ABSTRACT

From the very beginning, humanity has realized the vital importance of water in principle but has been reckless about its use in practice. Water plays a multidimensional role in all walks of human life, starting from food security to overall socio-economic development of the society. Though, water is a manageable resource, it is often used in crop production quite wastefully. Punjab state is the largest surplus state in India in terms of food grains. Agricultural development has taken place at a very fast rate in Punjab state. In the recent past, several indicators highlight that natural resources of the region, especially, land, water and biodiversity are under severe pressure to meet the growing food demand. Therefore, efficient use and management of agriculture resources especially water has become absolutely necessary. Against this background, the study was attempted to see the irrigation utilization pattern in the state of Punjab, its implications on the cropping pattern, falling groundwater table and its impact, water use efficiency in crop production at farmers' level. The data was collected from 150 farmers belonging to Amritsar and Faridkot districts, former mainly a tube well irrigated district and the latter, a canal dominated district.

The source wise irrigated area in the state shows that tube well and wells are the major sources of irrigation during the recent decades, whereas canals were the major source during TE 1965 in Punjab. The studies on cropping pattern has shown that because of the profitability and availability of water at shallow depth, rice replaced other kharif crops like maize, ground nut and pulses in the entire state. The area under paddy increased from 7.22 per cent in TE 1965 to 32.92 per cent in TE 2005. Similarly the area under wheat cultivation increased from 37.12 per cent to 43.53 per cent in the same period. The problem of ground water depletion was more serious in the sample farms of Amritsar district which were irrigated exclusively by tube wells and recorded a fall of 77 cm/annum. In the district of Faridkot the fall was 33 cm/annum. By Chow test it was confirmed that the two irrigation systems were significantly different in their input use pattern and output realization. The technical efficiency of farms was estimated by Data Envelopment Analysis. In case of tube well irrigated farms, the mean technical efficiency was 76 per cent in paddy production, whereas in canal + tube well irrigated
farms mean technical efficiency was 80 per cent. In wheat too, technical efficiency was higher in case of canal+tube well irrigated farms. The mean irrigation efficiency was 57 and 65 per cent in case of paddy production, in the two irrigation systems under study. In wheat production, the mean irrigation efficiency was 61 and 68 per cent respectively in both the systems. It clearly indicates that there is a chance to improve the efficiency of irrigation by 39 and 32 per cent respectively in the sample farms so as to have technically efficient farms.