

Package of Practice Polyculture



ADVANCING
NORTH EAST

An Initiative of North Eastern Council (NEC)

Implemented by North Eastern Development Finance Corporation
Limited (NEDFi)

POLYCULTURE

SCOPE:

Polyculture is a practice of culturing more than one species of aquatic organism in the same pond. The concept of polyculture of fish is based on the concept of total utilization of different trophic and spatial niches of a pond in order to obtain maximum fish production per unit area. The mixing of different fish gives better utilization of available natural food produced in a pond. The compatible fish species having complimentary feeding habits are stocked so that all the ecological niches of pond ecosystem are effectively utilised. It is a 1000 years old practice started in China & spread throughout Southeast Asia, and into other parts of the world. In India carp culture is major culture species in case of fresh water aquaculture, and it is a polyculture farming. Maximum out put we can expect from polyculture is approx. 8000-10000 kg per hectare if we manage scientific & efficient management practice.



**PIC 1: FISH AND SHRIMP IN
POLYCULTURE**

SOURCE: GOOGLE IMAGE

BACKGROUND:

The possibilities of increasing fish production per unit area, through polyculture, is considerable, when compared with monoculture system of fish. Different species combination in polyculture system effectively contribute also to improve the pond environment. Algal blooming is common in most tropical manure fed ponds. By stocking phytoplanktophagus silver carp in appropriate density certain algal blooming can be controlled. Grass carp on the other hand keeps the macrophyte abundance under control due to its macro vegetation feeding habit and it adds increased amount of partially digested excreta which becomes the feed for the bottom dweller coprophagous common carp. The bottom dwelling mrigal, common/mirror carp help re-suspension of bottom nutrients to water while stirring the bottom mud in search of food. Such

an exercise of bottom dwellers also aerates the bottom sediment. All these facts suggest that polyculture is the most suitable proposition for fish culture in undrainable tropical ponds.

HOW DOES POLYCULTURE WORK?

Ponds that have been enriched through chemical fertilization, manuring or feeding practices contain abundant natural fish food organisms living at different depths and locations in the water column. Most fish feed predominantly on selected groups of these organisms. Polyculture should combine fish having different feeding habits in proportions that effectively utilize these natural foods. As a result, higher yields are obtained.

FISH USED IN POLYCULTURE

Combinations of exotic and Chinese carps (bighead, silver and grass carp, common carp) are most common in Polyculture. But in India IMC (Indian Major Carps) along with exotic & minor carps are also used in case of polyculture fish farming. Other species may also be used. While fish may be grouped into broad categories based on their feeding habits, some overlap does occur.

FACTORS AFFECTING SPECIES SELECTION AND STOCKING RATES

1. Market value of fish
2. Water temperature.
3. Pond fertilization practices.
4. Feeding habits of fish.
5. Seed availability. etc

Potential Problems in Polyculture

Polyculture is an effective way to maximize benefit from available natural food in a pond. But, pond management becomes more difficult when stocking fish species having specialized feeding habits in the same pond because good fertilization and feeding practices must be followed. If inadequate fingerling supply severely limits the choice of species available for polyculture, at least one species should have general rather than specialized feeding behaviour. This will allow more of the available natural food to be utilized.

GENERAL MANAGEMENT:

Stocking can be done at the rate of 10000-120000 Pcs of fingerling approx. 100 g size per Hectare

In intensive culture a yield of 8-10tonnes/ha/year can be achieved

Floating fish feed and sinking fish feed should be given with FCR for floating@ 1.4-1.5 & Sinking with FCR of 1.6-1.7

Protein requirement 28% at starter phase, 26% at grower phase and 24% at finisher phase

Limining should be done with agricultural lime @100kg per hectare

Registers should be maintained pond wise on day-to-day management of the farm indicating the details of stocking, source of seed, inputs, sampling details, water quality details, health, growth, etc. The records should be produced at the time of inspection by the concerned fisheries authorities

Proper feed storage facility should be provided at the farm site with proper ventilation and fumigation. The feed should be stacked on raised wooden platforms without touching the walls to avoid mould. The feed should be used within three months from the date of production

WATER PARAMETERS:

Ph- 6-5-9.0

Dissolved Oxygen- above 5 ppm

Ammonia concentration- Below 0.5ppm or below

FEEDING STRATEGY:

Name	Feed type	Fish body weight in gm	Percentage of Feed	No of time of Feeding
Nursery	Crumble or 1.2 mm	2-5	30-25	3-4
Pre starter	Pellet 1.5 mm	6-10	20-10	3-4

Pre starter	Pellet 1.5 mm	11-20	10-8	3
Starter	Pellet 2 mm	21-100	8-3.5	2-3
Grower	Pellet 3 mm	101-400	3-2	2
Finisher	Pellet 4 mm	401-1000	2-1	2

70% of the total culture cost of fish goes with feed, so one must be cautious while dealing with fish feed

Daily feeding should be done 2-3 times the amount should be kept higher in evening feeding (60% of total daily feed)

Change the feeding percentage every after 10-11 days

Put the feed at specific location instead distributing them throughout

Give feed at definite time only

Regular monitoring and observation are required during feeding

SELECTION OF FINGERLINGS:

Select an established and experienced hatchery

Better fingerlings will have shiny body coat, fast moving

Size and body weight will be equally distributed

Body will not have any marks and the slimy film on the body coat is indicative of better fingerling

HOW TO EXAMINE THE GOOD FINGERLINGS:

Take few fingerlings randomly in a tray with water

Then examine its movement as well as body coat

Observe its size

Look into the uniformity in body weight

TREATMENT OF NEW ARRIVAL:

Take a 10lit bucket add 1 tsf KMNO₄ and mixed thoroughly



Take a piece of mosquito net and put few fingerlings in it and dip the whole content in the bucket with KMNO₄ solution

Keep them for 30 sec and then release them in the pond slowly by using the nets or the container by putting them in the water and the fingerlings will slowly go out

DAY TO DAY ACTIVITY:

Check water quality

Check fish movement

Check farm equipment and building

Personal hygiene

Provide feed at definite time and check feed stock

Remove unwanted material from water surface

Clean the dike on regular basis

Maintain feeding register

Any abnormality should be recorder

Care should be taken during cloudy days as dissolved oxygen depletes during that phase

HARVESTING:

Harvesting should be done early in the morning or late evening

Do not give feed for atleast 12 hours before harvesting and post harvesting

Try to harvest the stock at one go to avoid stress or try to do in two phases with atleast a gap of one 15 days to one month

Drag nets are suggested for harvesting

Harvested fish should be immediately iced and transported for domestic markets/processing plants

FARM ECONOMICS: