THE STUDY OF SEDIMENT BEHAVIOUR CHANGES AT SUNGAI LEMBING BETWEEN 2008 AND 2016

MOHAMAD AIMAN BIN MOHAMAD NAWAWI

UNIVERSITI MALAYSIA PAHANG

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This report is submitted as a partial fulfilment
of the requirement for the award of the
Bachelor Degree in Civil Engineering

Faculty of Civil Engineering and Earth Resources
University Malaysia Pahang

JANUARY, 2017

SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Civil Engineering.

Signature	: ……
Name of Supervisor	: NADIATUL ADILAH BT. AHMAD ABDUL GHANI
Position	: SUPERVISOR
Date	: 12 JANUARY 2016

Signature	: ……
Name of Co-supervisor	: DR. YOUVENTHARAN A/L DURAISAMY
Position	: CO-SUPERSIVOR
Date	: 12 JANUARY 2016

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature : ……

Name : MOHAMAD AIMAN BIN MOHAMAD NAWAWI

ID Number : AA13056

Date : 12 JANUARY 2016

To my beloved mother and father, and all my siblings, thanks you for your encouragements and supports.

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LIST OF ABBREVIATIONS

Sg.	Sungai
mm	Milimeters
cm	Centimeters
m	Meters
ump	Universiti Malaysia Pahang
C_U	Coefficient of Uniformity
C_C	Coefficient of Curvature

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ABSTRACT

A study on sediment behaviour was conducted at Sungai Lembing, Kuantan. In order to determine the change of sediment properties regarding size, density and fall velocity, several related were conducted in the laboratory. Particle size distribution and total suspended solid analysis that were carried out to classify properties of the soil sample and the concentration of suspended solid. From the soil classification test, this soil is gravel soil with fine soil and silt. The second objective is to identify the change of river cross section between 2008 and 2016.The cross section of river had measure and compare. It overcome huge changes after 8 years. The exact amount rainfall intensity 2016 recorded according Malaysia average rainfall. The characteristics at Sg. Lembing required to identify because it may effect the flow of the river during a usual day and flood event. This study involve five location of study area. The sediment sample sieving test results was classified using Unified Soil Classification System (USCS). The soil classification at Sungai Lembing for every station is almost entirely classified as Poorly Graded Sands (SP) . The flow rate data also had record for every location by using propeller current metre. The highest flow rate was recorded about 8.61m^3/s located at station 3. The lowest flow rate recorded is about 0.837m^3/s located at Station 1.

ABSTRAK

Satu kajian mengenai tingkah laku sedimen telah dijalankan di Sungai Lembing, Kuantan. Dalam usaha untuk menentukan sifat-sifat perubahan sedimen mengenai saiz, ketumpatan dan halaju jatuh, beberapa yang berkaitan telah dijalankan di makmal. Taburan dan analisa jumlah saiz zarah pepejal terampai yang telah dijalankan kepada hartanah dikelaskan sampel tanah dan kepekatan pepejal terampai. Dari tanah ujian klasifikasi, tanah ini adalah batu tanah dengan tanah halus dan kelodak. Objektif kedua adalah untuk mengenal pasti perubahan keratan rentas sungai antara 2008 dan 2016. Keratan rentas sungai diukur dan dibandingkan. Ia mengatasi perubahan besar selepas 8 tahun. Jumlah tepat keamatan hujan 2016 direkodkan mengikut Malaysia purata hujan turun. Ciri-ciri di Sg. Lembing diperlukan untuk mengenal pasti kerana ia boleh memberi kesan kepada aliran sungai pada siang hari dan banjir acara yang biasa. Kajian ini melibatkan lima lokasi daripada kawasan kajian. Keputusan ujian ayakan sampel sedimen diklasifikasikan menggunakan jadual Unified Sistem Pengkelasan Tanah. Pengkelasan tanah di Sungai Lembing bagi setiap stesen adalah hamper keseluruhannya diklasifikasikan sebagai Pasir Grad Rendah. Data kadar aliran juga mempunyai rekod bagi setiap lokasi dengan menggunakan kipas meter semasa. kadar aliran tertinggi dicatatkan kira-kira 8.61m^3 / s terletak di stesen 3. kadar aliran terendah yang dicatatkan adalah kira-kira 0,837m^3 / s terletak di Stesen 1.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Sedimentation is the tendency for particles in inclination to settle out of the fluid in which they are generate and come to rest against an obstacle. This is due to their gesture through the fluid in response to the forces acting on these forces due to gravity or centrifugal acceleration. The example of the suspended materials may be particles, such as clay or silts, originally present in the source water. There are sum of parameters are used to measure surface water such as suspended solid , turbidity, natural organic matter and color. Commonly, suspended material is created from material in a water and concentration that naturally form in surface water.

