



# Langkawi Geopark

Editors

MOHD SHAFEEA LEMAN  
KAMARULZAMAN ABDUL GHANI  
IBRAHIM KOMOO  
NORHAYATI AHMAD

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# Langkawi Geopark



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Institut Alam Sekitar dan Pembangunan (LESTARI)  
Universiti Kebangsaan Malaysia  
*Institute for Environment and Development (LESTARI)*  
*Universiti Kebangsaan Malaysia*



Lembaga Pembangunan Langkawi  
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Tanjung Datal

# FOREWORD



**DATO' SERI  
MAHDZIR  
KHALID**

CHIEF MINISTER  
STATE GOVERNMENT OF  
KEDAH

The famous legend goes that Langkawi was cursed to be barren for seven generations by an innocent lady, Mahsuri who was sentenced to death for a crime of adultery she never committed. Perhaps, the seven generations spell is now over and today, Langkawi is beginning to enjoy the dawn of a new era of development. The year 1987 is significant for Kedah State as it was in this year that Langkawi started to breath a new life when the island was declared a Duty Free Island. Since then, flocks of tourists turned to Langkawi to enjoy duty-free shopping and continuous development had come to Langkawi. It was during his reign as the Prime Minister, the Father of Malaysia, Tunku Abdul Rahman Putra Alhaj first expressed his visions on the future development of Langkawi. However, his vision has to wait for about 30 years for someone like Tun Dr, Mahathir Mohamad to actualise it. Tun Dr. Mahathir's declaration of Langkawi Free Duty Islands had truly lifted the curse and transformed Langkawi from its dooms to the bustling modern tourist destination it is today. Exactly 20 years later, another dream became true when Langkawi was declared an environmentally sustainable Langkawi Global Geopark by the UNESCO.

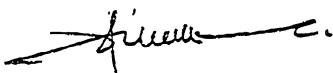
The Duty Free status of Langkawi had brought many promises to Langkawi but the establishment of Langkawi Development Authority (LADA) under the auspices of the Ministry of Finance in 1990 was one significant event that had moved Langkawi development to greater heights. LADA was given the task to develop the infrastructure to

facilitate and promote tourism activities with strong support from the State Government via the District Office of Langkawi, which is responsible for territorial and land-use planning of the islands.

The State Government has planned Kedah to become a developed state in the not too distant future and to achieve this, it has planned its development accordingly to suit the local Agenda 21 on sustainable development. In the past, Kedah's economy was very much dependent on its agriculture and primary natural resources. However, under the Kedah Developed State Master Plan, various other industries are developed by the state and a well-planned Development Zonation has been made for all districts within the state. In this regard, the District of Langkawi has been designated a tourism district with minimum dependency on agriculture, natural resources and heavy industries.

In planning for sustainable tourism in Langkawi, the State Government of Kedah and LADA seek advice from various state departments as well as professionals from local institutions of higher learning. Various MoUs have been signed by both the State Government and LADA with local universities to support and encourage serious research on the development of tourism and the socio-economy of Langkawi. In 2006, through continuous efforts undertaken by several experts in the field of geosciences, the State Government of Kedah came to realise the great potential of its rich geoheritage resources in further boosting nature tourism of Langkawi. As a result, Langkawi Geopark was established by the State Government of Kedah, with LADA and UKM playing major roles in planning, development and maintaining the park. Langkawi Geopark also received tremendous support from various other state and federal agencies, including the Kedah State Mineral and Geoscience Department, Kedah State Forestry Department, Ministry of Tourism and the, Ministry of Education, among others.

Further development of Langkawi will be seen in the near future with the launching of the Northern Corridor Economic Region this year. More high-end resort facilities and amenities will be constructed to cater for tourism demand. Obviously, such development will be mindful of the need to conserve the natural attributes of the district, consistent with the spirit of nature heritage under the Langkawi Geopark agenda.



