

Table 1. Rates of stocking density per acre and its biomass in farm pond		
Species	Avg. size (gm)	Stocking
Tilapia	0.20	20000
Pangasius	0.30	15000
IMC	0.30	20000

#### Post-stocking management:-

Post-stocking management involves maintenance of pond environment and harnessing the pond productivity in the form of natural fish food, maintaining supplementary feeding and health care.

**Supplementary feeding:-** Soon after stocking, the fish start grazing natural food available in the pond irrespective of their stage of life cycle. Seed feeds voraciously on plankton (if available). Therefore, immediate steps must be taken for providing supplementary feed. In the case of nursery phase where seed are reared for about a fortnight up to fry stage, the form in which the supplementary feed is given is also important. In the *Hapa* the feed should be provided in finely powdered form and may be broadcast over the surface. Tilapia seeds need more food than the naturally available food in the farm pond. Artificial food in floating form is useful for their growth.

**Fish health management:** Fishes should be sampled once in every 15 days to check the health and growth. The body surface should be checked for presence of parasites if any. The body surface should be checked for presence of parasites if any.

**Harvesting:** Tilapia usually weighs 500 to 600 gm in 5-6 months after stocking. The periodical harvesting is done subsequently with dragnet of suitable mesh size and final harvesting is carried out by completely draining the pond.

Table 2. Rates of Daily Supplementary Feeding management		
Period (Day from the date of stocking)	Rate of feeding	Amount of feed for 10000 seed
1 <sup>st</sup> Month	15% of body weight-4Times/Day	375g-2kg/day
2 <sup>nd</sup> - 3 <sup>rd</sup> Month	8-10% of body weight 3 Times/Day	8kg-20kg/day
4 <sup>th</sup> - 6 <sup>th</sup> Month	5-6% of body weight 2 Times/Day	25kg-35kg/day
7 <sup>th</sup> - 12 <sup>th</sup> Month	2-4% of body weight 2 Times/ Day	40kg-60kg/day

Table 3. Economics of Growout Tilapia production/acre in Farm pond during six to seven months					
Sr. no	Particulars	Unit	Rate (₹/ unit)	Qty/acre (Unit)	Amount (₹)
1	Tilapia	Nos	2	20000	40000
3	Medicine	-	-	30000	30000
4	Supplementary feed	Kg	50	5000	250000
5	Miscellaneous	-	-	50000	50000
6	Total Expenditures			370000	
7	Yield (Kg)	Kg	80	7000	560000
8	Net profit (7-6)				₹ 1,90,000

Keeping in view the local climatic condition with shorter growing period, better management practices such as selection of suitable fish species, seed stocking and water management are to be adopted in farm pond based aquaculture system. The local availability of fish seed is crucial to boost private fish farming. Adopting these management by the farmers that should generate average income of ₹ 200000/acre from the existing farm pond every year.

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## Farm pond based Aquaculture Model for Rainfed Areas



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## Introduction

Majority of the Indian population is dependent on agriculture and allied sectors for their livelihood and income. Significant emphasis is therefore given to the development and improvement of these sectors. However, limited irrigation is one of the important and critical constraints in these sectors particularly in rainfed areas, since only 35% of the net sown area in India could only be completely irrigated. To overcome irrigation problems as well as to boost the agriculture production the Agriculture Department initiated the 'National Horticulture Mission', Maharashtra Rural Employment Guarantee Scheme, Rashtriya Krishi Vikas Yojana (RKVY). Maharashtra State Government took significant step in this direction particularly for rainfed areas and launched a scheme popularly known as "Magel Tyala Shet Tale" (Farm pond on Demands) and Jalyukt Shivar (JYS). On similar grounds in Andhra Pradesh, mandal committee has also prepared a plan on 'Neeru-Chettu'. Under NREGA also several farm ponds have been construction. Under 'Panta-Kunta' programme, two to five small farm ponds will be dug in every village. All these farm ponds can also be potentially utilized for aquaculture without affecting the water level in farm pond. Such a farm pond based aquaculture has potential to improve farmer's surplus income and ensure their sustainable livelihood, while increasing the nutritive value of water for use in crops. Thus a customized Fish culture in these water bodies in rainfed areas has potential to increase fish production and economic return per unit area of land.

## Benefits/Utility

- 1) The main advantage of Farm pond based Aquaculture Model is ready availability of unutilized open water bodies in form of farm ponds which can be brought immediately under efficient utilization.
- 2) Nutrients, specifically nitrogen released during mineralization of the organic inputs like feed enriched accumulated sediment, will enhance yield in land-based agriculture.
- 3) Optimized strategy for efficient use of available resources (water, land and fertilizer)
- 4) Supply of healthy and better quality fresh fish to the consumers at local level.

5) Established Smallholder fish production systems in India.

6) Established systematic supply chain for fish fingerling/fish in the India.

## Farming strategies

Nursing fish seed is arguably the simplest component of farm pond based aquaculture model and a suitable entry-point into fish farming for new agriculture farmers and fishers. The different management strategies involved to fish production are:

## Nursery farming and management in earthen Farm pond:

In farm pond based aquaculture model, emphasis is given on boosting the primary productivity by manure and fertilization. This will ensure enough availability of plankton as natural food. In addition, supplementary feed plays an important role and fed @ of 5-8 % of body weight. Broadly, the various steps involved in the management of farm ponds may be classified as (i) Pre-Stocking Management, (ii) Stocking Management (iii) Post-Stocking Management operations

## Pre-stocking management:-

Pre-stocking management aims to properly prepare pond to remove the causes of poor survival, unsatisfactory growth, etc., and ensure ready availability of natural food in sufficient quantity and quality for seed/fry/fingerlings to be stocked. The first step in pre-stocking management is ploughing (in farm pond without lining) for eradicating aquatic vegetation and predatory & weed fishes. Then, the pond is fertilized with organic manures and inorganic fertilizers, the cow dung is applied generally @ of 1000 kg/ha, urea @ 100 kg/ha/year and single super phosphate @ 50 kg/ha/year. The oil emulsion dose (diesel and detergent @ 0.5 litre & detergent 200 gm) should be applied prior to 2-3 days of stocking. Pre-stocking part of the management involves the following sequential measures (Fig. 1-6).

## Nursery farming and management in HDPE lining Farm pond

In HDPE lining Farm pond, only Stocking Management and Post-Stocking Management operations are performed (Fig. 7).



Fig. 1 Pond bottom drying



Fig. 2 Ploughing



Fig. 3 Liming



Fig. 4 Manuring



Fig. 5 Netting for eradication of insect



Fig. 6 Hapa installation



Fig. 7 Hapa or cage for conditioning and nursing

## Stocking management:-

This may be conveniently done under fixed conditions by fixing/floating a 'Hapa' in a pond and releasing seed in it (See fig. no 7). Nursery ponds should be stocked with seeds usually in the morning hours.

**Execution of stocking:** Fish should be passed into farm pond with least stresses possible. Therefore, fish of all stages must be handled with care and released gently by means of acclimatization. Time invested in this action will achieve better survival of stocked fish. The rate of stocking in a well prepared farm pond depends on pond size and species to be stock (table 1). However, the survival level decreases with the increase in stocking density.