

**INVESTIGATION OF THE EFFECTIVENESS OF
UPPARU SALT BARRAGE IN
JAFFNA PENINSULA (3rd Stage)**

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Abstract

Jaffna is a peninsula which is 1000 km² of land covered by Indian Ocean by 160 km of coastline and no location is more than 10 km away from the coast. Hence it is very much susceptible to the salt water intrusion in to the land area. The water resource mainly the underground water in Jaffna Peninsula is totally polluted due to prolonged negligence and improper management of existing barrages and the salt water intrusion was taken place due to the none- maintenance of SWE bunds. In addition to these garbage and soakage pit pollution and increased usage of fertilizer chemicals also affected the ground water. As a result, people are facing problem in getting good quality water in their wells. Due to the salt water intrusion, hundreds of acres of lands, hundreds of wells are in abandon stage.

To convert the internal salt water lagoon Upparu, to fresh water lake is expected to improve the water resources of the peninsula, both in recharging the underground storage with additional surface storage and desalinating the lands fringing the lagoons and making suitable for cultivation (Shanmugarajah, 1993) and fresh water prawn farming in the banks of the lagoon.

This research focus on the area from the fringe of the lagoon into the land extending for 2 km perpendicularly to evaluate the effectiveness of the barrage by delineating the salt water intrusion pattern and ground water flow pattern. Wells were selected in a profile perpendicular to the fringe of Uppu Aru and Jaffna lagoon. The areas coming under study are parts of Nallur, Kopay and Chavakachcheri D.S Divisions. Electrical conductivity (EC) values and water level were measured in situ for groundwater samples which were drawn from 78 wells in each month of January and July. Sixty shallow well samples were selected for chemical analysis out of 78 wells in which EC was measured. Water samples were analysed to determine Chloride and Sodium.

EC values for groundwater in the study areas vary between 574 $\mu\text{S}/\text{cm}$ and 23,470 $\mu\text{S}/\text{cm}$ in wet seasons between 544 $\mu\text{S}/\text{cm}$ and 22,810 $\mu\text{S}/\text{cm}$ in dry seasons. Chloride values vary in between 449.8mg/L and 7,197.7 mg/L in wet seasons between 949.7 mg/L and 4,098.7 mg/L in dry seasons. Sodium values vary in between 38.3 mg/L and 802.9 mg/L in wet seasons and between 26.7 mg/L and 648.4mg/L in dry seasons.

Ground water quality is comparatively high in Upparu lagoon in both seasons. According to the effectiveness of the barrage the ground water in the fringe of the lagoon will become fresh in the coming years. We are hoping that the continuation of the researches in future will provide a better result. Most of the researchers feel that the conversion of fresh water lagoons shall make very big contribution to the GWT (70%-80% of the total requirement) but the side effects of this conversion also has to be analyzed environmentally, socially and economically.