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Culture based reservoirs fishery management in tropical regions, India: A case study

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Culture based fisheries (CBF) practices in Indian reservoirs play an important role to fulfill the pressure of growing demand of fish. Around 69 manmade reservoirs of Tamilnadu state, India are intensively utilized for fish production through CBF. Catla catla conspicuously outperformed in growth to other Indian major carps *Cirrhinus mrigala* and *Labeo rohita* stocked along with this fish. Time series data on annual stock rate (nos/ha) and fish catch (kg/ha) of Catla catla for 28 years on 22 reservoirs of different Carlson's TSI values were collected from state fisheries authorities. Reservoirs were grouped into three categories, Western Ghats oligotrophic small reservoir (WGOSR), Western Ghats oligotrophic medium reservoirs (WGOMR) and mesotrophic plain land reservoirs (MPR). Trend behavior of stocking density with catch over time was analyzed through nonparametric statistical analysis such as Mann-Kendall Test, Sen's slope and Kendall correlation using R/SAS software. Results showed that insignificant ($p>0.05$) monotonic upward trend in stocking density resulting significant ($p<0.05$) monotonic upward trend in catch in WGOSR indicated the annual fish catch rate (kg/ha) inclined gradually in spite of inconsistent increase in seed stocking rate ($r=0.49$, $p=0.002$). Conversely in WGOMR, catch was inconsistent with respect to the stocking rate as depicted in insignificant trend values ($r=0.02$, $p=0.84$). In MPR, the trends ascending rate of stocking enhanced correspondingly the production ($r=0.27$, $p=0.03$) giving scope for further stocking would facilitate the utilization of biogenic capacity of the mesotrophic reservoirs. Hence, production functions of the reservoirs are determined by the trophic status than the surface area.

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