



UNIVERSITI PUTRA MALAYSIA

**THE IMPACTS OF TOURISM DEVELOPMENT AND RESOURCE
ASSESSMENT IN LANGKAWI, MALAYSIA: ANALYSES AND
EXPERT SYSTEM DEVELOPMENT**

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**THE IMPACTS OF TOURISM DEVELOPMENT AND RESOURCE
ASSESSMENT IN LANGKAWI, MALAYSIA: ANALYSES AND EXPERT
SYSTEM DEVELOPMENT**

**By
SENGDEUANE WAYAKONE**

**Dissertation Submitted in Fulfilment of the Requirement for the
Degree of Doctor of Philosophy in the Faculty of Engineering,
Universiti Putra Malaysia**

February, 1999

**DEDICATED TO MY BELOVED
WIFE (LIEN SAENG WAYAKONE)
AND SON (DAOPASEUTH WAYAKONE)**

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LIST OF ABBREVIATION

ANSI	American National Standards Institute
CLIPS	C Language Integrated Production System
CIA	Centre for Intelligence Agency
COOL	CLIPS Object Oriented Language
EIA	Environmental Impact Assessment
ES	Expert System
FBI	Federal Bureau of Investigation
GIS	Geographical Information System
GUI	Graphics-User Interface
LADA	Langkawi Development Authority
LIMA	Langkawi International Maritime and Aerospace Exhibition
NASA	National Aeronautics and Space Administration
NTO	National Tourism Office
RM	Ringgit Malaysia
UPM	Universiti Putra Malaysia

Abstract of dissertation presented to the Senate of Universiti Putra Malaysia
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ASSESSMENT IN LANGKAWI, MALAYSIA: ANALYSES AND EXPERT
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February, 1999

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Faculty: Engineering

The study is concerned with the assessment of the residents', officers' and visitors' perceptions towards current and future impacts of tourism development and its resources in terms of importance and attractiveness. Based on the results of this study, the knowledge was translated into specific rules, which were incorporated into the expert system (ES). The tool chosen to represent the acquired knowledge in the ES was CLIPS. TIRA_EX (Tourism Impact and Resources Assessment Expert) is the name of the ES. It was developed through a combination of interviews with residents, government officers and visitors. All the knowledge information is stored in databases that can be updated and referred to through the ES. The possible role for TIRA_EX is as an intelligent assistant that aids management in analysing problems in tourism development. At the same time, it provides decision-maker with an effective way of examining possible impacts of tourism development and its resources in order to formulate future strategy for sustainable development of tourism, and keeps its impacts at a desired level, especially in Langkawi Island and in Malaysia in general.

Abstrak disertasi yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi syarat untuk ijazah Doktor Falsafah.

**KESAN PEMBANGUNAN PELANCONGAN DAN PENILAIAN SUMBER
DI PULAU LANGKAWI, MALAYSIA: ANALISIS DAN SISTEM
KEPAKARAN PEMBANGUNAN**

Oleh

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Kajian ini adalah berkaitan dengan penilaian pada residen-residen, pegawai-pegawai kerajaan dan tanggapan pelawat-pelawat terhadap kesan sekarang dan pada masa hadapan terhadap perkembangan pelancongan dan sumber-sumbernya dari segi kepentingan dan daya tarikannya. Berdasarkan kepada keputusan kajian ini, pengetahuan diterjemahkan ke dalam peraturan yang tepat dan khusus, yang mana disatukan ke dalam satu sistem yang mahir (ES). Alat yang dipilih untuk menggambarkan pengetahuan yang diperolehi di dalam ES adalah CLIPS. TIRA_EX (Tourism Impact and Resources Assessment Expert) adalah nama diberikan kepada ES. Ia dibina berdasarkan kombinasi temuduga dengan residen-residen, pegawai-pegawai kerajaan dan pelawat-pelawat. Semua maklumat mengenai pengetahuan disimpan dalam pengkalan data yang boleh diperbaharui dan dirujuk melalui ES. Peranan-peranan yang sesuai untuk TIRA_EX adalah sebagai pembantu yang cerdik (Intelligent Assistant) dan sebagai bantuan pengurusan di dalam menganalisis masalah pembangunan pelancongan. Pada masa yang sama, ia menyediakan pembuat keputusan dengan cara yang efektif untuk menyelidik kesan-kesan yang mungkin berlaku terhadap pembangunan pelancongan dan sumber-sumber dalam usaha membentuk strategi-strategi masa hadapan untuk ketahanan pembangunan pelancongan dan juga meletakkan kesannya pada tahap yang diingini khususnya di Langkawi dan di Malaysia secara amnya.

