

The Challenges of Sustaining Archaeological Heritage Sites at the Limestone Caves in Kinta Valley, Perak (Malaysia)

Adnan Jusoh, Yunus Sauman @ Sabin & Muhamad Termizi Hasni

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v8-i4/4129>

DOI:10.6007/IJARBSS/v8-i4/4129

Received: 07 March 2018, Revised: 25 March 2018, Accepted: 05 April 2018

Published Online: 17 April 2018

In-Text Citation: (Jusoh, Sabin, & Hasni, 2018)

To Cite this Article: Jusoh, A., Sabin, Y. S. @, & Hasni, M. T. (2018). The Challenges of Sustaining Archaeological Heritage Sites at the Limestone Caves in Kinta Valley, Perak (Malaysia). *International Journal of Academic Research in Business and Social Sciences*, 8(4), 997–1009.

Copyright: © 2018 The Author(s)

Published by Human Resource Management Academic Research Society (www.hrmars.com)

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licences/by/4.0/legalcode>

Vol. 8, No. 4, April 2018, Pg. 997 - 1009

<http://hrmars.com/index.php/pages/detail/IJARBSS>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at
<http://hrmars.com/index.php/pages/detail/publication-ethics>

The Challenges of Sustaining Archaeological Heritage Sites at the Limestone Caves in Kinta Valley, Perak (Malaysia)

Adnan Jusoh¹, Yunus Sauman @ Sabin¹ & Muhamad Termizi Hasni²

¹ Department of History, Faculty of Human Sciences, Universiti Pendidikan Sultan Idris, 39500 Tanjung Malim, Perak, Malaysia, ² PhD. Candidate, Department of History, Faculty of Human Sciences, Universiti Pendidikan Sultan Idris, 39500 Tanjung Malim, Perak, Malaysia
Email: adnan.jusoh@fsk.upsi.edu.my

Abstract

This article discusses the challenges faced in sustaining archaeological heritage sites at several limestone caves in Kinta Valley, Perak. Besides being rich in historical elements, both in the form of historical buildings and in the socio-culture of its community, Kinta Valley is also gifted with uniquely beautiful natural features resulting from the formation of limestone caves. More interesting, archaeological remains have been discovered at some of the limestone caves in Kinta Valley. Given all these advantages, this paper studies the extent to which the potential of the heritage sites in Kinta Valley has been exploited, and the challenges faced in the efforts to sustain these sites. Therefore, this conceptual paper will discuss some of the challenges in sustaining the heritage sites, especially the archaeological sites, at a number of limestone caves in Kinta Valley, Perak. In order to produce this paper, qualitative and observational methods have been applied to obtain sources and findings for the study. The findings are that there have been some issues and challenges in the effort to sustain the heritage (archaeological) sites at the limestone caves in Kinta Valley. Among these are the increasing threats to the condition of the sites caused by natural factors such as weathering, shaking and ruins as a result of quarrying activities, and vandalism and developments that have affected the ecology and environmental sustainability of Kinta Valley.

Introduction

The Perak government launched its Visit Perak 2017 campaign with a target of attracting 6.5 million tourists. One of the locations expected to be an attraction for tourist visits is the Kinta Valley area, especially Ipoh City. Other than that, the Perak government has also made a Special Area Plan (SAP) to make Perak Ipoh the Tin Heritage City 2020. Among the objectives of the SAP is the regeneration of the city centre and heritage areas (Ipoh City Special Area Plan – Tin Heritage

2020). It is not impossible that these aspirations will be realised, because Kinta Valley, and especially Ipoh City, is very strategically located and easy to reach. In addition to the historical factors, the unique natural features of Kinta Valley have become a distinctive attraction and are capable of attracting tourists.

However, given the enthusiasm about these aspirations, some aspects of the heritage, particularly relating to the archaeological sites found in Kinta Valley, need to be reviewed. This is because the sustainability of the archaeological sites at the limestone caves in Kinta Valley is endangered; in fact, in certain aspects the current status indicates that they are on the verge of destruction. Hence, this article will review the history of the research, discovery and potential of the archaeological heritage sites at several limestone caves found in Kinta Valley as well as the issues and challenges encountered in the context of upholding archaeological tourism.

