

GEO SPATIAL ANALYSIS OF GRAVE  
CRIME IN TRINCOMALEE POLICE  
DIVISION

By

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## Declaration

The work described in this thesis was carried out by me under the supervision of Dr. (Rev) Pinnawala Sangasumana and Mr. Prabhath Malavige and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.



U.S. Deneef

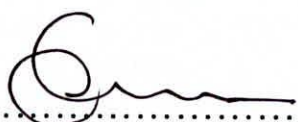


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## Certification

We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

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## Table of Contents

Declaration	ii
Certification	iii
Table of Content	iv
List of Tables	viii
List of Figures	ix
Acknowledgement	x
Abstract	xii
CHAPTER 1: INTRODUCTION	1
1.1 Definition of crime, crime mapping, crime analysis, and prevention	2
1.2 Research Background	2
1.3 Research Problems	4
1.4 Research Questions	4
1.5 Study Area	5
1.6 Aim/ Objective/ Scope	9
1.6.1 Aim	9
1.6.2 Objective	9
1.6.2.1 Main Objective	9
1.6.2.2 General Objective	10
1.6.3 Scope	10
1.7 Hypothesis	12
1.8 Methodology	12
1.8.1 Qualitative and Quantitative	12
1.8.1.1 Qualitative Data	12
1.8.1.2 Quantitative Data	12
1.9 Limitations	13
1.10 Chapter Outline	13
CHAPTER 2: LITERATURE REVIEW	15
2.1 Introduction	15

2.2 Definition of Crime and Crime Analysis	15
2.2.1 Introduction	15
2.2.2 The Historical Meaning of Crime	16
2.2.3 Definition of Crime	16
2.2.4 Legal Definition of Crime	17
2.3 Types of Crime	17
2.3.1 Crimes against Persons	17
2.3.2 Crimes against property	18
2.3.3 Crimes against Morality	18
2.3.4 White Collar Crime	18
2.3.5 Organized Crime	18
2.4 Sociological Look at Crime	19
2.5 Definition of Crime Analysis	19
2.5.1 Introduction to Crime Analysis	19
2.5.2 The four key points describe the four goals of Crime Analysis	19
2.5.2.1 Apprehending Criminals	19
2.5.2.2 Prevent Crime	20
2.5.2.3 Reduce Disorder	20
2.5.2.4 Evaluate Organizational Procedures	20
2.6 Types of Crime Analysis	21
2.6.1 Tactical Crime Analysis	21
2.6.2 Strategic Crime Analysis	21
2.6.3 Administrative/Academic Crime Analysis	21
2.6.4 Operations Analysis	22
2.6.5 Intelligence Analysis	22
2.6.6 Investigative Analysis	22
2.7 Crime Analysis Model	23
2.8 Spatial Analysis in Criminology	24
2.8.1 Spatial Analysis of Crime in Socio-demographic Perspective	25
2.8.2 Spatial Analysis of Crime in Environmental perspective	26
2.9 Some Theoretical Background	27
2.9.1 Routine Activity Theory	27

2.9.2 Rational Choice Theory	28
2.9.3 GIS in Spatial Analysis of Crime	29
2.10 GIS Functionalities in Crime Analysis	30
2.10.1 Visual Analysis	30
2.10.2 Attribute Query	31
2.10.3 Spatial Analysis Modelling	31
2.11 Generic Benefits of GIS	32
2.12 Methods for Automating Geographical Analysis of Crime Data	32
2.12.1 Introduction	32
2.12.2 The Geographical Analysis Machine	33
2.12.3 The Geographical Explanation Machine	34
2.13 Tools in the Spatial Analysis of Crime	37
CHAPTER 3: CONCEPTUALIZATION FRAME WORK & METHODOLOGY	42
3.1 Introduction	42
3.2 The Research Base	43
3.2.1 Study Area – Trincomalee Police Area Precinct	43
3.2.2 Research Tools	44
3.3 Methodological Framework	45
3.3.1 Data Collection	49
3.3.2 Within the Government	50
3.3.3 Through Local Authorities	51
3.3.4 Data Sets in this Research	51
3.3.5 Base Maps	52
3.4 Crime Data	53
3.5 Crime Prone Factors	53
3.6 Community Characteristics, Land Use, and Physical Environment	54
3.7 Geo Coding and Address Matching	55
CHAPTER 4: VISUALIZATION & SPATIAL ANALYSIS OF GRAVE CRIME	57
4.1 Introduction	57
4.2 General Overview	58

