



CHAPTER 7: CONCLUSION

Conclusion

Agriculture and pisciculture are main two pillars of the local economy of the district. The district like Purulia is bestowed with large no. of reservoirs. Through scientific management and proper utilization of those water bodies with the help of extension services of Govt. can bring a revolution in fish production scenario as a result rural socio-economic status of poor fish farmers may be uplifted.

Hatcheries in the Bankura district may be utilized as multi-purpose hatchery as those infrastructures are left non-functioning from Aug-Feb every year. This time can be utilized through breeding of Desi Magur, Singi, Koi and Ornamental fish species.

Limiting Factors of Production in case of water body of Purulia District:

1. Multi ownership Tank/ pond

In case of Purulia district most of water bodies are multi ownership type. Most of the cases farmers' dependent on Lease rented water body but most of the cases leasing period is 3 yrs or 5yrs. So execution of any government scheme is difficult in those water bodies because for getting Govt subsidized scheme leasing period is maximum 7 yrs.

2. Input problems

Lack of good quality fish seed and fish feed during the culture period is major one which resulted in low growth rate of fish and high mortality.

3. Water Quality problems:

The result obtained from analysis of different water quality parameter it shows that the water bodies of Purulia district are average (medium) productive in nature. Here most of the fish farmers do not maintain any fertilization and manuring schedule during pond preparation and culture period also that's why the nutrient content of pond is less. They don't apply lime on monthly basis in fish culture pond, for this reason pH value fluctuates between the ranges 6.933 to 7.45. Most of the pond organic load is more because most of the pond is community pond and pond water is used for multiple purposes like bathing, washing of cloth, cattle bathing etc.

4. Occurrence of Fish Disease:

Occurrence of fish disease is the major problem because most of the water bodies are not properly maintained. Non availability of drugs and chemicals is another problem.

5. Poaching:

6. Credit problem:

Here most of the fish farmers failed to apply required inputs like fertilizers and feeds, in due time due to lack of sufficient credit. In this case, loan from the bank or other organizations may be an alternative. But, difficulties in getting loan from government banks.

7. Lack of awareness among fish farmers:

They were not getting technical supports regarding culture practices from relevant government or non-government organizations and they had to discuss with neighbor farmers to solve their problems.

8. Seasonal water body:

In Purulia district most of the water bodies are seasonal in nature they retain water six months. To get optimum fish production from this water bodies special emphasis is to be taken.

Future Management Strategy of Fish Farming in the pond water of Purulia District

1. Proper Stocking density should be maintained.
2. Stocking of stunted fingerling (Size 100 – 150gm) in seasonal water body.
3. Apply formulated fish feed with a protein content of about 26% to 30% to get optimum fish production in seasonal water body and homemade conventional fish feed may also be applied.
4. Periodical manuring at 15 days interval for better plankton production.
5. Liming the fish pond after verifying the pond pH.
6. More and more engagement in Govt. scheme under Fish Farmers Dev. Agency for financial help.
7. Integration with Duckery is the most suitable culture practice in case of Purulia Dist. as there persist a heavy demand of duck meat.
8. Co-operative societies may be strengthen for availability of modern fishery inputs.

9. Organizing Awareness Programme for scientific fish farming.
10. Impart training with the help of extension personal about semi intensive fish culture practice.
11. Netting the fish at monthly basis for checking of fish growth, occurrence of disease etc.
12. Impart training with help of Block level Fishery Extension Officer or District Fishery Officer to expertise the fish farmer about testing of pond water quality parameter and what is the range of this parameter for good pond water quality to get optimum fish production.

Limiting Factors of Production in case of water body of Bankura District:

1. Disease Out break

Occurrence of fish disease mainly cultured fishes and brood fishes are a major problem in Bankura district. EUS and Argulus infection is common disease observed in cultured fishes.

2. Inundation due to floods

Due to heavy shower during July and September, a large part of the West Bengal freshwater fish farms get inundated, ultimately loosing majority of the stock.

3. Financial problem

Sometime farmers are not getting financial support from the state Government and banks. Many of them were forced to avail loans from private sources with high interest rates.

4. Poaching

5. Market price fluctuation

6. Lack of awareness among fish farmers:

They were not getting technical supports regarding culture practices from relevant government or non-government organizations and they had to discuss with neighbor farmers to solve their problems.