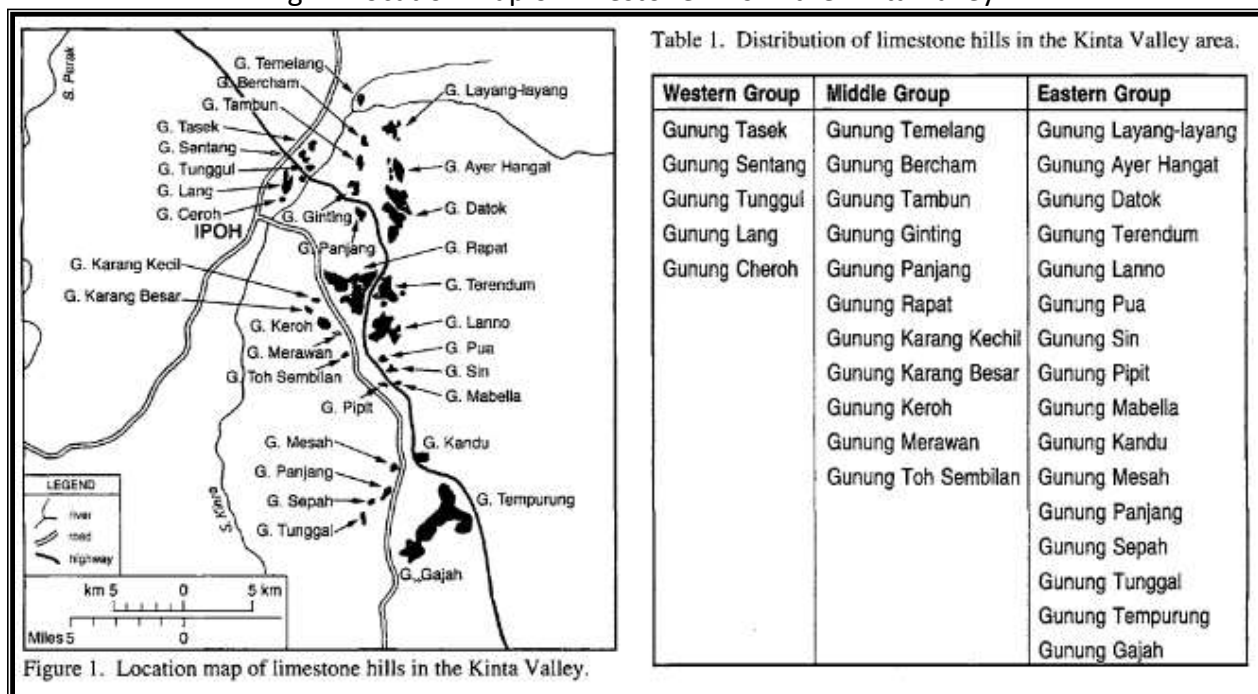
Background

Kinta Valley is an area that was once very rich in natural resources and, in particular, produced tin ore (Nasution & Lubis, 2005). During the nineteenth century, Kinta Valley became the focus for immigrants, particularly from China, who worked in the tin mining industry. The rapid growth of the mining industry led to the emergence of several towns or cities that were associated with tin ore production, including Ipoh City, Kampar, Gopeng, Batu Gajah, Pusing, Pasir Putih, Papan, Lahat, Menglembu, Jelapang, Tasek, Bercham, Gunung Rapat and others (Zuliskandar et al., 2015). In addition, Kinta Valley is a tourist attraction with beautiful natural scenery at Gua Tempurung, Gua Tasik Cermin, Pencil Rock at Gua Datok, Kek Lok Tong, Perak Tong, Hutan Lipur Ulu Kinta, Lata Ulu Chepor, Mata Air Panas, Gunung Lang Recreational Park and several other locations. In short, Kinta Valley possesses a complete package for tourism activities, with interesting natural phenomena such as limestone caves, lakes, rivers and waterfalls, as well as archaeological sites and historical buildings.

