

GEOLOGICAL HERITAGE AND CONSERVATION: THE MALAYSIAN INITIATIVE

KOMOO, I. Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, Bangi, Malaysia.

Introduction

The conservation movement in Malaysia began more than 50 years ago. It is now well entrenched under an administrative and legal infrastructure that take the form of the Department of Wildlife and National Parks (PERHILITAN) at the federal level, the Forest Departments at both the federal and state levels, and the Parks Trustees at the state level. In those 50 years conservation efforts focussed mainly on biological resources which meant that geological conservation arose purely accidentally if the geological or landscape heritage site just happened to be located in one of the protected areas. This scenario is now changing and augurs well for conservation geology.

The Theoretical Framework

The concept of *conservation geology* was first introduced to provide the theoretical and systematic framework for the characterization, classification, assessment and ranking of geological heritage sites.

It should be noted that conservation geology should be differentiated from the concept of *conservation of geological heritage* that has long been used in various parts of the world. The conservation of geological heritage sites begins from a heritage resource that is known, already recognised by the public and that is already being conserved either for preserving the beauty of the Earth or for recreation. The philosophy embodied in the World Nature Heritage Sites is based on this approach. Conservation geology, however, begins with a school of thought on the potential heritage resources that are as yet to be identified. It begins with research to determine the intrinsic value of geological features and to assess their heritage value. It ends with the presentation of a particular resource to the general public (not the geological fraternity) as a heritage site, including the promotion and management aspects of the site.

Geological heritage resources need to be seen from the aspect of 'geological diversity'. Characteristics of the diversity include the composition, mineralisation, texture, structure, fossilisation, origins and the process of birth of the feature. The diversity can also be gleaned from the variations in landscape formation, scientific records, ecological functions and the relationships with the culture of the local community. Hence, the diversity may be explored based on two different aspects: one, the differences in characteristics as outlined above and two, on variations based on historical evolution of the Earth.

The concept of *geotopes* and *geosites* are introduced within the context of conservation geology. A geosite is a rock exposure or landscape that indicates a clearly high heritage value. There may be several of the features at a particular site, region or nation but they are in general hard to find elsewhere. A geotope is a geosite that is unique and has an outstanding value. There may be one or several of the features at one site but they are not found anywhere else.

Heritage value, on the other hand, is defined as pertaining to the following values: *scientific* (important for the geological records or history of the development of the Earth); *aesthetic* (landscape which is breathtaking or unusual); *recreational* (suitable for various nature recreations); and *cultural* (usually associated with utilisation, local beliefs, and historic and archaeological value) (Ibrahim Komoo and Mohd Shafeea Leman 1999).

Exploitation of Geological Resources in Malaysia

As was the situation elsewhere in the world, geological activities in Malaysia in the past focussed on the exploitation of mineral resources. The philosophy, however, shifted towards utilization without destruction as global market forces transformed the ideology into one focussing on geotourism. This shift makes conservation feasible politically, as well as culturally and economically. For this reason geotourism can be seen as a natural extension of the nature tourism concept encouraged by the Malaysian government.

The shift in ideology has affected all, including the Department of Mineral and Geosciences Malaysia (DMG) which has traditionally been the initiator of the exploration efforts for economic and industrial minerals. The Department now pays attention to the exploration of geological resources for conservation. The first step in this new initiative involves the mapping of national geological heritage sites, a joint project between DMG and Universiti Kebangsaan Malaysia.

The Malaysian Approach to Conservation Geology

Because of the uncertainties involved, conservation efforts are normally met with initial resistance. Therefore the easiest first step to take in order to implement the conservation concept is to promote geological sites in already existing parks. The Kinabalu Park in Sabah and the National Park in Peninsular Malaysia are two existing parks that contain geological heritage sites. Using this strategy, efforts to establish Mount Kinabalu and the National Park as geological heritage sites have already been successful (Ibrahim Komoo *et al.* 1997). Similar efforts in other parks are now underway, while greater efforts need to be invested in areas that have not been designated as parks.

Even though laws for protecting national parks exist, the legal framework and management system specifically for conservation of geological heritage are not yet in place. Several indirect approaches for protection of geological sites are available, i.e. the Wildlife and National Parks Act 1972, the Museum and Antiquities Act 1976 and the National Land Code 1965. But they are severely limited within the existing management system. For this reason, up to now not a single geological heritage resource is conserved in its own right.

