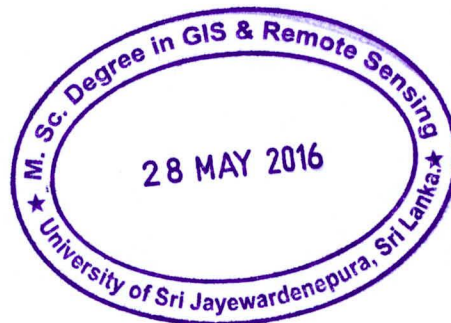


**Development of Tourism in Kandy District through  
Implementing a Geo- Spatial Information System**

**By**

**H.M.G.D. Welagedara**



**Thesis Submitted to the Faculty of Graduate Studies  
University of Sri Jayewardenepura for the Partial Fulfillment  
of Master of Science Degree in GIS and Remote Sensing on  
20<sup>th</sup> March 2016**

## DECLARATION OF CANDIDATE

The work described in this thesis was carried out by me under the supervision of Prof. (Mrs.) Sunethra Thennakoon and Mr Prabath Malavige also a report on this has not been submitted in whole or in part to any University or any other institution for another Degree/Diploma.

Date 2016/03/20.....

  
.....

H.M.G.D. Welagedara

29/90 A, Ampitiya Road,

Kandy

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## ABBREVIATION

GIS - Geographic Information Systems

USD - United States dollar

US - United States

FDI - Foreign Direct Investment

UNESCO - United Nations Educational, Scientific and Cultural Organization.

UNWTO - United Nations World Tourism Organization

SLTDA - Sri Lanka Tourism Development Authority

VFR - Visiting Friends and Relations

VSL - Visit Sri Lanka

CEO - Chief Executive Officer

JPEG - Joint Photographic Experts Group

GIF - Graphic Interchange Format

HTTP - Hypertext Transfer Protocol

URL - Uniform Resource Locator

ESRI - Environmental Systems Research Institute

OGC- Open Geospatial Consort

NTDC - National Tourist Development Cooperation

API - Application Programming Interface

XML - Extensible Markup Language

JSON - JavaScript Object Notation

DBMS - Database Management System

RDBMS - Relational Database Management System

SQL - Structured Query Language

CSV - Comma Separated Values

KML - Keyhole Markup Language

IP - Internet Protocol

GND –Grama Niladhari Division

DSD - Divisional Secretariat District

ICT - Information and Communication Technology

ATM - Automated Teller Machine

USGS - United States geological Survey

ER – Entity Relationship Diagram

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# **Development of Tourism in Kandy District through Implementing a Geo- Spatial Information System**

**H.M.G.D. Welagedara**

## **ABSTRACT**

Travel to countries or places where outside the usual surroundings for personal or business purpose is tourism. These people are called visitors; they can be residents or non-residents. The travel and tourism industry is one of the world's largest industries with a global economic contribution direct and indirect. Tourism is a rapidly growing investment point in Sri Lanka, where huge investment is take place. Even though the investment is very massive the planning, development and marketing is the key component of success in tourism zone enhancement. Main objective of this study is to implement a geo- spatial information system for development of tourism in Kandy.

IT technologies and GIS techniques facilitate huge promotion opportunity. Since tourism based on locations and geographical features, use of geographic information systems is advantageous. In this study it highlight potential tourist attractions and the accessibility and other required details through a web output. System requirements are identified by field surveys. Issues and challenges faced by travellers are mainly lack of specific location information, public transport schedules and reliable tourist attraction information. Highest numbers of the potential tourist attractions are situated in middle of the Kandy district. GIS techniques used were proximity analysis, spatial joint, and network analysis with Google direction API and Google place API. As a result Online Geo-Spatial information system provides a guide for tourist to find the destination routes, the service areas and all necessary details about a particular destination. Information system presents a backend Geo-database and web where tourist will be able to access by web URL and acquire the required location information and service areas.

Keywords: Tourism, Geo-database, API, GIS, Geo- spatial

## CHAPTER ONE - INTRODUCTION

### 1.1 Background of the study

Social, cultural and economic trend which involve people in the direction of travel to countries or places where outside the usual surroundings for personal or business purposes is tourism. These people are called visitors; they can be residents or non-residents. Tourism has an influence on the economy of the country, on the natural and built environment, on local population at the destination and as well as for the tourists themselves. Wide range of production is required producing goods and services acquired by guests, and the stakeholders involved or affected by tourism due to these multiple impacts. National and local tourism policies as well as the necessary international agreements or other processes should be established, to approach effective tourism development, management and monitoring (United Nations World Tourism Organization-UNWTO, 2015)

"Tourism comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes."(UNWTO, 2015)

The travel and tourism industry is one of the world's largest industries with a global economic contribution direct and indirect of almost seven trillion U.S. dollars in 2013. The direct economic impact of the industry, including accommodation, transportation, entertainment and attractions, was approximately 2.2 trillion U.S. dollars that year.

