

A Technical paper presented on the 23rd of July, 2002 to the OGADEP Monthly Technology Review meeting (MTRM) on Latest Technologies in Fish Stocking, Sorting and Marketing .

By DR. Oyin OLUKUNLE

Dept. of Wildlife and Fisheries Management Univ. of Ibadan.

Definitions of Fish Stocking

What is fish stocking? It is one of the principal means of improving the quality and quantity of fish production by deliberately introducing fish seeds or juveniles of desirable fish species.

Aim of stocking: is to obtain the optimum quality of fish quantitatively and qualitatively under the most economic conditions.

Purpose of stocking

To try to adapt the fish species, the number and weight of the fish released to predetermined physico – chemical and biological conditions of the ponds. Stocking has to take into consideration the size and the productivity of the pond especially when herbivorous and omnivorous species (that depend on the productivity of the pond) are stocked. If production is intense and concentrated there is need to apply artificial feeding then, stocking will be independent of pond productivity but must be adapted to the chemical physical, hygienic conditions and also the quantity of artificial food distributed.

Determination of stocking Rate

Stocking of a pond should lead to maximum Production | within Minimum time

Stocking should relate to total harvest or partial harvest

Stocking should relate to whether the fish reproduces or not

Stocking should relate to economic factor

Stocking should relate to productivity of the pond

Stocking should relate to individual growth increase when number stocked diminishes

Formula for stocking

Stocking Rate (Nos) = $\frac{\text{growth target or total productivity in (Kg)} + \text{Loss (in nos)}}{\text{Individual target growth in (Kilos) at harvest}}$

E.g if you intended to grow 1000kg of fish each fish weighing 1.0g with loss number = 50% *Clarias gariepinus*

$$\begin{aligned} \text{The SR} &= \frac{1000\text{kg}}{1\text{kg}} + \left(\frac{50}{100} \times 1000 \right) \\ &= \frac{1000}{1} + 500 \\ &= 1500 \end{aligned}$$

Problems of stocking

1. Size of fish stocked

Many hatcheries are selling undersized hatchlings, **Extension message** is that farmers should not purchase fries with size less than 1gm or 3-5cm in length. Stock fingerlings of 5 – 10g or 5 – 10cm to get a higher survival both in earthen ponds, cages IFAD (2000) and homestead ponds. For homestead pond of (3×2×1.5)m³ have recorded 0 – 10% survival when fries were stocked (2 weeks old). However, I had over 60% survival when I stocked 5 – 10g fingerlings (finger size). This has been repeated several times.

2. Water quality

Need to ensure that turbidity, fertility (if depending on pond productivity) is right, low nitrite level, low pH level, low ammonia level. It is not true that Clarias grow better in dirty water. Private rich farmers are using recirculating systems and they are getting good results. For not so rich farmers make maximum use of natural water supply. Use a flow through system to reduce disease conditions and poor quality water. Change water as often as possible.

3. Predators

Protect your stock from, birds, snakes, frogs, nymphs and adults dragonflies e.t.c. Can construct nettings over, around your pond or tanks.

4. Feeding

Feeding or non-feeding or feeding wrong sized diet to fish at all stages of development will make nonsense of good stocking. Feed. protein rich diet to your fish.

There is nothing wrong with using maggot to feed fish but stop a few weeks before harvest to avoid irritating your consumer. Use a finisher compounded diet to improve the flavor.

5. Pond – preparation

Use the old method of preparation liming (to kill predators eggs, larvae and adults to raise the alkalinity of pond) Fertilize to improve availability of food organisms.

SORTING

Sorting is a sort of grading to ensure qualitative harvest.

When to sort?

Sort especially *Clarias* fingerlings every two-four weeks after stocking depending on intensity of feeding. Sort at harvest.

Purpose : to reduce cannibalism, to reduce territorialism. To have equal sized fish harvest. For tilapia to reduce excessive reproduction.

Sorting at harvest helps the farmer to break- even because he can sell the bigger ones to consumers who can afford them and the smaller sized ones to

the lower income group and specialised marketing - pepper soup joints.