Kinta Valley is situated between two mountain ranges, namely the Titiwangsa Range (on the east side) and the Mount Keledang Range (on the west side). It lies between 4° 15' 00" and 4° 45' 00" longitude (North) and 101° 00' 00" and 101° 15' 00" latitude (East) and has an area of about 627 to 700 square kilometres. Kinta Valley is located in an area where the bedrock is composed of limestone that was covered by alluvium. The alluvial deposits in Kinta Valley were formed during the quaternary period, which has been found all over the world, especially Kinta Valley alluvial tin deposition. The alluvium in this area consists of old alluvium, young alluvium, organic mud and rocks. According to Gobbet and Hutchison (1973), the young alluvium dates from between the Holocene period and recent times, and the old alluvium from the early Pleistocene period (Saarani, 1997). Geological studies have found that the Kinta Valley area is coated by a sedimentary sequence of Silurian-Permian granitoid rock associated with a late phase minor breakthrough, likely to be between the Jurassic and Triassic. In terms of age, the limestone found in the Kinta Valley area was recorded as being from the Devonian to Permian periods (Suntharalingam, 1968). At a radius of 13km from the centre of Ipoh, there are more than 30 hills or limestone caves of varying sizes, with an altitude lying between 121.91 metres (400 feet) and 524.25 metres (1720 feet).

The unique geographical features are one of the reasons why Kinta Valley is rich in natural treasures and abundant in tin ore. One of the main attractions in Kinta Valley is the diversity of limestone formations and interesting karst phenomena. Among these are Gunung Rapat, Gua Kanthan, Gua Datok, Gunung Lang, Gunung Lanno, Gunung Cheroh and so on. According to Liz Price (2001), there are more than 80 limestone caves throughout Perak. According to the Kinta Valley report published by the Malaysia Natural Society (MSC, 1991), the number of limestone caves in Perak is over 65, and 45 of these are located in Kinta Valley, Perak. In general, the distribution of limestone caves in Kinta Valley is shown in the following map.

Fig. 1. Location map of limestone hills in the Kinta Valley



Source: G.H. Teh, Sibon, M. & Saarani, M.S. 2001

The Research History of the Limestone Caves in Kinta Valley

The landscape in Kinta Valley, Perak has attracted a number of foreign as well as local researchers, but the focus of their research has mainly been on geology and archaeology.

Research in the geological field

Scientific studies have shown that the caves were formed because of chemical weathering and water erosion. The caves started in limestone fractures underground at the groundwater levels. This is because 97% of the water on the earth's surface is contained within the soil and it is formed by the diffusion of rain. Water flows into the cracks and fractures in the rocks, especially on weak planes (lineamen) (Mohamed et al., 2000). The process begins when a small fraction of rock is dissolved in a reaction with rainwater. Over time, the flow of water that fills the fractures and cracks in the limestone dissolves the rock so that the cave grows. The continuous enlargement of the hole causes the wall of the cave to meet. The water that flows through the fracture at the top of the cave roof is usually loaded with calcium carbonate. The presence of this

calcium carbonate allows the formation of various physical forms in the caves such as stalactites, stalagmites, notches, dropstones, columns, and so forth (Jusoh, 2011). To facilitate our understanding, the sequence of the geological ages is as follows:

Table 1. Geological Periods

No.	Era	Period	Culture	Duration (million year)
1	Paleozoic	Precambrian		590-4,600
		Cambrian		505-590
		Ordovician		438-505
		Silurian		408-438
		Devonian		360-408
		Carboniferous		286-360
		Permian		248-286
2	Mesozoic	Triassic		213-248
		Jurassic		144-213
		Cretaceous		65-144
3	Cenozoic	Tertiary	Paleocene	55-65
			Eocene	38-55
			Oligocene	24-38
			Miocene	5-24
			Pliocene	2-5
		Quaternary	Pleistocene	2 million until 100,000 BC
			Holocene	100,000 BC until now

A geological study in the Kinta Valley area was carried out by Ingham and Bradford (1960), who found that the area was coated by marble and metasediment from the Devonian period. The marble rocks and metasedimentary rocks are believed to interbed one another. This rock was cracked by granite during the Triassic era. The marble granular sizes in this area range from subtle to rough (Hashim, 1991). This shows that limestone has been in Kinta Valley for thousands of years. In general, the geological age and the distribution of the new limestone caves found throughout Peninsular Malaysia including the Kinta Valley area are as described in the following table:

Table 2. Distribution and Era of Limestone in Peninsular Malaysia

No.	Era	Location
1	Late Triassic	Eastern region of Kuala Lipis, Pahang
2	Permian	Almost limes stone in Malaysia, particularly at east Perlis, Kedah, Perak (Taiping, Lenggong and KINTA VALLEY), Kelantan, Terengganu, east Pahang and Negeri Sembilan
3	Early Carboniferous	There is only in Kuantan, Pahang and a few site at northern part of Perak
4	Ordovician/Silurian	Include border Perlis/Thailand, Pulau Langkawi (Kedah) and Batu Cave (Selangor)