**DATO' SERI MAHDZIR KHALID**

*Chief Minister  
State Government of Kedah*



**PROF. DATO'  
DR. SHARIFAH  
HABSAH  
SYED HASAN  
SHAHABUDIN**

VICE CHANCELLOR  
UNIVERSITY KEBANGSAAN  
MALAYSIA

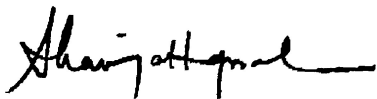
## FOREWORD

It began in 1996 when Universiti Kebangsaan Malaysia (UKM) signed the first MoU with Langkawi Development Authority (LADA) authorising UKM to lead national research towards sustainable development of Langkawi's rich natural resources. At the initial stage, UKM research team was led by small group of geoscientists who believed that Langkawi possesses the country premier geological heritage that should be wisely utilized in order to support the booming tourism industry in these legendary islands. Driven partly by UNDP resolutions drawn at the 1992 Rio Summit, these geoscientists gradually built inventory on geoheritage resources to be conserved along with other natural resources of Langkawi.

In promoting geological resources as a new class of heritage, UKM geoheritage researchers formed and led the Malaysian Geological Heritage Group (MGHG). This group carries nationwide tasks to convince various stakeholders, from decision makers to the general public on the importance of geoheritage conservation to the nation. Internationally, the MGHG works hand in hand with other active geoheritage researchers, particularly the European-led ProGeo in building alternative conservation concepts that would provide solutions for the future of geoheritage conservation. Under the umbrella of the United Nations Educational, Scientific and Cultural Organization (UNESCO), Malaysian and European geoheritage researchers established the

Geopark concept that provides a more holistic nature conservation without depriving the local socio-economic benefit.

Langkawi has long been recognised in the UNESCO Geopark initiative, as it was one of the study cases discussed by world geoheritage leaders during the incubation of the geopark concept. Langkawi, as we all know is a thriving tourism destination where the eco-tourism grows alongside other tourism components. In the past, however, the eco-tourism component of Langkawi focused only on the aspect of biodiversity. MGHG researchers have played important role in implanting awareness on the unique geological landscape and high heritage value of Langkawi rocks and subsequently in 2005, a unique Geoforest Park concept was adopted by the Forestry Department to conserve forest reserve that are rich in geoheritage resource. With new awareness on the significance of geoheritage components in the nature of Langkawi, LADA and the State Government of Kedah seized opportunity to establish Langkawi as one of the UNESCO Global Geopark. In 2006, with the Kedah State Government with the help from LADA and UKM geoheritage researchers have declared Langkawi as Langkawi Geopark to enable it to seek recognition from UNESCO. Now, Langkawi is proud to be the Malaysian and Southeast Asian first Global Geopark endorsed by UNESCO. University Kebangsaan Malaysia is indeed very proud that the MoU signed in 1996 with LADA has been very significant and productive, and very much in line with the need of research university.

**PROF. DATO' DR. SHARIFAH HABSAH SYED HASAN SHAHABUDIN**

*Vice Chancellor  
University Kebangsaan Malaysia*

# PREFACE

For decades the flora, fauna and landscape of Langkawi have never failed to astonish natural science researchers and natural lovers, from near and far. As for the geoscience community, the very well preserved geological records exposed along the islands' hundreds of kilometres rocky beaches, area simply the best in the country. Hence, these rich nature resources constitute the greatest assets for Langkawi in its pursue to become a leading nature-based tourist destination in the region. However, as Langkawi strives for its extensive tourism development, consequently the beautiful natural lanscape of the islands would gradually degraded and posses serious threat the natural environment as a whole.

Being one of the most barren regions in the country, perhaps the most threatend resources of Langkawi would be it's precious rocks and geological landscapes. Thus, by incorporating rocks into the conservation concept of the geoforest park, Langkawi could avoid unnecessary damages to the rocks and indirectly protect its unique flora, fauna and landscape. In this case, the development of Langkawi geological resources is directed towards geotourism as this knowledge-based tourism product and related innovative geoproducs would give higher added value for these resources.

