

Fish for Livelihoods

Key steps on small-scale aquaculture technology

1) Pre-stocking management:

1.1 Repairing pond dike and bottom

- Remove pond bottom black soil & compact pond dike properly
- Remove or trim large leaf falling trees and bushy plants



1.2 Eradicating Carnivorous fish:

- Pond drying or
- Remove carnivorous fishes by dragging fine mesh net or
- Apply rotenone (35g/0.01acre/feet water depth) or Tea-seed cake @ 750g/0.01 acre)



1.3 Lime application

- Dilute burnt lime with water and apply over the pond bottom & on dike (@ 1kg/0.01 acres)
- Lime will increase water pH value & effectiveness of fertilizer, compose organic materials and destroy parasites, germs and bacteria



1.4 Application of fertilizer (after filling water in pond)

- Apply TSP – 150g@0.01 acre, Urea 150g/0.01 acre and organic fertilizer 6kg/0.01 acres
- These fertilizers could be applied after 5 days of lime application



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2) Fish Stocking Management:

2.1 Characteristics of the healthy fingerlings

- Bright color with slimy scales
- No red spot or lesion on the body and gills



2.2 Conditioning of fish seed (fry/fingerlings)

- Allow to float the pot or bucket or plastic bag with fish seed on the pond surface for 15 to 20 minutes
- Slowly tilt the fish seed transport bag/container in the pond so that the fry/fingerlings could swim out easily



2.3 Fish stocking model for 0.01-acre pond

Species	Residing level of water	Size (inch)	Model-1 (Carp polyculture)	Model- 2 (Rohu-carp polyculture)	Model-3 (Thai punty-carp polyculture)	Model-4 (Tilapia-Carp poly culture)	Model-5 (Catfish mixed culture)
Catla or/and Silver carp	Upper level	5-6	8	8	8	8	8
Rohu	Middle and lower level	6-8	12	25	6	2	
Mrigal or /and Common-carp	Lower level	6-8	4	4	6		
Grass-carp	All level	6 -9	4			4	
Thai-punty	Upper and middle level	2-3	15		40		
Walking or stinging catfish	Lower level	5-6					22
Mono-sex tilapia	All level	3-4				100	
Pangas	All level	4-5					80
Total			44	36	60	114	110

Note: 80-100 Mola fishes may stocked along with other fishes of Model 1 and 2.

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3) Post-stocking management

3.1 Application of fertilizers

- Pond water should be green or brown. Transparent pond water means lack of natural food (phytoplankton and zooplankton) for fish.
- Apply below fertilizers as and when needed to increase natural food --
 - ✓ TSP - 6 Tikal's, Urea- 6 Tikal's & organic fertilizer- 3 viss/0.01 acre
 - ✓ Lime - 12 Tikal/0.01 acres should be applied 2-3 days before fertilizer application



3.2 Fish feeding

- Apply fish feed (@3-10%) twice per day (morning 9-10am & afternoon 4-5 pm)
- Feeding rate (% body weight) depends on fish size
- Feed needed to adjust after every sampling
 [an example; required amount of feed/day (if 3% body-wt.) = average weight of fish x total population of fish in the pond x 3%. If average weight of fish is 1 Tikal and total fish is 1,000 nos, then total feed per day is -1X1,000X3% = 30 Tikal's (15 Tikal's in the morning and 15 Tikal's in the afternoon.)]



3.3 Increasing feed efficiency:

- ✓ Using feeding tray (this system is better)
- ✓ Spreading feed evenly (this is suitable for pellet)
- ✓ Reduced daily feed quantity during cloudy and rainy day



3.4 What is Feed Conversion Ratio (FCR)?

- Feed Conversion Ratio (FCR) = Cumulative amount of feed used/weight of total fish population in pond

[an example: if cumulative total feed amount is 120 viss and total fish amount in pond is 40 viss. Then $FCR = 120/40 = 3$. If 1 viss feed price is 800 MMK. Cost of 120 viss feed is $120 \times 800 = 96,000$ MMK. If 1 viss fish price is 2,500 MMK, value of 40 viss fish is $40 \times 2,500 = 100,000$ MMK. In this case, profit is only 4,000 MMK. So, smaller the value of FCR, the better the profit is. There are other expenses such as the cost of fry, labor, etc.]



