

DETERMINATION OF BED SEDIMENT LOAD
FOR RIVERS



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OCTOBER 2001

TABLE OF CONTENTS

LISTS OF ILLUSTRATIONS	iii
ABSTRACT	1
1 INTRODUCTION	2
1.1 Objectives of research	3
1.2 Significance of research works.....	3
1.3 Scope of work and methodology.....	4
2 LITERATURE REVIEW	
2.1 Introduction.....	5
3 RESEARCH METHODS	
3.1 Site Description.....	7
3.2 Instrumentation and measurements	8
3.2.1 Velocity and discharge measurement.....	8
3.2.1.1 River discharge measurement using wading technique.....	9
3.2.2 Bed load measurement.....	11
3.2.2.1 Method and frequency of measurement.....	12
3.2.3 Bed material sampling.....	13
3.3 Laboratory work.....	14
3.4 Analysis of test results.....	16

4 RESULTS AND ANALYSIS.....17
5 DISCUSSION AND CONCLUSION21
REFERENCES..... 23

APPENDIX 1

Data on Bed load for Sungai Lui, Sungai Semenyih and Sungai Langat

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ABSTRACT

Bed sediment load is essential in calculating the transport rate of sediments in rivers and several empirical equations have been developed using experimental and field data by past investigators. However it should be noted that the equations developed were based on controlled conditions done in the laboratory and sediments were of uniform sizes. Even if the empirical equation derived is based on field data, this does not seem to match with our local conditions. The predicted rate of transport of bed sediments using these equations do not agree with the observed values. In view of this, several field data have been collected from river gauging stations in Selangor namely Kg. Lui Station for Sg. Lui, Kajang and Dengkil Station along Sg. Langat and Kg. Rinching Station along Sg. Semenyih to establish a relationship for the transport of bed load. The number of bed load samples taken at each cross-section in every observation vary between two to nine. The methods employed in the river gauging operation and sediment measurements depend largely on the flow conditions. In this research work the effective grain size of sediments was found from the S-curves. From the sieve analysis tests it was found that the river beds under study composed of more than 60 % of sand which has size ranges from 0.063 micron to 2 mm. A rating curve of discharge versus bed load has been prepared. A relationship for bed load transport have been established for rivers in Selangor.

1 INTRODUCTION

Bed sediment load contributes between twenty to eighty percent of the total sediment load in streams and rivers. This however depends on factors such as composition of sediments, density of sediments and other hydraulic characteristics of the river. The prediction of bed load transport is significant for the basis of hydraulics design as it is responsible for the change in bed configuration and fluvial process.

The transport of bed load tends to fluctuate with time and is strongly influenced by local currents and the availability of the bed materials. Therefore it is quite common for the bed load transport being highest at one strip and minimum at other. Composition of the bed load sediments does influence the amount of bed load transport. This has been discussed by Junaidah *et. al* (2001)

Great consideration has to be given in the selection for the method of measurement as this determines the accuracy of the bed load measurement. In this study, wading technique was employed and in most occasions sampling were centred on two gauging sites namely Kg. Lui and Kg Rinching where depths of flow rarely exceeds one meter.

From the analysis a proposed relationship in terms of flow depths and velocity is given. The agreement between the calculated and measured values is shown. A graph illustrating flow discharge against bed load discharge is analysed. With the proposed relationship for bed load transport it is hoped that problems associated with sediments that include sediment movement, prediction of sediment discharge to deltas, estuaries and coastal regions which may damage the hydraulic structures and devices could be partially solved at the initial stage. It should be noted that sediment discharge is not the only main factor that is aggravating the existing sedimentation problem but there are other contributing factors such as the rapid surface runoffs due to urbanisation and deforestation that should be given serious thought in order to normalised the existing environment.