Deeply moved by the affection for pristine natural environment of Langkawi, various individuals and non-governmental organizations have raised their views on the needs to stop the development in Langkawi. However, needless to mention, the government has to get revenue from these rich nature resources, in order to support the local socio-économic growth and to distract them from moving to the cities. The Langkawi geopark's sustainable development concept proposed in 2005 by the Malaysian Geological Heritage Group seems to be the most ideal solution for this long overdue problem with regards of envionment and development. In this concept, a non-destructive approach of natural resources exploitation through sustainable nature tourism and education would provide sufficient revenues for the government and create various job opportunities for the local public.

This book is specially organized in order to showcases geological and landscape resources, flora, fauna, cultures, tradisions, archaeological artifacts, legends and myths as valuable assets for the establishment of Langkawi Geopark. Also highlighted in this book is how nature conservation, education and poverty eradication could work side by side under the concept of Langkawi Geopark. This book also outline how Langkawi Geopark should be developed in order to achieve its premium target to the most prominent sustainable tourist destination in the region.

MOHD SHAFEEA LEMAN  
KAMARULZAMAN ABDUL GHANI  
IBRAHIM KOMOO  
NORHAYATI AHMAD

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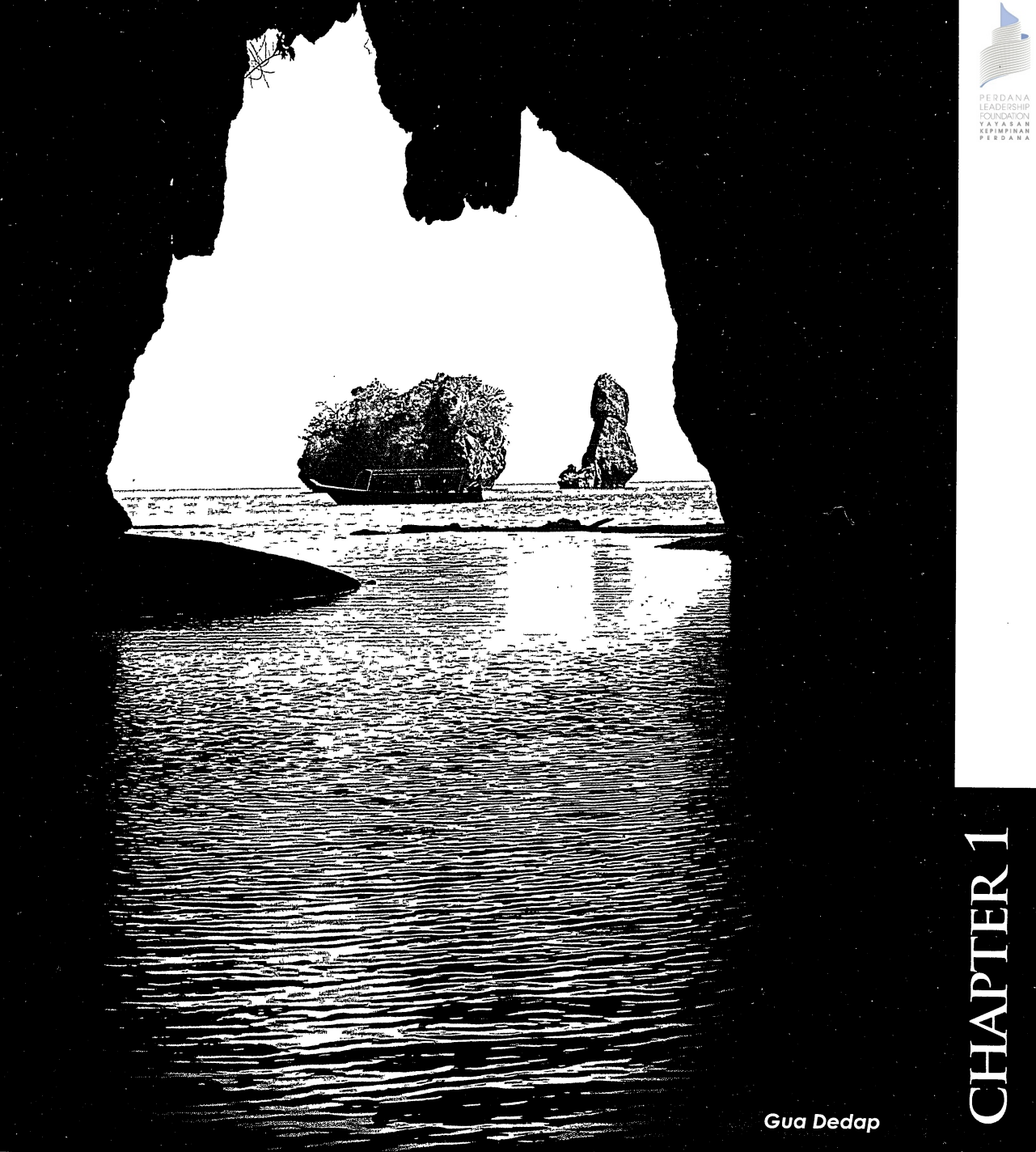
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*Gua Dedap*

