

management will bring improvement in water storage capacity and filling pattern and proper maintenance of supply channels will bring equitable distribution of tank water across the tank command area farms under both the tank systems. Human induced factors like encroachment in the foreshore and tank-bed area can be mitigated by imposing serious penalties and pricing under the surveillance of irrigation department officials of concerned tanks. Strengthening of water user's associations will benefit the command area farms to avoid demand-supply gaps, encroachment problems, improving number of water availability days and particularly improvement in socio-economic structure of tail end farms under both the tank systems.

Conclusions and future perspectives

The study in Andhra Pradesh compared non-system and system tank, revealing a consistent decline in the water spread area of non-system tanks from 65.20 ha to 36.53 ha, attributed to weather, encroachment and siltation. Encroachment and siltation levels increased in both tank types, resulting in reduced water availability. Over the study period, tank performance declined for non-system tank from 77.07% to 43.18% and for system tanks from 98.78% to 76.42% due to climatic and human-induced factors. Fillings and water availability showed a strong positive correlation with tank performance, reaching 77.4% for non-system tank and over 80% for system tank. Encroachment negatively affected non-system tank, while average gross farm revenue and water user associations contributed positively.

Optimization of tank water resources among non-system and system tanks with effective measures of desiltation and encroachment will bring improvements in tank performance and livelihoods of tank command area farmers. Sustainability in water use can be brought by careful usage of tank water supplemented with subsidized micro-irrigation sources. Inclusion of major area under less water intensive crops (coarse cereals under non-system tank, pulses and millets

