# STATUS OF MAHASEER FISHERIES IN J & K STATE WITH REFERENCE TO ON GOING EFFORTS FOR REHABLITATION AND HATCHERY BREEDING OF MAHASEER.

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Mahaseer the world famous game fish presently identified as a threatened species throughout India occurs in J & K mainly in the form of two species *Tor- putitora and Tor tor*. Mahaseer used to constitute a major portion in commercial fish as well. However, its catches have registered a declining trend during the past few years both in size as well as in numbers, the fact being observed throughout India.

Causes of its decline

In Jammu and Kashmir the main causes of its decline in nature are :-

1. Construction of Mangla dam in Pakistan has obstructed the route of upward migration of *Tor tor* into Jehlum, resulting into complete extinction of the fish from Kashmir valley in J & K.

2. Construction of Salal reservoir across river Chenab has obstructed the migratory route of *Tor putitora* upwards into the breeding grounds, similarly Ranjit Sagar Reservoir has also blocked the migratory route of the fish into Ravi river system.

3. Construction of roads, railway line in the hills have degraded the environment in general and affected the ecology of local streams, by increasing the silt load during breeding season affecting the hatching rate, pH and other factors in the breeding grounds. Further, the bigger pools which used to provide shelter to the fish are also decreasing in numbers.

4. Extraction of sand, bajri, boulders etc from the spawning grounds has degraded the natural breeding grounds of fish.

5. Availability of explosives, such as Gelatin, Dynamites etc.(used in construction of roads, railway line, tunnels, irrigation canals etc) have resulted into indiscriminate fishing and dwindling the Mahaseer population of all sizes.

6. Construction of large number of irrigation canals and water supply schemes.

7. Increased fishing pressure due to increasing number of fishermen and demand of fish for consumption.

## ON GOING EFFORTS FOR REHABILITATION

The decline in Mahaseer catch has been noticed by the J & K state fisheries department to make a number of sincere efforts for rehabilitation of the species, same of which are being enlisted as under.

a. Establishment of an exclusive Mahaseer Hatchery at Anji by the state Fisheries department is a significant milestone towards the ultimate goal of revival of Mahseer Fisheries. The hatchery has already achieved a major break through by breeding farm reared Mahaseer (*Tor putitora*) since last two years and now the trails are on to standardise the fish feed formulations for achieving the better growth and survival rate of the fingerlings on a mass scale.

b. Establishment of Reservoir Development projects at Salal and Ranjit Sagar so as to deal with individual requirements of the situation.

c. Efforts are on to amend the out dated "Fisheries Act" to give it more tooth and deal with the poachers and illegal means of fishing.

d. Conservation mechanism for the protection of fish in general and Mahaseer in particular is being strengthened and effective watch and ward is being taken to avoid poaching by explosives and destructive modes of fishing by explosives etc. and to enforce restrictions during breeding season.

e. Certain pools in the rivers of Jammu province locally known as"*BABA PADE"* are treated as *NO FISHING ZONES* by the local people due to the religious significance attached with these pools in the rivers. All such places are being identified and enlisted so as to declare them as sanctuaries under the Fisheries Act, which shall go a longway for the conservation of Mahaseer.

f. Experimental stocking of Mahaseer will be undertaken in the ponds along with other culturable species to determine their capability in carp culture in the local conditions.

# SALIENT FEATURES OF ANJI MAHASEER HATCHERY WITH DETAILS OF REARING AND BREEDING TECHNOLOGY

## MAHASEER HATCHERY

The farm as well as Mahaseer hatchery is designed on the pattern of running water system. The water is allowed to enter from the Anji stream through a desilting tank. The water after being desilted is allowed to flow into the raceways as well as the hatchery unit.

## RACEWAYS

Six numbers of raceways (80'X30'X6'), with inlet and outlet at top and a dewatering point at the bottom, having constant water supply from a inlet channel.

## HATCHERY

The main units in hatchery are:-

### a.RACEWAY

Having on American type raceway 15'x 8' with a partition in the centre with running water and provision of suction of bottom sediments through flow of water current.

### b.BREEDING POOL

One circular breeding pool with standard flow of Chinese hatchery.

### c.HATCHING TROUGHS

Three pairs of hatching troughs with running water, inlet and outlet at the top. Each single trough can accommodate eight trays of 18"x 12" size. Each tray with a capacity of hatching 3000 eggs.

## REARING OF BROODERS

Fingerlings of the local strain of Tor putitora were collected from the Anji streams, and stocked into the raceways, since 1995, initially a brood stock of 300(Av. Wt. 450gms) was maintained now 650 (Av. Wt. 575 gms).

