

Water Availability Study of Groundwater in Jaffna Peninsula of Northern Sri Lanka

Vijakanth, V., Sivakumar, S.S., and Ratnaweera, H.C.

Abstract — The Jaffna Peninsula lie in the northern-most part of Sri Lanka. It is separated from the mainland by two external lagoons. The Jaffna Peninsula depends for its water on the rainfall which percolates and stored in lime stone aquifers. The average annual rainfall is 1284 mm/year and the potential vapour transpiration is 1858.8 mm. The Jaffna Peninsula is struggling to meet the water demand and quality of available ground water also threatened by pollutants. The major aquifers within Jaffna Peninsula located in Valikamam, Vadamradchchi and Thenmaradchchi area. From 1966 several surveys and investigations were carried out to find out the water usage pattern, required water and available water, etc. The studies which are carried out in different periods on deriving possible “Safe Yield” from the aquifers of Jaffna Peninsula are showing inconsistent results for the same aquifers. In last few decades the ground water is exposed for the pollution due to over extraction for irrigation lead for sea water intrusion, heavy usage of agro chemicals lead to increase the Nitrate concentration beyond the limit and discharging industrial waste in to ground lead to the contamination of petroleum components. The studies done so far on estimating the availability of groundwater in Jaffna Peninsula have been carried out to certain extent and derived recommendations for “Safe Yield” as well. But the findings are varying with the time period for a specific aquifer. Also the carrying capacity of the aquifers are not clearly studied in detail as the groundwater in Jaffna Peninsula is stored in fractured weak limestone aquifers. Therefore the over storage of groundwater in the aquifers beyond their capacity may cause adverse impact to the environment. Based on the past studies, the recommended total “Safe Yield” from the aquifers in Jaffna Peninsula is 13,100 m³ per day in dry season and 34,600 m³ per day in wet season while having a basic water requirement for domestic need of 31,500 m³ per day. Further available annual water resources is 718 m³ per day per person which is less than the recommended amount in the World Water Development Report of the United Nations. These are indicating that the Jaffna Peninsula is facing the water scarcity. The availability of groundwater and the possible additional recharge shall be studied with correlation to the carrying capacity of the aquifer to ensure and improve the available water resources in a sustainable manner. This paper is analysed and summarised the past studies on groundwater in Jaffna Peninsula.