7. Water Quality Problems:

The result obtained from analysis of different water quality parameter it shows that the water bodies of Bankura district are productive in nature. Here most of the fish farmers maintain fertilization and manuring schedule during pond preparation and culture period also that's why the nutrient content of pond is better than Purulia District and plankton production is optimum for fish production. Here most of the farmers apply lime on monthly basis in fish culture pond, for this reason pH value fluctuates between the ranges 7.08 to 7.78. Here during the study period we observed that organic load is more in few ponds because few farmers apply poultry manure in

huge quantity that deplete the water body during summer season. Sometimes disease outbreak may occur.

Future Management Strategy of Fish Farming in the pond water of Bankura District

1. Fish culture practices by Multiple Stocking and Multiple Harvesting Technique
2. Juice based culture practices
3. Periodical manuring at 15 days interval for better plankton production.
4. Semi intensive culture practices with diversified aquaculture species.
5. Testing of water quality parameter on monthly basis.
6. More and more awareness camp with the help of extension personal.
7. Development of various schemes for betterment of fish farmer
8. Impart training programme for Co operative society member and supply of modern fishery inputs and providing “Big Water Bodies Scheme” under Rastriya Krishi Vikash Yojana.
9. Periodical Netting.
10. Organizing handsome training programme for fish farmer to trained them about testing of different soil water quality parameter.

Limiting Factors of Production in case of Reservoir of Purulia District:

1. Unmanaged condition of the water body: In Purulia District most of the reservoirs were under control of Primary Fishermen Co- Operative Society Ltd. They could not able to manage those reservoirs due to distance from their native village.
2. Unavailability of good quality fish seed.
3. Siltation is a major hindrance.
4. Weed infestation.
5. Poaching is a major issue.
6. Lack of financial support from any kind of financial institution.

Future Management Strategies:

1. Stocking of advance fingerlings
2. Normally a combination of different Indian major carps can be used to enhance the reservoir catch. The combination is determined by the vacant food niches identified previously. If the density of phytoplankton and zooplankton is high, equal proportions of *Catla catla* and *Labeo rohita* can be stocked. The percentage of *Cirrihinus mrigala* and *Cyprinus carpio* should be decided based on the benthic population and detrital

- load in the reservoir, but they should not be more than 30% of fish population, as they are difficult to harvest. If the system has a lot of *Hydrilla* and *Potamogeton*, grass carp can account for about 10% of stock to control vegetation while boosting fishery productivity.
3. More and more Govt. scheme for big sized fish production may be introduced in the reservoirs.
 4. Scientific culture and proper management can enhance fish production.
 5. Proper guidance and training regarding reservoir management to the Co-operative members.

Limiting Factors of Production in case of Reservoir of Bankura District:

1. Absence of Fish Seed Farm in the reservoir site:

In absence of Nursery and Rearing tanks at nearby site of the reservoir as well as there is no other water bodies except Kangsabati Reservoir under the possession of the Primary Fishermen Co operative Society. The fish seed were brought from distant places.

2. Inadequate infrastructure Facility:

Inadequate infrastructure facilities like community Hall, office building of Kangsabati CFCS limiting the scope of proper monitoring and supervision of the ongoing routine works.

3. Lack of Awareness among local fishermen:

Local fishermen caught all types of fishes during breeding season July to September that hinder the natural breeding and spawning ground of fishes.

4. Siltation

5. Abundance of Macrophyte: Macrophyte coverage upto 25 to 30 % of the water body

6. Loss of natural source of fish seed by Local Fishermen:

The natural stock of fish seed was destroyed by the fishers due to use of 'Chatjaal' as well as lack of awareness among them.

7. Improper Harvesting:

Difficulty in successful harvesting of fishes due to uneven bed and bottom of the reservoir which is covered with tree stumps, boulders, rocks ditches, river lets other

structures etc. and lack of skilled experienced fishers. Sometimes it needs to hire the experienced and skilled fishers from other district.

Future Management Strategies:

6. Fish Seed Farm:

In the year 1986 the Fisheries Department, GOWB has decided to construct Fish Seed Farms surroundings to the reservoir. Some areas adjacent to the reservoir were selected at Ranibandh, Khatra-I, Khatra-II Development Blocks under Bankura district and Manbazar-I Dev. Block under Purulia district and constructed 41 ha Nursery & Rearing tanks in 13 sites under RLEG Programme during 1986-1988.

