

Langkawi UNESCO Global **GEO**PARK GAZETTE

New **DR CEO** of LADA

The **expert** in Policy on Environment

24 Partners + **22** Ambassadors

Langkawi is their best UNESCO
Global Geoparks.

Geopark **Education & Awareness**

Inseparable **GEO - BIO - CULTURE**
Linkages



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Geopark Division, Langkawi Development Authority (LADA),
Kompleks LADA, P.O. Box 60,
Jalan Persiaran Putra,
07000 Langkawi,
Kedah Darul Aman, MALAYSIA

Tel.: +604 9600 600;

Fax.: +604 9600 509

Email:

geopark@lada.gov.my

Website:

www.langkawigeopark.com.my

Instagram: www.instagram.com/langkawiunsecoglobalgeopark

Facebook: www.facebook.com/langkawiglobalgeopark



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Bunting from
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Editorial and design by:

Geo Shafeea Solution

Email :

geoshafeeasolution@gmail.com

Website:

<https://geoshafeeasolution.wixsite.com/website>

Langkawi UNESCO Global Geopark (UGGp) is the only global geopark covering the entire archipelago of **99 tropical islands**. It is the **52nd UNESCO Global Geopark** and the **first in Southeast Asia**. Langkawi islands officially earned the title of UNESCO Global Geopark in **2007**.

Langkawi UGGp is located in the Andaman Sea off the northwestern coast of Peninsular Malaysia with total surface area of 478 square kilometers. Langkawi UGGp has **38 geosites**, **10 biosites**, **4 cultural sites** and **3 geoforest parks** which are the Machinchang Cambrian, Dayang Bunting Marble and Kilim Karst Geoforest Parks.

What's New?

Introducing champions of Langkawi UGGp -
Partners, Ambassador & Products

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Langkawi UGGp newest products - the Kubang
Badak BioGeoTrail

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Coming soon: Langkawi Geopark Discovery
Centre will be open for public.

On page 40

New Geopark
Map (left);

New Geopark
Brochure
(right)



FOREWORD

Dr Ahmad Hezri Adnan

Chief Executive Officer

Langkawi Development Authority (LADA)

Greetings all valued readers from the Langkawi Development Authority or LADA.

For over a decade, LADA has implemented prudent approaches in overall development of this geopark island to ensure the economic goal is achieved without compromising on environmental sustainability. In its mission, Langkawi strives to become leading geopark territory in the world.

Where ever it may be located, a UNESCO Global Geopark (UGGp) definitely is an ever changing dynamic destination. Hence, since it was inscribed in 2007, Langkawi UGGp never looked back except in aiming for a better balance between environment and development. Many thanks to the UNESCO Global Geopark Council (UGGpC), for since 2007, it had continuously gave Langkawi UGGp valuable advices, particularly through its highly respected geopark assessors during each of the past revalidation missions. By internalizing these advices, Langkawi UGGp is now a much better geopark than it was twelve years ago. Overwhelming number of high quality geopark activities and increasing number of Geopark Partners, Ambassadors and Products in the last few years are best testimony to this. The expansion of Langkawi UGGp Partners and Ambassadors Programmes gives a strong indication about a brighter future for the geopark.

During the last revalidation mission in 2015, Langkawi UGGp also received more ideas on further improving the quality of geopark environment and its activities. Since then a lot of activities was carried out systematically in ratifying all of the UGGpC recommendations. Most of these measures were already at final stages by the end of the year 2018, when Langkawi UGGp submitted its application for its third UGGp revalidation this year.

Year 2018 could be a critical turning point for Malaysia in general, and for Langkawi and its UGGp Programme in particular. Gladly for us, the first ever changes in Malaysian Government after over sixty years went on smoothly and



peacefully. In the new government structure, LADA was transferred from the Ministry of Finance to the Prime Minister's Department. This means that LADA will receive special attention directly from the Prime Minister, who happens to be the Langkawi Member of Parliament.

Under the new LADA structure, Langkawi UGGp Management Office proceeded with final preparations for its third revalidation exercise. Efforts were focussed on production of new geopark map, info panels, directive panels, website, and Langkawi Geopark Discovery Centre. The revalidation roadshow continues with Dialogues on Geopark-based Business, Langkawi UGGp Fossil Day and Earth Day. We are happy to report that Langkawi UGGp is still receiving new Partners, Ambassadors and Products. Langkawi was also managed to host its annual international event including the Langkawi International Maritime & Aerospace Exhibition (LIMA 2019), the Royal Langkawi International Regatta, Le Tour de Langkawi, RHB Langkawi Ride and Aktion Tuba Trail Run which all promoted Langkawi UGGp to the international participants and audiences. More events will be hosted by Langkawi UGGp and Partners during the second half of this year to promote Langkawi UGGp to the world.

LADA and Langkawi UGGp are much indebted to every individuals and institutions that have given their full supports and commitments in ensuring all events being successfully executed and in keeping Langkawi the best ever place to live. Langkawi UGGp and LADA appreciate continuous supports from all stakeholders in protecting Langkawi's priceless natural heritage that we all borrow from our future descendant.

MESSAGE

Prof. Emeritus Dato' Dr Ibrahim Komoo

Advisor of Langkawi UGGp



Greetings from the Langkawi UGGp.

I would like to congratulate LADA, its Langkawi Geopark Division, Geopark partners and Ambassadors for their tireless efforts in making Langkawi UGGp an enviable and one of the most respected geoparks in the world. Being located on a remote island, far away from the federal and state administrative capitals, sustaining a sustainable development in this UGGp is not an easy task at all. Special praise is due for the Langkawi Geopark Division of LADA for being very persevering in handling challenging tasks to improve the quality of environment and quality of life in Langkawi UGGp not just for the last period of in between revalidation but ever since Langkawi became Global Geopark in 2007.

The key to their successful endeavour is the smart partnership concept and the blue ocean strategy exercised between Langkawi UGGp through LADA and the various federal and state government agencies, industry players and community leaders. Also deserving highest complements are the highly devoted Geopark Partners, Geopark Ambassadors and Geopark Advisors who have pulled their own resources in various ways in helping Langkawi UGGp achieving its targeted objectives. Not to forget those individuals and organizations which are not in the list of any Langkawi UGGp esteem supporters but are as equally important in sustainably exercising their daily activities in line with the UNESCO objectives on sustainable development.

All these geopark development projects and activities are implemented by LADA and its associated stakeholders under the close guidance of four very important geopark committees i.e. the Technical, Development, Promotion and Marketing, and Conservation Committees all of which are closely supervised by the Langkawi Geopark Advisory Council chaired by the Chief Minister of Kedah. This is to ensure that objectives of these projects and activities are in line with Langkawi's endeavour towards fulfilling UGGp vision in territorial sustainable development.

Geopark is not merely about 'brand of tourism products', it is about how local community and stakeholders showcasing that they are able to develop their territory in the best sustainable manner in order to achieve the Sustainable Development Goals. For Langkawi UGGp every single members of local community, tourism players, entrepreneurs, scientists, federal and local government agencies, NGOs and tourists have their own roles and responsibilities to make Langkawi one of the best geopark in the world.

Today, we are very proud of Langkawi UGGp's role in spearheading geopark initiatives not only in Malaysia, but also throughout the whole Asia Pacific region. As the host of the Asia Pacific Geopark Network (APGN) Secretariat for a period between 2009 and 2018, Langkawi UGGp has become a regional training centre for geopark development. While handling series of Regional Courses on Geopark Development, Langkawi has the opportunity to showcase sustainable development practices in the island.

I believed the new management of LADA can propel Langkawi further to achieve its noble sustainable development goal, thus Langkawi UGGp can stand proud as the leading UNESCO Global Geopark.

PREFACE

Azmil Munif Mohd Bukhari

Langkawi UGGp Manager

Greetings from Langkawi UGGp Office.

Warmest welcome to all of our distinguished readers. This is a special issues for Langkawi UNESCO Global Geopark Gazette, dedicated for the upcoming UNESCO Global Geopark (UGGp) revalidation exercise. Each time an existing UGGp undergoing its four years revalidation the elected geopark experts will come out with fresh recommendations aimed at improving geopark services for the geopark's natural ecosystems, local communities, and visitors at large. Langkawi UGGp is not exceptional. We valued any recommendations for the betterment of our prestige geopark.

Langkawi UGGp have taken proactive approaches in addressing some of the issues raised by expert evaluators during the 2015 revalidation mission before receiving the actual recommendations by the UGGp Council along with its prestigious Green Card. Several big projects were planned including the production of this online magazine. This Langkawi UGGp Gazette Issue #3 highlights solutions to some of these recommendations, organizes in different columns with *Facts & Figures* alerting readers on important facts about Langkawi UGGp.

The Langkawi story column features three important articles. The articles on awareness and conservation, highlight linkages between geological foundation—biological ecosystem—human culture and showcase roles played by some Langkawi UGGp Partners. Meanwhile, article on advocating geopark summarizes on Langkawi UGGp most important programmes, i.e. Langkawi UGGp Partners, Ambassadors, and Products that promote the best of Langkawi UGGp to the world.

The following columns on iconic geosites and geo conservation deal further with geo-bio-culture links, heritage conservation as well as roles played by various stakeholders including CSR contribution by Langkawi's only cement factory. The Kubang Badak BioGeoTrail is an example of Langkawi UGGp's best planned geopark trail involving the



Langkawi UGGp, geopark *SiFus* and local community.

Profiles of Jeju Island UGGp and aspiring Jerai Geopark and networking activities are highlighted in Networking column. Three more geopark ambassadors and three more partners are highlighted in their respective columns. The latter include special acknowledgement for the Langkawi Research Centre (PPL), the crucial think thank since the making of Langkawi UGGp; Frangipani Resorts & Spa, the Green Practice champion and; Umgawa, the King of the Jungle Adventure.

In the final column we highlights Langkawi UGGp events into several sub-columns, i.e. community, recreation and promotion. While Langkawi UGGp proudly hosting LIMA 2019, biggest international events held in Malaysia this year, perhaps the even bigger event for Langkawi UGGp is the signing in of its new leader, the new LADA CEO Dr Ahmad Hezri Adnan. Among new events organized by Langkawi UGGp in 2019 include Fossil Day and Earth Day which seems to have amazed huge crowd of local Langkawians. Last but not least is a page on promotion of our new Geopark Discovery Centre.

On behalf of Langkawi UGGp we sincerely hope that our distinguished readers would enjoy reading this magazine. Feel free to contact us should you need any further information about Langkawi UGGp.

C ONTENT



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P

ublic Awareness on Langkawi UGGp

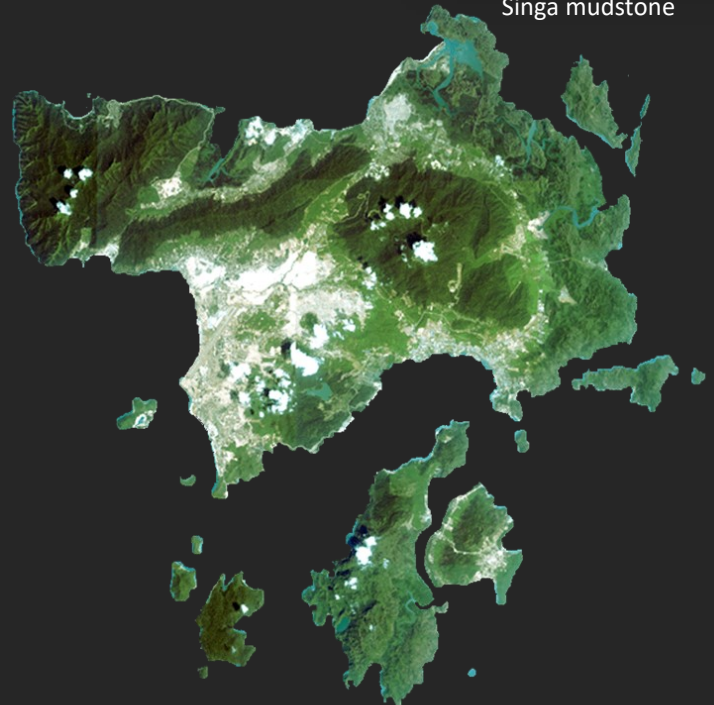
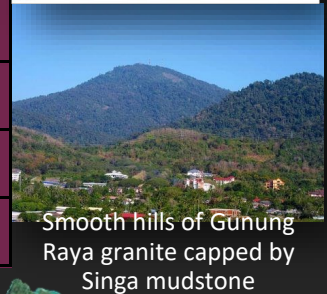
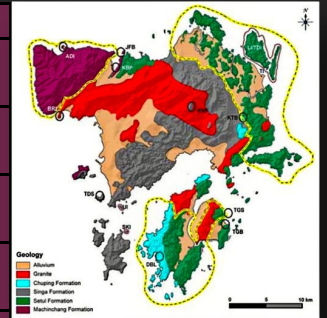
In order to become a UNESCO Global Geopark (UGGp), a particular area must possess geological heritage of international value. As for Langkawi UGGp, no one will ever doubt about the completeness of its Palaeozoic sedimentary rock sequence, its dynamic geological evolution and its unique island karst landscape. Together, all its different types of rocks, fossils, structures, landforms and landscape composed an amazing geological history book of Langkawi for over 500 million years period of the Phanerozoic Eon.

The long winding geological history of Langkawi is not a complicated scientific tale beyond general public imagination. Actually, the geological landscape (living environment) of Langkawi today strongly reflects chemical weathering against different types of minerals and rocks under prevailing humid tropical climate:

- Weathering on weak minerals within Gunung Raya Granite and shale of Singa Formation formed thick soils, supporting dense vegetation cover on smooth undulating hills with gentle slopes.
- Non-reactive quartz rich sandstone of Machinchang Formation created barren mountains with crested ridges without much soils on top, hence covered by sparse stunted vegetation
- For limestone and marble of Setul and Chuping Formations, the top surface underwent dissolution forming barren karst peaks, hence only suitable for rare and endemic flora. Dissolution within rock fractures formed caves, subsurface tunnels. Collapsed caves form dolina and karst lakes.

6 rock formations underwent various geological processes through 8 geological periods gave us the 99 islands of Langkawi, the jewel of Kedah.

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4	Common rock types
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7	>1km long sandy beach
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Landsat image showing different landforms that reflect the different geological background (see geological map above)



Barren ridges of Machinchang sandstone behind Sawar granite



Undulating hills of Singa shale behind karst of Setul limestone

“promote the link between geological heritage and all other aspects of the area’s natural and cultural heritage, clearly demonstrating that geodiversity is the foundation of all ecosystems and the basis of human interaction with the landscape” ...UNESCO GGP

Geo – Bio – Man

Through million years of **natural processes**, rocks of different ages were naturally segregated to produce the overall **geological landscape** of Langkawi UGGp. Different rock formations did not just portrayed its distinctive geological landscape, but also different **ecosystems** and **forest types**. Langkawi Geopark is an ideal place where one can easily demonstrate the fact that **geodiversity** is indeed the real **foundation of ecosystems** in which we live.

This phenomenon became fundamental in the old days when all myths of Langkawi were narrated. Though geology was totally alien to them, almost all characters in **Langkawi old folk’s myth** seemed to have reflected the different characters or geodiversity as well as its distinctive ecosystems. Hence, learning about geology of Langkawi could be a very exciting and enjoyable journey for the experts as well as the beginners.



Kilim Karst Geoforest Park—3 elements of geopark
(geo + bio + culture)

Geopark Education & Awareness Programme

It is the responsibility of each UNESCO Global Geoparks member to communicate the sciences of its priceless geoheritage assets to various walk of life in most effective ways. This will enhance public awareness on crucial links between geoheritage resources and other natural and cultural heritage in order to showcase the identity of the geopark and to strengthen the pride and sense of belonging among the local community. This will need in depth research and effective outreaching programs.

“Education at all levels is at the core of the UGGp concept. From university researchers to local community groups, UGGp encourage awareness on the story of the planet as read in the rocks, landscape and ongoing geological processes”

..... UNESCO Global Geoparks

In achieving these objectives the Langkawi Geopark Office have collaborated well with various agencies and stakeholders in Langkawi, each of which played their own roles under one **blue ocean strategy**. Langkawi Research Centre and Langkawi District Education Office are two most active partners of Langkawi UGGp in addressing this issue.

- **Langkawi Research Centre (PPL)**

Langkawi Research Centre or Pusat Penyelidikan Langkawi (PPL) is the pillar for geopark research and education in Langkawi. PPL conduct regular research, scientific expeditions, seminars, short courses, workshops, trainings, and lectures for various stakeholders on geopark development concepts as well as on the uniqueness of Langkawi UGGp. PPL Gallery is one of the most popular one stop education centre for promoting Langkawi the general public.



Scientific Expedition organised to gather more information on geology, biology, archaeology and socio-economy.



