`

STATISTICAL ANALYSIS ON RAINFALL AND DISCHARGE DATA: IN STUDY AREA IN JOHOR RIVER BASIN

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A dissertation submitted in fulfillment of the
requirements for the award of the degree of
Master of Mathematics (Statistics)

Faculty of Sciences
Universiti Teknologi Malaysia

JANUARY 2014

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ACKNOWLEDGEMENT

In the name of ALLAH S.W.T, the Most Gracious and the Most Merciful Lord, I want to express my gratitude of thanks to ALLAH S.W.T. for giving me a good health to enable me to complete this master thesis.

First and foremost, I would like to express my deepest thank to my helpful supervisor Dr. Shariffah Suhaila Binti Syed Jamaludin for their helps, supports and guidance that really benefited me in completing this study. All the kindness and interesting discussion that were given to helped me a lot. I really appreciated the opportunity of completing my master thesis under their supervision.

Lastly, I would like to give my hearty thank to my beloved parents for their unconditional love, inspiring support, encouragement and positive spirit. All of your supports and contributions were really meaningful to me and only ALLAH S.W.T can recall your kindness. Thank you so much.

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To my beloved family and friends!

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ABSTRACT

Johor river is one of the several river that drain into Tebrau Strait (Selat Tebrau). The Johor river catchment is centered about 35E, 0.5N. Rainfall and flow data for the period 1980 – 2011 were used in this study. The time series of monthly values of rainfall and discharge were analyzed using statistical methods. Trend analysis was performed using Mann-Kendall trend test. This was done in an attempt to determine whether or not there have been any significant change in rainfall and discharge over this catchment. Forecasting analysis which is ARIMA model and Smoothing Technique were used to select best model to predict for 5 years ahead. Best fitted model were analyze using statistical criteria of Mean Square Error (MSE) and Mean Absolute Percentage Error (MAPE) The best model used for forecasting the rainfall and discharge data is ARIMA model. While rainfall and discharge data analysis for the station slightly show the same trend before and after forecast.

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LIST OF ABBREVATIONS

MK	-	Mann Kendall
CV	-	Coefficient of Variation
JB	-	Johor Bahru
PWMK	-	Pre-Whitening Mann Kandell

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Malaysia is a country located in Southeast Asia and straddling the South China Sea. There are two distinct parts in Malaysia being Peninsular Malaysia to the west and East Malaysia to the east. Peninsular Malaysia is located south of Thailand, north of Singapore but east of the Indonesian island of Sumatra, Indonesia. East Malaysia is located on the island of Borneo and shares borders with Brunei and Indonesia. Malaysia consist of high land area (above 180 m above sea level), lowlands (less than 180 m above sea level), plains, basins and coastline.

Johor, "the southern gateway", is the third largest state in Peninsular Malaysia. Johor covering a total area of 19 984 square kilometers of land in the southern part of the peninsula. The state is located between latitudes 1° 20" N and 2° 35" N and longitude 102° turn is 40" T to 100° 16" T. It is bordered to the north of Pahang, Malacca and Negeri Sembilan on the west, Straits of Johor and Malacca Straits to the south and the South China Sea in the East. The capital city of Johor is Johor Bahru, located in the southern part of Johor.

In addition, the forecasting rainfall method can be used in hydroelectric generator industry. Field significance allows the determination of the percentage of tests that are expected to show a trend, at a given local (nominal) significance level, purely by chance, reflecting the cross-correlation in the data. A resampling, approach was used to determine the critical value for the percentage of stations expected to show a trend by chance. Therefore, ability to predict future rainfall and discharge is very beneficial. This model can be applied to predict rainfall and discharge for the next few years. After that, the exact rainfall can be estimated.

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