CHAPTER 1

# Introduction

MOHD SHAFEEA LEMAN  
IBRAHIM KOMOO  
KAMARULZAMAN ABDUL GHANI



Kuala Kilim

# Introduction

## LANGKAWI GEOPARK

The establishment of Langkawi Geopark by the Kedah State Government, Malaysia in May 2006 and endorsed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) under the Global Network of National Geoparks in June 2007, marked an important milestone both in the pursuit of geoheritage conservation as well as the enhancement of nature's ecotourism potential.

### GEOLOGICAL RESOURCES

Geological resources or earth materials and their secondary products are essential elements in our daily lives. Many forms of geological resources have been classified as essential commodities to certain nations. General trend shows that demand on various geological resources have grown steadily over the years to cater for the needs of a growing world population. To cope with this demand, man deployed their best knowledge to explore for more new reserves of geological resources and best technologies to extract exploitable resources. In order to optimise the recovery of various resources without unnecessary degradation and destruction, one requires very good knowledge through intensive research on the geology of prospected areas and its relationship with the regional setting. This knowledge would encompass the complete history of depositional, mineralization, tectonic and surface processes. Only with the deepest of understanding in these disciplines that geoscientists could unfold true nature of the occurrence of prospected geological resources, its quality as well as quantity. These would enable them to provide best guidelines for more nature friendly resource recovery and exploitation, paving for sustainable development of geological resources.



## GEOHERITAGE RESOURCES

Geological records gathered from mineral exploration researches have often unfold the extraordinary nature of occurrence for certain geological resources, hence giving high heritage value for such sites. Some particularly highly valuable geological records and their evidences, and aesthetic appearance of particular geological resources should be regarded as geological heritage or geoheritage. Other geoheritage resources constitute beautiful and unique geological landscapes etched wonderfully by various surface processes on particular resistant rocks. Unfortunately, heritage value for geological resources often being captured by man only after such resources have been exhaustively or completely extracted. These geoheritage resources would be dearly missed after they were destroyed or removed from the face of the earth by nature and most seriously due to human activities.

## GEOHERITAGE CONSERVATION

Appreciation on heritage value of geological resources has increased steadily over the years. The global scenario clearly shows that geoheritage is better appreciated in the developed nations, where various geoheritage sites have been developed sustainably within their National Parks and World Heritage Sites. Sustainable development initiatives in the developing nations, on the other hand, are generally facing stiffer challenges and hindrances. This is primarily due to the nation's higher dependency on natural resources to support their economic growth. Perhaps equally important is, the lower level of awareness on the fragility of natural environment as well as the importance of sustainable development for geoheritage resources.

Now, as we all are entering into the borderless world, such excuses should be reduced gradually. For the benefit of all mankind and future generation, alternative concepts of conservation are needed to cater for both the developed and developing nations. A more community-based concept such as the Geopark Concept of the UNESCO should be deployed in order to protect our precious geoheritage, without depriving local communities' socio-economic benefits. The latter could be achieved through utilisation of geoheritage features for the purpose of eco-tourism, research and education. Hence, this concept shows that conservation could work side by side with poverty eradication as well as literacy enhancement.