Field visit during workshop and training

Public awareness on Langkawi UGGp had gained its desirable momentum and will continue towards a higher level, thanks to tireless efforts by highly responsible stakeholders.



Students learning to observe geological features in the field



The first Langkawi UGGp Infocentre



One of the geosite map

♦ Geopark Information Centres

Essential information on Langkawi UGGp are exhibited at several venues in order to educate the public through various audio visual media. Three main information centres for Langkawi UGGp are the **Langkawi Geopark Discovery Centre** at Kilim Village, **Langkawi Geopark Infocentre** at Oriental Village and **PPL Gallery** at Pantai Kok. Apart from these galleries, comprehensive information on Langkawi UGGp are also displayed at LADA Building in Kuah as well as at several premises belonged to Langkawi UGGp partners.

Further educational materials can be observed on panels erected at all geosites, biosites and cultural heritage sites. Education brochures and leaflets on Langkawi UGGp are made available at important port of entrance to Langkawi as well as inside various premises belong to geopark partners and tourism companies. Online information are available through website at <https://langkawigeopark.com.my>, <https://www.lada.gov.my>, <https://www.unesco.org> and media of Langkawi UGGp Partners.

♦ Geopark clubs and schools

Especially for the locals, education and awareness on Langkawi UGGp were enhanced by the Geopark School and Geopark Community Program. Geopark Clubs have been established at several schools as a

medium to disseminate information and as centre for geopark activities. Most of the activities were organized together with Geopark Division of Langkawi Development Authority (LADA) and PPL. Geopark education modules were prepared for different level of students by LADA and PPL with the helps from keen teachers.

♦ Friends of Langkawi Geoparks (FLAG)

FLAG is one of the most active NGO formed in Langkawi UGGp in order to increase awareness on geopark among local community. FLAG is highly responsible in spreading geopark activities and awareness to the community of Pulau Tuba and Pulau Dayang Bunting. FLAG and its associates such as **trash heroes** and **geo-volunteers** also indirectly creating awareness on the importance of healthy living environment within geopark via their volunteer activities in keeping Langkawi clean.

♦ Langkawi Development Authority (LADA)

LADA usually incorporated a special session on geopark education during their various annual events to enable the visitors and the general public to learn more about Langkawi UGGp. In addition, LADA supports most of the activities on geopark education and awareness organized by Langkawi Geopark Partners.

LANGKAWI

Pantai Teluk Datai

MACHINCHANG CAMBRIAN GEOFOREST PARK (4,274 ha)

The Machinchang mountain range forms a spectacular landscape comprised predominantly of sedimentary sandstone and granite. These Cambrian rock formations are estimated to be over 550 million years old—among the oldest on Earth. It is also home to probably the oldest rainforest on the planet. In addition to numerous mountain trails, Mt. Machinchang can be accessed by the famous SkyCab, one of the longest and steepest free-span cable car rides in Southeast Asia.



Meet Trilobite, our official Langkawi UNESCO Global Geopark mascot! He is a fossil marine arthropod which was abundant during the Paleozoic Era, which goes back over 550 million years. He is therefore quite an appropriate mascot, and a superb guide to Langkawi UNESCO Global Geopark, where many of the geosite highlights date to that era and beyond. His top part is a carapace or hard crustacean upper shell, while the lower part is divided longitudinally into three lobes (hence, 'tri-' and 'lobite').

TRILOBITE'S GREATEST HITS

1. Unique Tropical Karst Island

Ever since the emergence of Langkawi island resulting from geologic uplift, there has been a slow but steady process of dissolution, carving the limestone rocks to create karstic formations unique to Langkawi's tropical island environment. These formations take various forms, from limestone pinnacles to sea stacks and sea arches, all of which are prevalent within Kilim Karst Geoforest Park.

2. Dropstones One Billion Years Old

Isolated rock fragments called dropstones, along with cold water fossils, were scooped up and transported by a glacier, eventually to be deposited in Langkawi's Singa Formation over 300 million years ago in the Permian period suggesting that Langkawi island was part of the ancient supercontinent Gondwanaland. Some of these dropstones are estimated to be one billion years old.

3. Oldest Rock Formation in Southeast Asia

The delicate sandstones which formed 550 million years ago during the Cambrian Period of the Paleozoic Era, and now make up the Machinchang mountain range, comprise the oldest rock formation in Southeast Asia—over half a billion years old.

4. Part of an Ancient Supercontinent

Despite its small land area, Langkawi boasts a complete geologic sequence stretching back over 550 million years; strong evidence to support the theory that the region was part of the ancient supercontinent of Gondwanaland that existed during the Paleozoic Era.

5. Meteorite Impact Crater

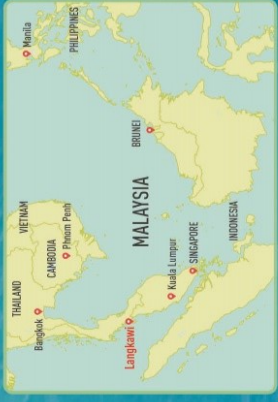
A large horseshoe-shaped ridge structure known as "Maksum's Ring" situated in the central part of Langkawi Island is evidence of a meteorite impact. It is believed to be the remnant of a round-shaped meteorite with a diameter of approximately 1.5km.

KILIM KARST GEOFOREST PARK (4,354 ha)

Explore a pristine wonderland of karst (limestone) formations—pinnacles, cliffs, outcrops and caves—in a rich mangrove network of rivers and mudflats. Discover ancient fossil beds, abundant marine life, and the home of the island's famous sea eagles and heronmy fites.

DAYANG BUNTING MARBLE GEOFOREST PARK (8,261 ha)

Located five minutes by boat from the main island, Dayang Bunting, or 'Island of the Pregnant Maiden', is the archipelago's second largest, and whose most prominent feature is a large freshwater lake surrounded by thickly forested hills. It's suggestive outline inspired the island's name. The park is home to some of the finest Permian marble formations in the world.



GEOsites

- 01. Doral Anticline
- 02. Pasir Tengkorak Cross-Bedding
- 03. Pulau Jemuruk Cambrian Fossil
- 04. Machinchang Peak
- 05. Tanjung Chinchin Dip Slope
- 06. Temurun Waterfall
- 07. Bukit Pihang Cave
- 08. Pulau Langgun Limestone
- 09. Tanjung Gending Sea-Notch
- 10. Pulau Anak Thut Fossil
- 11. Kelawan Cave
- 12. Kilim Pinnacle
- 13. Bukit Kesiti Fold
- 14. Wang Buluh Cave
- 15. Teluk Berembang Beach
- 16. Tanjung Rhu Karst
- 17. Tanjung Muli Dropstones
- 18. Pulau Teger Dropstone
- 19. Pulau Ulu Arenalment Platform
- 20. Pulau Singa Kechil Plateau
- 21. Sungai Iru Branching Fossils
- 22. Batu Ash Branching Fossils
- 23. Pulau Beak Red Beds
- 24. Gunung Raya Reef Platform
- 25. Ujung Buih Remnant Islands
- 26. Ujung Bunting Dolina
- 27. Pasir Doyang Cave
- 28. Pulau Jong Fossils
- 29. Ujung Bunting Marble
- 30. Telaga Tohu Waterfall
- 31. Pulau Tuba Sill
- 32. Gunung Raya Granite
- 33. Teluk Yu Granite Tor
- 34. Wang Bumbun Scar
- 35. Kicap Fault, Belanga Perchah
- 36. Ayer Kengat Hot Spring
- 37. Teluk Air Tuan Thrust Fault
- 38. Ulu Melaka Mahauri's Ring
- 39. Bungle Remnant Islands

BIOsites

- B1. Gunung Raya
- B4. Telaga Tohu
- B7. Air Terjun Temurun
- B8. Gua Kelawan
- B3. Lukut Semilang
- B5. Pulau Singa Besar
- B6. Sungai Kilim/Kicap
- B9. Teluk Datai

Attractions

- A1. SkyCab & SkyBridge
- A2. Bataan Lang
- A3. Ayer Hanga Village
- A4. Laman Padi
- A5. Timan Lagenda
- A6. Royal Langkawi Yacht Club
- A7. Resorts World Langkawi
- A8. Ribab Marina
- A9. Telaga Harbour
- A10. Pantai Teluk Datai
- A11. Pantai Bunting Rhu
- A12. Pantai Buegh
- A13. Pantai Cenang
- A14. Pantai Kok
- A15. Pantai Lagenda
- A16. Air Terjun Durian Peraing
- A17. Kompleks Kral
- A18. MARO Agro Technology Park
- A19. Crocodile Adventureland
- A20. Langkawi Wildlife Park
- A21. Underwater World Langkawi
- A22. Braga Terbakir
- A23. Makam Mahauri
- A24. Masjid Al-Hana

Heritage Conservation in Langkawi UGGp

"UNESCO Global Geoparks require a management plan, agreed upon by all the partners, that provides for the social and economic needs of the local populations, protects the landscape in which they live and conserves their cultural identity" UNESCO Global Geopark

Figures	Facts
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5	Eco-forest Park—Telaga Tujuh, Temurun, Pantai Pasir Tengkorak, Gua Cherita, Dayang Bunting
38	Geosites
10	Biosites
4	Cultural Sites

Geopark is not just about rocks

Geopark is a unique development concept that celebrates, protects and enriches its precious native heritage resources in terms of geological, biological, culture and traditions. Langkawi UGGp is working successfully with relevant federal and state government agencies, keen private sectors and local communities in implementing various legal instruments in order to protect Langkawi's precious heritage as well as its natural environment.

Protection of Geosites

Langkawi UGGp was established on the basis of its geological features of international value. There are 38 important geosites throughout the 99 islands. Most of these geosites are located within the Kedah State's Protected Forest Reserve (PFR), hence were protected under the Forestry Act 1984 (Act 313) together with flora and fauna within the forest. These geosites are managed by the Forestry Department of Peninsular Malaysia, but some of them have been entrusted to LADA subsidiary companies to manage, e.g. LADA Eco Sdn. Bhd. is managing the Tasik Dayang Bunting Geosite, while Panorama Langkawi Sdn Bhd is taking care of Machinchang Peak Geosite. Those geosites located outside of the PFR are protected by Langkawi Municipal Council or

land owners in support for the development of Langkawi UGGp. In most cases, LADA is responsible in providing some basic infrastructures leading to and within these geosites.

Geoforest Parks. Langkawi Island popularized its geoforest park concept in 2005, where rocks are predominantly exposed within the PFR. With this concept Forestry Department of Peninsular Malaysia are paying more attention in protecting geological resources within the forest regardless of their heritage value, compared to geological resources in other PFR which sometimes are targeted for production. Since then, more extensive research on geological heritage were focus into the three geoforest parks of Langkawi, i.e. the Kilim Karst, Machinchang Cambrian and Dayang Bunting Marble. As the result, more geosites were recognized and established within these Geoforest Parks. As part of the geopark concept on geotourism, tourist are allowed to visit some of these geosites with assistance of tour guide.



Protection of fossil site (top left) and pinnacles (bottom) within Kilim Geoforest Park and Pasir Tengkorak rock geosite (top right).

Protection of Biological Sites

As part of the **world 12 mega-diversity region**, Langkawi UGGp is well-endowed with rich and diverse tropical flora and fauna both terrestrial as well as aquatic. As major part of the island belong to the state PFR, Langkawi flora and fauna are subjected to protections under the similar forestry act. There are a total of 16 PFR within Langkawi Islands. The highlights of forest protection in Langkawi Islands is definitely about its precious mangrove forest ecosystem, particularly for protection against tsunami and coastal erosion as well as for the breeding sites for several marine fishes.

Kubang Badak BioGeoTrail. While the Kilim and Dayang Bunting mangrove forests are protected within

the Kilim Karst and Dayang Bunting Marble Geoforest Parks, the Kubang Badak mangrove does not belong to any geoforest park. Recent effort by LADA, PPL, and Koperasi Nelayan Sungai Kubang Badak Langkawi Bhd in protecting this small isolated mangrove forest has changed the area into a new geotourism attraction. It is promoted as the Kubang Badak Biogeotrail, incorporating the mangrove ecosystem, several geosites as well as cultural sites.

Meanwhile, rich marine fauna and flora around the Pulau Payar are protected under Fishery Act 1985 (Act 317) as **Pulau Payar Marine Park**.



Preserving a traditional house



Enriching intangible culture heritage



Protecting life within mangrove biosites

Protection of Cultural Sites

Efforts in conserving native cultures and traditions are headed by the Kedah State Art and Cultural Department with supports from Langkawi Municipal Council and LADA. Local artist associations, PPL and NGOs have identified local cultures and traditions to be nurtured and celebrated.

Traditional villages of Padang Matsirat and Kota Mahsuri are the two most well known historical sites in Langkawi. Efforts have also been given to promote several traditional fishing villages such as Kampung Kilim, Kuala Triang and Teluk Tuba for the purpose of ecotourism and protecting the culture.

Laman Padi. Apart from enriching fishing traditions in Langkawi, perhaps efforts in promoting traditional

paddy farming such as that of Laman Padi is worth notifying. Whereas many former paddy fields have now been turned into commercial lands, LADA have taken an unusual initiative to promote traditional paddy farming at the Laman Padi for the purpose of ecotourism.

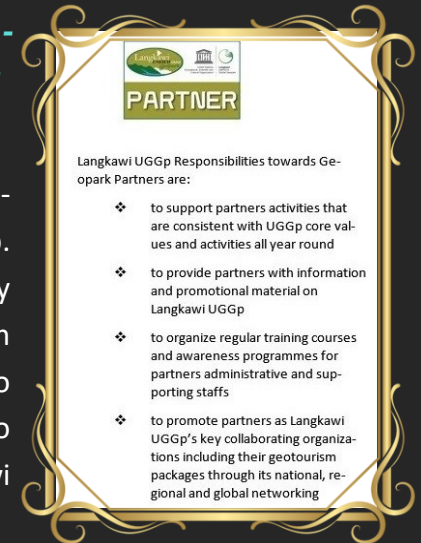


Tranquillity in traditional paddy field conservation showcase at Laman Padi

A dvocating Geopark

“Their bottom-up approach of combining conservation with sustainable development while involving local communities is becoming increasingly popular”UNESCO Global Geoparks

Years after years, senses of pride and belonging to the priceless UNESCO Global Geopark marque grew stronger among the inhabitants of Langkawi UGGp. Today, a growing number of establishments and individuals have eagerly came forward to support and promote geopark brand and to cooperate with the authority towards making Langkawi a better global geoparks. As a way to appreciate these endeavor, it is an honor to the Langkawi UGGp office to award selected local establishments, individuals and products as Langkawi UGGp’s esteem Partners, Ambassadors and Products.



Geopark Partners

Langkawi Geopark Partners are key players in supporting Langkawi UGGp’s efforts towards sustainability of its natural and cultural environment as well as the well-being of the community, and most importantly in promoting all the UNESCO Global Geopark core values to the tourists. They are pivotal in enhancing UNESCO Global Geopark image through Langkawi in their own ways within their own capacities within Langkawi UGGp domestic network. The success of this network is crucial in further propelling Langkawi UGGp towards the prime geopark in the country, the region and the world.

Langkawi UGGp Partners comes from broad sectors, but in general they can be classified into Service Providers, Tourism Operators, and NGOs.

Service providers are responsible in providing geopark educational, promotional and supporting geopark activities to enhance the visibility of Langkawi UGGp within their premises and network. Tourism operators are responsible in promoting geopark friendly activities with nature educational approach. NGOs are responsible in watching their respective members to promote sustainable tourism and environment within Langkawi UGGp. One thing they share is a duty to sell Langkawi as the best tourism destination in the world.

Roles and responsibilities of Langkawi UGGp and its partners have been drawn as a strong binder between them in order to ensure that Langkawi will always be the best UNESCO Global Geoparks.



