CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

In developing Intensity Duration Frequency (IDF) curve, three parameter need to be considered which are duration for x-axis, intensity for y-axis and return period as third parameter. By fixing the return period two, five, 10, 50 and 100 years or other periods, a particular curve between intensity and duration can be obtained for the area (Patra, 2001). The procedure was repeat for both method, Gumbel and Log Pearson Type III.

By following same procedure, IDF curve was developed for 35 towns in Malaysia for MSMA to use as to find peak rainfall intensity for design. The curve develop in MSMA 2 is valid between 5 minutes to 1440 minutes. To extrapolate between this limit is not recommended, it cause possible error for the result. The error is likely to be highest for the durations shorter than 30 minutes and longer than 15 hours, and for ARI longer than 50 years. For particular critical applications it may be appropriate to conduct sensitivity tests for the effects of design rainfall errors.
3.2 FLOW CHART

Figure 3.1 shows the flow chart of this study.

![Flow Chart of Study](image)

**Data collection**
- From Department of Irrigation and Drainage (DID)
- From 1990-2014
- Area Pahang

**Result & Data Analysis**

**Sorting the data**

**Find the missing data**

**Fit the raw data in frequency method:**
- Gumbel method
- Log-Pearson Type III method

**Calculate the intensity for different ARI**
- 2, 5, 10, 20, 50 and 100 years.

**Plot the graph in various duration in log-log graph in selected ARI**

**Calculate Kolmogorov Smirnov (KS) for fitting distribution.**

**Conclusion & Recommendation**

*Figure 3.1: Flow Chart of Study*
3.3 STUDY AREA

Pahang have 35,965 km² with 12 district; Bentong, Cameron Highland, Jerantut, Kuantan, Lipis, Maran, Pekan, Raub, Rompin, Bera and Temerloh. Figure 3.2 shown the location of the district in Pahang.

![Figure 3.2: Maps of District at Pahang](http://www.fairfun.net/my3/panna_my/maps/Malaysia/Pahang/Pahang.htm)

3.4 DATA COLLECTION

For this study, the data needed to analysis is rainfall data from the Department of Irrigation and Drainage Malaysia. The data use start 1990 until 2014. Department of Irrigation and Drainage Malaysia was extracted data for each storm that occurs the maximum depth for duration of 15 minutes, 30 minutes, one hours, three hours, six hours, 12 hours, 24 hours, 48 hours, 72 hours and 120 hours. The maximum rainfall depth for each duration was listed for each 12 month period from 1 July to 30 June for every year.