## GEPARK INITIATIVE

The Geopark concept was essentially triggered by the resolution adopted during the 1992 United Nations Conference on Environment and Development (UNCED) Summit in Rio de Janeiro. At the Rio de Janeiro Convention in 1992, the Agenda 21 (the Agenda of Science for Environment and Development) has been adopted by UNCED, within which the protection and sustainable development of geological heritage and geodiversity through environment and development was instilled. This agenda was reconfirmed by the World Summit on Sustainable Development 2002 in Johannesburg. The general consensus drawn from these summits is that the geology and landscape which have profoundly influenced society, civilization and cultural diversity of our planet, and they should be protected for the future generations.

A geopark is considered a national conservation entity until it is approved by the UNESCO elected committee to become a member of the UNESCO Global Network of National Geoparks. As defined in the 2004 UNESCO Geopark Operational Guidelines, a geopark should comprise of a territory with well-defined limits that has a large enough surface area for it to serve local economic development. It comprises a certain number of geological heritage sites (on any scale) or a mosaic of geological entities of special scientific importance, rarity or beauty, representative of an area and its geological history, events or processes. It may not solely be of geological significance but also of ecological, archaeological, historical or cultural value (<http://www.worldgeopark.org/wwwroot/OfficialDocuments1.htm>). As recommended by this definition and guidelines, the clearance for geoscientific qualification for any geopark to become a global geopark should be endorsed by the respective national Geological Survey(s) or other relevant geoscientific institutions.

The geopark concept was first drafted in 1999 and in the year 2000, the European Geopark Network was formed, followed by the formation of the UNESCO official Global Network of National Geoparks in 2001. The geopark conservation package provides an alternative to other heritage conservation packages based on earlier 1972 Convention concerning the Protection of the World Cultural and Natural Heritage in which many geoheritage sites was formerly protected. The provision of geopark, which highlights the potential interaction between socio-economic and cultural development and conservation of the natural environment, certainly gives it the edge over other concepts of conservation. In other words, the geopark conservation approach will provide opportunity to create a more balanced development between conservation of natural resources and the local socio-economic development.

## MALAYSIA'S INITIATIVE IN GEOHERITAGE CONSERVATION

In the past decades, the level of awareness on the importance of the geoheritage conservation has been rather low in Malaysia. As a result, the country has lost many of its valuable geoheritage sites, mostly due to the removal of the earth resources in order to support the economic growth of the country. Scattered efforts have been made by various individuals in highlighting this issue during the 1960s till early 1990s, but apparently these efforts were not very successful. The country's main dilemma was in addressing the priority of choice between development and conservation, as most of the available IUCN conservation packages proposes a complete development-free environment.

The 1992 Rio Summit had apparently brought into light new efforts on nature conservation in Malaysia, particularly with regards to geoheritage resources. Encouraged by the Rio Summit's resolution, in 1996 a small group of Malaysian geoscientists and nature endeavours unofficially formed the Malaysian Geological Heritage Group (MGHG) in order to influence the decision makers on the significance of geoheritage conservation to the nation as well as to educate the public on the heritage value of the country's geological and landscape features.

With better-combined efforts, this group initiated their activities in promoting geoheritage interest within the nation's readily popular tourist destinations. These efforts were carried out along with the formulation of the group's own theoretical framework and strategy for geoheritage conservation, the nationwide reconnaissance survey for identifying potential geoheritage sites and followed by the detailed mapping of selected strategic geoheritage sites, not to forget the public awareness campaign. With smart partnership strategies, the group's tireless efforts managed to draw attention of various stakeholders, particularly the decision makers that eventually led to:

- The creation of national geoheritage database (joint corporation with the Mineral and Geoscience Department),
- The inclusion of several geoheritage sites in the National Heritage List (adopted by the Heritage Department),
- The acceptance of various input on geodiversities into specialized rock galleries (at Taman Kinabalu, Muzium Nelayan Tanjung Balau, Galeri Geologi Kota Mahsuri, etc.),

- The formulation of Geoforest Park Concept with three geoforest parks in Langkawi (joint corporation with the Forestry Department of Peninsular Malaysia),
- The inception of Langkawi Geopark by the Kedah State Government (joint corporation with the Langkawi Development Authority or LADA).