Geopark Discovery Centre at the Four Seasons Resort



Langkawi Geopark Model at the Andaman Resort



1



4



2



3

Services and facilities provided by various Langkawi UGGp Partners:

	Partner	Info	Guide	Trail	Cons	Others
1	Langkawi Research Centre (LRC)	✓	✓	✓	✓	Training
2	District Education Office	✓	✓	✓		Training
3	Four Season Resort	✓	✓		✓	
4	The Andaman Resort	✓	✓	✓	✓	Training
5	Frangipani Resort	✓	✓	✓	✓	Training
6	Langkawi Craft Complex	✓				Training
7	Malaysia Airlines (MAS)	✓				
8	Pak Malau Nasi Dagang	✓	✓			
9	Lafarge Holcim	✓		✓	✓	
10	LADA Eco Tourism	✓	✓	✓	✓	
11	Panorama Langkawi	✓	✓	✓	✓	
12	Kilim Village Community Cooperative	✓	✓	✓	✓	
13	Underwater World	✓				
14	Wildlife Park	✓				
15	Langkawi Crocodile Farm	✓				
16	Tropical Charters	✓	✓			
17	NAAM Sdn Bhd	✓	✓			
18	Umgawa Legendary	✓	✓	✓	✓	
19	Friends of Langkawi Geopark (FLAG)	✓	✓	✓	✓	Volunteers
20	Langkawi Tourist Guide Assoc (LTGA)	✓	✓			Volunteers
21	Trash Hero Langkawi				✓	Volunteers
22	Langkawi Tourism Association	✓	✓			
23	Kubang Badak Fishing Village Community	✓			✓	volunteers
24	Selat Bagan Nyior Village JKKK	✓	✓	✓		volunteers



Service Providers



Tourism Operators



NGOs



17



16



10



15



23



6



8



13



11

Geopark Ambassadors

Langkawi UGGp Ambassadors are outstanding public figures who strongly believed in and advocated to promoting Geopark concept. They use their special position within the community to raise public awareness and to create good image for the Langkawi UGGp. They are highly knowledgeable, experienced and creative nature lovers who are very committed to Langkawi UGGp programs. As for now, Langkawi UGGp is proud to have 22 public figures as members of its Geopark Ambassador Programme.

1	Mdm. Norini Awang <i>Teacher, social activist</i>	Principal, Mahsuri Secondary School - pioneering Langkawi green school
2	Mr. Sabri Musa <i>Social activist</i>	Head, Kubang Badak Fisherman Cooperative - developing the Kubang Badak Biogeotrail
3	Mr. Rusamizal Ghazali <i>Social activist</i>	Head, Kubang Badak Tourism Cooperative - developing the Kubang Badak Biogeotrail
4	Mr. Teh Cheng Chye <i>Social activist</i>	Former Principal, Tunku Putra Secondary School - pioneering Langkawi Geopark School
5	Mr. Husin Mohd Said <i>Social activist</i>	President, Rotary Club Langkawi - pioneering jet ski learning adventure
6	Mr. Mehad Daud (Paksu) <i>Social activist</i>	Fish farmer - promoting local fish farming activities
7	Dr. Ghani Husin (the late) <i>Social activist</i>	Medical Doctor - promoting local traditional medicine
8	Mr. Irsyad Mobarak <i>Naturalist</i>	Resident Naturalist, The Datai Resort - fauna specialist, Malaysian #1 tour guide
9	Mr. Anthony Wong <i>Naturalist, Social activist</i>	Managing Director, Frangipani Resort & Spa - pioneering green hotel
10	Mdm. Sufina Halim <i>Teacher, social activist</i>	Mahsuri Secondary School & Langkawi FM - airing geopark for public education
11	Mr. Othman Ayeb <i>Naturalist, social activist</i>	President, Langkawi Tourist Guide Association - fauna specialist, Snake King, martial art Master
12	Mdm. Fuziah Mohamed <i>Social activist</i>	Secretary, Langkawi Tourist Guide Association - educating tour guides
13	Mdm. Indara Rahayu <i>Naturalist, social activist</i>	Georimbawi Tours - fauna specialist, Malaysian Snake Queen
14	Mr. Aidi Abdullah <i>Naturalist</i>	Resident Naturalist, Four Season Resort - mangrove specialist
15	Mr. Jamaludin Hashim <i>Social activist</i>	Operator, Pak Malau Restaurant - promoting Mahsuri Ring and Langkawi legends
16	Pak Omar Ariffin <i>Social activist</i>	Former Head, Kilim Village Fisherman Cooperative - 1st community leader supporting geopark
17	Mr. Mohd Nasarudin Ibrahim <i>Naturalist</i>	Tour Guide -speaking 4 languages
18	Mr. Khairuddin Abdul Hamid <i>Social activist</i>	Secretary, Langkawi Artist & Visual Art Association - promoting nature of Langkawi through art
19	Mr. Imran Ismail <i>Social activist</i>	Manager, Kilim Jetty - promoting Kilim Karst Geoforest Park
20	Mdm. Norazlina Ahmad <i>Social activist</i>	Founder, Geo Cookies - pioneering cookies with Langkawi image
21	Mr. Razmi Rahmat <i>Social activist</i>	General Manager, Adya Hotel - President, Malaysian Association Hotels Kedah
22	Mr. Ammar Qanwa Mokhtar <i>Teacher</i>	Religion Teacher, Kelibang Primary School - pioneering Boys Scout Geopark Camp



Geopark Product

While most local peoples are involved directly in Langkawi tourism industries, there are a few who ventured into products that can be associated closely with Langkawi Geopark. Langkawi UGGp Products are acknowledged quality products that promote the identity of Langkawi. They are either originated or genuinely made in Langkawi or using local material or ingredients.

Langkawi UGGp promotes these products internationally through Global Geopark Network and continuously encourages local communities to get involved in supporting these products and innovating into new better quality local products. This will greatly boost the sense of belonging among local entrepreneurs while proliferating local cottage industries especially in penetrating the regional and international market.

Company	Products
Fiqaazlina Enterprise	Geocookies
Raha Zara Enterprise	Gamat Chocolate Chip Biscuit
Fabillah Marble	Granite Marble Craft
Faizy Crystal Glass Blowing	Langkawi Crystal
Datai valley	Virgin Coconut Oil & Soap
Twopai Craft	Tempurung Craft
Canai Intan Legacy	Traditional Coffe Pot



Among well known Langkawi Geopark Products are Langkawi Crystal (above) and Geocookies (below)

Geopark Advisory Board

Langkawi UGGp is a very special program in Malaysia, especially in Kedah State. The active involvement of the highest officers in both state and Federal Governments ensure every stakeholders are committed towards this program. Among highly influential personnel within the Advisory Board of Langkawi UGGp include its:

Royal Patron:

Her Royal Highness Tunku Temenggong Kedah Dato' Seri Diraja Tan Sri Tunku Puteri Intan Safinaz binti Almarhum Sultan Abdul Halim, Princess of Kedah State had proudly accepted her role as the Royal Patron of Langkawi UGGp ever since it was established in 2006.

Chair Persons:

Chief Minister of Kedah State and Minister of Finance were elected as Chairpersons of the LADA to ensure smooth planning and continuous funding for the geopark since 2006 to 2018. Since 2019, only the Chief Minister of Kedah State hold the post as LADA is no longer under the jurisdiction of Ministry of Finance.



Advisor:

The appointment of the Emeritus Professor Dato Dr Ibrahim Komoo (the GGN Vice President) as its advisor since 2006, is a great bonus to the Langkawi UGGp as he is a very influential figure within the structure of the UNESCO Global Geopark.

Apart from them, the appointment of the CEO of LADA as the Langkawi UGGp *Coordination Committee Chairperson* and the Director of LESTARI UKM as the *Scientific Committee Chairperson* are also very important in order to balance between development and environmental conservation.

Facts	Figures
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Langkawi UGGp Products	7

Telaga Tujuh

Experience being 340 million years apart

One of Langkawi's top natural attractions, the Seven Wells or **Telaga Tujuh Waterfall** is a scenic series of natural rock pools set atop a towering 91 meter waterfall flowing to the Kok Beach on the southern foot of Machinchang Range seen elegantly along Machinchang Cable car ride as well as from the UMGAWA zipline ride.

The waterfall flows on Triassic (~210 million years old) granite. The waterfall was named after seven large potholes developed on the upper plateau of the waterfall forming seven natural wells. These wells are mostly sub-circular in shape, ranged in diameter from 2 to 5 meters across and depth from 0.5 to 3.5 meters formed by grinding stones. After every heavy rain, fast flowing river formed whirlpool as it passed through the pool causing

Figures	Facts
638	Steps to the top plateau
91	Height of waterfall (in meters)
7	Fairies wells (or potholes)
3.5	Depth of Telaga Biru (in meters)

trapped large rocks spinning and grinding the bottom of the pool.

At the foot of the waterfall there are several larger natural pools to be enjoyed

by those who cannot climb 638 staircases to the top of the waterfall. These pools are formed by the hydraulic energy from the waterfall with little help from grinding stone as well.

Enchanting wells! or Gorgeous waterfalls!

What if we can step a foot on 550 million years old rocks and the other on 210 million years old rocks?

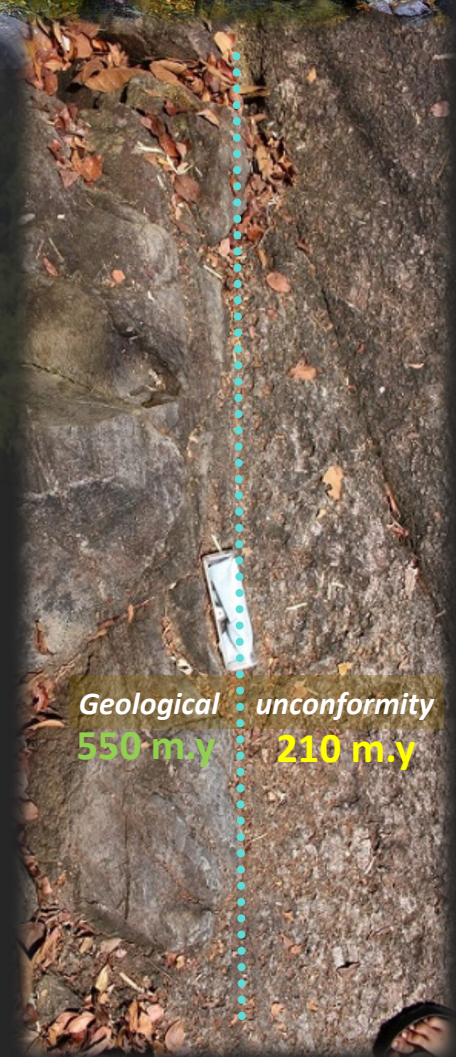
Amazingly, at the bottom of the waterfall there is a clear line separating the 550 m.y. quartzite of Machinchang Formation in the west and the 210 m.y. granite of Sawar that make the foundation of



Telaga tujuh waterfall

the potholes and waterfall. This feature is called a **contact boundary** and since there are a huge age gap between the two different rocks, then it is called an **unconformable contact boundary** or more popularly known as an **UNCONFORMITY**.

This is a very special geosite where the oldest rocks and youngest rocks of Langkawi sit side by side. **Some 210 million years ago** during the formation of Peninsular Malaysia a large body of hot magma from underneath Langkawi making its way up and intruding, not just one rock formation but all of the older rock formations in Langkawi. Interestingly, the different contact boundaries did not occur together, and this strongly indicated that the magma was segregated into smaller magma chambers probably following the ancient fault lines.



Contrasting Forest and Geology

Deep tropical weathering on Sawar Granite formed very thick soils hence could support extremely large rainforest trees as we can observe all along the trail up to the top of the waterfall. Among common trees are *Dipterocarpus*, *Shorea*, *Koompassia* and *Mesua*.

On the other hand, Machinchang sandstone is rather resistant against tropical weathering hence did not produced thick soils to support large trees.

The different vegetation profile at Telaga Tujuh is clearly a manifestation of its bedrocks or geological foundation. As a results, more larger fauna would also prefers to live within thicker and denser forest of granitic soil. Among wildlife encountered are macaques, wild boar, giant squirrels and hornbills.

Myth and geology

As for today, nobody really lives within the vicinity of the waterfall because it is located fairly deep within the Machinchang Forest Reserve. Perhaps in old days there were peoples living in the jungle to observe the unique phenomenon of the waterfall and potholes. The number seven is very significant in Malaysian folklore as there are many other places in the country which were related to seven wells, seven falls, seven mountains etc.

For the Langkawi folk, Telaga Tujuh Waterfalls was believed to be a secret garden for seven beautiful fairies who always come down to enjoy themselves bathing in seven beautiful crystal clear water pools. One day a local prince found this secret garden. He was keen to get to know and hope to marry one of them. Upon knowing that their secret garden was already known to earthling the fairies fled away to search for other secret garden elsewhere.

Geosites	Figures (m.y.)	Facts (age different between granite and its host rocks)
Telaga Tujuh	340	quartzite (Machinchang Fm)
Penarak; Teluk Ewa	270	marble (Setul Formation)
Gunung Raya	80	hornfels (Singa Formation)
P. Dayang Bunting	40	marble (Chuping Formation)

Telaga Tujuh Waterfall from aerial view



Telaga Tujuh upper plateau



Telaga Biru—the deepest of the seven potholes



Interestingly, people in the past are already mesmerized on geological phenomenon even though they never have any formal knowledge on geology.

Dayang Bunting Lake

Dayang Bunting is the second largest islands in Langkawi. It is located to the south of Langkawi main island and can easily be reached by boat from various jetty points. Apart from a small settlement area near the Selat Bagan Nyior, the island is virtually an uninhabited rugged limestone karst terrain.

But why is this island so famous?

The literal meaning of Dayang Bunting is 'Pregnant Maiden'. Upon approaching the open south sea, we will observe a very peculiar landscape of hills resembling a pregnant lady with bulging tummy laying on her back, facing the sky.

Located in the southwest of the island is the famous Tasik Dayang Bunting or (the Lake of the Pregnant Maiden) named after a myth of similar name. It is a rare fresh water lake, measuring about 400 meters wide,

Figures	Facts
2	Fresh water doline lakes; Tasik Dayang Bunting, Tasik Langgun
2	Salt water doline lakes: tasik Gua Langsir, tasik Gua Dedap
1+	Dry dolinas: Tasik Jantan + many other unexplored dolinas.

800 meters long and 10 meters deep, making it one of the largest natural fresh water body in the country. The crystal clear water (though seasonally become slightly greenish) is of pure fresh water body even though it is only separated from the ocean by a narrow (about 10 meters wide and 7 meters high) limestone wall.



Dayang Bunting Trail.

Once you reach the geosite, there is a jetty to the office. From the office you walk along a concrete pathway up to the top of the ridge, then climb down some 100 steps to the lake platform where all recreation amenities are located. You can continue walking along on the plank walk as far as the southern ridge where you can stand on the ocean—lake divide.



The origin of the Tasik Dayang Bunting

Dayang Bunting basin is one of the many circular or oval-shaped depressions developed within karstic limestone terrain dominating the eastern part of Langkawi UGGp. The arrangement of this depression along the arbitrary fault lines suggested that they all represent ancient collapsed cave structures or scientifically known as *dolina*. Some of them are dry or seasonally filled by fresh water, others become permanent fresh water lakes, or salt water lakes connected by sea tunnels, or circular coves.



Fractured marble along fault zone

When two blocks of limestone are faulted (or slipped) against one another, the rocks often formed a highly fractured zone. These fractured zone is prone to extensive dissolution process by ground water, forming large underground cave that would eventually collapse to form dolina structure.

Palaeoclimate or Neotectonic?

Collapsed dolina will only be filled with fresh water or salt water once the ground water table raised which most likely correspond to the raising of sea level. This is probably due to prolonged global warming or possible tectonic subsidence of the island. The floor of Tasik Dayang Bunting was probably positioned above the ancient sea level during the last ice age or before the land subsidence.



Lake recreation infrastructure

Myth and geology

Tasik Dayang Bunting was long considered as Lake Guillemard that have special power to help married couple to conceive their desperately needed child. There was an old myth about a fairy princess who fell in love with a mortal prince. They got married and conceived a child, but unfortunately lost their child not long after his birth. They lie the child to rest near the lake. The fairy princess then blessed the lake so that married woman who had difficulties in conceiving a child would be able to do so once she drinks the water from the lake.

Geoforest

While the lake create an ideal ecosystem for fresh water flora and fauna, the dry dolina next to the lake known as the Tasik Jantan created a rather confined ecosystem with some endemic species of flora such as *Maxburretia gracilis*. The lake and the surrounding area are part of the Dayang Bunting Marble Geoforest Park featuring a special ecosystem developed on mainly massive metamorphosed limestones (marble). Apart from the lake, among notable geosites are the Gua Pasir Dagang, Pulau Lima and Pulau Jong fossil site.



Maxburretia gracilis

Cambrian Geoforest

Forest Conservation vs Production

Being part of the mega-diversity world, conservation often means deprivation of huge economic incomes because timber simply means money. Malaysia has lost a lot of tropical forest in the past century, mostly for mining and agriculture. As part of the country's pledge to support international quest for sustainable development, a large portion of the remaining forest are allocated for various level of protection and conservation.

