.6**		
Sl. No	**Description of Item**	**Length**	**Breadth**	**Depth**	**Quantity (cum)**	**Task/man-days (cum)**	**No. of man-days**
1	Mixed medium hard soil with soft moorum, kankar, pebbles, lead up to 24.4m & lift up to 1.5m (up to 0.6m	14	7.5	0.6	63.00	1.473	43.00
2	Mixed medium hard soil with soft moorum, kankar, pebbles, lead up to 24.4m & up to 1.5m(Next 0.6m depth)	12.8	6.3	0.6	48.38	1.473	33.00
3	Mixed medium hard soil with soft moorum, kankar, pebbles, lead up to 24.4m & lift beyond 1.5mt up to 2.4m (next 0.3m = 1.5m depth from GL)	11.6	5.1	0.3	17.75	1.473	12.00

Sl. No.	Description of Item	Length (m)	14	Breadth (m)	7.5		
		Depth (m)	3.66	Berm (m)	0.6		
		Length	Breadth	Depth	Quantity (cum)	Task/man-days (cum)	No. of man-days
	Hard soil/hard morrum, laterite or rocky soil; lead up to 24.4m, lift beyond 1.5m up to 2.4m (next .3m = 1.8m depth from GL)	11.6	5.1	0.3	17.75	1.077	16.00
4	Hard soil/hard morrum, laterite or rocky soil; lead up to 24.4m lift beyond 1.5m up to 2.4m (next .6m = 2.4m depth from GL)	10.4	3.9	0.6	24.34	1.077	23.00
5	Hard soil/hard morrum, laterite or rocky soil; lead up to 24m & beyond 2.4m up to 3m (next 0.6m= 3m depth from GL)	9.2	2.7	0.6	14.90	1.020	15.00
6	Hard Soil/Lateritic Soil, lead Up to 24.4m & lift beyond 3m up to 3.5m (next 0.45m = 3.45m depth from GL)	8	1.5	0.45	5.40	1.020	5.00
	Hard Soil/Lateritic Soil, lead Up to 80ft & lift beyond 11.5ft up to 4.57m (next 0.15m = 3.6m depth from GL)	8	1.5	0.15	1.80	0.992	2.00
	Total:			**3.6**	**193.32**		**149**

HOW IT IS CONSTRUCTED?:

a) Select an appropriate site on the basis of the considerations outlined above

b) Make the layout for the excavation of the farm pond at the chosen site

c) Leave a gap of about 2 to 3 m between the excavated portion and the mud piled up after excavation. This gap is known as a berm

d) If the mud excavated is fertile, spread it in the field.

e) A part of excavated earth should be used to strengthen the field bunds. Make a small 4" high bund around the pit to keep some standing water in the field.

vi) WHAT ARE THE ADVANTAGES?

This model not only saves the crop in the plot but also increases percolation to augment water availability in the downstream. Additionally, this treatment increases the farmer's access to water as there is a storage structure in each of his plots. So the farmer can exercise individual choice to best utilize it.

PRECAUTIONS:

a) Proper calculation of water requirement and availability of runoff water to be done while designing the pond. The area of pond generally varies from 5% to 10% of command area.

b) Proper catchment area treatment should be done in the upstream of the farm pond to reduce the rate of siltation

c) For a given storage capacity, deeper ponds are better than shallower ones since they occupy less of the farmer's land and less prone to evaporation losses. Generally the depth varies from 2.5m to 3.75m

d) Proper inlet with the provision of silt trap should be made to ensure that maximum silt free runoff water is harvested

e) The outlet should be pitched properly with stones to avoid soil erosion when the water flows out of the outlet

f) Creation of such Farm ponds in cluster (6-8 no in 2Ha of farming patch) instead of one or two in isolation

g) Maintain adequate berm (1m- 2m) and slope of excavation (1-2%)

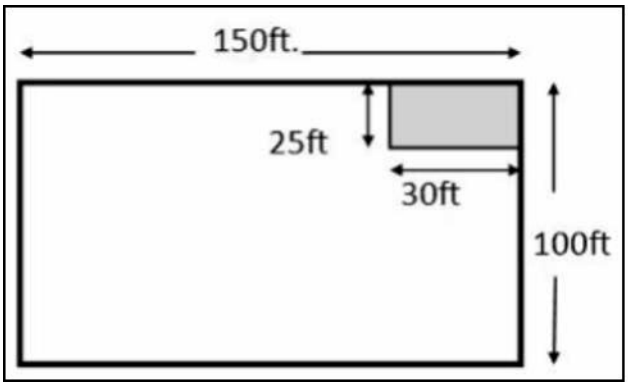

Figure : Location of Farm pond in a field

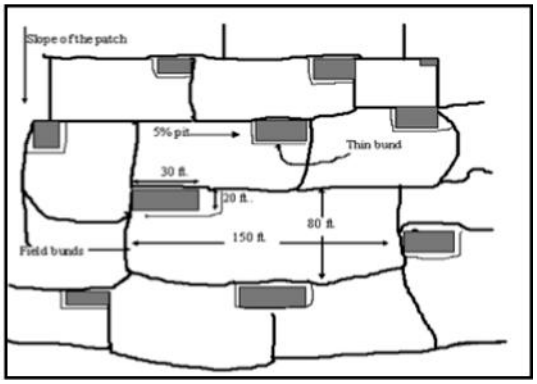

Figure : Location of Farm ponds in cluster of fields