

## Performance evaluation of water delivery system in canal command area of PAP Basin, Tamil Nadu

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■ **ABSTRACT** : The present study examines the water delivery performance of 4(L) distributory of Pollachi canal command located in Parambikulam-Aliyar-Palar (PAP) basin of Coimbatore district, Tamilnadu. The command area is divided into two zones which receive the canal supply once in alternate years. The performance evaluation of 4(L) distributory was conducted during 2005-2010 for Zone-A and Zone-B based on the supply turn corresponding to that year. The irrigation water requirement for crops grown in the area were calculated using AquaCrop3.1 model for the years 2005-2010 based on the supply turn corresponding to that year. The sluice outlet wise water delivery performance indicators have shown poor performance of the system. Considering the irrigation season and the system as a whole, the calculated indicator's average values were found as poor for adequacy, equity and dependability. The overall efficiency in 4(L) distributory was categorized as poor. The PAP canal system acts merely as a protective irrigation system not designed to meet full cropping intensities. The water was available in the canal system when irrigation water requirements were at its minimum. Improvements for water availability during periods of crop demand need to be considered rather than supply when water was available in the canal system. So demand based supply system is a better option in these areas *i.e.*, to allow water as per the crop demand and not as per water availability. Even variable discharges based on crop demand can be helpful for effective utilization of surface water resources and reducing the groundwater draft.

■ **KEY WORDS** : Performance evaluation, Water availability, Indicators, Improvement

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**A**griculture, is the centre to all strategies for planned socio-economic development of the country. Rapid growth of agriculture is essential not only to achieve self-reliance at national level but also for household food security and to bring about equity in distribution of income and wealth resulting in rapid reduction in poverty levels. The present population which is over a billion now, is projected to increase to 1333 million (higher limit) by 2025. The annual production of food grains in India has increased from around 50 million tonnes (mt) in 1950s to about 235.88 mt in the year 2010-11. Using the population projections for 2025, the total annual food grain requirement of the country has been estimated by the National Commission for Integrated Water Resources Development Plan (NCIWRDP, 1999) to be between 308 and 320 MT. The National Water Policy (Ministry of Water Resources-MoWR, 2002) envisages that the annual food grain production will have to be raised to around 350 MT by the

year 2025. Much of the food production has to come from irrigated sector only even though the contribution from rainfed sector is significant. The average productivity of irrigated land is 2.2 t/ha while it is 0.5 t/ha only in rainfed agriculture. Therefore, assured irrigation is the only credible insurance against famine.

Due to the large spatial and temporal variability in the rainfall, water resources distribution in the country is highly skewed. The per capita availability of water, which was 1901 cubic meter (cu m) per year in 2001, considering the population of 1027 million and renewable water resources as 1953 billion cubic meters (b cu m), will reduce to 1518 cu m per year with the projected population by 2025. However, in several river basins, sub-basins the per capita availability of water is likely to be less than 1000 m<sup>3</sup>/year in 2025. Under these circumstances, the ultimate irrigation potential has been assessed as 140 Mha (Million hectare) of which about 100