## LANGKAWI GEOPARK INITIATIVE

The acceptance of the geopark concept by LADA is due to the common aspiration on sustainable development and appreciation on geological heritage resources shared by both the LADA Management and the MGHG. This decision was highly timely, as LADA had been searching for its own identity to enable Langkawi to strive as the region's leading nature-based tourism destination of its very own kind. By adopting the geopark concept, Langkawi could now become the leading 'daylight' tourist destination in the region focusing mainly on the excellent tributes of nature. As a geopark, Langkawi would be able to enhance its capacity to fulfill LADA's as well as the country's aspiration in:

- Achieving sustainable development where nature conservation is given a the top priority,
- Multiplying tourism products based on the value-added k-tourism,
- Increasing carrying capacities among local community which is essential in driving its sustainable socio-economic development,
- Making Langkawi the nation's leading nature education and research destination

At the same time, Langkawi Geopark could also promote the concept of Geoforest Park developed under the jurisdiction of the Forestry Department of Peninsular Malaysia, in which geological heritage are given the top priority in forest conservation. It is the first time that such a concept is being introduced for any forest reserves in this country or anywhere else in the world.

Meanwhile, as Langkawi could gain great benefits from the establishment of geopark, the State of Kedah under which Langkawi is a district, and the surrounding regions should also enjoy some direct and indirect benefits from the establishment of Langkawi Geopark in the form of:

- promoting Kedah State to be the pioneer state in the country to have an internationally recognized geoheritage conservation entity,
- increasing the number of local and foreign tourists to visit Kedah and neighbouring States, particularly Perlis and Penang,

- increasing abilities to further improve the economy of the neighbouring States,
- promoting Kedah State as the leading state in supporting the agenda on sustainable development.

Last, but not least, Malaysia is proud to become the first nation in this region to have one of its National Geoparks to become a member of the internationally recognized the UNESCO Global Network of National Geoparks. This is an additional effort by the country to further strengthen its relationship and collaboration with other members of UNESCO and United Nations as a whole. This would also be a great boost to the country's effort in supporting the global agenda on sustainable development, particularly the Local Agenda 21. The success of Langkawi Geopark should be a catalyst for other responsible parties and relevant State Governments to adopt and promote more National Geoparks in the future. In addition, it will set the pace to spur further interests of aspiring geoparks in the Asia Pacific region to register into the UNESCO Global Network of National Geoparks.



*Gunung Machinchang*

**CHAPTER 2**

# Langkawi Geopark

MOHD SHAFEEA LEMAN  
IBRAHIM KOMOO  
KAMARULZAMAN ABDUL GHANI



Telaga Tujuh

# Langkawi Geopark

LANGKAWI GEOPARK



**Langkawi Geopark** is Malaysia's first established geopark located in the far northwestern corner of Peninsular Malaysia (Figure 2.1). It is also the first geopark in South-east Asia under the banner of Global Geoparks Network under UNESCO. Located in the State of Kedah, the Langkawi Geopark is unique in the sense that it comprises 99 islands that formed the legendary Langkawi archipelago. Langkawi, which has already been established as Malaysia's premier tourism destination, jump-started its development originally through the declaration of Langkawi as a Free-Duty Island in 1987. This declaration and the inception of the Langkawi Development Authority (LADA) later in 1990 has brought systematic development to these legendary cursed islands and transformed them into the present day modern tourist destination. With strong support from the federal and state governments, LADA has placed much effort to make Langkawi an environmentally sustainable tourist destination capitalising on its rich nature diversity and recreational potential. The realisation of Langkawi Geopark is a testimony to this endless effort to make these islands a premier ecotourism destination in this part of the world.

