DEVELOPMENT OF A DECISION SUPPORT TOOL FOR MONITORING WATER QUALITY OF THE COLOMBO CANAL SYSTEM.

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ABSTRACT

The Colombo Canal System comprises of a rather complex network of large open drainage canals, smaller tributary canals and low lying marshes functioning as natural retention ponds. It caters to the drainage needs of the Greater Colombo area, reducing incidence or flooding, and thereby improving the health and sanitation conditions of the urban community.

Pollution of the Colombo Canal System has been recognized as a major issue o(concern for the past two decades. It is especially detrimental to the health and well-being or the urban poor w ho frequently inhabit canal hanks and low-living regions of Colombo. Although a commendable effort has been made to improve the canal water quality under the Greater Colombo Flood Control and Environment Improvement Project (GCFC&EIP>. the pollution levels of some of the canals arc significantly high even at present. A Comprehensive Water Quality Monitoring Program has been carried out by Sri Lanka I .and Reclamation and Development Corporation(SLLR&DC) from IW to date under GCFC&EIP. where monthly measurements have been recorded at 16 locations in the greater Colombo Canal System for 10 physical and chemical Parameters. However, no detailed study has been carried out so far to analyze the short term and long-term variations in water quality, or the relationship between water quality and other variables, such as rainfall. There fore ,the present study aims to fill the above gap by Integrating the available raw data, analyze is of the water quality regime of each location, as well as a study of its relationship with canal water level, average daily rainfall and canal discharge in a single user-friendly computer package The end product of this exercise as a simple informative decision support tool called the Water Quality Monitor (WQM).

Al present there exists an array of water quality models incorporating hydrodynamics arid rater quality, and the majority of these have been developed in the USA cither by the United States environmental Protection Agency (USEPA) or the US Army Corps of Engineers. In addition, the Danish Hydraulic Institute (DHII) Has also developed a few water quality models These models serve as decision support tools for adopting water quality improvement measures. Many of the above models appear very complex. Requiring a plethora 01 input data .and are intended TO BE USE ONLY BY specialists in the field. Therefore. it Was felt that there existed a need (or a simple tool, which serves the dual purposes of knowledge dissemination as well as decision support, with regard to surface water quality in the Colombo area, while utilizing the existing wealth of data; hence this study. In addition, this report also disuses some of the more complex models along with earlier studies on water quality of the Colombo Carol System.

An attempt has been made to look at the total quality regime of each monitored location, and assist in arriving at a realize qualify criteria, which could actually be met by improving canal water quality. In addition, the relationships between canal water level and water quality. are also between average daily rainfall and water quality are also examined. The relationship between water quality and canal discharge a examined for one location where discharge data is available At the end of the analyses a user of the package will be aided in making a decision regarding the reachable level of quality for a particular site in Colombo, and also examine the relationships between Hs water quality and Other variables such as water level and rainfall A special feature of the tool is the facility provided to analyse the user's own set of data other than the built in Colombo data This report also discus some prominent outcomes of applying the tool to the Colombo Canal System, and winds up by discussing some feasible interventions for improving canal water quality, bused on those outcomes.

DECLARATION

I certify that this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any university and to the best of my knowledge and belief it does not contain any material previously published or written or orally communicated by another person except where due reference is made in the text.

.....
Signature of the candidate

To the best of my knowledge the above particulars are correct.

UOM Verified Signature

.....
Prof (Mrs.). N. Ratnayake

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ABBREVIATIONS

BOD	-	Biochemical Oxygen Demand
CEA	-	Central Environmental Authority
COD	-	Chemical Oxygen Demand
ESRI	-	Environmental Systems Research Institute
GCFC&EIP	-	Greater Colombo Flood Control and Environment Improvement Program
GIS	-	Geographic Information Systems
SLLR&DC	-	Sri Lanka Land Reclamation and Development Corporation
TDG	-	Total Dissolved Gas
USEPA	-	United States Environmental Protection Agency
WGS	-	World Geodetic System
JICA	-	Japan International Corporation Agency
1 – D	-	One Dimensional