CHAPTER I

INTRODUCTION

Tourism in Langkawi

Langkawi is located off the north-western coast of Peninsular Malaysia between latitudes 6° 10' and 6° 30' north and longitudes 99° 35' and 100° east. It is about 30 km from Kuala Perlis and 51.5 km from Kuala Kedah (Figure 1). Langkawi comprises 104 islands, of which Pulau Langkawi with an area of 32 180 ha is the largest island. This is followed by Pulau Dayang Bunting (5 091 ha) and Pulau Tuba (1 763 ha). Currently, these three islands are populated. Other islands are small in sizes and are still kept in their natural state except for Pulau Singa Besar and Pulau Beras Basah which have been developed for tourism, e.g. for wildlife park and tourist accommodation respectively (Langkawi District Council, 1992).

Overall, Langkawi is a group of islands well endowed with unspoilt environment and outstanding natural landscape. Amongst its assets are the existence of tropical rain forest which has not only created distinctive views, but is also considered to be one of the unique assets of Langkawi. Besides, its white sandy beaches provide enjoyment to all visitors at the seafront.

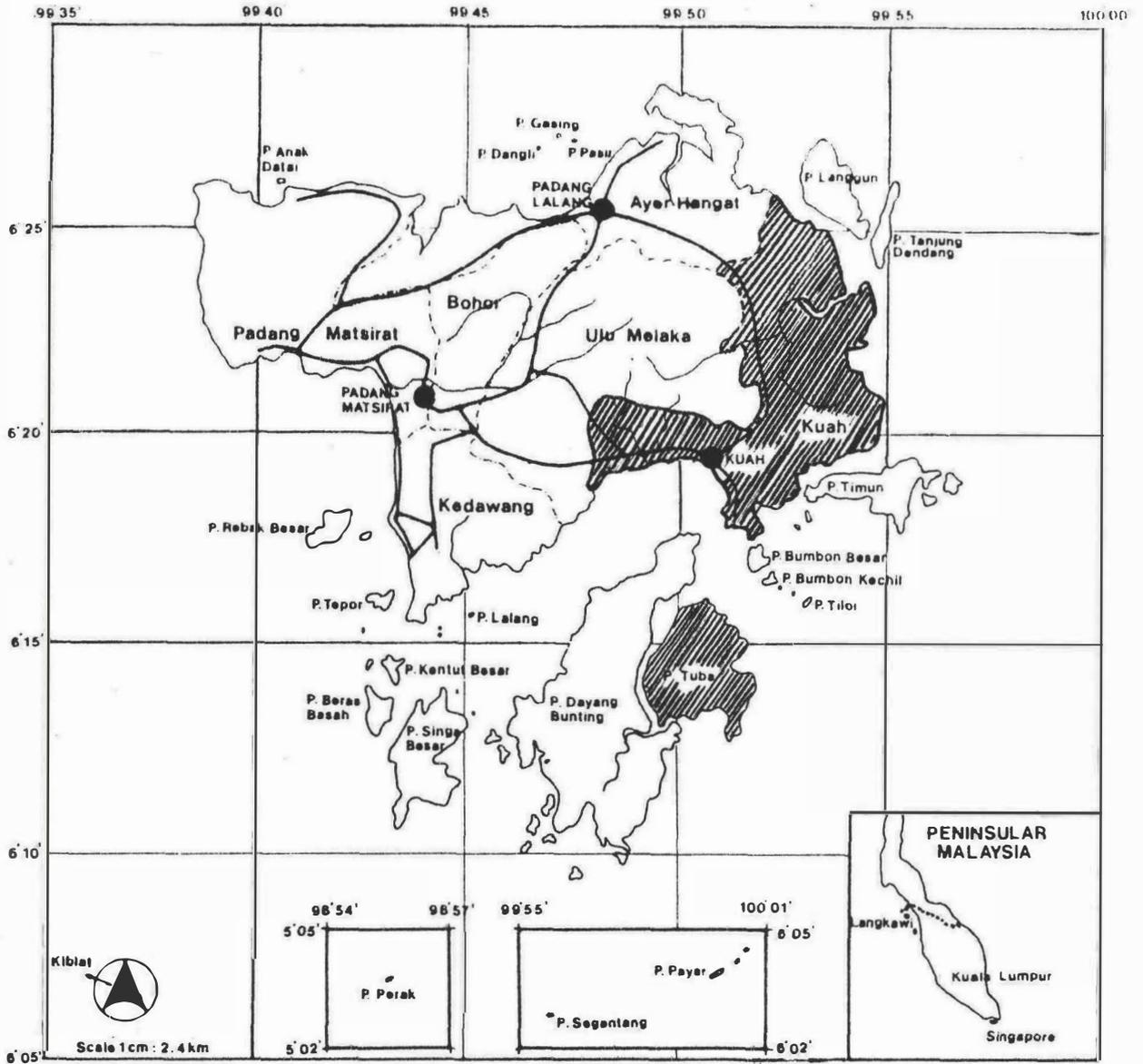


Figure 1: Study Area in Langkawi

- Legend:
-  Major Settlement Areas
 -  Road
 -  Mukim Boundaries
 -  Study Area

There are a few other small islands in Langkawi with their own characteristics and potential for development as tourist attractions. This potential should be further enhanced with the provision of accommodation facilities. These islands provide various water-based activities such as yachting, scuba diving, snorkelling and other related sea sports. Moreover, Langkawi is well known as a historical island. Historical remains such as the Tomb of Mahsuri (Makam Mahsuri), Beras Terbakar (Burnt Rice) and Telaga Ayer Hangat (Hot Spring) are popular tourist attractions. The way of life and customary practices of the locals can also be exploited as another tourist attraction. A few traditional *kampungs* or villages such as fishing, agriculture and estate settlement can be developed for tourist attraction purposes.