In sedimentation process, there have many methods can use such as identify the characteristics of sedimentation and the sedimentation pattern. Sedimentation is accomplished by decreasing the velocity of the water being treated to a point below which particles will no longer remain suspension. Sediment characteristics between river branch and the main stream reflect both

downstream distance from sediment source and the characteristics of the respective transport processes. Sediment transport is the movement of solid particles, due to a combination of gravity acting on the sediment. The movement of the fluid in which the sediment is entrained. Sediment transport occurs in natural systems where the particles are sand, gravel, boulders, and mud are force of gravity acts to move the particles along the sloping surface on which they are resting. Sediment load includes all particles moving as bedload, suspended load and wash load.

Sediment deposition will slow down or stop the water flow due to the settling occur. Sediment deposition can be found anywhere in a water system from high mountain streams to rivers, lakes deltas and floodplains. The sediment deposition also important for aquatic habitat growth and ecosystems through nutrient replacement by creation habitat. However it should be note that it can be environmental issues if the deposition rates too high, or too low.

1.2 BACKGROUND OF STUDY

The size and type of particles is an important effect to the sedimentation process. For examples, sand or silts which have a light density can be eliminate very easily. The deposition of particles and comprising both organic and inorganic components are bought simultaneously and accumulated in the middle of the river.

Sediment conditions can influence the spreading of dispersion by affecting the ability of various species to burrow, build tubes or feed (Gray 1981, Snelgrove and Butman 1994). Some natural factors which can affect the sedimentation characteristics. For example submarine basin, rainfall, depth of water and the chemical composition.

Sedimentation is factor the river flow rate decrease and increase. The increase bedload in the river will decreasing of river flow rate. River flow is always related to the sediment rate. The sediment rate is measure by looking at

bedload. If the velocity of flow become lower, the rate of sedimentation will be increases.

1.3 PROBLEM STATEMENT

The aim of this study was to investigate the characteristic at Sg. Lembing require to identify because it may affect the flow of the river during a usual day and flood event. The characteristics of the river depend on the more factors which to determine the characteristic of sediment. There have more natural factors which affect the sediment characteristics regarding to the (Mann 1982, parsons et.al, 1990). So, this study will determine some of characteristics at Sg. Lembing and the factors that will affect it.

The study of deformation of sediment along the river caused major flood at last few decade in Sg.Lembing. The deformation of sediment is related to sediment rate in the river. There must be a changes of size and shape of sediment particles from years to years at Sg.Lembing. The sediment will reduce the function of the river and it comes from upstream to downstream when receives heavy rainfall during monsoon time. Regarding to Radionuclide Mass Balance used by European Geophysical Society in order to determine the sedimentation rate (Cazala et. Al ,2003).

The study of sediment characteristic and deformation is quite importance for development our country. By doing this study, it can avoid the problem which is related to our human culture such as flood and water quality. As case, the depth of stream get to be shallow if the sedimentation happened. It also will make the quantity of aquatic life will reduced. the home at Sg. Lembing additionally will confront flooding in light of the fact that the waterway gets to be flood because of sedimentation process.

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