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**DISPERSION AND WATER EXCHANGE IN STRONGLY  
RESTRICTED INLET LAGOON: A REKAWA LAGOON, SOUTH  
COAST OF SRI LANKA**

A PROJECT REPORT PRESENTED BY

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DISPERSION AND WATER EXCHANGE IN STRONGLY RESTRICTED INLET  
LAGOON: A REKAWA LAGOON, SOUTH COAST OF SRI LANKA

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Rekawa Lagoon is small, seasonally open tidal inlet lagoon in the south coast of Sri Lanka. The sea level variability, salinity and water exchange in the lagoon are studied using field measurements and numerical models. The field campaign was made during the period when the lagoon mouth was open. Sea level variation in the lagoon due to tides is very small and it is only  $1/6^{\text{th}}$  of the oceanic range, although, semi diurnal tides are strongly filtered through inlet canals compared to diurnal and fortnightly tides. Salinity in the lagoon varies from zero to more than 30psu and strongly related to freshwater supply.

Simple 1-D tidal numerical model is developed and applied to Rekawa lagoon to predict tidal sea level variation in the lagoon. Observed and model predicted sea levels were compared for model calibration, and the quadratic bottom friction coefficient;  $C_d$  was used as the calibration. The  $C_d$  of 0.002 gave a reasonable agreement between the observed and model simulated sea levels.

Three-dimensional hydrodynamic Estuary Lake Computer Model (ELCOM) was also applied to Rekawa lagoon to simulate salinity variations and water exchange. The model runs were made with different situations, i.e. with and without river discharge as an input open and close of lagoon mouth etc. No actual river discharge measurements were available for model simulations. The wind and heat fluxes were specified on the lagoon surface. Sea levels, surface salinity and temperature were specified at open boundary of the model for simulations carried out with open lagoon mouth. When the lagoon mouth is open and no river input, the lagoon salinity increases from 10 to more than 30psu within 30 days. The model runs were also made with starting initial lagoon salinity with 34 psu and continuous river discharge of  $15\text{m}^3\text{s}^{-1}$ , after 12 days lagoon salinity decreased to 05 psu. The flushing time of the lagoon is in the order of 30 days.