Moreover, Langkawi with its proven track record as a venue for many major conventions and exhibitions has always been selected for many prestigious conferences. International events are held annually in Langkawi such as the International Motor Show, International Cat Show, World Powerboat Race, Langkawi International Marathon and the Langkawi International Maritime and Aerospace Exhibition (LIMA).

According to Langkawi District Council (1992), the economic base of Langkawi is still dominated by the agriculture/fishery sector (56 % in 1985). Poverty level and emigration rates are high due to the lack of job opportunities and dependency on the less-productive basic sectors. Since its establishment as a free port

in 1987, the total number of tourists' arrivals in Langkawi has increased significantly. In 1986, total arrivals to Langkawi were 209,763 people, whereas the next following year was 310,004 (an increase of about 47.8%). The highest growth rate was in 1989 (50.2%) with a total of 658,993 tourist arrivals. Though the growth rates for 1990 had dropped (12.2% - 19.1%), the absolute numbers of tourists' arrivals had increased substantially. In 1992, the figure had reached a total of one million exceeded by 46,874 (Figure 2). The total entry is projected to increase up to 1,300,000 tourists by the year 2005.

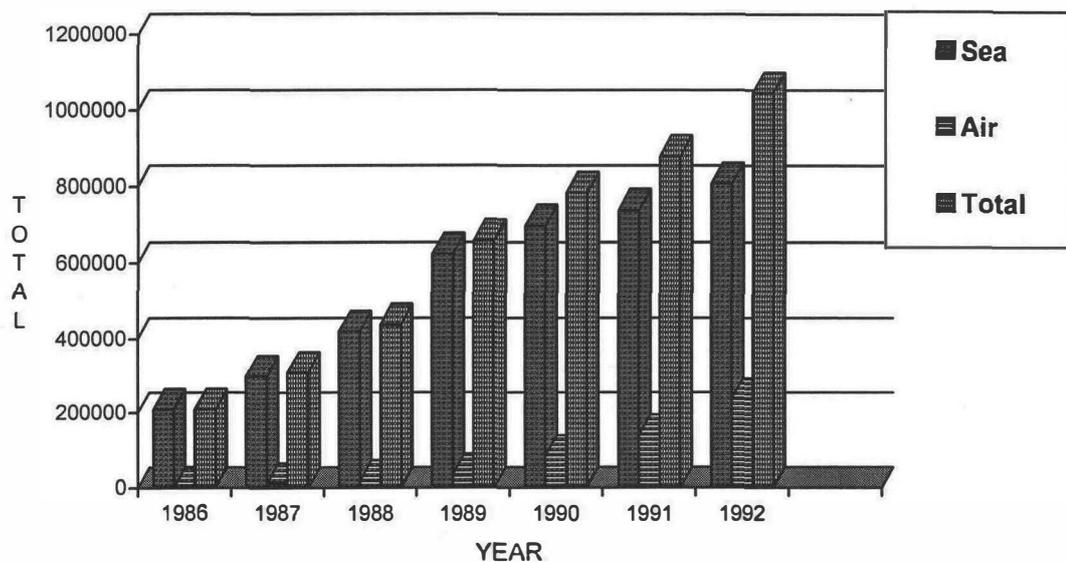


Figure 2: Tourist Arrivals to Langkawi, 1986-92
(Source: Langkawi District Council, 1992)

The declaration of Langkawi as a free port has enhanced the potential for developing trading and commercial activities. In fact, the rapid growth of the commercial sector in Langkawi started off since the declaration. The duty free

imported goods available in Langkawi have contributed to the increase in number of tourists to Langkawi. The commercial sector however can be enhanced further through the provision of better quality and wider choices of goods. The free port status can also be exploited to promote industrial development even though industrial activities are only confined to non-polluting types so as not to contradict with the objective of promoting Langkawi as one of the main tourist destinations in the region. Types of industries permissible are handicrafts and cottage industries, which support tourism development.