Source: Jusoh, 2007

The limestone hills in Kinta Valley have a karst topography which is generally steep. The karst topography also shows the presence of cave systems, notches and gullies due to the process of chemical solution and water corrosion. The karst landscape was formed in the limestone area, which had experienced dissolution during the chemical weathering process by surface and underground water. The formation of the karst topography in Kinta Valley is believed to have been the result of a long process of dissolution or karstification. The dissolution process in the area is believed to have started once the area was exposed, sometime around the Middle Tertiary age, and continues to this day (Muhamad & Kommo, 2006). The carvings formed by this oxidation process resulted in a unique and attractive landscape, with sinkholes (*wang*) or dolines, caves with stalactites and stalagmites, mogotes and steep-sided or vertical hill towers (Kommo & Mohd, 1996).

A study in Kinta Valley was also conducted by Ros Fatimah Muhamad in 2004 and published in *The Characteristic and Origin of the Tropical Limestone Karst of the Sungai Perak Basin*. Her research focused more on the original nature or characteristics of the karst limestone in the Sungai Perak basin.

Research in the Archaeological Field

Archaeology is a multi-disciplinary study involving the fields of history, science, geology, palaeontology, geomorphology, anthropology, botany and several others. The timescale is focused on the human and environmental aspects of the past, often known as the prehistoric and protohistoric periods. To facilitate our understanding, the sequence of time or periods in the archaeological field is as follows:

Table 3. Archaeological Periods

No.	Era	Culture	Duration (Year)
1	Prehistory	Paleolithic	40,000-35,000 BC
		Mesolithic/Hoabinhian	12,000-2000 BC
		Neolithic	4000-3000 BC
		Bronze Age - Bronze/Iron	500 SM-500 Century
2	Protohistory		1/6 - 14 Century

Archaeological studies have been conducted in the Kinta Valley area. For example, Leonard Wray (Curator of the Taiping Museum) performed excavation activities in Gunung Cheroh, Ipoh, between 1886 and 1891. Among the findings from the excavation were several stone adze (Price, 1995). Callenfels, a Dutch archaeologist, also explored several limestone caves in Perak in the 1920s and 1930s (Callenfels & Noone, 1928). The limestone caves were the focus of the study because they were said to have been used as places of residence or for other activities by the ancient communities. The study discovered an artefact that was very useful for research purposes, especially in relation to prehistoric communities. These studies show that research on the limestone caves in Perak has attracted many researchers since the colonial period.

In 1936, H.D. Noone and P.V.S. Callenfels conducted a study at Gol Bait, Sungai Siput, Perak. The study discovered pottery fragments within the upper layer (0-40 cm), consisting of pieces of the lips and bottoms of pottery. Among the functions of the pottery found in Gol Bait were water storage and food storage; a bowl used for ritual ceremonies in the prehistoric society was also found (Collings, 1938). R.L. Rawlings reported that the paintings on the limestone cave walls were images of human beings and animals (wild boar, *tapir* and *dugong*), dots, lines in other patterns and abstract figures (Rawlings, 1959). Adi Taha and Zulkifli Jaafar conducted a study at Gua Kelawar and discovered rock tools, earth pottery, food residues and a cave painting using charcoal, which was the most interesting finding (Taha & Jaafar, 1990).

Fig. 2. Rock art at Gua Tambun and Gua Kelawar



Source: Jusoh, 2011

Jusoh (2011) discussed the discovery of ancient paintings at Gua Mat Surat in Kinta Valley, Perak and the relationship with the ancient paintings discovered at Gua Kelawar, Ipoh (Taha & Jaafar, 1990). In addition, Jusoh (2011) mentioned the danger to the sustainability of the natural heritage of the limestone caves in Kinta Valley, Perak. In another article, Adnan Jusoh (2016) emphasized that the heritage sites (archaeological sites, historical buildings and natural sites) in Malaysia need to be fully explored so that they can be turned into archaeological tourist sites.

Fig. 3. Erthernware and Porcelin from Gua Mat Surat



Source: Jusoh, 2011

In summary, the archaeological research in Kinta Valley and the findings are shown in the following table.