Machinchang Cambrian Geoforest Park

On May 1941, 4274 hectares of forest areas around Machinchang mountain ranges, northwest Langkawi was established as Gunung Machinchang PFR in the old Kedah State Government. After the independence, it was later governed under Forestry Departments of Peninsular Malaysia, using the Forestry Act 1984 (Act 313). In 2005, it was re-branded as **Machinchang Cambrian Geoforest Park** to show the Forestry Department's strong support

Figures	Facts
4274	Size (in hectares)
1941	Birth of Forest Reserve
2005	Birth of Geoforest Park



500 m.y. old trilobites

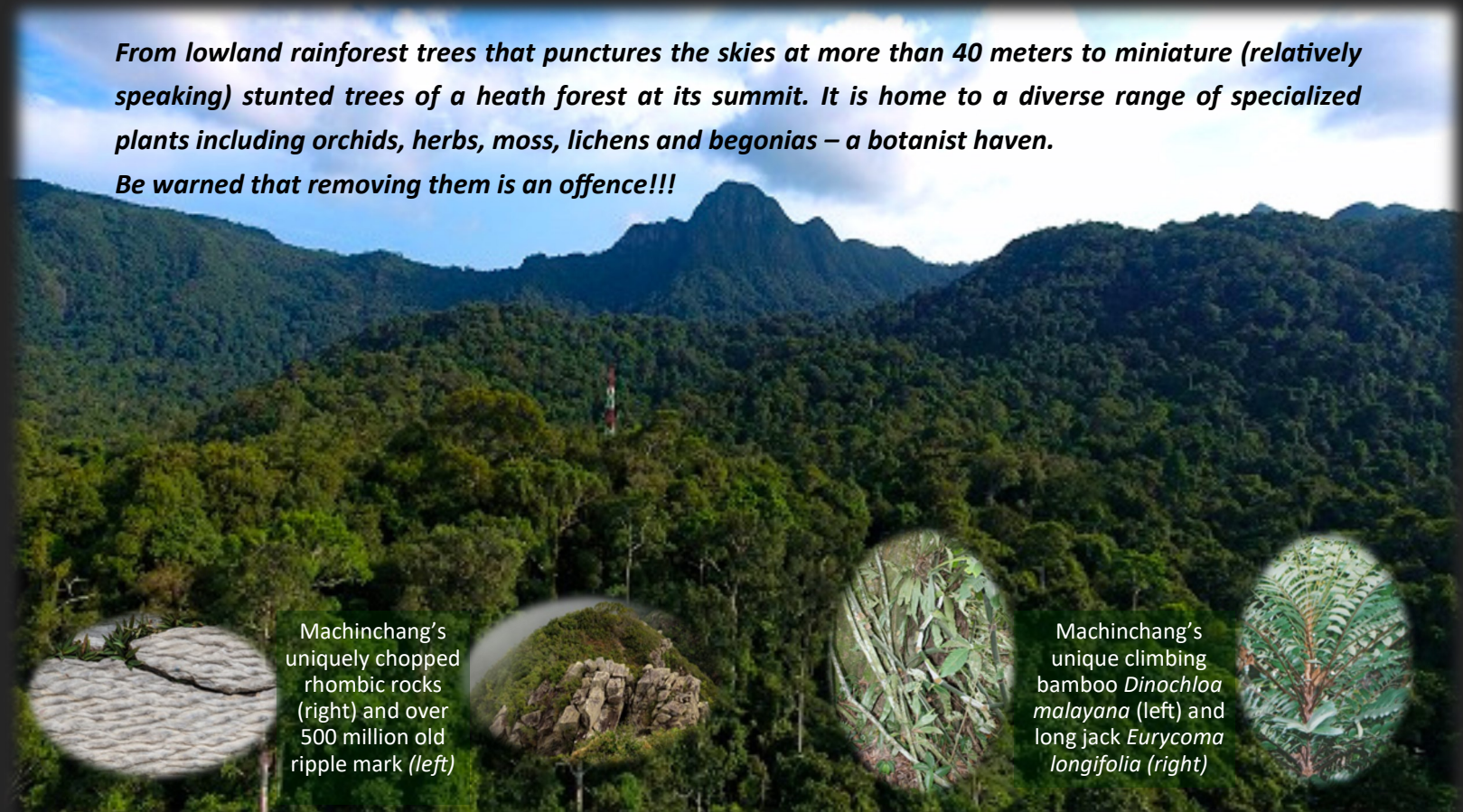
for the development of Langkawi UGGp. It was named after the age of the main rock formation in the area, i.e. the Machinchang Formation. It constitutes the biggest single forest reserves in a geoforest park. When Langkawi became the pioneer UNESCO Global Geopark in the region, the State Government pledged to maintain 58% of the island under Permanent Forest Reserved (PFR) that will protect not just the flora and fauna, but would also protect the rocks and natural environment.

From lowland rainforest trees that punctures the skies at more than 40 meters to miniature (relatively speaking) stunted trees of a heath forest at its summit. It is home to a diverse range of specialized plants including orchids, herbs, moss, lichens and begonias – a botanist haven.

Be warned that removing them is an offence!!!

Machinchang's uniquely chopped rhombic rocks (right) and over 500 million old ripple mark (left)

Machinchang's unique climbing bamboo *Dinochloa malayana* (left) and long jack *Eurycoma longifolia* (right)



The Forest

Machinchang Cambrian GFP is of typical insular forest. It comprises largely of mixed dipterocarp sub-montane forest and subordinate lower dipterocarp forest, while some steep and overhanging cliffs are almost barren. The mixed dipterocarp sub-montane forest developed on thin sandy soil of Machinchang Formation mostly on top of the mountains, while the lower dipterocarp forest developed within pockets of alluvial soil as well as on thick granitic soil at the southwestern slope of the mountain. The forest often exposed fresh rocks especially along the coast, at the waterfall and along the steep vertical cliffs.

The Ecoforest Parks

Three Ecoforest Parks have been developed for public education, recreation and geotourism within the Machinchang Cambrian GFP. They are the Telaga Tujuh, Temurun and Pasir Tengkorak Ecoforest Parks which were also regarded as among important geosites of the Langkawi UGGp.



A millipede found at Machinchang GFP

The Geosites and Geotrails

Other geosites within Machinchang GFP are developed as sustainable geotourism sites include Tanjung Chinchin, Tanjung Huluh, Machinchang Summit, Pulau Anak Datai, Pulau Anak Burau, Teluk Tok Manap, and Sungai Tamar. There are two optional geopark walking trails within this GFP, i.e. Machinchang Cable Car and Pasir Tengkorak—Tanjung Buta Trails.



A natural fountain on rocky west coast



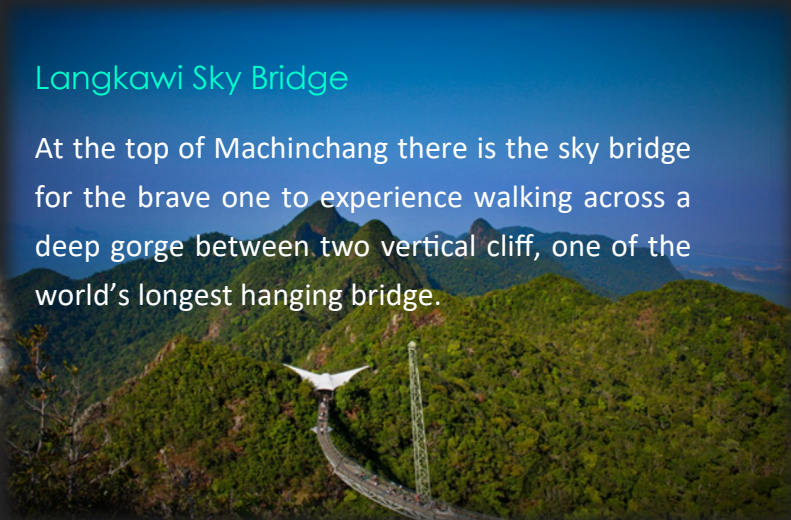
Gorgeous
Temurun Waterfall

Langkawi Sky Cab

Today one can reach the peak of Machinchang by cable car from The Oriental Village known as Langkawi Sky Cab. It is a most exhilarating journey to peak, and one will be rewarded by some of the most breathtaking views of Langkawi. The Gondola sits six comfortably and it silently glides over the tops of magnificent rainforest trees before scaling up vertical rock cliff to its middle station before another gentle glide over a heath forest to reach the top station.

Langkawi Sky Bridge

At the top of Machinchang there is the sky bridge for the brave one to experience walking across a deep gorge between two vertical cliff, one of the world's longest hanging bridge.



BioGeoTrail

Mangrove swamps, old charcoal kiln ruins, fossil finds, bat cave, white-bellied sea eagle and Brahminy kite, undersea geysers are among the 13 sites that made this unique BioGeoTrail.

Kubang Badak BioGeoTrail is the first joint venture project by Langkawi UGp—PPL—Sungai Kubang Badak Langkawi Ltd (with support from LaFarge-Holcim) to develop the latest geotourism product in Langkawi. This new tourism product was officiated by Her Royal Highness Kedah Princess in 2018.

Kubang Badak BioGeoTrail was planned to address issues on rapidly increasing tourist arrivals to Kilim Geoforest Park. It is hoped that significant number of the tourists would come to Kubang Badak and thus would reduce tourism pressure to Kilim Geoforest Park.

Kubang Badak is a large estuary with young mangrove forest cover located along northern coast of Langkawi, east Machinchang Range. The remnants from the past can still be found here, laying the foundation over millions of years to accommodate nature's finest treasures that can only be explored through the Kubang Badak BioGeoTrail program. The BioGeoTrail enable us to unravel the mysteries of the locale with insights provided by the team of naturalists.

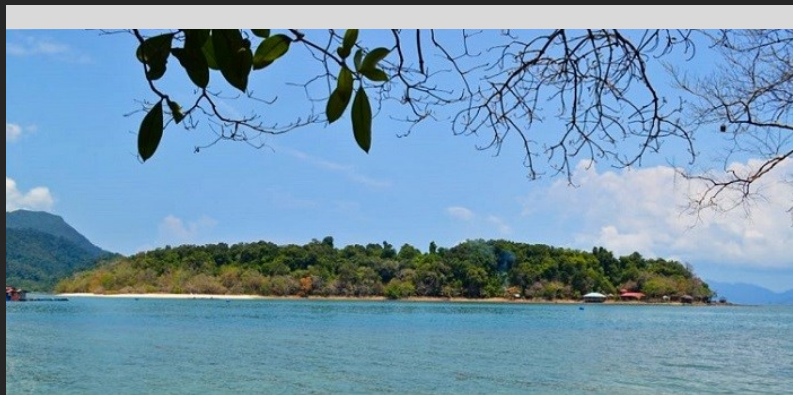


Teluk Kubang Badak

According to folklore, the name Kubang Badak was derived from a creature resembling powerful rhino that protects the village from harm. It may well have been a confusion long time ago between a wallowing buffalo which was probably thought to be a rhinoceros.

Kubang Badak is actually a small mangrove island located in front of the Kg. Kubang Badak Jetty. It was originally one of the many sandbars formed within this large estuary which were later covered by silt and mud trapped by the mangroves.

Kubang Badak estuary is a broad funnel-shaped river mouth protected from strong waves of Andaman Sea by rocky headland of Tanjung Buta. This allowed the strong currents to transport large amount of sands from the ocean into the estuary which were later accumulated as numerous sandbars (bohor) separated by braided channels.



Pulau Jemuruk Geosite is an island where many late Cambrian (~500 million years old) trace fossils and fragments of sauikiid trilobites are found. The geosite represents the top most sequence of Machinchang Formation.

Phycodes (right), *Dictyodora* (far right) - among typical Cambrian trace fossils found at Pulau Jemuruk.



Figures	Facts
3	Rock formations
13	Geo+Bio+Culture sites
45	Mangrove related species

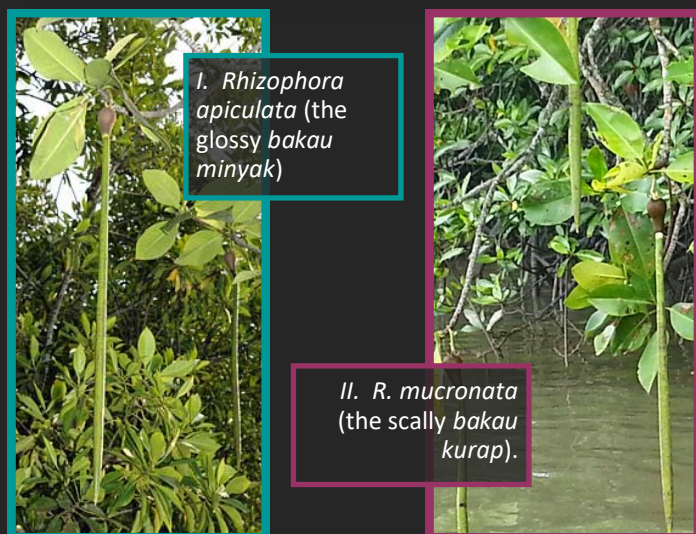
Geology.

Kubang Badak estuary were developed at the meeting point of

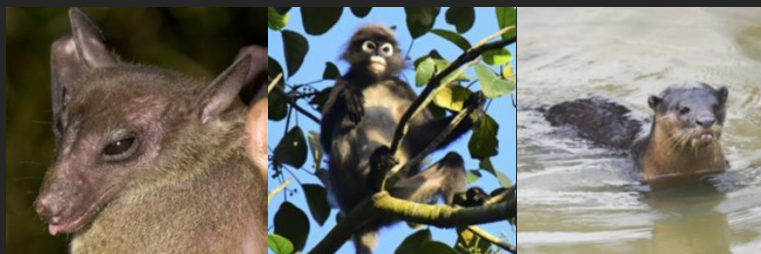
three important rock formations, namely the Cambrian Machinchang Fm in the west, Ordovician Setul Fm in the east and Sawar granite in the south. At Tanjung Sabung one can observe the transition boundary where the limestone of Setul Fm conformably overlain the sandstone of Machinchang Fm. There are 4 geosites within the Kubang Badak BioGeoTrail, i.e. Tanjung Buta, Pulau Jemuruk, Tanjung Sabung and Gua Pinang.



Biology. Kubang Badak BioGeoTrail are is mostly covered by mangrove forest. Kubang Badak mangrove grew on *ancient tidal flat and sandbars* with 45 species of mangrove related flora, dominated by two species of red mangrove:



Kubang Badak BioGeoTrail is rich in terrestrial and marine fauna. Common terrestrial fauna are the crab eating monkey, spectacle monkey, nectar bat, red eagle, white belly eagle, kingfisher, monitor lizard, pit viper, toad, smooth otter, among others.



Clockwise from top left: nectar bat; spectacle monkey; smooth otter



Gua Pinang is made of 480 m.y. old limestone, a host for nectar bats. At its entrance's terrace there is an ancient high level shell deposits.

Culture. There are Sungai Siam, Kampung Siam and Bukit Menora indicating that early settlers here were people of Thai ethnic, as do most of the peoples living along the north coast of Langkawi today. Among cultural heritage left are the remnant of charcoal making industry found at old Kampung Siam.

Dust X CSR ✓

Langkawi's only cement factory was formerly owned by the Malaya Industrial and Mining Corporation Sdn. Bhd. and changed its name to Kedah Cement Holding Bhd. in 1991. Today, it is owned by an international conglomerate, the LafargeHolcim Group. Teluk Ewa LafargeHolcim factory manufactures cement from the local limestone, clay and shale. The view of this gigantic plant may have tainted the beauty of Langkawi natural landscape to some extent, but the socio-economic benefit of its operation is immense.

Community welfare. Their employee mostly come from surrounding villages. The company seems to have taken very good care of the welfare of their employees and the community around them. Ever since they started their business in Langkawi, we can clearly see the improvement of air and water qualities in the surrounding villages. All quarry and plant operations are monitored with sophisticated sensors to avoid any untoward incidence.

Dust reduction. LafargeHolcim have invested millions of Malaysian Ringgits to reduce air and water pollutions from the factory. They use a bag filter technology that emit dust to even lower than the national limit and they make sure that there will be no

particles and toxic substances entering the Andaman Sea. They used green technique of GEO Cycle to handle their waste disposal and used treated trash to burn to make the clinker (product).



Local and imported material used in daily operation



Professional staffs at monitoring rooms

Corporate Social Responsibility. Perhaps LaFargeHolcim is the biggest CSR contributors towards conservation in Langkawi UGGp. For the geosites, the company had immediately stopped their quarrying activities to conserve the southern pinnacles as soon as Langkawi was declared as a UNESCO Global Geoparks in 2007, and recently they have surrendered another site to be conserve as the very important Gua Pinang geosite within the Kubang Badak BioGeoTrail.

For the biodiversity conservation, they have put a massive joint efforts with the Andaman Resort and Universiti Malaysia Terengganu (UMT) on Artificial Reefs Module System (ARMS) sank down the Andaman Sea slope off the Teluk Datai. They've also organized regular talk regarding the importance of preserving natural habitats and the geological significances in Langkawi UGGp to their employees.



