**ANN – 5.2**

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

**Highlights on Morpho-metric characteristics**

Scientific studies on morphometric and hydrological features and on productivity of most of the reservoirs of state are limited. The highlights of studies of CIFRI,1998 on reservoirs Wyra, Musi, Nagarjuna sagar, Singur , LMD and Kadam are as follows

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| **Mean Depth** | NGS is a deep reservoir with a high mean depth of 40.5 whereas the other reservoirs are shallow with mean depth of less than 10.0 m; LMD reservoir of study district has mean depth of 8.4 m.  Shallow reservoirs are relatively more productive because of high proportion of euphotic zone |
| **Mean Area** | Highest for NGS and least for Wyra |
| Area:Catchment | High of 756 in Nagarjunasagar, moderate in Musi (361) and Singur (334) and low in the rest of reservoirs. LMD has ratio of 97.  Reservoir with high Area:Catchment is likely to be more productive as the influx of nutrients from allochthonous source may be high. |
| Flushing rate | Favorable in the case of Wyra, NGS and Kadam (around 3) and low in LMD and Musi (around 1).  Low flushing rate is likely to result in less loading of nutrients and organic matter into reservoir. |
| Dendricity | Singur, Kadam and Nagarjunasagar are highly dendritic with high Shore line development Index (SDI) (around 8) whereas others are moderately dendritic. The SDI value for LMD was 4.7  Reservoirs with high SDI are likely to be more productive because of larger littoral area. |
| Gradient basins | Musi and NGS have steep gradient basins, Volume Development Index (VDI) >1; whereas Wyra and Singur have gradually sloping basins (<1).  LMD and Kadam have near steep gradient basins (VDI of 0.94 and 0.95 respectively) |
| Est. Potential fish production (Kg/ha) on the basis of carbon assimilation | Potential fish production (kg/ha) has been estimated, on the basis of carbon assimilation, at 159 kg in Wyra, 115 kg in Kadam, 114 kg in Srisailam, 83 kg in Singur, 79 kg in LMD and 69 kg in N.sagar  Wyra , Kadam are in higher category of production with a potential higher than 100 kg/ha and in others the range being 69 to 92 kg/ha.  In all probability, the actual yield would be much higher because the allochthonous organic matter contributes substantially to fish yield in reservoirs  No effort has been made to estimate the potential production of Musi as it is a polluted reservoir. Its potential is bound to be substantially higher than all the reservoirs studied (CIFRI, 1998). |

Source: 1.India-WRIS (Water Resources Information System) 2. Irrigation & CAD Department

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| ***Abiotic parameters*** | ***Vertical distribution of physico-chemical parameters*** |
| *LMD* | The vertical distribution of nutrients showed orthograde distribution with mild variation from surface to bottom. Data is insufficient to make any inference. |
| *Nizamsagar* | Thermocline was observed between 1 and 2 m depth with a drop of 0.30 C. pH variation from surface to 5 meters depth was from 7.2 to 6.8. Oxygen showed significant variation with 5.2 mg/l at surface and 2.0 m at 5.0 m depth indicating high decomposition activity, an index of productivity.  The conductivity and alkalinity values exhibited orthograde distribution |
| *Pocharam* | Temperature declined by 1.6 m in the thermocline between 4 and 6 m.  pH and oxygen showed strong clinograde distribution. Oxygen declined from 8.8 at surface to a low of a 2.0  mg/l at 8 m. pH declined from 7.8 to 6.8 from surface to 8 m depth. Alkalinity and conductivity exhibited negligible vertical gradient which may be due to mixing of water column in the recent past. The clinograde distribution indicates high decomposition activity, an index of productivity. |
| *Rali Vagu* | Orthograde distribution of physico-chemical parameters was observed |
| *Golla vagu* | Thermocline was observed between 2 and 5 meters with drop of temperature by 0.60C. Oxygen and pH showed clinograde distribution with anoxic condition at the bottom layers |
| *General Observations* | Habitat variables responsible for a reservoir's productivity   * Most reservoirs visited are generally shallow, not well sheltered and reported high wind velocity during monsoon and pre-monsoon months, high water temperature throughout the year,continuous drawdown, low to medium wind and wave mediated turbulence, thermal stratification during the summer stagnation * Water replenishment was high in most of the balancing reservoirs eg. Sarala sagar and also in small reservoirs viz., ralivagu and Gollavagu * Main soil types are alluvial, deep and medium black, red and laterite. The principal type of soil present in the catchment area, apart from the red soil, is black cotton mixed soil * Age of the reservoir seems to have an influence on the macrophyte community   Pocharam, Nizamsagar and Golla Vagu reservoirs appears to be productive as Oxygen exhibited strong clinograde distribution, which is due to high decomposition activity |