UNIVERSITI TEKNOLOGI MARA

EFFECT OF POPULATION ON GREEN AREA AND SURFACE TEMPERATURE USING REMOTELY SENSED INDICES

PUTERI FATIN NASYUHADA BINTI MEGAT MOHAAMAD HALIM

Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Surveying Science and Geomatic (Hons)

Faculty of Architecture, Planning and Surveying

July 2019

AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of student	: Puteri Fatin Nasyuhada Binti Megat Mohamad Halim
Student's ID No.	: 2016490816
Programme	: Bachelor in Surveying Science and Geomatics (Honours)
Faculty	: Faculty of Architrcture, Planning and Surveying
Code Programme	: AP220
Project Title	: Effect of Population on green area and surface temperature using remotely sensed Indices.
Signature of Student Date	:

ABSTRACT

As a developing country, Penang experiences rapid urbanization that brings a lot of benefits to the citizens. Unfortunately, it become uncontrollable and tends to become the environmental problem. The most obvious impact of urbanization is the increase in ambient temperature due to the increased of built-up area and increased the number of population from year to year. This situation may affect the green area since many developments has been proposed in order to fulfil the requirement and facilities for residents on Penang. Thus, with the advanced of technology of remote sensing and Geographical Information System, this study aims to determine the effect of Population on green area and surface temperature using Normalized Difference Vegetation Index and Land Surface Temperature at Penang on year 1991, 2000 and 2010.The green area and Surface Temperature will be extracted from the Landsat TM 5 by using a remotely Sensed Indices. Next, regression analysis will be used in order to determine the relationship between LST and NDVI on study area. Thus, the correlation between these two variables will show the effect on the green area and surface temperature caused by urbanization in Penang.

TABLE OF CONTENTS

CONTENTS	PAGES
CONFIRMATION BY PANEL OF EXAMINERS	**III**
AUTHOR'S DECLARATION	**IV**
ABSTRACT	**VI**
ACKNOWLEDGEMENT	**VII**
TABLE OF CONTENTS	**IX**
LIST OF TABLES	**XII**
LIST OF FIGURES	**XIII**
LIST OF ABBREVIATIONS	**XVI**
LIST OF APPENDIX	**XVII**

CHAPTER ONE: INTRODUCTION

I.1	Introduction	1
1.2	Research Background	1
1.3	Research Gap	3
1.4	Problem Statement	6
1.5	Research Aim and Objective	7
	1.5.1 Aim	7
	1.5.2 Objective	7
1.6	Research Question	8
1.7	Scope and Limitation of Work	9
	1.7.1 Scope of work	9
	1.7.2 Data used	9
	1.7.3 Software Used	10
	1.7.4 Study Area	11
1.8	Significant of study	12
1.9	Summary	

CHAPTER THREE :METHODOLOGY

3.1 Introduction 42

3.2 The Flowork of methodology 45

3.3 Preliminary Study 46

3.4 Data Acquisition 46

3.4.1 Population data 47

3.4.2 Imaginary data 48

3.4.3 Hardware and software requirement 49

3.5 Pre-processing 49

3.5.1 Layer Stack 49

3.5.2 Radiometric correction 51

3.7 Post-processing 52

3.7.1 Remotely Sensed Indices Processing 52

3.7.2 Determination of NDVI and LST value based on the year 1991, 2000 and 2010 52

3.8 Land Surface Temperature retrieval from Landsat 5 TM data 54

3.9 Reclassify the data (based on the range) 56

3.10 The changes of population, NDVI and LST based on three year on Penang 57

3.11 Data Analysis 58

3.12 Map Production 59

3.13 Summary 59

CHAPTER 4: RESULT AND ANALYSIS

4.1 Introduction 60

4.2 The NDVI and LST value on year 1991,2000 and 2010 61

4.2.1 The total number of populations at Penang on year 1991 61

4.2.2 The NDVI and LST value on year 1991 at Penang 64

4.2.3 The total number of population at Penang on year 2000 69

4.2.4 The NDVI and LST value on year 2000 at Penang 72

4.2.5 The total number of populations at Penang on year 2010 77

4.3 The changes of population,NDVI and LST value based on the year 1991,2000 2010 at Penang 79