Sinking off the ARMS for coral conservation (top), discussion with Langkawi UGGp delegates (bottom)



Teluk Ewa southern karst cliff with unique pinnacles, in contact with intruding granite



Jeju Island UGGp

Triple UNESCO Crown Jewel of Korea

Jeju Island UNESCO Global Geopark, a beautiful island of 1784 square kilometres was formed from volcanic activities occurring up to relatively recent times. It is located about 100km off the south Korean Peninsula. Jeju Island is the youngest volcanic island in South Korea featuring some astonishingly well preserved volcanic landforms such as lava tube caves, volcanic edifices, volcanic shield, lava dome and columnar joints. The entire Jeju Island was designated as the first Korean *UNESCO Global Geopark* in 2010. *Jeju UGGp became a sister geopark to Langkawi UGGp in 2014.*

World Heritage Site. Jeju Island is a great destination for academic research on volcanic activities and geomorphology. There are traces of volcanic activities occurring from 1.8 million years to about 1000 years ago in their original states. For such recognition, Jeju Volcanic Island and Lava Tube was inscribed as the only natural UNESCO *World Heritage Site* of South Korea in 2007.

Biosphere Reserved. Mount Hallasan (1950m) at the core of Jeju Island is a very special place for the Korean. It was protected under Korean Natural Monument (1966) and Korean National Park (1970) to enabled the area to be designated as Korean UNESCO Biosphere Reserve in 2002.



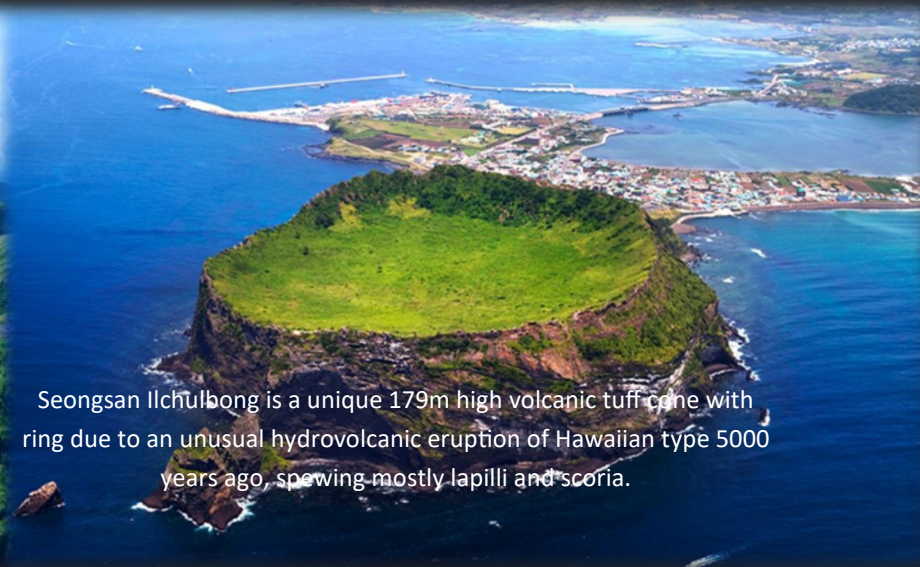
Amazing columnar jointing basaltic lava, expanding up to 3 kilometres along the at Jungmun Daepo Coast.



Astonishing lava tube of the colourful Manjanggul (Manjang Cave) formed by ropy or *pahoehoe* lava for an amazing total length of 7416m (5296m for lower tube + 2120m for upper tube) Apart from its colourful banding the cave is also furnish by astonishing helictites, stalactites, stalagmites and many other cave features.



Mt Hallasan UNESCO Biosphere Reserve, rich in endemic flora and fauna.



Seongsan Ilchulbong is a unique 179m high volcanic tuff cone with ring due to an unusual hydrovolcanic eruption of Hawaiian type 5000 years ago, spewing mostly lapilli and scoria.

Figures	Facts
3	UNESCO Titles
2002	UNESCO Biosphere Reserves
2007	UNESCO World Heritage Site
2010	UNESCO Global Geopark

Peak of Jeju UGGp, the Mount Hallasan (with broad crater) covered by snow during the winter time.

Culture. There is cultural diversity within Jeju Island UNESCO Global Geopark where marine and continental cultures including China co-exist. Jeju Island is surrounded by rich sea and thus heaven for seafood. The most unique and well known culture is Jeju *Haenyeo* or Jeju Women Divers where a group of skillful women were to dived without using any breathing apparatus into the sea during the summer to search for sea life especially abalone, sea urchin and snails. In 2016, this culture had been listed as *UNESCO Intangible Cultural Heritage*. The Jeju Government built Haenyeo School and Haenyeo Museum in order to support this unique cultural tradition.

The Jeju Island Special Self-Governing Province managed Jeju Island UGGp to create more economic activities and conserve the natural environment of the island. Various kind of activities to adhere to UGGp's guidelines in celebrating natural heritage including improvement of infrastructures, education material, education for local residents, training of guides, promotion of innovative products such as geo-food, geo-gift and geo-buddy character, enriching traditional culture festival, exploring new potential geosites, and extending international partnership with other UGGp members. Jeju UGGp also plays very important role in stimulating the development of geoparks throughout South Korea.

Jeju *Haenyeo* are ready to explore the wealth of the sea floor.

UNESCO INTANGIBLE CULTURAL HERITAGE



Transnational Geopark!

"In many cases, geological boundaries, shaped by rivers, mountain ranges, oceans and deserts, do not follow the boundaries drawn by people. Some UNESCO Global Geoparks naturally cross national borders, connecting peoples of different countries and encouraging intimate regional, cross-border cooperation"
UNESCO Global Geopark

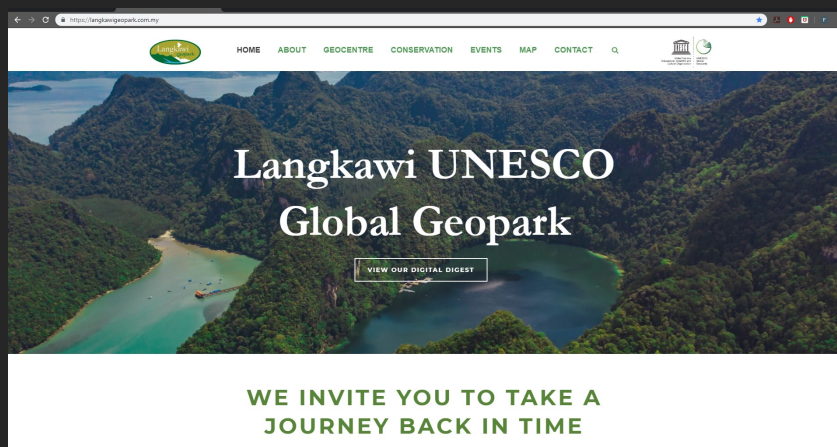
Indeed, Langkawi UGGp and its neighbouring Satun UGGp do have several components in common. Hence, instead of becoming a mere distant Sister Geoparks, on June 14th 2019 the two geoparks have signed a closer cooperation agreement on four main pillars, i.e. on joint promotion, exchange program, joint activity, and joint research. This has been seen by many observers as a very positive move towards realizing a dream of having the first Asia Pacific Transnational UNESCO Global Geopark between Malaysia and Thailand. To start with, the two geoparks will proceed with active joint research between university partners of both geoparks.



This historic agreement was signed by Dr. Ahmad Hezri Adnan (second from left) on behalf of the Langkawi UGGp and Assistant Professor Dr. Pongsak Thongnueakhaeng (third from left) on behalf of the Satun UGGp.

Virtual Network

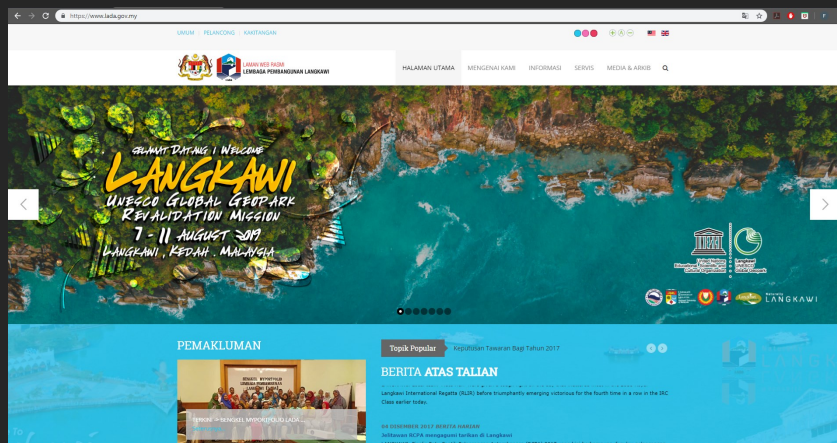
Internet is undeniably the fastest and most efficient ways of modern networking. For this reason Langkawi UGGp had recently published its own website to communicate with the outside world and to promote UNESCO Global Geopark. Beside this new website we can also follow the up to date development in Langkawi UGGp through LADA website and the geopark facebook.



The new Langkawi UGGp,s own website at <https://langkawigeopark.com.my/>



www.facebook.com/langkawiglobalgeopark



Langkawi UGGp old posts hosted at <https://www.lada.gov.my/>

Second National Geoparks of Malaysia approved on 18th July 2017

Figures	Facts
816	Size (kilometer squares)
2	Districts (Yan & Kuala Muda)
5	Islands (Bunting, Songsong, Bidan, Sayak, Telur)
25	Geosites

Sunset at Gunung Jerai viewed from the east

Jerai National Geopark is located within the Yan and Kuala Muda Districts of Kedah State with a total area of 816 square kilometers of land and sea area. It covers the magnificent insular Gunung Jerai (1217m), the vast Yan's paddy fields, the natural Sungai Merbok estuary, the offshore Sayak, Bidan, Bunting, Songsong and Telur Islands and water body surrounding them.

Jerai geopark was built on quartzite of Cambrian Jerai Formation, mudstone of Devonian—Carboniferous Kubang Pasu Formation, Jerai Granite and Quaternary deposits. The geopark possesses 25 geosites, 3 geo-archaeological complexes and 9 historical and cultural sites.

The highlight of Jerai Geopark is the geological heritage of Gunung Jerai, Old Kedah civilization and the mountain and mangrove biodiversity.



His Majesty the Sultan of Kedah launched the Jerai National Geopark on November 2018



Jerai Geopark map

Geo-archaeological Sites

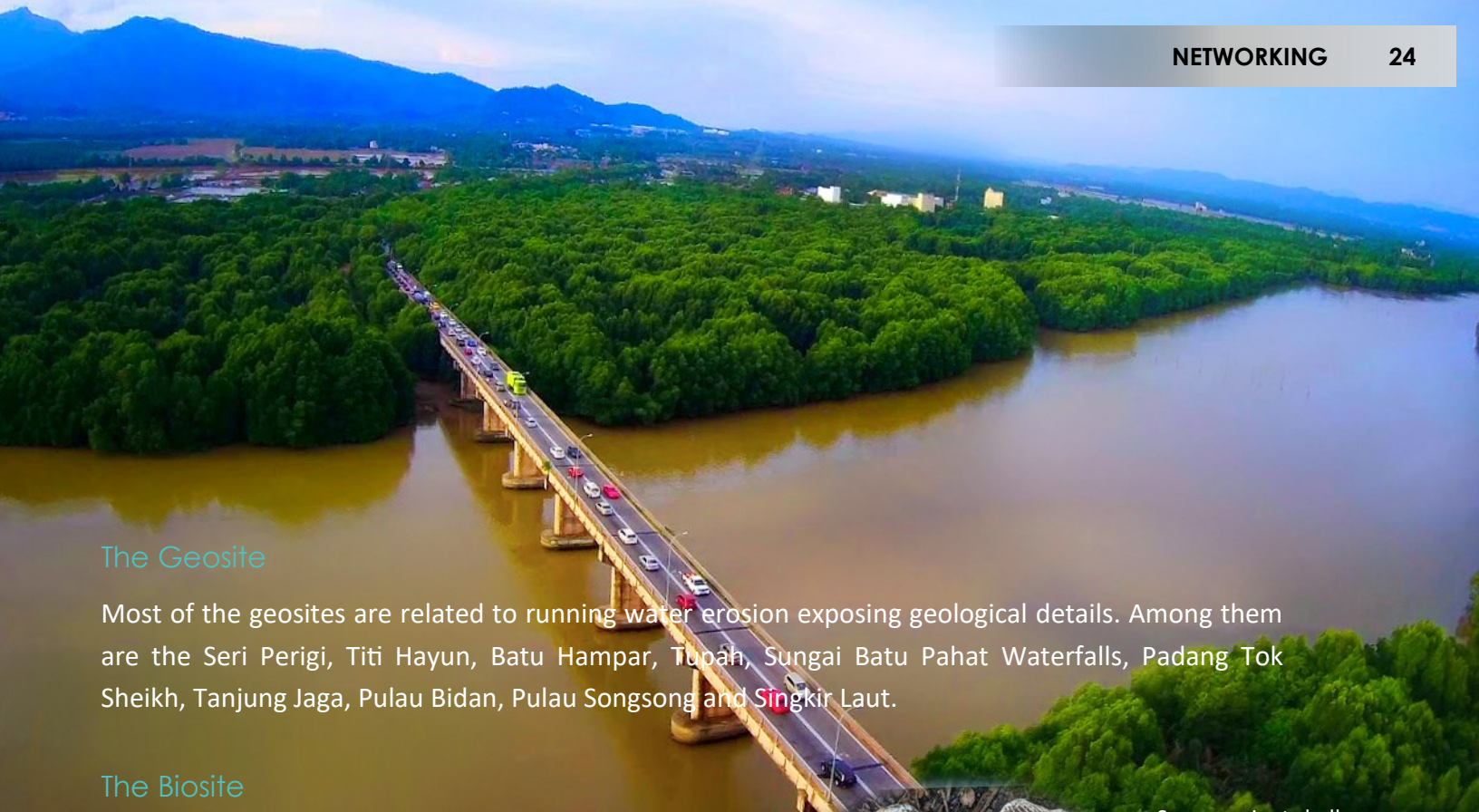
Jerai became the landmark in archaeological heritage of this region where the Old Kedah (*Kataha*) civilization prospered well around its foothill. Several large archaeological sites have been unearthed and research are still actively been carried out on this mysterious civilization.



Huge crystals of feldspar, mica and tourmaline forming pegmatite along the contact between granite and quartzite - Tanjung Jaga.



Ruins from temples of Old Kedah civilization - Sungai Bujang geo-archaeological site.



The Geosite

Most of the geosites are related to running water erosion exposing geological details. Among them are the Seri Perigi, Titi Hayun, Batu Hampar, Tupah, Sungai Batu Pahat Waterfalls, Padang Tok Sheikh, Tanjung Jaga, Pulau Bidan, Pulau Songsong and Singkir Laut.

The Biosite

Sungai Merbok mangrove is the only ecosystem where all mangrove species of Malaysia are found together.



Some ancient shells from Singkir Laut higher ancient sea level.

The Historical Site

Padang Tok Sheikh at the Jerai summit is a Cambrian trace fossil geosite which is also a historical site. The land was awarded by the then His Majesty Sultan of Kedah to Tok Sheikh Abdullah for his role in spreading Islam in the Kingdom of Old Kedah. Tok Sheikh Abdullah came to Jerai in the year 1135.



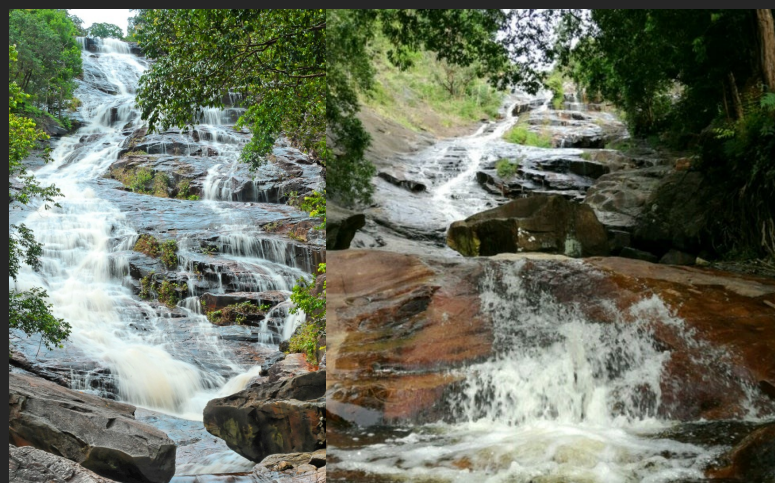
Padang Tok Sheikh geological and historical site

Tok Shiekh Pond

The community

The majority of the local community belonged to Malay farmers and fishermen practicing Malay culture and traditions. They are proud of their geological, archaeological, historical and biological heritage and they are advocated to geopark as geopark activities provide them a bit of extra incomes in terms of geotourism products and geotourism services.