Table 4. Archaeological Research in Kinta Valley

No	Site	Researcher & findings
1.	Gol Bait (Noone & Callenfels, 1936; Colling, 1938)	<ul style="list-style-type: none"> This site was studied by H.D. Noone and P.V.S. Callenfels in 1936. The study managed to find lip and base fragments of earthenware pottery. Among the functions of the pottery were water storage and food storage, and there was also a bowl used for the ritual ceremonies of the prehistoric community (Colling, 1938). In addition, the study also discovered two beads made of shells. The first bead was a <i>cypraea lamarckii</i> shell and the second a <i>cyprae caputserpentis</i> shell; this was confirmed by W.M.F. Tweedie.

-
- | | |
|--|---|
| | <ul style="list-style-type: none">• Other than that, there were also some stone tools, among them <i>beliung batu</i> and a tool that looks like a chisel. |
| 2. Gua Tambun
(Rawlings, 1959; Matthews, 1959; Ahmad, 2005) | <ul style="list-style-type: none">• The colonial researcher Rawlings discovered about 30 cave paintings, with various images such as humans and animals (wild boar, <i>tapir</i> and <i>dugong</i>), dots, lines in other patterns and abstract figures on cave walls. |
| 3. Gua Kelawar
(Taha & Jaafar, 1990) | <ul style="list-style-type: none">• This site was studied by the curators of the Museum and Antiquities Department led by Adi Taha and Zulikifli Jaafar in 1986.• The study found a number of cave paintings produced using charcoal and hematite.• Additionally, 265 fragments of earthenware pottery were found with a pattern marked by cord. The size of the pottery was no more than 8 cm, with an average thickness of between 4 and 8 millimetres. |
| 4. Gua Mat Surat
(Jusoh, 2011; 2017) | <ul style="list-style-type: none">• This site was studied by the Universiti Kebangsaan Malaysia (UKM) team led by Nik Hassan Shuhaimi and Nik Abdul Rahman.• The findings found cave paintings with sketches of four-legged animals, humans, chickens or birds, and trees (Jusoh, 2011).• Other findings were pottery fragments, food residues of the prehistoric community, such as shells of either <i>Brutia Costula (BC)</i> or <i>Brutia Spinoza (BS)</i>, bone fragments, animal teeth, and iron and charcoal remnants. |
-

The challenges of sustaining the archaeological sites in Kinta Valley

The growth in development activities in Kinta Valley has been very rapid over the past 10 to 15 years. Various physical and infrastructure facilities have been built to improve living standards, especially for the people in Kinta Valley. These include the upgrading of transport systems and housing, and the building of schools, offices, hotels, small and medium-sized factories, and so on.

However, the rapid development activities in Kinta Valley are also indirectly affecting the efforts to sustain the heritage sites. The destruction of the limestone caves in Kinta Valley will have implications and cause us to lose important data for research, whether in archaeology, geology, botany or other fields. Among the causes of destruction are the following factors:

a) Quarrying

The most serious and concerning problem that may threaten the sustainability of the limestone caves in Kinta Valley is quarrying activity. Although quarrying companies provide considerable revenue from an economic point of view, in the long term quarrying also affects the ecology and the environment. Apart from noise and air pollution, the destruction of the limestone caves may also threaten the habitats of birds, insects and humans. It is believed that most of the limestone caves found around Kinta Valley, such as in Gunung Terendum, Gunung Kanthan, Gunung Cheroh and many others, are threatened by quarrying activities.

b) Cave erosion and Collapse

The second threat to the sustainability of the limestone caves in Kinta Valley is cave erosion and collapse. In addition to the natural process of weathering due to reactions with rainwater, the limestone caves in Kinta Valley also experience shaking due to the explosions set off by the quarrying companies. This is because the shaking of the limestone cave structures over time may grow bigger and eventually lead to collapse. For example, the weathering process that threatened the cave paintings on the walls of Gua Tambun has caused the images to be blurred. The cave paintings at Gua Tambun are among the most ancient paintings found in the country and were made by the early people using a material known as hematite.

Other than at Gua Tambun, Perak, ancient paintings have also been found at Gua Lobang Kain Hitam, Niah, Sarawak (Ahmad, 2005). Since these paintings were created a long time ago, it is undeniable that the erosion and collapse will have a direct impact on the durability of the paintings. Recent studies have found that the colour of the ancient paintings found on the walls of Gua Tambun is also fading (Jusoh, 2007). In the long run, these cave paintings will be destroyed, indirectly destroying the assets that are attractive for archaeological activities in Kinta Valley.

