राष्ट्रीय मात्स्यिकी विकास बोर्ड
National Fisheries Development Board
मत्स्यपालन विभाग/Department of Fisheries
मत्स्यपालन, पशुपालन और डेयरी मंत्रालय /Ministry of Fisheries, Animal Husbandry & Dairying
भारत सरकार /Government of India
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NFDB/PMMSY Cell/ Mini RAS/ 2021-22 **Date: 12.04.2022**

To
The Secretary (Fisheries)
Department of Fisheries
Ministry of Fisheries, Animal Husbandry and Dairying
Krishi Bhawan, New Delhi

Sub: Model Estimate for Mini Backyard RAS -reg

Respected Sir,

As directed by the Competent Authority, please find enclosed herewith the 2 models of Mini Backyard RAS with estimate @ Rs.50000/- along with cost economics for your kind perusal.

- Model-I: Mini Backyard RAS in tank system.
- Model II: Mini RAS with Aquaponic setup.

Yours faithfully,

Senior Executive Director (Tech)

Encl: As above

Copy to:

1) The Joint Secretary (Inland Fisheries), Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, New Delhi
2) The Joint Commissioner (Fy), Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, New Delhi

Establishment of Backyard mini RAS units

Sl.No	Components	Components
A	**Capital Cost**	**Capital Cost**
1	PVC Tarpaulin Tank (3000-5000 L) Tarpaulin 3 MT, 5000 L with Liner	15000.00
2	Mechanical /Gravel/Bio filter	5000.00
3	Aeration for both fish tank and bio filter	3500.00
4	Pump (100 to 200w)	5000.00
5	Battery Backup for aeration	4000.00
6	Plumbing/ Electrification charges	2000.00
	Sub Total(A)	**34500.00**
B	**Operational Cost**	
7	Seed (500pic @ Rs.5/pc 2 inch size)	2500.00
8	Feed 300 kg (28-32% Protein floating Feed @Rs.35/- per kg)	10500.00
9	Electricity	1500.00
10	Miscellaneous	1000.00
	Total (B)	**15500.00**
	Grand Total (A+B)	**50000.00**

Note: The other fish varieties like Tilapia , Pangasius, Pearl Spot, Pabda, Anabas can be also cultured in the Backyard RAS. (Species selection can be made based on the consumer preferences for that particular fish variety) High Value fish shall be cultured

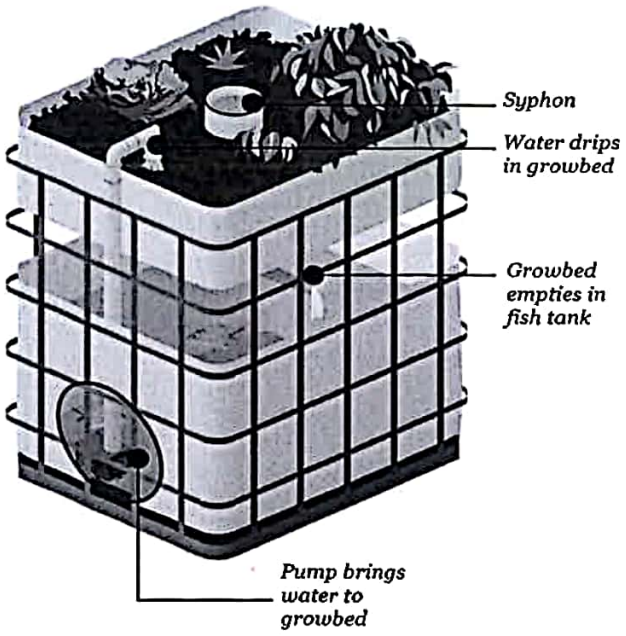
Sl No.	Particulars	Amounts/quantity (Rs.)
1	Culture period (months)	5-6
2	Stocking density (100 nos/m3)	500
3	Expected Survival (%)	80
4	Total Fish Survived (Nos)	400
5	Average size at harvest (Kgs)	0.50
6	Production/year (2 cycles)	400x2=800 Kgs
7	Sale Price (Rs./Kg)	150 -200/-
8	Gross Income(Rs./Year)	120000/-(per cycle Rs.60000/-)

Note: Gross Income will be subjected to vary depending on type of species cultured, marketability pattern and FCR.

Mini RAS System

Photograph showing the Model Mini RAS system installed at NFDB

Schematic Drawing of Mini RAS



Advantage of Mini RAS

- Extended durability of tanks and equipment
- Reduced dependency on antibiotics and therapeutants hence, advantage of getting high quality fish.
- Reduction of direct operational costs associated with feed, predator control and parasites.
- Potentially eliminate release of parasites to recipient waters.
- Risk reduction due to climatic factors, disease and parasite impacts
- RAS production can promote flexibility in terms of location for farming, proximity to market.
- Feed management is considerably enhanced in RAS when feeding can be daily monitored for 24 hrs.
- Exposure of stock to stress on RAS can be reduced for some factors such as adverse weather, unfavourable temperature conditions, external pollution and predation.
- Enable secure production of non-endemic species.
- Judicial use of water and land areas

Disadvantage of Mini RAS

- Constant uninterrupted power supply is required if electric power fails than backup of electricity is required
- Capital cost of starting a recirculating aquaculture system is high .
- Can be used only for domestic use
- Can be used as business model only with more number of systems.