The vision of UNESCO Global Geoparks that emphasizes the geological heritage and landscapes should be holistically managed for conservation, public education and sustainable development.



Seri Perigi Waterfall

Titi Hayun Waterfall

Mother of Nature

"I did it for my love of nature, I did it for my Langkawi UGGp and for our future custodian"



Geopark Ambassador



Trees are planted at every corners within school compound of SMK Mahsuri in order to reduced carbon emission to nature.

There are several geopark schools in Langkawi but some schools are definitely more active in geopark education than the others. Most school children will not learn about the importance of nature and the need for protecting the environment by themselves. They need some idols to inspired them to love nature, to devote their times to learn more about nature and to do something to show their nature appreciation. School teachers can play important roles in inspiring their students they meet every day, so that they could become part of a healthy and useful future generation.

In Langkawi, natural wonders are easily found everywhere but without a little bit of extra curiosity and inspiration these wonders will be just like any other objects, nothing extraordinary. As for school children, there's none other who can inspire them to admire the secret of nature like **Cikgu Norini Awang** did.

Cikgu Norini Awang is the Principal of **Sekolah Menengah Kebangsaan (SMK) Mahsuri**, located within the vicinity of Kuah Town. She has been a great teacher for more than 13 years, and prior to this she served as the Principal of SMK Kedawang for 8 years. She received the title as Geopark Ambassador since 2016 due to her passion in preserving the nature environment inside the school compound as well as outside the school area. As a school principal, she live with her moto in **'Green school and zero carbon'**.

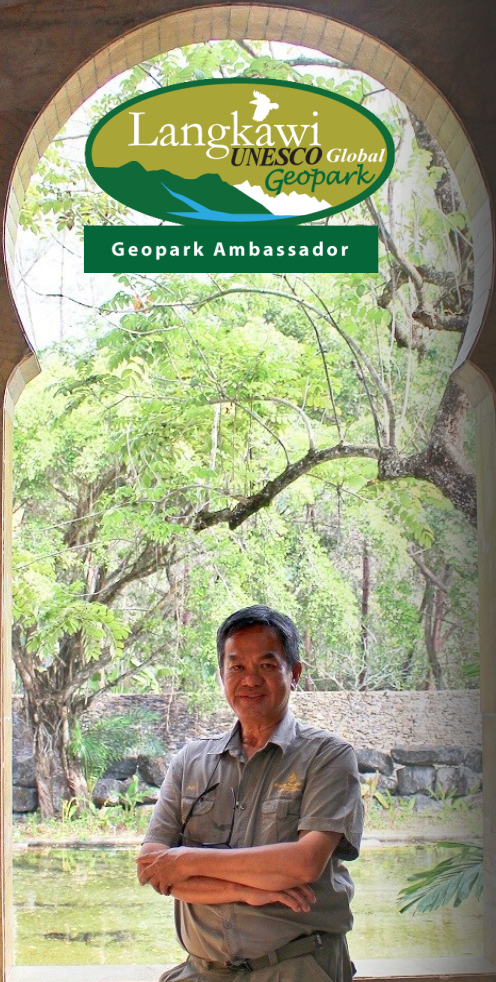
Her first act as an ambassador is **'Plastic Free School'** where students are not allowed to use any plastic material at all. She even taught her students to make a handmade paper bag to reduce the plastic usage within school area. Cikgu Noraini said *"teaching this at school will change the student's perception outside the school area"*. She also creates a school Geopark Club where the club members are responsible in preserving the nature and protect the environment, while at the same time enhancing their knowledge about the UNESCO Global Geoparks especially Langkawi UGGp.

She also inspired student to join her in planting the trees and to take care of them every day. And every day she like to tell her students that ***"If there's no money to donate, then plant trees and protect the environment to give everyone a good quality of air supply as a donation."***

Mangrove Gentleman



Geopark Ambassador



Mr. Aidi Abdullah at the Four Seasons Resort at Tanjung Rhu, Langkawi.

He may not be a Professor in Biology, but he has excellent cameras, heaps of references and respectable connections to refer to should new discovery appears unexpectedly. And most important of all he has all his heart and soul on the amazingly beautiful nature of Langkawi.

A good naturalist shall not only be an expert on plants, animals and natural environment, but more importantly should love and passionate about them. For these attitudes, a Gentleman simply known as Mr. **Aidi** had been hired as a resident naturalist by Four Seasons Resorts Langkawi (a Langkawi UGGp Partner), one of the most prestigious resort hotel in Langkawi for more than 14 years. For his endeavor to nature, Mr. Aidi was acknowledged as one of the earliest Ambassadors by the Langkawi UGGp. Mr. Aidi said *"Langkawi island have the most perfect nature that no other island in the world has"*.

For mangrove conservation, Four Seasons have ensured a guard guide for every single boat trip they run to maintain cleanliness, speed limit and an educational mangrove trip. Mr. Aidi also run a campaign for other boat operators to follow this practice. At the resort, he was entrusted to manage the resort's gallery to educate visitors about Langkawi's geological history, rainforest, mangroves and all kind of animal species to be found in Langkawi UGGp.

Mr. Aidi said *"as a Langkawian, we all need to do our part to protect Langkawi's nature together"*.

Fun facts #1: Do you know why Langkawi's Mangrove is so special?

"Langkawi is well-known due to its limestone which is everywhere in Langkawi even under the water. Due to the presence of underwater limestone, Langkawi mangrove forest is the only one in Malaysia which grow in a neutral water (pH7)" said Mr. Aidi Abdullah.

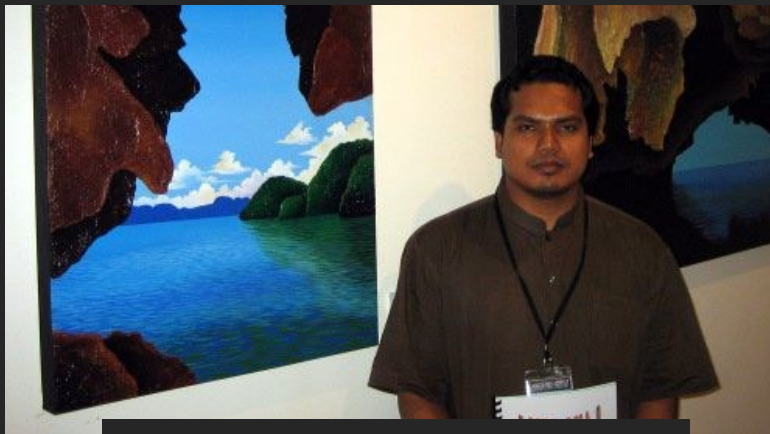
Fun facts #2: Do you know why genuine leather is brown?

"To make a perfect leather, the tanner has to soak the leather with mangrove roots to preserve it while these mangrove roots will produce brown color liquid that will affect the color of a leather" said Mr. Aidi

Nature and
Biodiversity
at Tanjung
Rhu



If folks of **Renaissance Era** might get inspiration through immaculate paintings on **portraits, geometry** and **anatomy** of Sir **Leonardo da Vinci**, let's see how peoples of today can get their **geopark inspiration** through our highly talented artist on his immaculate paintings of **landscapes, geometry** and **geology**.



Youngest Langkawi UGGp Ambassador—Khairudin

Avid naturalists may not necessarily help to protect the environment through their voices on streets or actions in fields, but can also fight their heartfelt course through whatever talents they are gifted in. The quiet Mr. **Khairudin** knows well how much he can contribute to nature course through his paintings, drawings or sculptures. With his great skills and creativities this young Langkawi UGGp Ambassador becomes great asset to Langkawi, the land his first blood was dropped. Khairudin initiated the *Langkawi Artist Visual Art Association (LAVAA)* to inspire young artists to acquire higher level of skills and creativities in arts.



Sculptures at Langkawi International Airport

Langkawi Sculpture. After graduating in Fine Art from Universiti Sains Malaysia in 2005, he joined a group of local and foreign artists to create sculptures from *Langkawi marble* exhibited in 2007 at the Langkawi International Airport roundabout.



Mr Khairudin Abdul Hamid [KbAH] did them all for his love of nature and Langkawi.

Paintings on natures of Langkawi. Khairuddin or his trade name **KbAH** impressed the nation by his masterpieces of 3D paintings on caves of Langkawi during *Langkawi Geopark Art Exhibition 2008*. Several pieces of his paintings were selected to become *permanent collection of the National Art Gallery*. All his cave door paintings show strong element of landscape, geometry and geology.

Khairudin said *"I like to draw door caves a lot because it means as an open door to welcome tourist to see Langkawi's natural beauty"*. That was the first thought when he started connecting his arts and Langkawi Geopark.



Permanent collection at National Art Gallery

*Everything happens for a reason.
Perhaps not many knew how Langkawi
UGGp was first transpired.*

UKM—LADA collaboration

Since the mid-twentieth century, the natural wealth of Langkawi islands have already been very popular among local and foreign geoscientists and environmentalists. When it was established in 1970, the Universiti Kebangsaan Malaysia (UKM) have chosen Langkawi as one of its main research destination.

In supporting the **Agenda 21** formulated during the Rio **Earth Summit 1992**, UKM established its **Institute for Environment and Development (LESTARI)** in 1994 with sustainable development of Langkawi as one of its main agendas. In 1996, a memorandum of understanding was signed between the UKM and LADA, where LADA should facilitate researchers from LESTARI UKM to conduct their research in Langkawi while LESTARI UKM should advice LADA on best development practice for the rich nature resources of Langkawi.

Langkawi Research Centre (PPL)

In early stages, LESTARI UKM had promoted the eco-tourism and geotourism approaches for the development of Langkawi natural resources. However, since geopark was conceptualized in 1999, LESTARI UKM had started using Langkawi as its geopark model and in building its human capitals.

In 2002, **Langkawi Research Centre** or **Pusat Penyelidikan Langkawi (PPL)** was established under the auspices of LESTARI UKM in order to concentrate in its effort to materialize Langkawi Geopark concept. This concept was first proposed to LADA in 2002, and after some improvement made, it was accepted by the Board of LADA in 2006. Langkawi became Global Geopark in 2007 with concerted efforts from LADA officials and geopark experts of PPL.



Pusat Penyelidikan Langkawi, LESTARI UKM
Address : Kampus Tuanku Abdul Halim Mu'adzam Shah
Pantai Kok, Langkawi, Kedah Darul Aman

PPL Research Flagship

PPL's flagship research is science of geoparks for regional sustainable development in the Asia Pacific region, with main objectives to conduct fundamental and policy-driven research in order to explore knowledge and initiate the Global Geopark movement in Malaysia and Asia Pacific region. These are handled under the following programmes:

- 1) Geological and Landscape Heritage,
- 2) Biodiversity Heritage,
- 3) Culture Heritage and Social Sustainability,
- 4) Environmental Integrity.

To date, PPL have secured millions of Malaysian Ringgits worth of national and international research grants and collaborated with several local and foreign universities including the Charles Darwin University (Australia), La Sierra University (US), Hiroshima University (Japan), Eotvos University (Hungary), among others.



Scientific Expedition. Apart from individual research, in order to harmonized the finding between researchers from broad disciplines, PPL and Langkawi UGGp have organized a series of scientific expeditions followed by seminars. Proceedings from these seminars were published containing research findings on all four programs and are area-based, thus are very useful for future development of targeted areas. Series of coffee table books and field guide books are also regularly published by PPL and Langkawi UGGp.

Home for Malaysian Geoheritage Group (KWGM)

During the establishment of LESTARI UKM, the geoscientist team seem to be most proactive in conducting group research and publication. This group quickly gained recognition from peer geoscientists from various sectors nationwide, consequently the *Kumpulan Warisan Geologi Malaysia* (KWGM) or Malaysian Geoheritage Group was established in 1996, parked in LESTARI UKM. KWGM organized regular national training



Bukit Sawar expedition 2011 (left); Pulau Jong fieldwork 2014 (right)



PPL and Langkawi Geopark organized a Regional Workshop on Development of a geopark in 2014.

Secretariat for Asia Pacific Geopark Network (APGN)

In 2007, Langkawi Geopark and PPL had the honor to organized the Inaugural Symposium for Asia Pacific Geoparks, during which the Asia Pacific Geopark Network (APGN) was proposed. The proposal was approved by the Global Geoparks Network during the 2008 Third International Conference on Geoparks (ICG) in Germany, which also honoring Langkawi Geopark and PPL to host the Fourth ICG in 2010. In honoring its role in uniting geoparks in the region, PPL was honored to host the APGN Secretariat up till 2018 when China was voted to as the new host for APGN.

activities, Annual Geoheritage Conference and regular publication of Geoheritage books. Soon KWGM received strong supports from researchers from other disciplines as well.

As KWGM later became the main player to accomplish the UKM-LADA MoU, the group was re-located under the newly established PPL in 2002. In 2004, KWGM Geoheritage Conference was expanded to Malaysia-Indonesia Joint Geoheritage Conference and became Regional Geoheritage Conference later in 2018 with more Southeast Asian countries joining them.

Langkawi Research Centre or Pusat Penyelidikan Langkawi (PPL) have inspired the making of not only Langkawi but also several other UGGps across East and Southeast Asia.



PPL and Langkawi Geopark organized the 4th ICG in Langkawi in 2010



Geopark course organized by APGN, PPL and Langkawi UGGp in 2018



A National Heritage Object (fossil) housed at PPL Gallery

Regional Training Centre

Through its long research history PPL now has one of the biggest number of geopark experts in East and Southeast Asia. With this human capitals PPL strives to be regional training centre for various aspects of geopark development. This is in line with the placement of APGN Secretariat at PPL. PPL is equipped by various facilities including an auditorium, science laboratories, seminar rooms, galleries and hostel.

This far, PPL organized two events related to geopark development in annual basis: i) APGN Regional Course, ii) MTCP Workshop sponsored by the Academy of Science Malaysia. Apart from these PPL also organized regular training courses on geoheritage and geopark development for staffs from various government agencies as well as basic courses on geology and geopark for tour guides, children and the general publics.



PPL and Langkawi UGGp organized Workshop on Geopark for the Malaysian Technical Corporation Program (MTCP) in 2018.



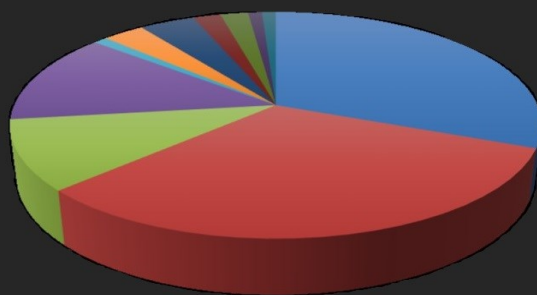
PPL organizing field excursion for the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) Meeting participants in 2014.

International Student Mobility Program

PPL involved in many ways to portrays Langkawi Geopark as the best examples of regional sustainable development. Among PPL's most successful endeavor in is encapsulated in its specially tailored *International Student Mobility Program* entitled *Sustainability of Tropical Heritage*. Here, students were exposed about geopark and other programs on heritage conservation, highlighting the advantage of developing geopark as in Langkawi. Up till now, over 200 student ambassadors have enrolled in this program. They came from Mexico, South Korea, Hong Kong, Taiwan, Turkey, Japan, UK, Australia and China.

PPL Gallery

PPL Gallery have this far served as one of the best and most comprehensive gallery for education on Langkawi geopark. It housed a hefty collection of geological, biological and cultural specimens to be found in Langkawi. Scientific publications on Langkawi's rich nature and culture heritage are on sale at this gallery.



Malaysia	Mexico	South Korea	Hong Kong
Japan	Turkey	Australia	UK
China	Indonesia	Taiwan	

International students in Langkawi UGGp. A pie chart on their nationalities (from Tanot Unjah)

As a stalwart Langkawi UGGp Partner, PPL have been deeply involved in the development of Langkawi Geopark, since the making of the geopark up till today, and will continue to support Langkawi to always be the best geopark in the world.

King of the Jungle

Adventurous nature education

Extreme adventure sports often are daunting enemy to nature conservation, but **Umgawa** Zip Line Eco-Adventure also known as Umgawa Legendary Adventures sell adventure packages with nature education at the topmost of their priority.

A staunch naturalist, Mr. Charles Farell moved his ecotourism operation to Langkawi where he could really enjoy sharing nature experience with all his clients. As an assurance, Umgawa only hired highly trained and dedicated staffs, especially their Safety Sky Rangers/Guides who must also well verse not only about flora and fauna but also the rocks within the Machinchang Cambrian Geoforest Park.