In July 1998 Malaysia, together with UNESCO, organised a seminar on "The Nomination of Cultural and Natural Heritage of Malaysia to the World Heritage List" in Penang. Since then the

authorities of the Kinabalu Park in Sabah, the Gunung Mulu National Park in Sarawak and the National Park in Peninsular Malaysia have laid down the groundwork to enable such a listing to be achieved. As the uniqueness of both the Kinabalu Park and the Mulu National Park is intimately related to their geological features, it is hoped that this effort will also galvanise the authorities into expediently incorporating provisions that are necessary for geotope conservation in all legal and administrative frameworks (Lamri 1998; Gill *et al.* 1998; and Jasmi Abdul 1998).

The situation in Malaysia is encouraging as networking and cooperation have been established between researchers of geological heritage resources and the policy makers in the government agencies at both the federal and state levels, focussing on the importance of a convergent approach towards the development and management of such resources. Cooperation between the various parties in research and development activities is shown in Table 1. The DMGM, the Department of Museum and Antiquities, PERHILITAN and the institutes of higher learning are aware of the gaps in the conservation strategies of the resources in Malaysia. The introduction of the concept of conservation of geological heritage sites in the form of Geological Parks, Geological Monuments, Protected Sites and Aesthetic Landscapes is beginning to gain acceptance.

Research and Development Activities

The government of Malaysia is well aware of the importance of conducting R&D to develop and manage Geological Heritage Resources. Two research projects have been approved for funding under the Intensification of Research in Priority Areas (IRPA) mechanism. The titles of the two projects are as follows:

- ❑ Geological Resources in Nature Parks for Tourism Development (1996-1999).
- ❑ Development of Geological and Landscape Resources for Conservation and Ecotourism (2000-2001).

As a consequence of these project activities the following have now taken place or are currently being carried out:

- ❑ A Geological Heritage Group was established in 1996 to carry out basic and applications research on a continuing basis to ensure that major geotopes and geosites are properly identified in order to propose the correct conservation mechanisms and appropriate geotourism development activities.
- ❑ Focus has been given to detailed conservation studies on the Langkawi Islands, an international tourist destination and a haven to the geologists in terms of heritage value.
- ❑ Potential geosites and geotopes in Kinabalu Park, Sabah and the National Park, Pahang are currently being investigated and described.
- ❑ Geosites in other states are being identified and a specific map on the geological heritage sites of Malaysia is being prepared.
- ❑ A National Core Group on Geological Heritage of Malaysia was formed to formalise and endorse the identification and establishment of conservation sites. This National Core Group also serves to advise the federal or state governments regarding the appropriate conservation strategies to be implemented.

- ❑ The first National Conference on Geological Heritage of Malaysia was organized and saw the participation of many researchers and policy-makers from local universities and government agencies.

Education and Public Awareness Programmes

Continual and in-depth research can only be propagated if there exist effective education and public awareness programmes in Conservation Geology. At the postgraduate level, a local university, namely Universiti Kebangsaan Malaysia, has commenced such a programme since 1997. At the end of 1999 two students were awarded their Master of Sciences by thesis work on the following projects:

- ❑ Conservation of Geological and Landscape Resources: Case Study in Langkawi Islands and Kinabalu Park.
 - ❑ Tourism Geology of Kinabalu Park, Sabah.
- Three students are currently doing their Master of Sciences and Doctor of Philosophy by thesis work on the following subjects:
- ❑ Development of Geological and Landscape Heritage in Langkawi Islands: Case Study for Beach Characterization.
 - ❑ Development of Geological and Landscape Heritage in Kelantan: Identification of Potential of Geosites and Geotopes.
 - ❑ Development of Policy Direction and Database for the Preparation of a Geological Heritage Conservation System in Malaysia.

At the undergraduate level, Universiti Kebangsaan Malaysia has also introduced a core course on Conservation Geology in the existing Geology Programme, the first time such an initiative was taken in the country. All future graduates of this University will have a firm foundation on the conservation geology approach in Malaysia.