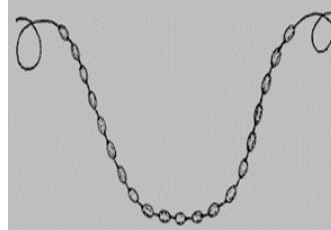
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4) General management

4.1 Pond bottom could be dragged using chain

- Drag pond bottom using chain to remove harmful gases from the bottom of pond
- While dragging, fishes moves fast which make them healthy
- Fishes eat more feed and grow fast



4.2 Common problem and how to solve

Problem	Solution
Oxygen deficiency in pond water (symptom: fish will come in the pond surface to take oxygen at early morning & late night)	<ul style="list-style-type: none"> ✓ Make waves in the pond using pitcher from opposite direction, recycle pond water like flashing or using injector, stop feeding and fertilizer application
Red layer on the surface of the pond water	<ul style="list-style-type: none"> ✓ Dragging out the red layer form the surface of the pond water by using rice straw rope or banana leaves, or ✓ applying 100-150 gm of urea for 2-3 times (10-12 days intervals) or ✓ apply 100 gm of potash alum for 0.01acre pond area
Green layer on the surface of the pond water	<ul style="list-style-type: none"> ✓ Dragging out the green layer form the surface of the pond water by using rice straw rope or banana leaves, or ✓ Stop feeding and fertilizer application ✓ Stock large size silver carp for biological control
Turbidity into pond water	<ul style="list-style-type: none"> ✓ Apply 500 gm of burnt lime or 1-1.5 kg of gypsum can be applied or - 2.5 – 3.0 kg of dry rice straw bundle for 0.01 acre pond area



4.3 Fish harvesting

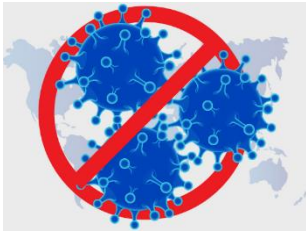
- Larger fish could be harvested partially and restock with same number of fingerlings in order to allowing remaining fishes to grow faster
- Can get money to buy fertilizer and feed for pond
- Reduce loss, in case of any natural disasters (eg. Flood and draught)
- Minimizing threat about social security



Small-Scale Aquaculture Investments for Livelihoods




Protect yourself from Coronavirus, COVID-19

How does it spread?









- Can spread through respiratory droplets produced when an infected person coughs or sneezes
- Can spread from person-to-person through surfaces that have been touched by those infected
- Can spread through a person travelled to countries that have been hit by COVID-19 outbreak within 14 day or having close contact to the infected person









Symptoms:

	<p>Fever (Above 38 °C/100.4°F)</p>		<p>A cough</p>		<p>Shortness of breath and breathing difficulties</p>
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Ways to prevent:

	<p>Avoid close contact with people who are sick</p>		<p>Clean and disinfect frequently touched objects and surfaces</p>
	<p>Cover your cough or sneeze with a tissue, then throw the tissue in the trash</p>		<p>Stay home when you are sick, except to get medical care</p>
	<p>Avoid touching your eyes, nose and mouth</p>		<p>Wash your hands often with soap and water for at least 20 seconds</p>

Hand Washing Procedure:

<p>1</p> 	<p>Palm to palm</p>	<p>2</p> 	<p>Between fingers</p>	<p>3</p> 	<p>Back of hands</p>	<p>4</p> 	<p>Base of thumbs</p>
<p>5</p> 	<p>Back of fingers</p>	<p>6</p> 	<p>Fingers nails</p>	<p>7</p> 	<p>Wrists</p>	<p>8</p> 	<p>Rinse and wipe dry</p>

Credit- Ministry of Health and Sports