Although Langkawi is quite isolated from the mainland, it is considered quite strategic in terms of tourist attraction by virtue of its location between Pulau Pangkor, Penang and Phuket (Thailand). With its strategic location, it can easily be included as a stopover destination in a package programme for tourists visiting these islands.

Statement of the Problem

Tourism grew rapidly during the 1960s and 1970s, but it was soon realised that this growth was not without costs. The social, cultural, economic, and environmental impacts of tourist growth became subjects of serious studies. Tourism planning was advocated as a tool for controlling the negative impact of tourism development and for protecting the resources upon which the profitability of the industry depended. However, many tourism development studies and plans were not (and many still are not) based on rigorous quantitative and integrated analysis of the

several dimensions of tourism neither did they control for the contribution of other activities besides tourism to observe the expected impacts.

Many developing countries, anxious to reap the fullest benefits of tourism development have, without indulging into the proper analysis of impacts, transformed their virgin areas into touristic centres to cater for the tastes and desires of the mass travellers. Such rapid development can lead to a complete transformation of the area, with grave consequences such as extensive or irreversible damages to the natural environment.

Malaysia is well endowed with natural resources, with about 60% of the country under natural forests, a long coastline and rich territorial waters. Parks and conservation areas have been gazetted to conserve the rich natural heritage. This rich and diverse natural heritage provides the foundation of a potentially rich ecotourism industry (Salleh, 1992). In the past, tourist destinations have been developed without comprehensive planning and control. It follows, therefore, that the facilities and improvement are set in place only when these areas have become popular. Further upgrading and improvement of the tourist and recreational facilities and services invariably depend on the availability of funds and expertise. Other factors, which should be taken into consideration, include lack of management capabilities, poor environmental awareness among the tourist service personnel and poor enforcement control.

Meanwhile, many countries, in their attempts to optimise economic benefits have placed little regard for two of the most important communities who play critical roles in the tourism development: the resident community and the tourist community.

If the tourist based economy is to be sustainable, it is important that the residents are willing to be partners in the process (Pizam, 1978; Rothman, 1978; Mathieson and Wall, 1982; Allan, 1988). To achieve this procedure, the residents must be encouraged to involve in the tourism planning, they must be informed and consulted about the scope of the development and their attitudes towards tourism must be assessed.

On the other hand, the entire picture of tourism is made up of those individuals who are motivated to travel. Hence the perception of tourists play a key role in the marketing and development of the tourist area. A positive perception of tourists towards an area indicates that the demand of that area would increase (Chubb and Chubb, 1981; Mathieson and Wall, 1982; Wan Sabri, 1987; Allan, 1988; Manmohan, 1990). A thorough tourism planning then must attempt to optimise not only the economic but also the social and environmental benefits of tourism while minimising its deleterious effects. Most importantly, it must be able to satisfy the tourists' needs and the residents' needs as well.

In order to make tourism development sustainable and to keep its impacts at a desired level for future development, it is important that the present trend of use of visiting areas are evaluated and the attitudes of residents towards tourism development and perception of visitors for visiting areas are assessed. At the same time resource assessment in terms of importance and attractiveness is also to be implemented. This study is the first in Malaysia attempting to examine the attitudes of residents, officers and visitors towards resources and tourism development using an expert system developed by the researcher.

Objectives of the Study

The main objective of this study is to develop a comprehensive Expert System for assessing the impacts of tourism development and resources based on the perception of the local residents, officers and visitors that could be used as a tool for better tourism management and monitoring. The specific objectives are as follows:

- To determine residents' and officers' attitudes towards current and future impacts of tourism development in Langkawi Island.
- To assess the resources in Langkawi with reference to the perception of the residents, officers and tourists in relation to the importance and attractiveness of the resources.

- To identify the uses of the area by visitors and determine the types of activities preferred by the visitors.
- To identify the variables which influence the perception of residents, officers and visitors towards tourism development.
- To combine the opinions of the local people, officers, and visitors in order to produce a set of rules to enable the expert system to be used to make decisions. The knowledge derived from interviews is translated into a form that could be used in the expert system to be developed.

Significance of the Study

The outcome of this study is a production of an expert system (ES) that can be used to assess the impacts of tourism development and its resources. It is envisaged that the ES would become a very useful decision-making tool for a better tourism management and monitoring. Planners, managers and policy makers can become familiar with some aspects related to tourism development impacts and its resources in helping them to understand the needs of residents and visitors. This tool can help them in formulating future strategy for sustainable development of tourism, specifically in Langkawi and in Malaysia generally.