

TRENDS OF RAINFALL IN SARAWAK & ITS IMPACT  
ON TOURISM



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## 1. Letter of Report Submission

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Head  
Research Management Institute (RMI)  
Universiti Teknologi MARA  
40450 Shah Alam  
Malaysia

Dear Professor,

### FINAL RESEARCH REPORT "TRENDS OF RAINFALL IN SARAWAK & ITS IMPACT ON TOURISM"

With reference to the above, I am pleased to submit two copies of the final research reports entitled "Trends of Rainfall in Sarawak & its Impact on Tourism".

Thank you.

Yours truly,



RAFIDAH HUSEN  
Leader  
Research Project

## 5. Report

### 5.1 Proposed Executive Summary

An abiotic factor such as weather can be disruptive to certain businesses. Weather sensitive businesses (WSB) such as agriculture, construction, retail, transportation and tourism (travel and leisure) are often the first to feel the financial impact of severe or changing weather. Many WSB do not regularly quantify weather impact on performance, and such few have developed comprehensive strategies for managing weather risk. The impact of extreme weather on WSB occurs all over the world including Sarawak. However, there are limited studies on weather impacts on businesses especially at a local level. Therefore, it is significant and necessary to conduct this study as a preliminary step to help businesses better understand local rainfall patterns/trends and volatility trends to ensure good planning and risk mitigation for the future.

As for this project, it accesses the daily rainfall data in Sarawak for the past ten years, starting from January 1998 until December 2007. All the eleven divisions in Sarawak will be covered, namely Kuching, Samarahan, Sri Aman, Sarikei, Sibul, Kapit, Mukah, Bintulu, Miri, Limbang and Lawas Divisions. This study will also gather informations from the tourism sector by distribution of questionnaires.

It is hoped that this project will provide concrete scientific data which can be used for future studies and references. The data provided can be used by various business sectors especially tourism to include weather risk in planning and managing their business activities.

The proposed methods of study are:

- 1) Collection of all Sarawak divisions' rainfall data in the past ten years (1998 to 2007) from Meteorological Department and Irrigation & Drainage Department.
- 2) Investigation of top dry and rainy areas using the average rainfall and rainy days parameters determined.
- 3) Investigation of volatility trends using Mann Kendall Test.

### 5.3 Introduction

Many studies to analyse the changes in the amount of rainfall and its pattern of distribution have been conducted throughout the world. Many scientific papers and studies have concluded that most regional rainfall time-series have experienced fluctuations at different time-scales, rather than a notable or significant long-term trend (Folland *et al.* 1992, and Srikanthan & Stewart 1991). On the other hand, some evidence also showed consistent decreasing trends in some regions of the world (Nicholson and Palao 1993).

Malaysia's climate can be classified as a typical tropical climate, hot and humid with temperature above 18°C throughout the year. The coastal plains temperature averaging 28°C, the inland and mountain areas averaging 26°C, and the higher mountain regions, 23°C. The area's relative humidity is quite high, and ranges between 70 and 90 percent. The main variable of Malaysia's climate is rainfall. Malaysia has extreme variations in rainfall that are influenced by the monsoons. The dry season usually starts from June to September, and the rainy season December to March. Western and northern parts of Malaysia experience the most precipitation, since the north- and westward-moving monsoon clouds are heavy with moisture by the time they reach these more distant regions. Typhoons can sometimes hit Malaysia from July to mid November, and can cause heavy damage, flooding and erosion (Weather Online).

Even though many studies have been carried out globally and for specific regions, studies on rainfall pattern in Malaysia is very limited. Changes in long-term annual rainfall and its main characteristics for the whole of the country have not been studied comprehensively as yet.

An abiotic factor such as weather can be disruptive to certain businesses. Weather sensitive businesses such as agriculture, construction, retail, transportation, tourism are often the first to feel the financial impact of severe or changing weather. Many weather sensitive businesses do not regularly quantify weather impact on performance, and such few have developed comprehensive strategies for managing weather risk (WeatherBill, 2007).

The impact of extreme weather on weather sensitive businesses occurs all over the world including Malaysia. However, there are limited studies on weather impacts on businesses especially at a local level. Therefore, it is significant and necessary to conduct this study as a preliminary step to help businesses better understand local rainfall patterns/trends and volatility trends to ensure good planning and risk mitigation for the future.