Fig. 4. Cave erosion and ruins at Gua Tambun and Gua Tanjung



Source: Jusoh, A. 2011

c) Vandalism

Vandalism is a bad habit of some individuals who scribble or write words in a public space. This is happening in most caves in Kinta Valley such as Gua Mesah, Gua Tambun, Gua Kanthan, Gua Kandu, Gua Kelawar and other limestone caves. For example, most of the walls of Gua Tambun are covered with writing, names, numbers and various forms of pornography (Jusoh, 2007). Besides being an eyesore, these irresponsible acts may affect visitors including adolescents. Apart

from that, these bad habits also affect the facilities provided on the sites, such as rubbish bins, public telephones, visitor boards and fences, in such a way that tourists are not attracted to come and visit.

d) Development Barriers

The emergence of residential areas around Kinta Valley also affects the picturesque natural landscapes, especially the complex of mountains and limestone caves. The limestone cave environment is getting worse because of the lack of land or space for development purposes. For example, the area behind Gunung Datok has now become a luxury housing estate through the reclamation of lakes and limestone caves. Similarly, a theme park known as The Lost World of Tambun is an attraction of Ipoh City. This theme park is located in the area of Gunung Datok, one of the limestone caves which is part of the identity of Ipoh City. Although the physical condition of the limestone cave has been maintained, the renovation and construction of various facilities in the environment have caused the cave environment to be destroyed (Jusoh, 2007).

Additionally, the construction of nursery sites, rubber or palm oil estates and fish ponds can be seen in some caves and also affects the ecology around Kinta Valley. As a result, limestone caves may be endangered and important archaeological data may be destroyed. This can be seen at Gua Kanthan, Gua Mesah, Gua Kelawar, Gua Tok Semelah, Gua Paradise Valley, Gua Tanjung and several other caves.

In addition, there were also several caves in the Kinta Valley area where archaeological artefacts had been found but which were further away and were isolated. These conditions made them vulnerable to various forms of unscrupulous threats and activities. For example, the surrounding area of Gua Naga Mas was used as a dumping spot for goods such as old tyres, furniture, old cars, metal and so on. The same is true for several other caves around Kinta Valley such as Gua Kandu, Gua Mat Sirat, Gunung Datok, Gunung Karang Kecil and so on, as if they are now becoming abandoned (Jusoh, 2007). It is even worse when the cave area also becomes a place for drug addicts and immoral activities. A cave environment which seems to be abandoned and dirty may fail to attract tourists.

Conclusion

In addition to its strategic location, Kinta Valley is blessed with a fascinating natural landscape which is unique and attractive. The heritage assets of these very valuable archaeological heritage sites should not only be sustained but should also be developed to benefit the economy, especially with regard to tourism. This is because, in a broader context, we should learn from the approaches practised by some other countries in the world that are the focus of millions of tourists each year. For example, in Angkor Wat (Cambodia), Borobudur Temple (Indonesia), Petra (Jordan), the Pyramids (Egypt) and so on, the importance of the archaeological sites has never been diminished, and this may further highlight the greatness of their heritage in the eyes of the world.

However, in recent years, the development in Kinta Valley has been unbalanced because the heritage elements were being left out. Now most archaeological sites at the limestone caves

in Kinta Valley are threatened by destruction as the result of several factors discussed above. Among these are quarrying activities, erosion and collapse, vandalism, and development barriers, and there are no integrated plans. All of these factors are actually related to a poor level of awareness within the community. In addition, the weak enforcement to conserve and maintain the heritage site contributes to the destruction. In this regard, it is our responsibility to highlight the uniqueness of Kinta Valley as a heritage site that is capable of attracting visitors from all over the world. Although it may not be as good as the karst topography found in Zhangjiejie (China), the uniqueness of the limestone cave phenomenon in Kinta Valley has its own distinctive attraction.

Acknowledgement

This research was carried out with the assistance of the *Fundamental Research Grant Scheme (FRGS) (2017-0080-108-02)*. The authors wish to express their gratitude to Minister of Higher Education (MOHE) and UPSI who provided the research fund and the parties involved in this research.

