

AN ECONOMIC ANALYSIS OF GROUNDWATER USE IN THE
JAFFNA DISTRICT FOR AGRICULTURE

By

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ABSTRACT

Heavy withdrawal of groundwater has been identified as a serious natural resource problem affecting groundwater quality threatening agricultural productivity and thereby the income of the farmers in the Jaffna district. The main purpose of this study is to develop and apply a model to allocate a finite water supply throughout the irrigation season, to suggest an optimal cropping pattern and suitable policy changes to improve groundwater use in the Valigamam region of the Jaffna district.

There were two stages in this study. In the first stage the groundwater recharge using the soil moisture balance model and irrigation requirements using CROPWAT programme were estimated for ten years from 1971 to 1980 in five Agrarian Service Center(ASC) areas. The information generated from the above hydrologic models was entered into a linear programming model at the second stage with other resource constraints. The mean optimal values on net returns, crop mix, planting time and input usage were evaluated by comparing them with those observed from the existing one in each ASC areas. Socio-economic data from 1980 to 1989 were used in this economic analysis.

The estimated average groundwater recharge is 136.70 million cu.m. of which 78% is the agricultural water demand

at 40% irrigation efficiency in the Valigamam region. The analysis of the water balance show that water was over utilized in Nallur, Keerimalai and Tholpuram ASC areas and under utilized in Uduvil and Puttur ASC areas.

Institutional credit need to be increased and family labour to be fully utilized for higher returns. Significant changes were noted in the cropping mix of the average optimal over the existing plans at all recharge levels in all the ASC areas. This suggests potentials for increasing the total cropped area and net returns particularly in Puttur and Uduvil ASC areas. This leads to an over all 26% more intensive use of land and 14% increase income from agriculture and the effective utilization of water in the whole study area.

The responsibility for water management is at present divided among a number of local and national agencies. Also there are no legal provision for controlling water extraction. It is suggested to form farmer organizations to whom scientific knowledge regarding the optimum use of groundwater need to be imparted. The results will be useful to the farmers in efficient utilization of water and other resources and increasing their farm income. The findings will also be useful to the policy makers and administrators in promoting and implementing development plans in the study area.