What do you use in Sorting?

1. Hand nets with different mesh sizes
2. Plastic bows with different ^{sized} perforations.
3. Sieves with varying hole sizes.
4. Pour on a table and grade.
5. Use a device with bar across the grid. The small fish will pass through while retaining the big ones which can be removed page 396(Huet,1973).
6. V-shaped measuring board p.398 (Huet) to measure the length of the fish and grade.

MARKETING

what is a market ?

A market is a place where buyers and sellers meet, goods and services are offered for sale and transfer of ownership occurs.

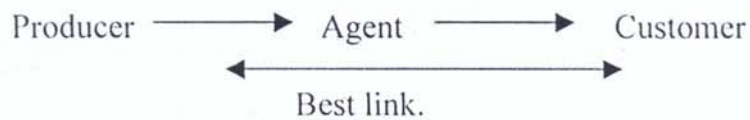
Marketing is a ^{means} means to satisfy.

- People who have money to spend.
- People who are willing to spend the money.
- *People who have goods to offer for sale.*

For fish, the demand is higher than the supply therefore farmers have been getting away with selling low quality product.

1. To get better profit, target a particular group e.g. either target the low income or the high income group.
2. Go out to meet customer's need.

3. Make sure that the selling price does not over shoot the cost price excessively.
4. Observe the 4 P's of marketing on –
 - Production – remember that fish is perishable
 - Pricing – remember that cost should be low, Selling price should not be too excessive. Ensure a moderate profit.
 - Place – target a particular market.
 - Promotion – This is the message to the market buyers. It should be timely to avoid the fish perishing. Link should be the shortest from the



The agent is represented by market women. Fish should be sold as fresh as possible.

Thank you for listening.

References

1. Heut, M. (1972). Textbook of Fish Culture. Fishing News Books Ltd. Farnham, Surrey, England.
2. IFAD (200). IFAD Sponsored Oyo State Adaptive cage culture trials. Report submitted by the Committee on cage culture trials.
3. Oyin Olukunle (2000). Homestead pond management. John Archers (Publishers) Limited.

RECOMMENDATION

- Juveniles must be stocked. The committee observed a higher survival in the cages when juveniles were stocked e.g. growth was better and survival of Clarias higher in Ogbomoso and Saki. The result could have been better if the cages were not destroyed at Ogbomoso and Saki by crabs and human parasites and by crabs respectively.
2. The fisherfolks must be taught the local technology of pelleting feed.
 3. Use of the poultry dung bags must be encouraged in the tilapia cages to promote algal bloom/fertilization.
 4. The cages must be accessible to the operators. The distance must not be more than 200 --- 300 meters to where the feeds are stored.
 5. The bottom layer of the net cages must be reinforced i.e. the net layer should be doubled to deter predator animals e.g. crabs and larger fishes from attacking the stocked fishes in the cage.
 6. Feeding must be regular and intensified to avoid Clarias growing gaunt, eating each other and Tilapia dying for lack of food.
 7. The positioning of the cages must take into consideration the current rate and the terrain of the land to ensure adequate oxygenation. For instance high temperature fluctuation was reported at Ogbomoso which increased mortality.
 8. The relative success of the project at each of the selected centres is a reflection of the seriousness of the officers posted to each site and that of the participating fishermen; posting for future exercise should take this in to consideration.
 9. Pelleted feed should be used predominately for future adaptive trial of fish culture in cages.

1.6 Conclusion

The result of the first cycle of this project is an eye-opener. The mistakes of this experience will expose and utilize the inherent potentials available. The fisher folks at Oyo, Ogbomoso and Saki are very willing but the local politics within the FCS at Eleiyele and Oyo affected the execution of the project.

Therefore, the cages should be easily accessible by the fishermen during management without jeopardizing security. This experience should encourage a repeat of this project either by the funding agency, individual fisherfolk or corporate fisherfolks. If by the funding agency, vehicle(s) should be provided for monitoring, if by fisherfolks a workshop should be organized for training of proper and detailed management.