

**UNIVERSITI TEKNOLOGI MARA**

**EVALUATION OF  
HYDROLOGICAL FLOW FOR  
FLOOD MITIGATION  
MANAGEMENT A CASE STUDY OF  
SG BULOH BASIN, MALAYSIA**

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## ABSTRACT

Flood is the natural disaster in msia which contributes up to 90 percent of damage to the country, affecting 4.9 million people every year. The estimated loss suffered in terms of utilities and infrastructure in Malaysia is over RM20 Million, This thesis examines the management of flood mitigation in a basin by considering the losses experienced by residents in the basin, infrastructure, industry, etc. with the benefit of the implementation of the proposed flood mitigation. The objective of this study is to verify hydrological flow from previous studies, predict the cost of damage due to flooding in the study area and propose a suitable flood mitigation plan to reduce the risk of flooding. This research was conducted to study flood prediction (Develop a flood map) and losses in the basin area. The data that needs to be obtained is the Hydrological Flow and will verify the data by carrying out another analysis method, namely the Hydrological Procedure(HP) from the Department of Irrigation and Drainage(DID). Solution methods to overcome flooding will also be suggested by considering the construction cost as optimal. Secondary data will also be taken from past reports such as flood mitigation reports and the Integrated River Basin Management Plan (IRBM). A comparison of the two hydrological flow rates was found to be less than 15% allowing the flow rate data to be used to analyze losses due to flood events. The total amount of losses in the Sg Buloh basin for the 50-year ARI flood condition is RM 58,831,000.00 and the 100-year ARI flood condition is RM 75,120,000.00. The estimated construction cost for the whole is RM 28,544,700.00. Conclusion for estimation cost is flood mitigation construction project in the Sg Buloh basin needs to be carried out to benefit the people in the Sg Buloh basin and the Malaysian Government.

**Keywords:** Hydrological data, Losses cause flood, Structural Measure

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## TABLE OF CONTENTS

	<b>Page</b>
<b>AUTHOR'S DECLARATION</b>	<b>i</b>
<b>ABSTRACT</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT</b>	<b>iii</b>
<b>LIST OF FIGURES</b>	<b>vii</b>
<b>LIST OF TABLES</b>	<b>x</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xii</b>
<b>CHAPTER ONE: INTRODUCTION</b>	
1.1 Research Background	1
1.2 Problem Statement	4
1.3 Research Objectives	8
1.4 Scope and Limitation of Research	8
1.5 Significance of Research	9
1.6 Summary	9
<b>CHAPTER TWO: LITERATURE REVIEW</b>	
2.1 Introduction	10
2.2 Overview of Flood Event	11
2.3 Factor Influence the Occurrence of Flood	13
2.3.1 Natural Factor	13
2.3.2 Human Factor	14
2.4 Review Methodology	14
2.4.1 Computer Modelling	14

# CHAPTER ONE

## INTRODUCTION

### 1.1 Research Background

Floods are a disaster that can cause significant losses to flood victims. As a result of the flood, many human and animal lives were lost worldwide. The effect of flooding in an area may also vary according to topography. However, destroying public property and loss of life will harm human health, especially those continuously affected by floods (Jamaludin, 2022).

In the short term, flood victims are exposed to the risk of infection, wounds, hypothermia, and even bites from insects and poisonous animals during floods. At the same time, they are exposed to water-borne diseases that can cause diarrhoea (Jamaludin, 2022). In the long term, this disaster can cause severe financial problems. Some victims are psychologically affected and cannot live peacefully even after the flood recedes. Undoubtedly, the flood disaster brought various challenges. As a result of the flood, many people also suffered and had to start their lives over again (Jamaludin, 2022).

Hydrological flow is a parameter in the hydrological system that determines the characteristics and amount of water involved in the river basin. Hydrological Flow also consists of the water cycle determined by measuring rainfall, surface and subsurface storage and flow, and evaporation (Al Amin, 2020). Hydrology is a science that studies the existence of water, its movement, and flow. Accordingly, many natural phenomena exist, such as heavy rain, drought, floods, and groundwater flow. The hydrological system is the cycle of water from the river's surface, evaporation, runoff, surface water, underground water flow, and return to the river's surface. The balance of this cycle is the amount of water coming in, and the water going out the same. Figure 1.1 shows an overview of the hydrological cycle and water balance.