Abstract

Tank Irrigation is the oldest from of environmentally sustainable irrigation which has been used for the purpose of irrigation in India as well as the state of West Bengal in India. It plays a pivotal role in agricultural production in saline zone where ground water irrigation is not feasible.

The research works on tank irrigation over the years have focused mainly on the issues like tank performances, tank management and tank rehabilitation covering south Indian states. But West Bengal a state of India with a large number of water bodies had not been studied carefully. There is dearth of studies on tank irrigation in the saline zone of West Bengal.

Against this backdrop, the present study attempt to investigate the different issues of tank irrigation in the saline zone. A study on tank irrigation in different blocks of South 24 Parganas has been undertaken to understand its impact on agricultural productivity.

The broad objectives of the present study are the following: i) To investigate the different characteristic of tank irrigation in the saline zone, ii) To judge the overall status of tanks in saline zone, iii) To investigate the performance of the tanks and factor affecting it, iv) To analyse tank management practices.

Three blocks namely Patharpratima, Mathurapur-II and Kakdwip in the district of South 24 Parganas that are close to Bay of Bengal and fall in saline zone have been selected for the present study. A total 65 water bodies consisting of 30 large tanks (khal) and 35 small tanks in 21

villages have been undertaken for the present study. Three hundred farmer households have been surveyed in the selected sites of South 24 Parganas.

Different methodologies like Multiple Regression Analysis, Principal Component Analysis (PCA) and Data Envelopment Analysis (DEA) have been used for the analysis of the data according to the objectives of the study.

The result shows that large command area, proper management and less number of benefited families are significant variables for the higher tank productivity. In case of other variables, they have expected sings, but are not significant. It is also understood that socio-economic aspects like education, age etc. play crucial role in farmers' willingness to pay (WTP) for tank water. Farmer's WTP for tank water is found to be influenced by farmers' annual income, command area and distance from the fields. In the efficiency analysis, average efficiency scores of the water bodies have been calculated as 0.53.The minimum efficiency and standard deviation are 0.14 and 0.33 respectively. Seven water bodies which achieved 100% efficiency. From the Principal Component Analysis of farmer's participation in water body irrigation management it had been found that well maintained channels, proper maintenance, adequate water supply, sufficient effort are much needed for irrigation management and these are the decision making factors.

Finally, the findings suggest that proper government policy and irrigation management have to be developed for the restoration of tanks is necessary to increase tank productivity in the study area.