MSC Degree in Environmental Science

ASSESSMENT OF INDUSTRIAL POLLUTION AND ITS IMPACT ON WATER QUALITY IN THE LOWER PART OF THE KALU RIVER BASIN

A dissertation submitted

by

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ABSTRACT

Kalu River is one of the major rivers in Sri Lanka, with a length of 129 km and a drainage area of 2720 km^2. The Kalu River starts in the central slopes of Sri Pada, a mountain 2100m above sea level, and it empties into the sea near Kalutara. The burden on the nation's water resources is rising because of economic growth, population pressure, and expanding demands for food production, electricity, and sanitation services. In the western province, there is a huge demand for water resources for industrial activities such as hotels, rubber factories, hospital services, food processing industries, and textile dyeing factories. At the same time, the Kalu River is the best solution for industrial wastewater discharge. Therefore, the present study aims to assess the industrial pollution and its impact on water quality in the lower part of the Kalu River basin. Eighteen industries contributing to significant wastewater discharges were identified based on the structured questionnaire survey. Treated wastewater parameters (water quality parameters, temperature, pH, electrical conductivity (EC), total suspended solids (TSS), chemical oxygen demand (COD), Biological oxygen demand (BOD), Oil and grease and the concentrations of ammonia nitrogen) were collected as secondary data from 18 industries and analysed. Surface water samples were collected from 21 sampling stations,and analysed for 6 parameters including temperature, pH, EC, and COD using standard methods. Based on the results obtained for discharged treated wastewater in the research period, the pH values were within the range of 6.25 to 7.70, and the turbidity values were between 150-273 NTU. EC and TSS ranged from 0.07 – 4.29 mS/cm and 3-125 mg/L, with no extreme value obtained during the study period and all within the requirement of CEA inland surface water discharge limits. Consider the COD and BOD of industrial discharge, ranging from 25-269 mg/L and 13-142 mg/L. Similarly, most of the values are within the CEA inland surface water discharge limits, and 2 industrial measured values show a slight increment in the value. Based on the pollutin load calculation of the service stations' COD, BOD, TSS, and Oil and grease, ranging from 60-187.5, 7-29.5, 8-32, 1.5-6.5 g/day. Rubber industry's pollution load, COD, BOD, TSS, and Ammonical nitrogen ranged from 720 - 5566 , 112.5 - 6248, 319.5-310,6.34-1628 g/day while the highest pollution load was calculated OT4 industry