

CHAPTER 1

INTRODUCTION

1.1 Study Background

The river irrigation system is very beneficial to humans. However, it can also pose a hazard to humans if not properly managed. One of the possible disasters is flooding. According to the Drainage and Irrigation Department (DID) (2000), flooding can be classified into two types, namely flash floods and monsoon flooding. In terms of hydrology, the main difference between the two categories of this flood is the time taken to discharge levels to return to normal levels of peak flood discharge. Flash floods take several hours to return to normal levels of expression compared with monsoon floods that sometimes take up to a month to get down to normal levels (Noorazuan 2006). Normally, if it is associated with the flood, people will relate the flooding occurred due to heavy rain which was not stop during the long period of time. This prediction is correct, however, the flooding actually occurs due to various other factors such as drainage and irrigation system were not systematic and a lack of water catchment areas.

On the east coast of Peninsular Malaysia, especially in the study area, namely in Sungai Kuantan, floods can occur, especially during the Northeast monsoon wind that blows between the months of November to March can lead to unusually heavy rains. During that period also known as the monsoon season, the population in Sungai Kuantan area will get ready to face the flooding disasters.

In addition, the floods also always occur due to uncontrolled logging activities. Samples will be collected in the study area, namely in Sungai Kuantan. In this area, it can be found that a lot of timber logging in upstream part of Sungai Kuantan. In fact, green spaces such as forests are buffer zones. This is so, because these plants have the

privilege to absorb water and stored in the soil. Each tree is estimated to be able to absorb as much as 400 gallons of water. So, due to the greedy hand of man has resulted in rainfall and runoff cannot be blocked because there are no more green area as a buffer to prevent runoff and rainfall.

1.2 Problem Statement

Flooding problems faced in the study area, Sungai Kuantan is very worrying. A study has been made to predict the streamflow in the catchment area. It is been clarified that majority of the sub basin area for Kuantan River Basin is un-gauged or no data except one stream flow station is gauged which is Kenau station. Therefore, the data of streamflow is unknown. Thus, it is very difficult to model the flood simulation due to lack of river flow data for calibration and validation. Besides that, there are many reasons for lacking of data which are long periods of unseasonable rainfall that producing unrepresentative relationships and significant modifications to catchment characteristics.

In addition, for most of the sites where a structure is to be constructed, if there are no streamflow or rainfall records available and the designer has to recourse to alternative methods in estimating the design flood. It is considered not appropriate to instrument the catchment for the period required to collect the hydrological data necessary to derive the design flood. This is time consuming and expensive and is generally warranted when it involves projects with major capital expenditure. Therefore, an acceptable way is to estimate the design flood using a flood estimation procedure in the absence of hydrological data even though the approach is subject to a greater degree of uncertainty.



Figure 1.1 Flood disaster at Sungai Isap area in 2013

Source: <http://amirahhananni.blogspot.my/2013/12/2013-banjir-besar-di-kuantan-pahang.html>

1.3 Objectives

The main objectives of this study are:

1. To determine river sub-basin characteristics for flood modelling purpose in Kuantan River Basin.
2. To develop a rainfall-runoff model for ungauged of sub-basin area using HEC-HMS.
3. To predict the streamflow in ungauged of sub-basin area.

1.4 Scope of Study

For this study, about eighteen (18) sub-basins were involved, which are Sungai Kuantan, Sungai Cereh, Sungai Kenau, Sungai Nada, Sungai Sebarau, Sungai Caru, Sungai Reman, Sungai Panching, Sungai Ah Tong, Sungai Gading, Sungai Riau, Sungai Pinang, Sungai Pandan, Sungai Tiram, Sungai Talam, Sungai Isap, Sungai Belat, and Sungai Galing whereas these areas are lack of streamflow data. The main basin for these all river is Sungai Kuantan.