With respect to public awareness, many presentations have been made regarding conservation geology at seminars, dialogues and conferences. Papers have also been written in several local newsletters and journals for the consumption of geoscientists and non-geoscientists. In addition to this, numerous activities have been held for the general public. These include public lectures, exhibitions, science fiestas and fossil hunts.

Concluding Remarks

Malaysia has had a strong tradition in conserving its biological heritage with the establishment of several national parks, state parks, protected forests and wildlife reserves and sanctuaries. However, the awareness amongst the general public and the decision and policy makers of the importance of geological heritage resources is very low and a systematic approach towards their conservation does not exist. Nevertheless, since 1996 a systematic R&D effort in the field of conservation geology has catalysed several follow-up actions, including the formation of formal working groups and a vigorous education and public awareness programme. Such efforts have also recorded a few successes in terms of engagement of state governments and state park authorities in various issues pertaining to conserving geological heritage sites. No doubt it will not be long before conservation geology becomes an integral part of the nature conservation movement in Malaysia.

Table 1: Cooperation between the various parties in research and development activities related to conservation geology. EPU –Economic Planning Unit, DMG – Department of Mineral & Geosciences, DMA – Department of Museum & Antiquities, PERHILITAN – Department of Wildlife & National Parks, TCPD – Town & Country Planning Department, and NGO – Non Governmental Organization.

RESEARCH					DEVELOPMENT			
OBJECTIVE	INVENTORY	CHARACTERIZATION	EVALUATION	COMPARISON	POLICY	PLANNING	DEVELOPMENT	MANAGEMENT
	Identification of Geosites	Description of geology and landscape	Geological Heritage Value <ul style="list-style-type: none"> Scientific Aesthetic Recreation Cultural 	Heritage Status <ul style="list-style-type: none"> Local State National World 	Policy on Nature Heritage Conservation	Urban & Regional Landuse <ul style="list-style-type: none"> Conservation Control Special function 	Conservation & Development <ul style="list-style-type: none"> Protected Sites Monuments Nature Parks 	Management & Financial System <ul style="list-style-type: none"> Public Private
	Researchers	Researchers	Researchers	Researches Policy-makers Planners	Policy-makers Researchers Planners Implementors	Planners Policy-makers Implementors Researchers	Implementors Planners	Implementors Private sector NGO
MAJOR AGENCIES	R&D Centres	R&D Centres	R&D Centres	<ul style="list-style-type: none"> TCPD R&D Centres Federal & State Economic Planning Units 	<ul style="list-style-type: none"> EPU R&D Centres TCPD DMG PERHILITAN DMA 	<ul style="list-style-type: none"> TCPD EPU R&D Centres DMG PERHILITAN DMA 	<ul style="list-style-type: none"> DMG PERHILITAN DMA TCPD 	<ul style="list-style-type: none"> DMG PERHILITAN DMA Private Sector NGO

Acknowledgement

The research on conservation geology is funded by the Malaysian Government (IRPA Grant No. 02-02-02-0015).

References

Gill, D.W., Sapuan Ahmad and Liam, J. 1998. A Brief Proposal for the Inclusion of the Gunung Mulu National Park as a UNESCO World Heritage Listed Site. Paper presented at the Seminar on the Nomination of Cultural and Natural Heritage of Malaysia to the World Heritage List. 28 – 29 July 1998, Pulau Pinang, Malaysia.

Ibrahim Komoo, Mohd Shafeea Leman, Kadderi Md Desa and Ibrahim Abdullah 1997. *Geological Heritage of Malaysia – Conservation Geology for Ecotourism* (In Malay). LESTARI, UKM Publication, 319pp.

Ibrahim Komoo, Mohd Shafeea Leman 1999. *Geological Heritage of Malaysia – Conservation Geology for Geotope Development* (In Malay). LESTARI, UKM Publication, 350pp.

Jasmi Abdul 1998. The Management of Taman Negara in Peninsular Malaysia. Paper presented at the Seminar on the Nomination of Cultural and Natural Heritage of Malaysia to the World Heritage List. 28 – 29 July 1998, Pulau Pinang, Malaysia.

Lamri Ali 1998. Kinabalu Park: A World Heritage Site? Paper presented at the Seminar on The Nomination of Cultural and Natural Heritage of Malaysia to the World Heritage List. 28 – 29 July 1998, Pulau Pinang, Malaysia.