As for his commitment towards nature conservation, the zip-line routes were carefully delineated that all trees are kept intact, without any tree felling needed. Their devotion to nature conservation and geopark education had boosted Langkawi UGGp's image and attracted more visitors worldwide to enjoy nature and culture of this legendary island. In return, Langkawi UGGp had eagerly appointed Umgawa as one of its esteem Partners.

For their world class zip lines, Umgawa Legendary Adventures is currently ranked by TripAdvisor Community at no. 2 among 65 outdoor operators in Langkawi.

Why Umgawa?

The "umgawa" echoing call was used by the legendary Tarzan to put the jungle community on high alert so that the core nature (ecosystem) of the jungle would remain safe for every living thing.



Umgawa office is located at Jalan Telaga Tujuh, a few minutes walk from the Langkawi Oriental Village.





For an unforgettable and thrilling experience on the legendary island of Langkawi, strap on for an Umgawa adventure!

Adventure and nature. If you are not afraid of height, Langkawi Umgawa zip line is probably the best sports for you. While enjoying your flight above the canopy you will be mesmerized by some of the best natural phenomena in one of the world oldest tropical paradise, the Machinchang Cambrian Geoforest.

Umgawa Zip Line Eco-Adventure provides you a thrilling journey along 12 ziplines and 3 skybridges. The zip line is up to 80m high above the ground and up to 200m long across an enchanting valley. There are short and long courses, but it is the full 2.5 hours course that will give you the utmost thrill and most scenic and educational journey. You will not just fly across the deep ravine with stunning view of the dynamic Telaga Tujuh waterfall, but you will actually cross the boundary between granitic terrain (210 Million years old Sawar Granite) to sandstone terrain (550 million years Machinchang sandstone). Don't forget to observe the changes in the natural forest when you cross this boundary.

Nature conservation. For Umgawa, there are no compromise on the two following serious matters—**integrity of nature** and **safety of operation**.

Thus, prior to the construction, they seek for strict advice from regional forestry management authorities, conservation experts and naturalists to pick the most suitable nature friendly courses. During the construction, Umgawa assembled the most experienced and advanced construction team and engineers as well as the best and safest building material from all

over the world. During operation, Umgawa maintained its strict ruling on safety. Visitors with health and fitness problems are not allowed to take part in this adventure. In ensuring safety and learning objectives, only small group (a maximum of nine guests) are taken. Each group will be accompanied by two highly dedicated internationally certified Safety Sky Ranger and Guides who not only are highly-trained on safety, but also highly knowledgeable on nature and culture in Langkawi UGGp, especially on the amazing wonders of Machinchang Cambrian Geoforest Park.



PARTNER

Successes can be achieved in many different ways.

While luxury hotels would spend millions of US Dollars in order to capture glamorous awards, the rather low profile Frangipani Langkawi Resorts & Spa did it almost the opposite ways. They have won not one, but many accolades by saving thousands of US Dollars.

Frangipani Langkawi is a modest 4 Star Resort located along the pristine Pantai Tengah overlooking the tranquil Andaman Sea. The resort earn its precious regional recognitions due to the unwavering stand of its Managing Director Mr. Anthony Wong on sustainability. The resort invested into green practice since the first day of its operation in 2006. Today the resort is applying over 300 ways to reduce, reuse and recycle as well as exercising rainwater harvesting and tapping of solar energy in order to reduce our ecological footprint while ensuring sustainability of the business and environment.

Langkawi UGGp is very lucky to be a home for the leading green resort in the region and very proud to have the Frangipani Langkawi Resort & Spa as one of its esteem Geopark Partner. The resort's award winning Eco Walk has become very popular learning site which received over 30 school visits annually for last couple of years. Mr. Wong, meanwhile, has been giving free consultations to other resorts to help them save money and the nature.

"Our continuous effort ensures the geological assets our guests have come to enjoy, remain as they are for many generations to come" the management.

Their efforts save them around RM 15,000-20,000 per month in water and electricity bill





Frangipani is the name of the beautiful sweet-smelling flower plant *Plumeria*, come in variety of colour, common throughout the island.

Year	Awards (category)
2018	Asian Green Hotel Award
2016	PATA Gold Award (<i>Environment—Education Programme</i>)
2015	Malaysian Tourism Award (<i>Best Hotel Services</i>)
2014	Asian Green Hotel Award
2011	Langkawi Award
2011	Malaysian Tourism Award (<i>Green Hotel</i>)
2010	ASEANTA Award (<i>Best Asean Conservation Effort</i>)
2009	PATA Gold Award (<i>Environmental Education Programme</i>)
2008	Prime Minister Hibiscus Award
2008	Virgin Holiday Responsible Tourism Award (<i>Best Large Accommodation</i>)
2007	Asian Green Hotel Award



Frangipani Eco Walk

“Come join us on our Award Winning Eco-Walk where we showcase over 300 Green Practices which aids in keeping The Frangipani Resort & Spa sustainable, and reducing our carbon footprint on the environment” the Frangipani website.

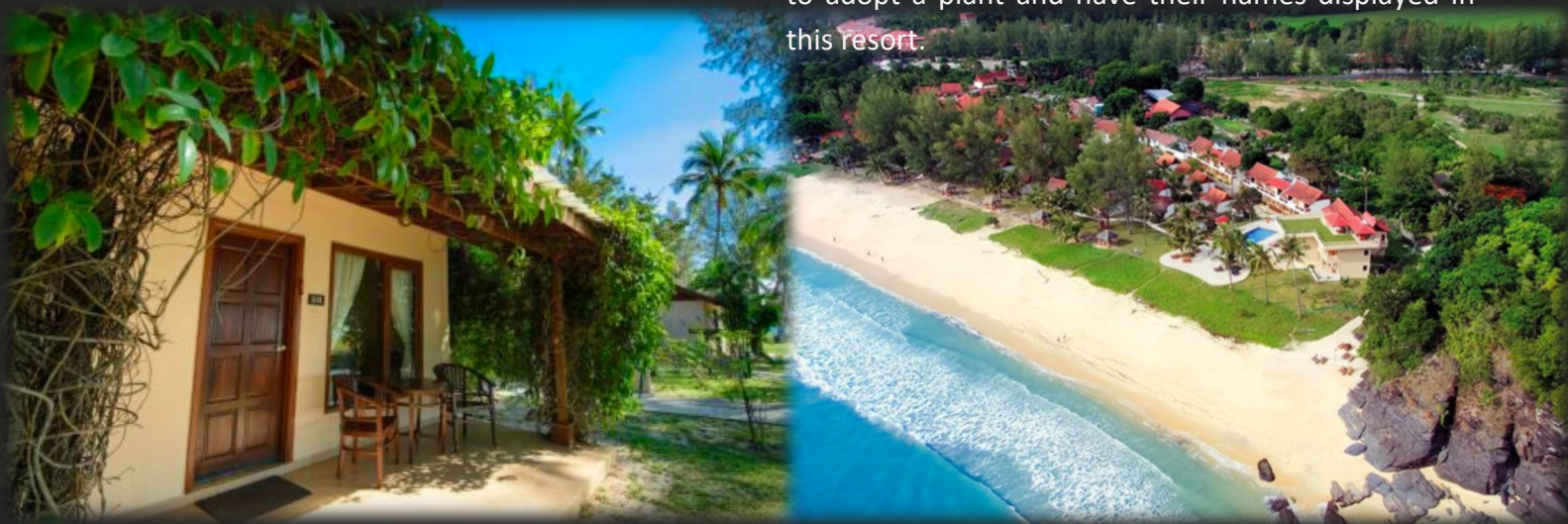
Reuse–Recycle. For years, the resorts have continually assessed, managed, and improved ongoing relationship with its environment, and incorporating sustainable green practices. These include exploring numerous ways to recycle, like reusing of water from air conditioning units, collecting rainwater, and reusing of old bottles, toilet bowls and bath tubs for art decorating the garden as well as the interior of resort.



The resort heavily promotes recycling of all of its waste. They made their own Grade A compost for fertilizing the sterile rocky and sandy ground before they can grow their own vegetable farm and green the resort area. In addition they also they also raised a range of poultry in their farm and fishes in their recycling water pond for their restaurant’s kitchen.

No sea water pollution. Frangipani Resort & Spa is committed against ejecting organic waste water into the sea as to avoid unnecessary bloom of hazardous jellyfish population. Frangipani is the only resort in Langkawi with 100% natural filtration system which utilizes aquatic plants to treat waste water, turning it into Grade-A drinking water which they use to watering plants within the resort.

Hands on. Interestingly the resort is offering its guests to take part in their Eco Resort daily activity where they can experience and learn about various green practices. Guests will also have an opportunity to adopt a plant and have their names displayed in this resort.



WELCOME NEW LADA CEO

Congratulations!



April Fools' Day could have not surprised peoples of Langkawi more than the news on the appointment of the youngest ever Chief Executive Officer (CEO) of LADA who happen to have no Economic background. However, the veteran Prime Minister Tun Dr. Mahathir knew very well of his choice when he made one for Langkawi.

On April 1st 2019, Langkawi UGGp entered a new era with the appointment of Dr Ahmad Hezri Adnan FASc as the new CEO of LADA. Former Senior Director of the Institute of Strategic and International Studies (ISIS) replaced Datuk Azizan Noordin who completed his two years of excellent service on November 30th 2018. In between LADA was led by Haji Mohd Asri Redha Abdul Rahman as an Acting CEO. This gap was partly due to changes made by the new Malaysian Government in which LADA was transferred to the Prime Minister's Department from previously under the Ministry of Finance. From this angle, the appoint-

ment of Dr. Hezri is a huge blessing for Langkawi UGGp as he will directly be answerable to the Prime Minister whom all along is well known for his dedication to Langkawi.

As a distinguished Fellow of the Academy of Sciences Malaysia (2016), Dr. Hezri holds a *Doctor of Philosophy degree in Public Policy* from the Australian National University (ANU) and *Masters degree in Environment and Development* from UKM. He is an Honorary Associate Professor at Fenner School of Environment and Society, ANU and Adjunct Professor at Universiti Tenaga Nasional (UNITEN). His specialization is in *comparative public policy on environment, green economy, natural resources governance and sustainable development*. In 2015, Dr Hezri was appointed as a *member of the United Nations' International Resource Panel (IRP) on strategic issues of resource scarcity, efficiency and decoupling*.

With his vast experience in policy advocacy on development and sustainability issues, Dr. Hezri is just the person Langkawi need at the moment to steer its development towards the right path of sustainable development. In his first official duty he stressed that Langkawi will focus on sustainable development with the right balance between growth and conservation, while tourism in Langkawi will pursue for further sustainable practices to ensure the ecology and pristine conditions of the island were preserved.



Haji Asri handing over the CEO job to Dr Hezri

Dr Hezri giving a certificate to Excellent student



Following the immense success of the Langkawi International Maritime and Aerospace exhibition (LIMA) 2019, in terms of local and foreign participation, plans are afoot to make the next one even bigger. According to the 7th Prime Minister, Tun Dr Mahathir Mohamad “LIMA ‘19 exhibition was the best ever”. Notably, the exhibition was also visited by the His Majesty the Yang di Pertuan Agong (The King), who visited LIMA ‘19 exhibition booths and watch the amazing air shows. The King was joined by other royal dignitaries including His Royal Highness Sultan and Prince of Selangor, Her Royal Highness Tengku Temenggong Kedah as well as the Governors of Melaka and Sabah.

Defense Minister, Mr. Mohamad Sabu said “Aircraft Technology, a new sector, would be featured in Lima 2021, together with the existing maritime and aerospace sectors”. The success of LIMA’19 was based on the close cooperation between the Defense and Transport Ministries together with other agencies under the International Trade and Industry Ministry, something which has given a positive impact to the country at the global level.



Fossil Day

To any palaeontologists, Langkawi UGGp is a fossil heaven where so many richly fossiliferous horizons are readily exposed by nature. Surprisingly, quite large number of Langkawian also seemed to be very passionate about fossil. They attended the Fossil Day Program organized by Langkawi UGGp on February 28th 2019 to interact freely with the country's top palaeontologists, Professor Dr. Mohd Shafeea Leman.

Professor Shafeea enlighten the audience on how fossil was formed and shared his vast experience working on fossils of Langkawi. He shared some of his own collection for audience to have hands-on experience on Langkawi fossils. It was a fun-filled event dragged for several hours. The event shows that there is a need to organized two separate events to cater the beginners and fossil enthusiast who wanted to know more about fossil.



Earth Day

In commemorating the Earth Day on April 21st 2019 Langkawi UGGp organized a talk on Unique island biodiversity in Langkawi UGGp. The talk was given by none others, Professor Dr Norhayati Ahmad, Malaysian top herpetologists who happen to be the Chair of Langkawi Research Centre. The Auditorium of LADA was full of eager audiences including the new CEO of LADA, Dr Ahmad Hezri Adnan and the Advisor of Langkawi UGGp, Emeritus Professor Da-to' Dr Ibrahim Komoo.

Professor Norhayati reflected on rich Langkawi biodiversity with successions of fauna and flora for over 500 million years. As a professional photographer, she she stunned the audiences with her own photos on some of the rare and endangered species of fauna and flora of Langkawi. She ended with an appeal that everyone should look around for those endangered species or for a potential undescribed species.



GEO PARK BUSINESS PARADIGM

This breakfast program was held on the March 1st 2019 at the Laman Padi where casual discussion between keen businessman of Langkawi and the Langkawi UGGp team took place. The program was intended for businessmen to venture into geopark-based business in contributing to heritage conservation, local community development, economic growth and financial stability. The participants were urged to create a more recreation and service business that based on geopark, tourism, educational experience and culture because the geopark project is depending on the current industries. And as mentioned by Prof. Dato'. Dr. Ibrahim Komoo that "Langkawi is a region that contains international geological heritage and



GEO COMMUNITY

RAMADHAN TOUR

Ramadan Al-Mubarak is a blessed month for everyone once a year especially for Muslims around the world. This year, LADA in collaboration with its Subsidiary and Associate Company of LADA and Langkawi FM held a Ramadan Tour Program 2019 at Masjid AnNawawi, Bohor Merah on May 13th 2019 and Masjid AlHijrah, Selat Lubuk Chempedak on May 20th 2019. During these events, LADA and Langkawi UGGp staffs join the local community for Ramadhan breakfast, prayers and lectures as well as handing of donation to the needy. The goal of Tour is to strengthen the bonds of friendship and the spirit of togetherness among the donors and on the receivers.

As Ramadhan is over, everyone celebrates Syawal with joy. On June 27th, LADA, Langkawi Tourist Guide Association, Langkawi Vocational College and Langkawi Kraft Complex organized a grand **Eidilfitri Celebration** at the Laman Padi, participated by 13 main hotels of Langkawi and the general public. The feast was highlighted by demonstrations of traditional treats making by the Langkawi Kraft Complex.



CEO of LADA handing in donation (left), scene from Ramadhan Bazaar (bottom), public gathering during Aidilfitri Celebration (right)

ROYAL REGATTA 2019

The Royal Langkawi International Regatta (RLIR) event took place between January 7th to 12th 2019. RLIR '19 was organized in partnership with Tourism Malaysia, the Ministry of Youth and Sports Malaysia, the Malaysia Sailing Association and LADA. This 17th RLIR celebrates the Winner of the Prime Minister's Challenge Trophy organized by the Royal Langkawi Yacht Club (RLYC).

The RLIR 2019 welcomed 35 new entrees and witnessed the come back of veteran sailors from eight countries including Australia, USA, Russia, Singapore, Malaysia, Japan, and Thailand. Malaysia was represented by nineteen sailing boats. All sailing boats will compete for prestigious titles under seven classes in the highly anticipated annual sailing event. Participants were enlighten about the fact that Langkawi UGGP is made of the entire islands and their activities is part of the geopark activities.