4.3. Point Based Hot Spot Analysis	59
4.3.1 Visual Inspection	60
4.3.2. Pros and Cons of Point based Analysis	63
4.4 Area Based Hot Spot Analysis	63
4.4.1 Hot Spots – Cheating	70
4.4.2 Hot Spots – House Breaking, Theft, Robbery	71
4.4.3 Hot Spots – Rape	72
4.4.4 Hot Spots – Grievous Hurt	73
4.5 Correlation Analysis	74
4.5.1 Socio Economic Analysis	74
4.5.1.1 Population Density, Poverty and Crimes	75
4.5.1.2 Land Use, Building and Crimes	75
4.6 Land Use Distribution and Crime Rate	78
CHAPTER 5: CONCLUSION AND RECOMMENDATION	86
5.1 Introduction	86
5.2 GIS as a Platform for Crime Analysis	86
5.2.1 Data Management	86
5.2.2 Data Visualization	87
5.3 Findings	88
5.4 Recommendation	89
5.5 Conclusion	90
References	91



## List of Tables

Table 1.1 Population Distributions among DS Divisions of Trincomalee Division	9
Table 3.1 Internal Sources	50
Table 3.2 External Sources	50
Table 3.3 Data Sets in this Research	51
Table 3.4 Crime Prone Premises	53
Table 3.5 Community Characteristics, Land Use, and Physical Environment	54
Table 4.1 Cinema Centers	63
Table 4.2 Banks	64
Table 4.3 Security Establishments	64
Table 4.4 Population by GND	65
Table 4.5 Schools and Tuition Centers	66

## List of Figures

Figure 1.1 Location of Study Area	5
Figure 1.2 Land Use of Trincomalee Head Quarter Police Area	6
Figure 1.3 GND's of Trincomalee Head Quarter Police Area	7
Figure 1.4 Road Network of Trincomalee Head Quarter Police Area	8
Figure 2.1 Crime Analysis Model	23
Figure 3.1 Trincomalee Head Quarter Police Area Precinct	44
Figure 3.2 Internal and External Approach for the Analysis	47
Figure 3.3 Four Steps of Using GIS in Problem Oriented Crime Analysis	48
Figure 4.1 Study Area	57
Figure 4.2 Major Crime Categories in Trincomalee Police Area	58
Figure 4.3 Crime Types in Trincomalee Police Area	59
Figure 4.4 A pin map of the Reported Crime in Trincomalee Police Area	61
Figure 4.5 GND's in Trincomalee Head Quarter Police Area	68
Figure 4.6 Road Network in the Study Area	69
Figure 4.7 Hot Spots - Cheating	70
Figure 4.8 Hot Spots – House Breaking, Theft, and Robbery	71
Figure 4.9 Hot Spots - Rape	72
Figure 4.10 Hot Spots – Grievous Hurt	73
Figure 4.11 Land Use in Trincomalee Head Quarter Police Area	76
Figure 4.12 Road Buildings in Trincomalee Head Quarter Police Area	77
Figure 4.13 Crime Prone factors vs. reported Crime – Hot Spots	79
Figure 4.14 Crime Prone factors vs. Grievous Hurt – Hot Spots	80
Figure 4.15 Crime Prone factors vs. Rape – Hot Spots	81
Figure 4.16 Crime Prone factors vs. House breaking and theft – Hot Spots	82
Figure 4.17 Crime Prone factors vs. Cheating – Hot Spots	83
Figure 4.18 Liquor Establishments vs. Reported Crime	84

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# **Geo Spatial Analysis of Grave Crime in Trincomalee Police Division**