Corresponding Author

Adnan Jusoh, PhD.
Department of History
Faculty of Human Sciences
Universiti Pendidikan Sultan Idris
35900 Tanjung Malim, Perak, MALAYSIA.
E-mail: adnan.jusoh@fsk.upsi.edu.my

References

- Abdul Rahman, N. H. S. N. (1998). *Early history*. 4. Singapore: Archipelago Press.
- Abdul Rahman, N. H. S. N., & Jusoh, A. (2011). "Gua batu kapur di Malaysia: Tinjauan dari aspek penyelidikan arkeologi". *IKSEP*. Jil. 2. Melaka. pp. 35-56.
- Ahmad, S. (2005). Lukisan primitif gua batu kapur Malaysia. *Jurnal Arkeologi Malaysia*. Bil 18. Kuala Lumpur: Ikatan Ahli Arkeologi Malaysia. pp. 97-117.
- Callenfels, P. V. S., & Noone, H. D. (1928). *Report on excavations in Perak, Ethnographer FMS Museums*, (12): 60-145.
- Hashim, A. S. (1991). *Kajian penilaian potensi batu kapur di Perak*. Jabatan Penyiasatan kajibumi Malaysia, No. Laporan: 21.
- Jusoh, A. (2007). "Gua batu kapur Lembah Kinta dari perspektif arkeologi". In. Leman, M.S., Ali, C.A. & Kommo, I. (Pnyt.). *Warisan geologi Malaysia*. Bangi: Institut Alam Sekitar dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia. pp. 169-190.
- Jusoh, A. (2011). "Lukisan gua di Gua Mat Surat, Lembah Kinta, Perak". In. Abdul Rahman, N.H.S.N. (Editor). 2011. *Perak – warisan arkeologi*. Kuala Lumpur: Ikatan Ahli Arkeologi. pp. 58-74.
- Jusoh, A. (2016). "Melestarikan tapak warisan arkeologi, monumen dan bangunan bersejarah dalam konteks arkeopelancongan di Malaysia". *Jurnal WARISAN*. Bil. 1. Kuala Lumpur: Jabatan Warisan Negara. pp. 38-66.

- Jusoh, A. (2011). "Warisan semula jadi gua-gua batu kapur di Lembah Kinta". In. Ghazali, A.Z. & Ahmad, M.R. (Editor). *Perak-Warisan, budaya & sejarah*. Kuala Lumpur: Persatuan Muzium Malaysia. pp. 68-106.
- Kommo, I., & Mohd, H. (1996). Geopelancongan: Pendekatan berterusan ke arah pemuliharaan khazanah geologi. In. Kommo, I., Leman, M.S., Desa, K.M. & Abdullah, I. *Warisan Geologi Malaysia*. (Editor). UKM: LESTARI UKM.
- Matthews, J. (1959). Rock painting near Ipoh. *Malaya in History*. Kuala Lumpur: The Malayan Historical Society.
- Muhmamad, R. F., & Ibrahim, K. (2006). The evolution of karst in Kinta Valley, Perak, In. Leman, M.S. *Warisan Geologi Malaysia*. LESTARI, Universiti Kebangsaan Malaysia.
- Nasution, K. S., & Lubis, A. R. (2005). *Kinta Valley – pioneering Malaysia's modern development*. Perak Academic.
- Price, L. (2001). *Caves and Karst of Peninsular Malaysia*. Kuala Lumpur: Gua Publications.
- Roslan, M. K., Ibrahim, K., Leman, M. S., & Ali, C. A. (2000). Geopelancongan Bukit Keluang, Besut, Terengganu. In. Kommo, I. & H.D. Tjia. *Warisan Geologi Malaysia*. UKM: LESTARI UKM.
- Taha, A., & Zulkifli, J. (1990). A preliminary report on archaeological research and excavation at Gua Kelawar, Sungai Siput, Perak. *Jurnal Arkeologi Malaysia*. Kuala Lumpur: Ikatan Ahli Arkeologi Malaysia. pp. 111-124.
- Teh, G. H., Sibon, M., & Saarani, M. S. (2001), Characterisation, geochemistry and possible usage of the limestone hills in the Kinta Valley area, Perak. *Geological society of Malaysia Annual Geological Conference*, June 2-3, Pangkor Island, Perak Darul Ridzuan, Malaysia. pp. 53-57.
- Wray, L. (1897). The cave dwellers of Perak. *Journal of the Royal Anthropological*. Institute of Great Britain and Ireland 26(1): 13-15