## FEEDING TO BROOD STOCK

The brood stock is fed normally with mustard oil cake and Rice Bran in the ratio 1:1 @ 3gms/kg body weight supplemented with sheep/goat lungs @ 2gms/kg body weight just six months before spawning season during the year 1998-99.

However, during 1999-2000, the sheep/goat lungs were discarded and the Mahaseer was fed mainly by mustard oil cake and rice bran @3gms/kg body weight twice daily.

The running water system is also supposed to supply natural feed as well.

## WATER MANAGEMENT

Water from Anji stream was allowed to enter the farm after passing through a desilting tank. The running water raceways were cleaned every fortnight to remove silt and the left over feed etc. due care was taken to avoid handling of fish. A water level of 5 feet was maintained in the tank. In case of heavy floods in the stream the water supply was disconnected.

## INDUCED BREEDING

The brooders after attaining an age of +4 years were selected for breeding. No segregation of brooders was done before the spawning season. Breeding was undertaken in batches during the 3rd and 4th week of September 1999-2000, details are as given under in the table:-

| Batch No. | Date | No. of ♀ Injected | Average weight of ♀ (in gms) | No. of ♀ spawned | Quantity of fertilized eggs obtained |
|---|---|---|---|---|---|
| I | 23.9.99 | 10 | 450 | 8 | 9000 |
| II | 24.9.99 | 6 | 430 | 3 | 2000 |
| III | 29.9.99 | 12 | 470 | 4 | 2500 |
| | **Total** | **28** | **450** | **15** | **13500** |
| | | | | | |
| I | 24.9.2000 | 12 | 525 | 8 | 10000 |
| II | 25.9.2000 | 8 | 490 | 6 | 7000 |
| III | 27.9.2000 | 11 | 475 | 7 | 5200 |
| IV | 29.9.2000 | 9 | 470 | 5 | 3500 |
| | **Total** | **40** | **490** | **26** | **25700** |

INJECTION

Both males and females were simultaneously injected with a single dose of OVAPRIM at the base of pectoral fin. The females were given a uniform dose @ 1ml/kg body weight and the males were given a dose @ 0.5ml/kg body weight at 11.30 a.m. on each occasion when the air and water temperature was about $26^{O}$c and $24^{O}$c respectively.

After injecting both males and females were kept in circular breeding pool with running water, rate of flow was just like that maintained normally for Indian Major Carps.

The fish behaved normal after injection except that occasionally one or two were observed just floating on the surface of breeding pool in resting position after about 10 to 12 hours of injection. No chasing like movements were observed.

STRIPPING

The brooders were recollected at 6.00 a.m. next day(after 18-19 hrs after the injection), and females were gently pressed at the abdomen, the Gravid females immediately released the eggs in a dry plastic tray on which the milt was released immediately. The eggs were slightly sticky and had tendency of sticking with the plastic tray and were brushed with cock feathers. Batchwise quantity of eggs obtained is shown in table.

HATCHING

The fertilized eggs were immediately shifted to specially designed trays and kept in the hatching trough, the hatching trough had running water system. The water coming from the Anji stream after passing through a desilting tank at an average temperature of $24^{0}$c.

Picking and removing of unfertilized and dead eggs was immediately taken up by siphoning out, since they changed their colors instantly to whitish and were quite distinct from the yellowish fertilized eggs. The trays were covered with dark covers.

There was no significant change in the eggs visible to the naked eye till 80 hours after fertilization when the hatchlings just wriggled out of the egg and hatching out of eggs was almost simultaneous for each batch since hatchlings of the same batch hatched out with in two hours.

## BEHAVIOUR OF HATCHLINGS

The hatchlings showed a peculiar behaviour, they had a tendency to accumulate on the corners of tray and even enter the joints and crevices available in the tray and were quite active within 24 hours of hatchling out.

The hatchlings were kept in the tray ( in running water trough) for a prolonged period of six days.

## FIRST FEEDING

First feeding was started in the hatching tray itself just after four days of hatching. The hatchlings at this stage are very reluctant to accept the feed (Frankly speaking, even after fifteen days of close observations we could not observe the fry actively taking up the feed).

The first feed comprised of a mixture of twelve ingredients including blood meal.

## STOCKING IN NURSERY AND SUBSEQUENT FEEDING

After six days of hatching about 8000 hatchlings during Ist year and 17500 in 2nd year hatchlings were stocked in the specially prepared nursery and were subsequently fed on standard trout feed.

## EARLY GROWTH

The fry attained an average length of 16mm in 20 days.

## HARVEST

A net harvest of 5000 fry in Ist year and 13850 during 2nd year was obtained from the nursery after 20 days and has been kept at Anji Mahaseer hatchery of J & K State Fisheries Department