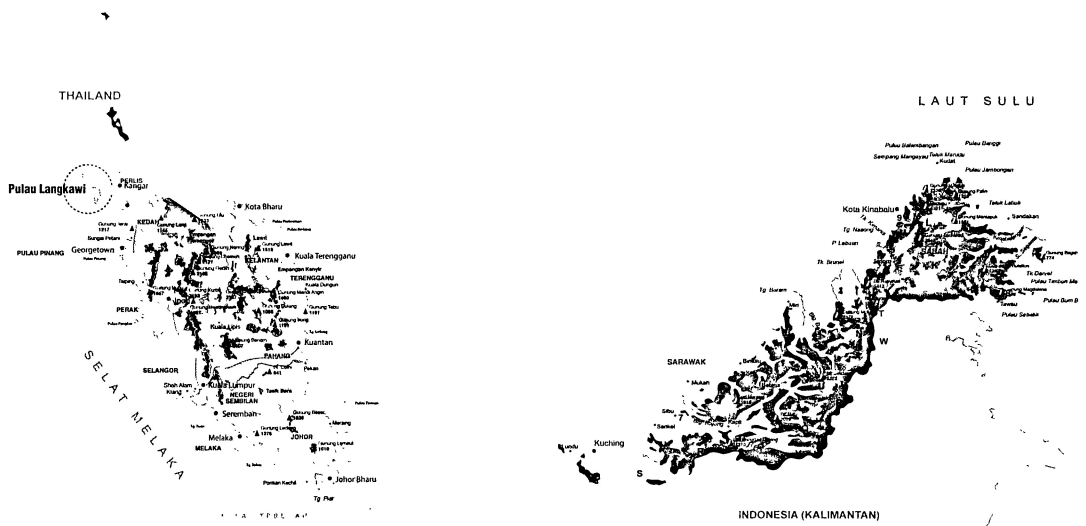
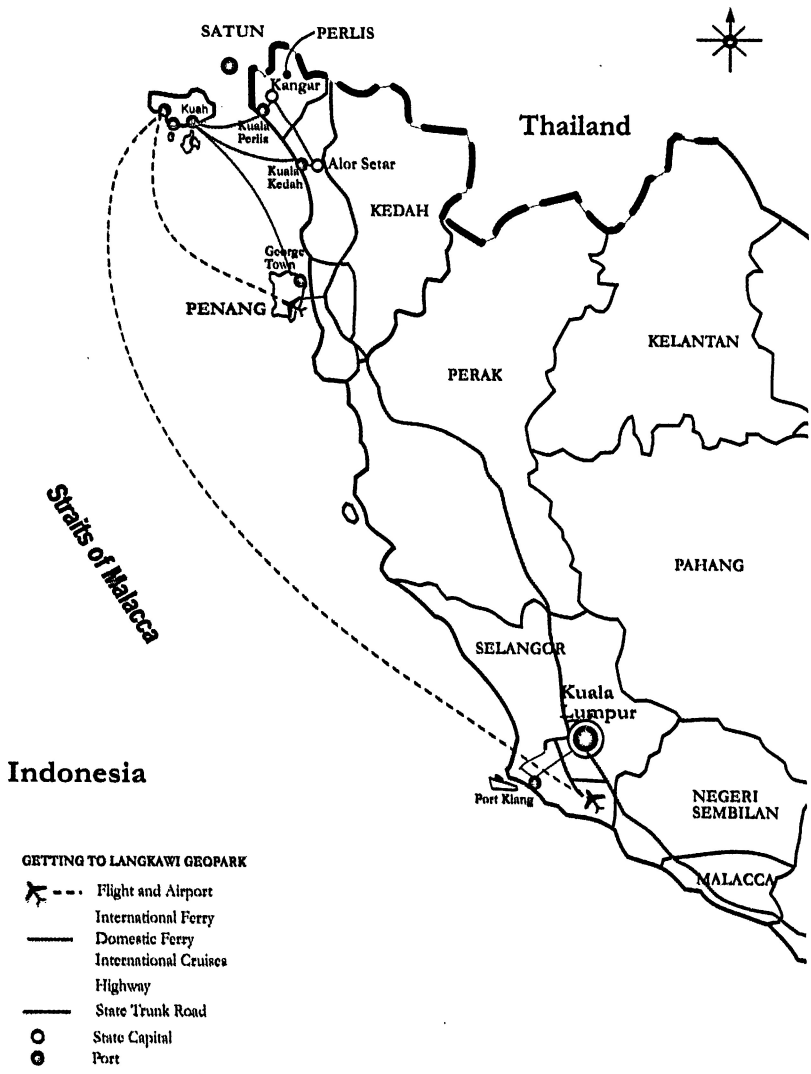