Species suitable for Mini RAS

- Tilapia (*Oreochromis niloticus*)
- Pangasius (*Pangasianodon hypophthalmus*)

Components of Mini RAS:

- Grow out tanks: FRP tanks, including inlet, outlet drain pipes arrangements
- Tank for Expanded clay
- Water Storage (sump) tanks
- Small Pumps and motors
- UPS if intermittent power failure exists
- Electrification
- Automatic feeder (not mandatory)
- Aeration system (air/ oxygen), Carbon dioxide trapper system (degasser)
- Water testing kit
- Water supply system etc. (wherever required)
- Inputs such as Seed, Feed, additives and supplements, electricity, man power etc.

Feed:

- A high protein feed, containing all the essential minerals and vitamins
- Species specific feed
- Feeding can be done @ 3-5 % of the body weight of the fish depending on the quality and protein content of feed.
- More frequent feedings (several times per day) shall result in better growth rates and thus improved feed conversion ratio.

Model Technical Specification for GIFT Tilapia culture in Mini RAS

Sl. No	Parameter/title	Description
1	Name of the species	**GIFT**
2	Fish Tank size Expanded Clay Tank	**1.50m X 1.50m X 1.00m** **1.20m X 1.20m X 0.50m**
3	Total effective volume	**2.00 cum(2000 lit)capacity**
4	Stocking size	**Fingerling stage**
5	Stocking density	**90 per m^3 (Total 180 for 2 cum)**
6	FCR	**1:1.5**
7	Survival rate	**80%**
8	Crop duration	**6 months**
9	Cost of seed	**Rs.6 per pc**
10	Cost of feed	**Rs.40 per kg**
11	Total feed requirement	**108 kg**
12	Size at harvest	**500 gm**
13	Expected biomass	**72 kg**
14	Sale price	**Rs.150 per kg**
15	No. of crops per year	**2**

Cost estimates for GIFT Tilapia culture in Mini RAS

Sl. No.	Components	Amount (in Rs.)
A	**Capital Cost**	
1	Fish Tank with 2000 lit capacity	10,000.00
2	Tank for Expanded clay 500 to 750 lit capacity	5,000.00
3	PVC pipeline with fittings	8,000.00
4	Pump , filters, aerator, oxy-tube and accessories etc	2,500.00
5	Stand with frame to hold Both tanks	10,000.00
6	Cost of Expanded clay	3,500.00
7	Installation, plumbing, electrification charges	5,000.00
	Sub total (A)	**44,000.00**
B	**Input Cost**	
1	Seed cost (180 nos. of seed @Rs6 per pc) incl transportation	1080.00
2	Feed cost (108 kg @Rs. 40 per kg)-28-30% protein, floating feed	4,320.00
3	Electricity	500.00
4	Miscellaneous	100.00
	Sub-Total (B)	**6,000.00**
	Total Cost (A+B)	**50000.00**

Economic feasibility for 1-year production

S.No.	Particulars	Amount (in Rs)
1	Capital cost	44,000.00
2	Operational cost	6,000.00
3	Total project cost	50,000.00
4	Gross income from 1st crop	10,800.00
5	Gross income at the end of 1st crop after deducting the recurring cost for the 2nd crop	4,800.00
6	Gross income from 2nd crop	10,800.00
7	Gross income at the end of 2nd crop	15,600.00
8	Recurring cost for next year	6,000.00
9	**Profit per year (for two crops)** (7)- (8)	**9,600.00**

Note:1. Depreciation, Interest on loan component and monthly repayment amount are not taken into consideration.

2. If the Fish is sold in live condition the sale price will be **25% to 30%** more and the profit also will be more.

RAS Scheme under PMMSY Guideline

Beneficiary Oriented Sub-Components And Activities

S.No.	Sub-Component and Activities	Unit	Unit Cost (Rs. Lakhs)	Page No.
A	**Enhancement of Production and Productivity**			
5	**Technology Infusion and Adaptation**			
5.4	Establishment of Backyard Mini RAS Units	(No)	0.50	121-122

PMMSY guideline says: *As far as mini RAS taken up as a group activity by Groups of fishers and fish farmers i.e. fisher SHGs/Joint Liability Groups (JLGs)/Fisher Cooperatives etc. in their own back yard, the Governmental assistance will be 1 unit multiplied by the number of members of the group/society with a ceiling of 20 units per group/society.*