CHAPTER- 6

SUMMARY & CONCLUSIONS

For present investigation, two floodplain wetlands (beels), viz. Patiasola (N 26°50'10.1" & E 94° 12'17.4"), and Borsola (N 26° 0 50'22.3" & E 94° 0 13'12") of Jorhat district, Assam was selected for habitat study as well as specimen collection. The Borsala beel is one of the largest (90 ha) floodplain lake in upper Assam, about 14 km north of Jorhat town. Borsola beel is directly connected through a connecting channel (open type) with the River Brahmaputra. Patiasola beel (66 ha) is closed type wetland, adjacent to Borsola beel. The present study was conducted for four hours-between July 2010 and June 2013.

The proposed work has three broad aspects: (A) Habitat ecology of fish: Seasonal variations of water temperature, pH, electrical conductivity, transparency, Dissolved oxygen (DO), free CO₂, alkalinity, dissolved and suspended solids of the selected wetlands were studied; (B) Biological aspects: The different aspects of food, feeding and reproductive biology of four selected species of Trichogaster; (C) Captive breeding: A total of 9 no of glass tanks (aquaria) were used for breeding of the gourami. The brooders were collected and reared in tank/aquarium (size 120 x 45 x 45 cm) for acclimatization. Each aquarium was provided with a mixture of river sand and small gravel with smooth surface and the thickness of bottom bed was kept at 1.5-2.5 cm. This was followed by filling up of 3/4th of each aquarium with good quality water. The water was allowed to settle for the next 5 days. Provision for
biofilter and aeration were kept in the tank. Some submerged/floating plants were also kept to facilitate a natural spawning habitat for the test fish species. The fish specimens were provided artificial feeding. Standardization of hormonal dose, survival of spawn, standardization of protocol of breeding technique was observed as per MPEDA guidelines.

It is clear that a distinct seasonal variation in selected physico-chemical parameters of the beel water. Maximum temperature and free carbon dioxide were found during post monsoon and minimum during winter. Dissolved oxygen, pH and transparency were found to be maximum during winter. Total alkalinity, total suspended solid, total dissolved solid, total solid were found to be maximum during monsoon season while the minimum values for the same was recorded during winter. Limnological data reveal that no significant seasonal variations in major physico-chemical parameters occur in beel and all the parameters are within approximate range (BIS, 1982).

The exponential value ‘b’ was significantly lower than ‘3’ in different length groups of the *Trichogaster* species. However, the growth coefficient (‘b’ ) indicated that the males of *T. fasciata, T. labiosa* showed better growth rate than females, but in case of *T. lalia, T. sota* it was just reverse. Moderately high to fairly high co-efficient of correlation (r) was found between length and weight of the *Trichogaster species* in both the sexes. The value of ‘K’ was found >1.0 in all size groups and seasons indicating healthy ‘condition’ in all the species.

The highest RLG values were recorded in younger specimens of all the *Trichogaster species* except in *T. labiosa*. Feeding intensity (GSI) in all the studied species was higher from pre-monsoon onwards but reduced feeding was observed in
winter months. As far as fullness of gut of *Trichogaster* is concerned, active feeding (full and 3/4 full) was observed high during July/August, moderate (1/2 full) during May/June and poor (1/4 full and nearly empty) and empty during December/January respectively. Again, fullness of gut in relation to the different maturity stage revealed that the highest percentage of active feeding (full and ¾ full) were found in maturing and the highest percentage of moderate feeding (1/2 full), poor feeding (¼ and nearly empty) and empty in immature stage. Based on the RLG values, it reveals that *T. fasciata* and *T. labiosa* are herbivorous in feeding habit while *T. sota* and *T. lalia* are carni-omnivorous.

In males, dorsal fin is longer than the females and reaches up to the caudal peduncle. A mature female has a swollen belly, much rounder in the stomach region. They exhibit distinct color dimorphism and the males often display much brighter color as well a wide range of color combinations. The overall sex ratio is highly skewed and females are more frequent in the catch in all the *Trichogaster species* except in *T. labiosa*. In both sexes of *Trichogaster species*, the highest GSR values was recorded in May/June and showed a declining trend from August/September onwards. The GSR in relation to different maturity stages of all *Trichogaster* spp. was maximum in ripe stage and that of minimum for both the sexes in spent stages. The gonadal development started from January-July (peak in May-June) and subsequently decreased from August/September onwards. This indicates that the spawning is over by August for all the *Trichogaster* species. The ova diameter of *T. fasciata*, *T. labiosa*, *T. lalia* found to rise from January-February, reached its peak during April to July and then gradually fall down from August onwards, indicating that the spawning was over. The minimum fecundity for *T. fasciata* was found in January and maximum in June. In *T. labiosa*, the lowest fecundity was recorded in January while the highest
was recorded in June-July. In *T. lalia*, the minimum was found in January while the maximum was in June. In *T. sota*, the lowest fecundity was observed in January while the highest was in May. *T. fasciata* and *T. labiosa* are moderately fecund while *T. sota* and *T. lalia* are low fecund fish with a small relative fecundity.

Each breeding set consisted of two male and one female. In natural breeding the ripe male creates 'bubble nest'. For each *T. fasciata* and *T. sota*, 7 breeding trials were conducted. Observation was made on the courtship behaviour after 6-8 hours ovaprim treatment. After completion of courtship the female releases the eggs at late night and completed the spawning activity in the morning. The mating took place below the nest. The released eggs were scatter and fall inside the bottom. The numbers of egg varied from 190 to 429, in *T. fasciata* and 111 to 236 in *T. sota* depending on the size of the females and dose of ovaprim injected. After spawning parents collects the falling eggs in their mouth and spit them beneath the nest. The latency period varied from 9 to 15 hrs. The rate of fertilization was varied from 44 to 74% in *T. fasciata* and 46 to 57% in *T. sota*. The eggs remained attached to the underside of the nest. The male guards the eggs and hatching occurs in 48-72 hours. The percentage of hatchlings was 44 to 64 in *T. fasciata* and 48 to 60 in *T. sota*. After 96 hours, the fry were free swimming and they were fed with egg albumen. Fine flake foods were given to the fry once they are approximately one month old. Water was changed every two to three days. As the fry grew larger they were distributed between several tanks to reduce lethal build up of wastes.