Figure 2.1. Location of Langkawi Geopark in Malaysia

# GENERAL INFORMATION

Langkawi Geopark comprises 99 islands with the main Langkawi Island constituting the largest and most populated one. The total land area of the geopark is about 478 square kilometers with a total population of around 86,000, predominantly of Malay ethnic origin. The geopark is easily accessible by sea from Kuala Perlis, Kuala Kedah and Penang Ferry Terminals and by air from Kuala Lumpur and Penang International Airports (Figure 2.2). The journey from Kuala Lumpur to Kuala Kedah and Kuala Perlis is greatly facilitated by the excellent Malaysia's premier North-South Highway and several alternative trunk roads. The geopark could also be internationally accessed direct by sea from Satun Ferry Terminal in southern Thailand and by air from Singapore International Airport and Bangkok Airport in Thailand.

12 LANGKAWI GEOPARK



**Figure 2.2.**  
Langkawi Geopark  
access route

## LANGKAWI GEOPARK HIGHLIGHTS

Upon approaching the Langkawi Geopark, via sea or air, one would be mesmerised by the beauty of Langkawi's highly diverse scenic and colourful natural landscapes. More often than not, these various natural landscapes of Langkawi reflect the islands' highly diverse geodiversity and their complex geological history. In a country that is largely affected by intense tropical weathering, the abundance of geological landscape should be regarded as a rare heritage of nature. Complementing this rich geodiversity is the islands' rich flora and fauna. These rich natural resources together with diverse local culture have always been the attraction in promoting Langkawi as a leading ecotourism hub in the region. In addition to the rich geodiversity and biodiversity, Langkawi Geopark is also a land of many legends, myths, cultures and traditions as reflected by the daily life and rituals of the local folks.

Geologically, the Langkawi Archipelago possesses the oldest rock formation and the most complete Palaeozoic sedimentary rock sequence in the Southeast Asian region. This has made Langkawi such an important site for geological research where geoscientists from all corners of the globe made their various discoveries and findings. With the current global interest in conserving geological resources, a group of local geoscientists, the Malaysian Geological Heritage Group has highlighted the heritage value for many of Langkawi geological and landscape features. This undoubtedly justifies Langkawi as a national geopark and its inclusion into the UNESCO Global Network of National Geoparks.

Langkawi Geopark is supported by a well-planned environmentally friendly infrastructure of high quality, including one international airport, several ports and highways. Langkawi Geopark also has the necessary townships and hotels to support the geopark related tourism industry. To oversee that the future development of Langkawi Geopark follows guidelines provided by State and Federal Governments as well as the UNESCO Geopark Guidelines, a special unit called the Langkawi Geopark Division was established by LADA.



Langkawi Geopark is a rare island geoparks comprising 99 islands, possessing one of the most beautiful tropical island karst landscapes in the Southeast Asian region. It was officially endorsed by the Chief Minister of Kedah on 31<sup>st</sup> May 2006 to support sustainable development of natural resources. This is manifested through sustainable ecotourism and geoheritage conservation. LADA provides the administrative backing and finance, while UKM provides academic input towards the realization of Langkawi Geopark. Geoheritage conservation, on the other hand, is carried out under the jurisdiction of Forestry Department. This book contains valuable information on geological and landscape resources essential in the establishment of Langkawi Geopark. It also includes other nature and culture resource components of the geopark.

*On the first of June 2007, Langkawi Geopark was declared as a member of the UNESCO Global Network of National Geopark, the first in Southeast Asia.*

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Institut Alam Sekitar dan Pembangunan (LESTARI)  
Universiti Kebangsaan Malaysia  
Institute for Environment and Development (LESTARI)  
Universiti Kebangsaan Malaysia



Lembaga Pembangunan Langkawi  
Langkawi Development Authority