

NUR ELLISYA BINTI BAHAR

BACHELOR OF SURVEYING SCIENCE AND GEOMATICS (HONOURS)

AUGUST 2023

FLOOD HAZARD MAPPING OF JELAI RIVER, PAHANG
BY INTEGRATION HEC-RAS AND ARCGIS SOFTWARE

NUR ELLISYA BINTI BAHAR

2021622076



SCHOOL OF GEOMATICS AND MANAGEMENT
COLLEGE OF BUILT ENVIRONMENT
UNIVERSITI TEKNOLOGI MARA MALAYSIA

AUGUST 2023

**FLOOD HAZARD MAPPING OF JELAI RIVER,
PAHANG BY INTEGRATION HEC-RAS AND ARCGIS
SOFTWARE**

NUR ELLISYA BINTI BAHAR

2021622076



**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

AUGUST 2023

DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

In the event that my project/dissertation be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree of the Bachelor of Surveying Science and Geomatics (Honours) and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Student : Nur Ellisya Binti Bahar
Student's ID No : 2021622076
Project/Dissertation Title : Flood Hazard Mapping of Jelai River, Pahang by
Integration HEC-RAS and ArcGIS Software
Signature and Date :

Approved by:

I certify that I have examined the student's work and found that they are in accordance with the rules and regulations of the School and University and fulfils the requirements for the award of the degree of Bachelor of Surveying Science and Geomatics (Honours).

Name of Supervisor : Dr. Nazirah Binti Md Tarmizi
Signature and Date :

ABSTRACT

Floods were a type of natural disaster that causes massive property damage and death. Due to continuous rain and high tide, water overflowed to land and causing floods. The main goal of this study was to determine the flood recurrence to raise awareness and produce a map for flood event preparedness. Flood mapping was important because it will be helpful for preparing for upcoming flood events. It can serve as important guidelines for decision makers who want to make the best preparation for potential flood disaster in the future. In order to assist for preparedness, flood modelling was important because it can simulate real-world physic to provide hydrological parameters for damage modelling. The objectives of this study were to simulate the river's water flow into the flood-prone area using HEC-RAS, to calculate the extent of the floodplains during the return period of interest and to generate the flood risk map using ArcGIS software. This study explains how the HEC-RAS model was used to create flood extent mapping of Jelai River in Lipis, Pahang. The analysis will use Digital Elevation Model (DEM), hydrological data and daily rainfall data. For flood frequency analysis, Log Pearson Type III used to calculate the peak flow of different return periods. The result from HECRAS analysis imported to ArcGIS to produce flood hazard maps for different return periods. The result from HEC-RAS analysis was imported to ArcGIS to produce flood maps for different return periods. These flood levels along the Jelai River's side were 62.671, 63.359, 63.652 and 63.950 meter for return periods of 5, 25, 50 and 100 years, respectively. In general, this study found that flooded areas that was affected likely in low elevation places especially in the middle sections of the Jelai River.

TABLE OF CONTENTS

| CHAPTER | TITLE | PAGE |
|----------|----------------------------------------|------|
| | DECLARATION | ii |
| | ABSTRACT | iii |
| | ACKNOWLEDGEMENT | iv |
| | TABLE OF CONTENT | v |
| | LIST OF FIGURES | vii |
| | LIST OF TABLES | ix |
| | LIST OF ABBREVIATIONS | x |
| 1 | INTRODUCTION | |
| | 1.1 Introduction | 1 |
| | 1.2 Background Study | 1 |
| | 1.3 Problem Statement | 3 |
| | 1.4 Research Question | 3 |
| | 1.5 Aim and Objectives | 4 |
| | 1.6 Scope and Limitation | 4 |
| | 1.7 Significance of the Study | 4 |
| 2 | LITERATURE REVIEW | |
| | 2.1 Introduction | 5 |
| | 2.2 Flood | 5 |
| | 2.3 Flood in Malaysia | 6 |
| | 2.4 Flood Recurrence | 6 |
| | 2.5 Flood Frequency Analysis | 7 |
| | 2.6 Flood Modelling tools and Software | 8 |
| | 2.7 Impact of Flood | 22 |
| | 2.8 Summary | 22 |