The tourism industry has experienced steady growth almost every year worldwide. The industry revenue increased from 528 million in 2005 to 1.09 billion in 2013. Figures were forecasted to exceed 1.8 billion by 2030. In 2013, global international tourism revenue reached approximately 1.16 trillion U.S. dollars, having almost doubled since 2005 (<http://www.statista.com>).

The resources are supposed to plan and promote appropriately to achieve sustainable tourism development. According to the world tourism organization network sustainable tourism is:



“Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary. Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them”(http://sdt.unwto.org).

According to the current Tourism Development Strategy in Sri Lanka, the main target of tourism sector for next five years is to achieve a target number of 2.5 million tourists by 2016. There is a master plan strategy developed by Ministry of Economic Development the document predict tourist's arrivals to Sri Lanka up to 2020, also it gives a classification of tourism by region. According to the published document the highest tourist arrivals will be from Europe region, second and third will be acquired by Americans and Asia/Pacific region. (Ministry of economic and Development, 2010)

According to the strategic development plan, tourism is rapidly growing investment in Sri Lanka, where huge investment is take place. Even though the investment is very massive the planning, development and marketing is the key component of success in tourism zone enhancement. Decision making in tourism development and planning is becoming gradually complex because of the interrelationship between various impressions with locals, stakeholders, local culture and natural environment. Return on investment plays an important role to developed tourism in a sustainable manner.

Some of the key objectives to be achieved through the 5 year strategy are as follows:

1. Increase tourist arrivals from 650,000 in 2010 to 2.5 Million by 2016.
2. Attract USD 3,000 Million as Foreign Direct Investment (FDI) to the country within 5 years.
3. Increase the tourism related employment from 125,000 in 2010 to 500,000 by 2016 and expand tourism based industry and services all island.
4. Distribute the economic benefits of tourism to a larger cross section of the society and integrate tourism to the real economy.

5. Increase the foreign exchange earnings from USD 500 Million in 2010 to USD 2.75 Billion by 2016.

6. Contribute towards improving the global trade and economic linkages of Sri Lanka.

7. Position Sri Lanka as the world's most treasured island for tourism. (Sri Lanka Tourism Development Authority-SLTDA, 2014)

According to the report of Central Bank of Sri Lanka (2014), it demonstrates tourist arrival and development. Considering the room occupancy rate (43.9% to 71.9%) it rapidly growing form year 2008 to year 2013 which is a positive growth.

The central province has been considered as one of the fastest growing provinces besides the Western Province. It contributes 10 % to the Gross Domestic Product in Sri Lanka. Agriculture and trade dominates the economy of the central province. The province has one of the leading universities, teaching hospital, vocational and agricultural school, reputed schools, well-known botanical gardens, many tourist attractions and archeological sites including the world famous temple of the tooth relic (Dalada Maligawa) and other attractions.

Kandy is a world heritage city competitive advantage of being heritage city, already established brand name and unique culture (Dalada Maligawa and Kandy EsalaPerahera, Kandyan dance and handicrafts) will be used as the basis for developing this zone under the theme culture and heritage. Develop existing and potential attraction/activities around the core attractions are the main tasks. The zone covers Pallakelle to Pilimathalawa including Dalada Maligawa, Kandy City, Kandy Lake, Peradeniya Botanical Gardens, University of Peradeniya, Kandy Museum, Udawattakelle forest, Pallakelle Stadium and Lankathilaka and Gadaladeniya temples.

Geographic analysis is to transform data into useful information to satisfy the requirements or objectives of a consumer. Fundamental of network analysis simply extract information from a network. Complex analyses process information in the network model to derive new meaningful information. Shortest-path between two points is a network model that process information to achieve the outcome. The vector mode is more suited to network analysis than the raster model. Network Analysis is



closely related to spatial interaction modeling. A set of geographic locations is interconnected in a system by a number of routes (Jovanovic and Njegus, 2008).

“A network is a system of interconnected elements, such as edges (lines) and connecting junctions (points), that represent possible routes from one location to another”(Arc GIS Resource center,2016).

GIS can be measured as a tool that provides techniques and technologies to achieve sustainable tourism development with spatial data. This techniques can also considered as a set of powerful tools to process spatially referenced data and this spatial data can be used to identify conflict and analyze accessibility for cretin tourism zone.

## **1.2 Study problem**

According to the Tourism Strategy Development Plan, there are huge investment projects all over the country. Tourism destinations will be developed and hidden tourism site have to be promote, tourists should be able to access the destinations. Digital media and internet is one of the main promotion trends available nowadays. When considering a tourism destination accessibility is a key point. Therefore, proper information hub should implement. Accessibility for a destination is an important factor when it's come to planning.

Development of information technology people makes use of internet as their information source. Tourism has been increased while the development of technology, therefore budget travelers and individual tourist are used to travel. Nowadays, most of the tourist would like to travel alone which is more comfortable rather than moving with a large group. People who are interested in adventure tourism will travel by alone. Individual travelers are flexible they usually hunt for new places. Therefore targeting those groups will be a superior promotion point where awareness of destination, routs, activities, events, services is all about promotion. As a tourism destination Sri Lanka should be able to provide a suitable guidance for visitors where it is a good promotion point. Building a brand name is the key success; to build a brand name service is important.