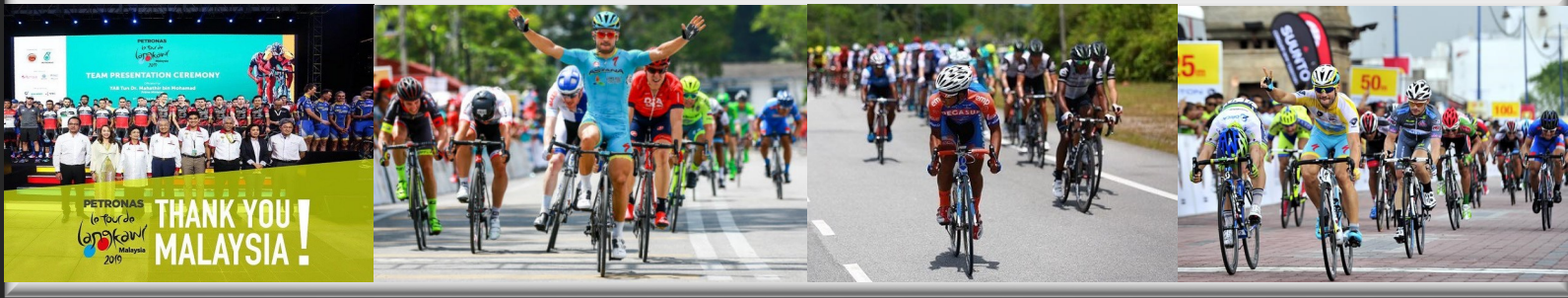


AKTION TUBA TRAIL RUN 2019



The trails were calling! Aktion Tuba Trail Run 2019 (MALAYSIA) is back again for another trail adventure for those who can lift up to the challenges of the trail. The Aktion Tuba Trail was held on April 20th 2019 and was started at 7.30am on Tuba Island, Langkawi. This run took participants through the scenic Tuba Island, the third largest islands of the Langkawi archipelago. The event was organized by LADA and associated with E-Plus Global Sdn. Bhd. Due to an overwhelming respond from the local and international participants, The Tuba Trail Run is back for more with a new set of challenging courses and trails. Contestants of the Aktion Tuba Trail '19 were tested through very challenging trail set on wilderness of Pulau Tuba and Dayang Bunting while exploring some of the untouched Langkawi natural geological wonders. The event benefited a large number of local residences in forms of providing foods and beverages, transportations, souvenirs, guides as well as part time workers during preparation of venues and trails and cleaning up after the event.

Le Tour de Langkawi & RHB Langkawi Ride



It's back to 10 stages this year for the Asia's premier Cycling Circuit **le Tour de Langkawi**. This year the race was even more exciting when racers rode their final two stages (VII and VIII) in Langkawi UGGp on April 12th – 13th. Two separate routes were established to enable riders to experience the thrill of navigating through Langkawi's legendary heritage sites, flat open vistas, challenging gradients and fast track descents. The two days event also allowed riders to enjoy more of Langkawi rich natural heritage in between races. The *le Tour de Langkawi '19* was sponsored by PETRONAS. Heartiest appreciation goes to the Father of le Tour de Langkawi, YAB Tun Dr Mahathir Mohamad and wife for their gracious support on the event.

In nurturing cycling sports further among the locals, local bank RHB came forward to sponsor a new cycling event named as the **RHB Langkawi Ride 2019** on the April 13th 2019. Competitors raced under three different categories, i.e. 100km Eagle, 75km Heritage and 25 km Adventure Rides.



FIVB Beach Volleyball World Tour

The 2019 **FIVB Beach Volleyball World Tour** is the global elite professional beach volleyball circuit organized by the *Fédération Internationale de Volleyball (FIVB)* held in Langkawi on April 11th – 14th 2019. Malaysia is the sole ASEAN nation to host the tournament which is fully sanctioned by FIVB. The 2019 FIVB Beach Volleyball World Tour Calendar comprised three FIVB World Tour 5-star tournaments and Malaysia hosted this year's third FIVB Beach Volleyball World Tour with 32 top male and female beach volleyball players from over 16 countries were competing.



Discovery Centre

A UNESCO Global Geopark must show a corporate identity to enhance its geopark image and visibility. Langkawi UGGp has its own Management Structures, office bearers, office space, and information centre under the auspice of Langkawi Development Authority (LADA). In enhancing the geopark visibility LADA has developed a new one stop geopark gallery called the Langkawi Geopark Discovery Centre (LGDC) at the Kilim Jetty complex, off the Kuah—Air Hangat Road. This new establishment will add one more attraction to the present Langkawi UGGp tourism destinations. More importantly, this fun-filled learning venue is aimed at increasing public awareness on Langkawi's extensive natural wealth, awareness on geopark development concept and the role of UNESCO Global Geopark in fostering regional sustainable development.

Based on the concept of "Making the Past Present for the Future", LGDC blends together all of its element of natural and cultural heritage in order to show how important is our geological foundation in providing us our diverse natural environment and colorful cultural environment.



The front facade of the building (above) was designed after fracture pattern of the limestone karst wall by the side of the discovery centre.

Aerial view of Langkawi Geopark Discovery Centre at the Kilim Geoforest Park Jetty Complex (below)



The main goal of Langkawi Geopark Discovery Centre (LGDC) is to promote the Langkawi's unique natural history for over a billion years. It was built as an ongoing commitment of Langkawi in promoting UNESCO Global Geoparks to the general public. The discovery centre is part of LADA's commitment under the Langkawi Tourism Blueprint (2012-2015) in which geopark development is at its highest priority.

ZONE
1**MAIN LOBBY**

Your Langkawi UNESCO Global Geopark discovery starts here. Find out all the things to do, and all the topics there are to explore, with help from our staff.

ZONE
2**INTRODUCTION AND SOCIOCULTURE**

Langkawi's mountains, islands and beaches hold fascinating facts and stories that go back over half a billion years. Take a geological and historical exploration of Langkawi and witness its natural beauty through a series of 3D animations showcasing the island's formation and development through era, epoch and age!

ZONE
3**MYTHS AND LEGENDS**

Langkawi is a land of myths and legends. From the story of a giant and an eagle to the romance of a warrior and a princess, the island's many tales have become part of the Langkawi mystique. Let us introduce you to some of Langkawi's famous heroes and heroines, including the most famous of all—Mahuri, and her tale of tragic, yet true love.

ZONE
4**MANGROVE FOREST**

Langkawi's extensive mangrove forests are one of the Park's 'Jewels in the crown'. Learn more about this fascinating ecosystem at our exhibition!

ZONE
5**UNESCO GLOBAL NETWORK OF GEOPARKS**

Learn about the UNESCO Global Geopark Network of 147 parks worldwide, and how LGGP became the first in Southeast Asia.

ZONE
6**INTERACTIVE GAMES**

Make your visit to the Discovery Centre even more exciting and engaging when you experience the fun and excitement of our interactive game zone.



The Minister on working visit to monitor the progress of the discovery centre (above). Below (from top to bottom): Main exhibition hall with geopark model and cultural exhibits; mangrove forest diorama; rock foundation of Langkawi.



LGDC comprises of two story building where the ground floor is dedicated for exhibition, theatre and souvenir shops, while the upper floor host the administrative office and seminar and activity rooms.

The ground floor is divided into five sections, i.e. Introduction to Main Exhibition Hall which showcase scale model of Langkawi UGGP and culture of Langkawi; Myths and Legends; Mangrove Forest; UNESCO Global Geopark which includes displays of Langkawi UGGP's Sister Geoparks; and Interactive Games.

LGDC is also provided with an amphitheater facility that can accommodate up to 100 people at one time, mini Library facilities, souvenir shop, and landscape and recreational areas and Administration office. Ample parking spaces, shop lots and amenities are provided at the entrance of the Kilim Jetty Complex. LGDC will be a testament to endless endeavors to make Langkawi one of the major tourism destinations in Malaysia.

REVALIDATION 2019

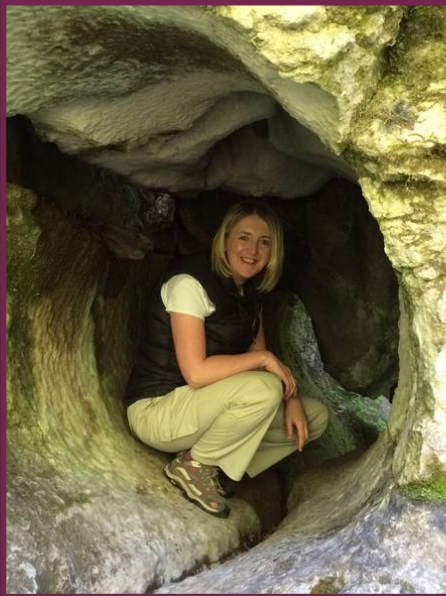


To honourable UNESCO Global Geopark Expert Evaluators

Warmest Welcome
from Langkawi UNESCO Global Geopark



August 7th - 11th 2019



Welcome Dr Kirstin Lemon

Team Leader: Information & Infrastructure, Geol. Survey of Northern Ireland (GSNI)

Member: UNESCO Global Geopark Council (UGGpC)

(photo from UNESCO Website)

Velkomin Mr Sigurdur Sigursveinsson

Katla UNESCO Global Geopark, Iceland
Professor, Research Centre South Iceland, University of Iceland



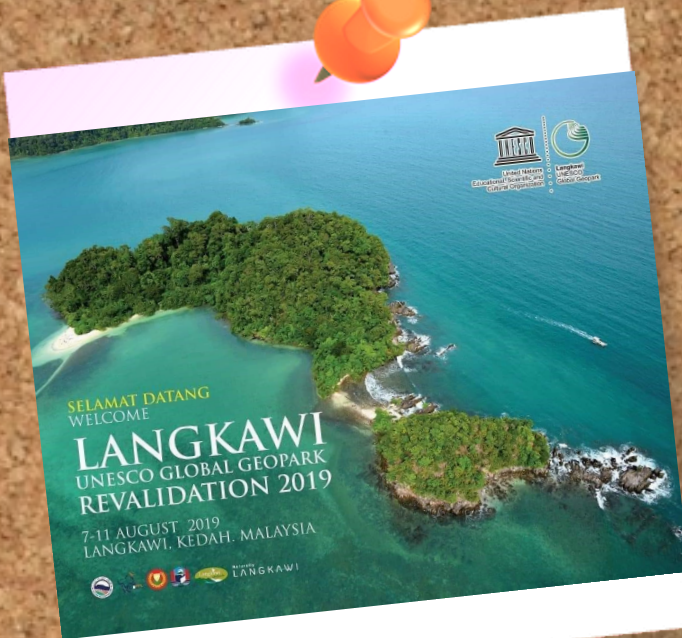
Four Years ago we welcomed honourable Mr. Pablo Rivas Palomo from Spain and Mr. Pasquale Li Puma from Italy to Langkawi UGGp, looking forward to their wise recommendations on how to further improve our geopark. With their recommendations we have strategized our four years activities in making Langkawi a much better geopark today. Now we are ready for our next big day, the Third Revalidation.

On August 7th 2019 Langkawi will be honoured to receive two more geopark experts from UNESCO, Dr. Kirstin Lemon of Northern Ireland and Mr. Sigurdur Sigursveinsson of Iceland for the Third Revalidation Mission for the Langkawi UGGp. From August 8th to August 10th Dr. Lemon and Mr. Sigursveinsson will thoroughly inspect every aspects of geopark development in Langkawi from geopark documentation to infrastructure, from site conservation to education, from cultural to local product promotion, from industry CSR to community participation, from visibility to networking, both locally and globally.

We wish Dr. Lemon and Mr. Sigursveinsson to have a pleasant trip to and from Langkawi and most importantly for you to have an enjoyable stay in our 99 beautiful islands of Langkawi UNESCO Global Geopark. You are most welcome to extend your stay after completion of the Revalidation Mission.

It is the greatest privilege for peoples of Langkawi Islands as indeed the whole Malaysians to greet our highly respected assessors to our beautiful Langkawi Geopark.

UPCOMING EVENT 2019



AUGUST

Langkawi Funride Jamboree



Langkawi International Beach Soccer at Pantai Kuala Muda

AUGUST

The Royal Langkawi Cat Show at MIEC



THE ELS CLUB

Langkawi Cup Golf Tournament at The Els Club



Geomangrove Programme



SEPTEMBER



SEPTEMBER

GFNY Malaysia 2019



Langkawi International Extreme Festival at Pantai Cenang

EXTREME FESTIVAL

SEPTEMBER

Lawn Bowls Mahsuri International Mixed Pair at Kompleks Sukan Langkawi



2nd International Dragon Boat Regatta at Pantai Taman Legenda



REGIONAL GEOHERITAGE CONFERENCE 2019

CELEBRATING EARTH'S LEGACY THROUGH GEOHERITAGE

25-27 SEPTEMBER 2019

REGIONAL COURSE ON UNESCO GLOBAL GEOPARKS 2019

07 - 11 OCTOBER 2019
LANGKAWI UNESCO GLOBAL GEOPARK, MALAYSIA

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ORGANISED BY:



IN COLLABORATION WITH:



OCTOBER

The Langkawi International Bird Festival at Oriental Village



IRONMAN Langkawi at Tanjung Rhu



NOVEMBER

Royal Kedah Muaythai Championship at MIEC



NOVEMBER

Raja Muda Selangor International Regatta 2019 at Royal Langkawi Yacht Club



Sail Malaysia Passage at Telaga Harbour Park



Oceanman Langkawi at Tanjung Rhu



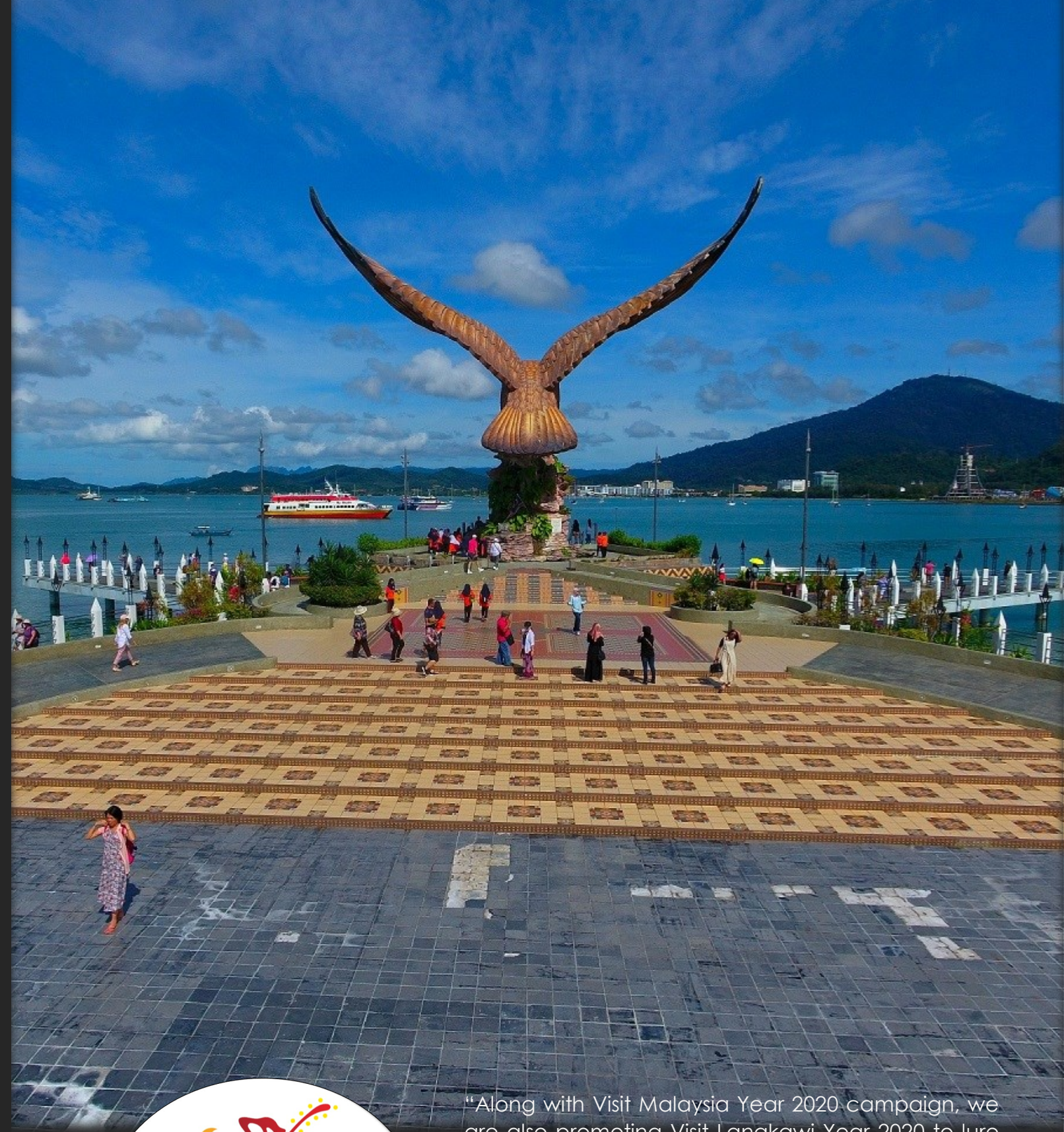
NOVEMBER

Langkawi International Mountain Bike Challenge



DECEMBER

Langkawi International Jetski Championship at Pantai Taman Legenda



"Along with Visit Malaysia Year 2020 campaign, we are also promoting Visit Langkawi Year 2020 to lure more tourists to Langkawi" said CEO of LADA, Dr Ahmad Hezri Adnan during the EidilFitri Celebration.

CEO of LADA, Dr. Ahmad Hezri Adnan said that for the Year 2020 LADA will upgrade and beautify the environment around Sungai Kuah to make it into a new tourism hub.