

ABSTRACT

This thesis reports the results and discussion of a series of experiments conducted to evaluate whether the Mahaweli Development Project in system 'H' has had any impact on "Climate and Hydrology of the area".

Data on climate were collected weekly & inter-relationship were established among climatic parameters. Rainfall data for different locations before and after the commencement of the Mahaweli Development work, were statistically analysed. The analysis revealed that the rainfall distribution in these areas had changed after the development. Reasons such as deforestation, chena cultivation and other economical activities of man in the periphery of the developing area, other than the Mahaweli Development have attributed to this change in climate.

The elaborate study on physical, engineering and aqua-physical properties of the Reddish Brown Earths (RBE) and Low Humic Gley/ (LHG) soils indicated that LHG prevent the lateral movement of ground water from RBE and result in an increased water table of RBE in this area.

Existing irrigation systems in the area did not contribute much to the ground water table as the seepage losses from these channels were very low. Therefore, the increased water table of

It was observed that this problem could be overcome by introducing sub-surface drainage systems with a drain spacing of 15m. Locally available drainage materials such as straw and sticks were found to be suitable for drains.

A complete water balance study was not possible due to limited availability of equipment. Though the water table in the study area increased over a period of 15 months, firm decision as to its future behaviour could not be made as the period of study was short.

The Mahaweli water, sampled at different locations exhibited a difference in quality. The salt content of the Mahaweli water, which entered the Kalawewa tank was found to be higher than the water sampled at other locations. Therefore, it was observed that the excess usage of Mahaweli water may lead to soil salinity.

Poor drainage conditions, high water table, Low quality irrigation water and existing improper water management practices, emphasize the necessity of introducing a drainage system, if not, the prevailing conditions of this area may lead to an ecological and economical crisis.

Instruments required to monitor soil moisture, salinity and seepage losses were fabricated locally. These instruments were found to be suitable and accurate for purposes such as this study.