**ANN - 2.5**

**Baseline study for Fisheries Development in Telangana state**

Studies on resource productivity

Fisheries and aquaculture activities are being pursued in the state in diversified water bodies of different sizes and varied bio-physical characteristics. Data base on resource characteristic related to resource biological productivity and fish biodiversity are supportive for developing strategies to enhance fish production and productivity in a sustained way and also to suggest measures for conservation and propagation of native and endemic species. The approaches of analyzing abiotic and biotic parameters of selected reservoirs and tanks are important in assessing fish production potentials of water bodies and make predictions on their potential fish yield. Similarly, studying type and varieties of self-populating native (fish biodiversity) and stocked fish species in ecosystem helps in assessment of fish and fisheries in natural water bodies.

Estimation of fishery resource productivity and production potentials of different resources has been one of the points in the TOR which has been complied with and the required assessments have been carried out including the biological productivity study. The biological studies have been carried out in the following 11 reservoirs spread out in 7 of the study districts covering 7 small, 2 medium and 2 large reservoirs. Eight reservoirs covered are in Godavari basin while three are in Krishna basin.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl.no** | **Reservoir** | **District\*** | **Size** | | | **River basin** | |
| **Large** | **Medium** | **Small** | **Godavari** | **Krishna** |
| 1 | Nizamsagar project | KMR | ✓ |  |  | ✓ |  |
| 2 | Pocharam reservoir | MDK |  | ✓ |  | ✓ |  |
| 3 | Singitam | KMR |  |  | ✓ | ✓ |  |
| 4 | Lower Manair Dam | KRN | ✓ |  |  | ✓ |  |
| 5 | Ralivagu project | MAN |  |  | ✓ | ✓ |  |
| 6 | Gollavagu Project | MAN |  |  | ✓ | ✓ |  |
| 7 | Indirammasagar | RGR |  |  | ✓ | ✓ |  |
| 8 | Rangasamudram | WPY |  |  | ✓ |  | ✓ |
| 9 | Ukachettuvagu Ramanpad | WPY |  |  | ✓ |  | ✓ |
| 10 | Saralasagar | WPY |  | ✓ |  |  | ✓ |
| 11 | Tummala cheruvu | BDR |  |  | ✓ | ✓ |  |
|  | **Total** | **7** | **2** | **2** | **7** | **8** | **3** |

***\*Two study districts Mahabubabad and Yadadri have no reservoirs***

Similar studies have been carried out in 36 tanks covering 9 districts of which there are 28 Departmental tanks 6 Gram panchayath tanks and 2 private tanks as shown in the following list:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl.no** | **District** | **Numbers** | | | **Total** |
| **DPT** | **GPT** | **Private** |
| 1 | KMR | 1 |  |  | **1** |
| 2 | KRN | 3 | 1 |  | **4** |
| 3 | MAN | 4 |  |  | **4** |
| 4 | MDK | 3 |  |  | **3** |
| 5 | RGR | 3 | 2 |  | **5** |
| 6 | WPY | 1 | 1 | 1 | **3** |
| 7 | BDR | 3 | 1 |  | **4** |
| 8 | MBD | 4 | 1 |  | **5** |
| 9 | YDR | 6 |  | 1 | **7** |
|  | **Total** | **28** | **6** | **2** | **36** |

The biological productivity tests carried out in the reservoirs and tanks as above are Gross Primary production, Trophic status, Habitat characteristics and Fish Assemblage (Species richness, Fish diversity).

**Gross Primary production:** The large potential of the resource for fish production remains underexploited due to paucity of data on ecology and fishery potential and improper management. Measurement of primary production or photosynthesis is helpful to understand the trophic status and to assess the fish production potential of aquatic ecosystem (Melack, 1976; McConnel *et al.,* 1988; Oglesby, 1977).

Gross primary productivity (GPP) of select Telangana reservoirs/tanks was estimated during late monsoon/early post monsoon (September/October 2017). Photosynthetic rates at different levels of water column were estimated by oxygen difference following Winkler's method using duplicate light and dark bottles at each depth (0.1, 1, 2, 3 and 5 m). In water bodies which were having less than 5.0 m depth, the depths of incubation were reduced accordingly. The period of incubation was four hours with the mid-time of incubation around 12 noon. Using dissolved oxygen values, gross primary production was estimated palnimetrically (Wetzel and Likens, 1991). The oxygen values were converted to carbon using a factor of 0.375. The photosynthetic coefficient was taken to be 1.0. The productivity values obtained for the incubation period of 4 h was converted to daily values using a diurnal expansion factor of 2.

**Habitat characteristics:** Morphometric and hydrological data of reservoirs (Location, altitude, area, volume, inflow, and catchment area) were obtained from available records.

**Trophic status:** Water quality parameters (Physical and Chemical) viz., Temperature, Transparency, Alkalinity, Dissolved oxygen and Specific conductivity were recorded during late monsoon/early post monsoon (September/October 2017) by employing standard methodology (Temperature using thermometer with 0.50 C graduation; Transparency using Secchi disc; pH using colour comparator; Alkalinity by titrimetric method using Methyl orange indicator; Dissolved oxygen by Winkler’s method and Specific conductivity using Conductivity pen). Based on the limnological characteristics, the trophic status of water body was assessed.

**Fish Assemblage (Species richness, Fish diversity):** The proportion of native, endemic and exotic species was estimated using Multi-meshed monofilament nylon gillnets of  20 mm,  35 mm,  45 mm,  65 mm and  90 mm (stretched mesh) of 20.0 m length of each mesh size joined together randomly to form a set. The nets were operated at the surface from 6.00 pm to 6.00 am; two sets of nets were operated in each water body with one set in the limnetic (open water) and the other in littoral (near shore) zone. These mesh sizes cover from minnows to table-size carps. The fishes caught were sorted species wise and their number was recorded for calculating species richness and biodiversity parameters. Important ornamental species were documented. Based on the diversity parameters, the health of ecosystem was assessed.