7. Initiative taken from National Cooperative development Corporation:

In the years 1996-1999, the NCDC-BENFISH launched a project for development of Kangsabati reservoir fisheries in the head of distribution of crafts & gears and stocking of fish seed programme for the Cooperatives.

8. Initiative of Kangsabati Central Fishermen Co operative Society:

In the mean time the KCFCS Ltd. along with its PFCS decided some policies to ensure fish production through stocking of fish seeds from their own fund and they decided that the fund will be created by the collection of Registration fees and Fishing license fees from the participants' fishers. The required fish seed should be collected from the societies and the deficit if any, will be procured from nearby Societies, FPGs, SHGs, Local farmers etc.

9. Stocking of Fish Seed:

The stocking of fish seed in the Kangsabati Reservoir are in 2 ways: (1) Auto-stocking / Natural stocking and (2) Artificial stocking

(A) Auto-stocking / Natural stocking: (a) Auto stocking occurs from the river Kangsabati and Kumari during rainy season and

(b) **Natural breeding:** Natural breeding of different fish species usually occurs at different time. Recent past it was observed that the Indian major carps along with other fishes were breeds naturally at the shallow parts of upstream (head water recharge areas) during

Monsoon period; adjacent to the area of Manbazar-I and Manbazar-II Development Block under Purulia District.

(2) Artificial Stocking:

a) Stocking of fish seed by rearing in Nursery and Rearing tanks. Attempt was taken to produce seeds in pen and cages also. The Kangsabati CFCS Ltd. along with members of the societies, extension personnel of Fisheries Department, Local Administration and Panchayat Raj Institution commonly decided that the fishers should refrain themselves from catching all type of fishes during July to September to stop disturbance of natural spawning and spawning ground at higher strata.

5. Organizing Awareness Programme:

Awareness camps were also organized in village to village along with mike broadcasting, leaflets distribution, role playing, participating in the local Melas etc.

6. Complete Harvesting of Fishes:

Now mostly they fished by gill net and in some parts of the reservoir they use drag nets, cast net along with other fishing devices like traps, lining and hooking.

Now Fisheries Department Govt. of West Bengal has taken initiation for execution of scheme distribution of Minikit in Big water bodies (Kangsabati Reservoir) under social Fishery scheme. The motto of the scheme was to improve the fish farming of Kangsabati by way of increasing the fish stock and to improve the Socio economic condition of the fisher folk whose livelihood depends only on fish catching at Kangsabati Reservoir.

Existing production of the reservoir per Ha/Year is about 45kg/Ha/yr, which is expected to be 125/Ha/yr after stocking. The per capita income of the fishers is Rs.5000/-Rs.6000/ per month before stocking which is likely to be increased Rs.12000/-Rs.15000/ per month after stocking.

7. Development of Eco Tourism:

Apart from fisheries point of view there is tremendous scope of eco-tourism development in the Kangsabati reservoir surrounding Mukutmonipur which may cater and provide good

opportunity to the other members of the fishers family to add earnings and side by side their livelihood also in river riding of the tourists through their traditional boats . Mukutmanipur perhaps the best picnic spot in the state of West Bengal as well as the biggest earthen dam in Asia. The scenic natural beauty of Mukutmanipur attracts people across the state over the years. The village environs are striking combination of rolling land, natural vegetation, lake and tribal hamlets. Mukutmanipur's undulating forested landscape marked by the vibrant colours of 'Palash' and 'Sonajhuri' trees is refreshing and invigorating for the body and mind. It is marked by the prominent hillock about 200 meters high, locally named "Baroghutu" (Baro- twelve, ghutu-/stones/hill). The tribal hamlets of Baroghutu, Jambeda, Kumorbahal, Dhagora and Mukutmanipur encircle this hillock. With a landscape that seems naturally designed for adventure, Mukutmanipur offers opportunities in rock climbing, trekking and a variety of water sports. The local festivals, 'Tusu', 'Bhadu', 'Sahrai' and 'Badna' are symbolized by much music and dance, and strengthen the Mukutmanipur experience, laden with the relaxed air of nature in the heartland.