

Environmental Risk Assessment of Water Basin in Capital City Area of Sri Lanka

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Metropolitan city Colombo can be polluted by many ways. This study was addressed to analyze canal/lake sediment and water samples in selected locations within the Colombo basin to assess the possible environmental risks and challenges of people in those areas. Sampling was carried out only between 8.00 a.m. to 12.00 noon in order to arrest the similar conditions in terms of tidal variations. A grab sampler was used to collect sediment samples at the bottom surface and water samples were collected from the upper 12 inches of the surface. Sulfate, Chloride and heavy metals of sediment samples and pH, Conductivity, COD, BOD, Heavy Metal, Total & Fecal Coliforms and Oil and Grease content of water samples were analyzed in accordance with BS 1377: 1990 and APHA (2005). Heavy metal content varied as for cadmium in the range of 0.4 to 8.3 mg kg⁻¹, chromium 20.1 to 72.8 mg kg⁻¹, lead 30.2 to 805.3 mg kg⁻¹, arsenic 0 to 3.1 mg kg⁻¹ and mercury 0.7 to 3.0 mg kg⁻¹. Sulfate content of sediment varied within the range of 50 to 439 mg kg⁻¹. Chloride content of sediments was from 4 to 48 mg kg⁻¹. The pH varied in between 7 to 8.5 and mostly pH was 7.6. Conductivity was distributed within 11.1 to 539 μ s cm⁻¹. BOD levels were in the range of 9 to 20. COD values were in between 14 to 60 ppm. Oil and Grease content was somewhat high and it was at 7.3 - 296.8 ppm. Total Coliforms was 230000 to 5400000 MPN per 100 ml. Fecal Coliforms was in between 130000 to 490000 MPN per 100 ml. From the above studies, we conclude Beira Lake has the highest risk for pollution and Madiwela East Lake reported to be at lesser risk with respect to chemicals and microorganism. All measurements indicated that all sampling locations are badly contaminated with fecal matter and hence it will have the considerable adverse impact on human health.

Keywords: Water, Sediment, Risk Assessment, COD, BOD.