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Variation of water quality along Moragoda Ela

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In this study the water quality of Moragoda Ela located in the Galle town was evaluated using graphical and statistical analysis of water quality data at 14 sampling points along the stream. Principal Component Analysis was used to obtain the correlation matrix of all the parameters. The sampling points were selected according to the land usage pattern such as industrial, institutional, commercial, residential and agricultural areas; general hydraulic conditions such as flow directions and flow velocities; the locations of sewer outfalls along the stream, sanitary bypasses and the locations of solid waste deposits with a high content of organic silt and matter. The study revealed that the stream had a relatively high pollution level. The degree of pollution decreased along the river from downstream to upstream. Different segments of the stream got polluted to different degrees. The level of pollution was highly dependent on the parameter of concern.

There was a close relationship between the water quality of each sampling point and the respective condition in the surrounding area. Mean values of COD and BOD_5 were 127.5mg/L and 14.8 mg/L, respectively. Mean values of fecal and total coliforms were 47 and 23471 colonies/100 mL, respectively. Prevailing BOD_5, COD and the total coliform content exceeded the ambient water quality standards for inland waters in Sri Lanka. The mean fecal coliform value did not satisfy the ambient standards of fecal coliform content for the activities other than irrigations and agricultural needs. Overall the water quality was lower than the demanded quality of water for many activities such as drinking, bathing, irrigation and recreational activities. It is concluded that the water quality deterioration of Moragoda Ela may be attributed to the illegal discharges from a large number of industries, institutions and commercial establishments, high population density and the illegal community activities.

Keywords: water quality parameters, standards, effluent discharge