**UMARTHEEN SAHATHOONAL DENEFF**

## **ABSTRACT**

The new century brings with it increasing interest in geo spatial crime analysis through GIS & RS. This interest spans theory from the perspective of understanding the etiology of crime, as well as practice from the perspective of developing effective crime preventions tactics to reduce crime. The author do not attempt a comprehensive treatment of the substantial body of theoretical and empirical research on place and crime but focus instead on methodological issues in spatial statistical analyses of crime data. Special attention is given to some practical and accessible methods of exploratory data analysis that arguably should be the starting place of any empirical analyses of the relationship of crime and the other crime prone factors. Many of the capabilities to support computerized mapping and spatial statistical analyses emerged only through GIS and Remote Sensing. The promise of using spatial data and analyses for crime control still remains to be demonstrated and depends on the nature of the relationship between crime and place too.

If spatial features serve as actuating factors for crime, because of either the people or the facilities located there, then interventions designed to alter those persons and activities might well affect crime. Alternatively, if the spatial distribution of crime is essentially random, then targeting specific places is not likely to be an effective crime-control strategy. Sorting out the place or crime relationship requires analytical methods that are best suited to isolating the impacts of place on crime.

In this study the importance of GIS for the spatial analysis of crime are explained thoroughly for the decision making process of the police authorities in the selected area.

## CHAPTER 01

### INTRODUCTION

#### 1. Introduction

Crime analysis is both a profession and a set of techniques. The professionals, who perform crime analysis, and the techniques they use, are dedicated to helping a police department become more effective through better information.

We are presently living with the fast growing trends in computer technology, information systems and virtual world to obtain data about the physical and cultural worlds, and to use these data to do research or to solve practical problems. The current digital and analog electronic devices facilitate the inventory of resources and the rapid execution of arithmetic or logical operations.

The Geo-information Technology; Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS) are undergoing much improvement and they are facilitate to create, manipulate, store and use spatial data much faster and at rapid rate as compared to conventional methods.

Spatial analysis of crime is recognized as powerful tools for the study and control of crime, because spatial analysis of crime help police identifies problems at the block. The most powerful weapon in law enforcement nowadays is information technology. The applications areas of GIS in law enforcement are relatively narrow, because: although police forces are using GIS technology, the penetration of GIS into every application is still relatively limited worldwide. In Sri Lanka GIS has not yet been viewed as an obligatory technology within the police department, Whereas organizations such as the utilities have taken GIS on board, this is due to high cost of GIS tools and lack of GIS experts in the police force.

Law enforcement needs information management, especially location information. Traditional law enforcement for different types of police applications really deals with data collection. However, data collection without data analysis is useless. Not only GIS allows integration and spatial analysis of data to identify, apprehend, and prosecute

suspects, it also aids more proactive measures through effective allocation of resources and better policy setting.

### **1.1 Definition of crime, crime mapping, crime analysis and crime prevention**

**Crime** is a multifaceted concept that can be defined in legal and non-legal sense. From a legal point of view, it refers to any rational human conduct that violates a criminal law and is subject to punishment and breaches of the criminal laws that govern particular geographic areas (jurisdictions) and are aimed at protecting the lives, property and rights of citizens within those jurisdictions.

**Crime mapping** involves the manipulation and of spatially referenced crime data in order to display visually in an output that is informative to the particular user (Alex and Kate 2001). Crime mapping can provide information concerning the location of hotspots or high level of reported crime.

**Crime analysis** is a set of processes applied on relevant information about crime patterns. Administrative and operational personal can use the results of analysis to prevent and suppress of criminal activities and also for investigation purposes.

**Crime prevention** seeks to reduce the risks of criminal events and related anti-social behavior by intervening in their causes.

### **1.2 Research Background**

Environmental criminology is one of the approaches in the geography of crime that considers place and environmental features as imperative elements of crime. The analysis by this approach is often performed at two spatial resolutions. First is the macro level crime patterning in which aggregated data in enumeration areas are used as the measurement unit. The major research question in this approach is the relationship between crime prone factors and crime severity in each enumeration areas. Since information derived from incident-level data will be generalized and aggregated, there is a need for the incident-level analysis to deal with the exact locations of crimes in relation to crime-prone premises or crime prone factors. At the micro-level, the