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Geoheritage Conservation : Indicators affecting the condition and sustainability of Geopark – a conceptual review

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Abstract

Geopark concept is introduced to establish country's historical value while protecting all the priceless assets and has become an exciting eco-tourism destination. Due to these facts, there is an incredibly increasing number of tourists who will lead to an increasing demand for facilities and other tourism development. Hence, new eco-tourism development, growth and industry become a major concern that gives the potential and adverse impact or pose a problem to the environment. This research will study on the current indicator proposed by Global Geopark Network (GGN) and how the indicator involved in measuring the performance and establishing the Geopark concept.

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Keywords: Geoparks; ecotourism; geo-heritage; conservation

1. Introduction

Historical areas have their distinctiveness and attraction, especially towards its esthetic and historical value. Heritage includes both tangible and intangible elements. Both factors could identify the level of identity and value

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towards human history and its surrounding environment. Heritage includes nature, culture, monument, archeological sites and others. Identity and image of a place depend on their historical background and also how the local authority plans for its development. Nowadays, rapid development and modern technologies show an excellent impression towards an attractive design approach. The purpose of those ideas was to promote to the whole world while automatically trying to solve the rapid increasing of population growth and globalization issues.

Surprisingly, continuous development had given a big impact towards the environment and became a primary concern. The primary changes and transformation of land uses, such as tourism, industrial and especially commercial had caused most of the historical place to be abandoned and less respected. Although there are many interesting design concepts and well – planned development that are introduced to each area, but current development had led to the issues towards the lack of identity and loss of historical value. Apparently, an uncontrolled development plan had created a rapid growth of modern design that has contributed to the loss of identity and distinctiveness character of precious historical places. The new design and ideas will create a good visual quality, but sometimes it may not consider in preserving the historical value that is important as the witness of the history of the early development around any particular area. If this phenomenon occurs, our future generation will lose their awareness towards history and also lost their chance to recognize the distinctive character of their heritage value.

In contrast to the present issues, there are a few approaches to reviving and preserving our historical value that is through the heritage conservation plan. One of the approaches is focusing on preserving Geo-heritage elements. Nowadays, the general view from the nation aspect is that some natural elements that including it surrounding's traditional culture and community identities is not well - respected. Therefore, in preserving the Geo-heritage value, a new concept known as Geopark area was introduced to be practiced by each country. This paper is aimed to discuss the current indicators proposed by Global Geopark Network by elaborate the indicator that involved in measuring performance and establishing the Geopark concept.

2. Geopark and geo-heritage conservation

Geopark has become widely known as the most valuable and amazing heritage site for each country and also becoming as one of an exciting eco-tourism destination that are mostly requested. Geoparks served a richness of natural beauty, ecological harmony, archeological, geological and various cultural significant. Usually, heritage conservation concepts and ideas could be categorized to a few aspects such as cultural, monumental, artifact and including archeological sites (Howard, 2003). Therefore, Geopark is considered as innovative conservation approaches to protecting the Geo-heritage assets while encouraging scientific research, public education and local economic development (Komoo, 2010).

Accordingly, Geo-heritage refers to globally, nationally, statewide, to local features of geology, such as its igneous, metamorphic, sedimentary, stratigraphic, mineralogical, paleontological, geomorphic, and others at all scales, that are intrinsically or culturally significant sites, that offer information or knowledge regarding the formation or evolution of the Earth, or into the history of science, that can be used for research, teaching, or reference (Jayakumar & Liu, 2007). Meanwhile, conservation could be defined as referred work that carried out on heritage buildings, monuments and sites which include preservation, restoration, repair and rehabilitation, reconstruction and adaptive reuse, or any combination of these (Jaafar, Nordin, Abdullah, & Marzuki, 2014). Therefore, Geo-heritage conservation can be described as a management or process that involved any effort such as preservation, restoration, reconstruction or rehabilitation, which suitable and intended to focus on protecting any natural assets known as geology in order to maintain the value, history and sense of place for future benefits. Hence, Geopark ideas were coming out as one of the approaches that represent most of Geo-heritage conservation aspect.

According to LADA (2011), prefix 'Geo' is taken from the Greek word which, given the meaning of the earth while the geology is the study of rock that relates to its history, formation, composition, structure, and also how the landscape has formed from the process of Earth's evolution over millions of years. Therefore, Geopark is known as a location selected for its geological significance, and the above mentioned aspects of the site that researched and promoted through mass media for the general public as well as academia, so that the precious natural heritage of these Geoparks can be preserved for posterity.

Nevertheless, as mentioned by ProGEO (2011), Geopark could be defined as an informal (non-statutory) term to describe the complexes of geo-sites, or even small geo-sites that are promoted for touristic purposes. For instance,

the label of ‘Geopark’ does not formally imply great scientific or heritage importance. However, it includes the capacity and utility of an area to be used for popularization and presentation of its interests. As well as visual and esthetic appeal and suitability for education, another key hope and aim has been that local socioeconomic gains will come from such popularization. In addition, according to ProGEO, the term Geopark evolved from an original concept for development of “geosphere” reserves, which then (during a discussion between UNESCO and ProGEO) was combined with the additional element of sustainable economic.

Hence, Geopark concept has evolved and introduced the ideas that transferring restricted and protected areas to become a development tool or branding area. Geopark concept was focused and considered the balance between Geo-heritage conservation, Geo-tourism activities and local community well – being. Thus, within the conservation program, the Geopark concept was protecting Geo-heritage sites while encouraging the biodiversity and cultural heritage to be conserved in an integrated manner (Komoo, 2010).

3. Elements affecting the development of the Geopark

Currently, the eco-tourism industry had rapidly developed in most of the country around the world. Eco-tourism industry had introduced the concept which involved the journey and exploration towards natural-rich environment, unexploited area, forest-reserved area and other destination that well-known for its natural sources, beauty and rich in various types of biological aspect (Samat & Harun, 2013). Eco-tourism development had been introduced in developing the tourism concept that minimizes the impact towards the natural environment and served public education towards the awareness of natural preservation and others (Mohamad & Ahmad, 2010).

Therefore, regarding the concept of an eco-tourism industry, Geopark ideas, concept and area were fulfilled the criteria and involved as one of the most popular eco-tourism destinations. The tourism activities around the Geopark area that related to the historical value has become the primary focus on heritage tourism ideas (Samsudin & S., 2013). According to Johnson (1996), heritage tourism had strengthened the aspect of authenticity and representation of geographical and historical knowledge. Tourism activities that related preserved the originality, historical value, and heritage elements had become the important aspect that could attract tourist especially the foreigners group (Zurick, 1992). In early 2000, Division of Earth Science, UNESCO has done a research regarding the Geopark’s development program and also Geo-heritage conservation approaches in Geopark area which should immediately recognize any Geo-heritage sites that are at risk or still abandoned (Komoo, 2010). However, to be recognized as Geopark area, any nominated area should have the ultimate well – known or historical value of Geo-heritage assets around the area (Leman, 2010).

Next, according to Komoo (2010), there are two major components that should be focused on the development plan of a Geopark. The two components should include both of the elements as follows:

- i. The area should conceive a few Geo-heritage sites that have high significance value and historical background towards the specific country or international level.
- ii. The historical area should have the strong biological and cultural aspect, especially regarding a close relationship between geological and landscape elements.

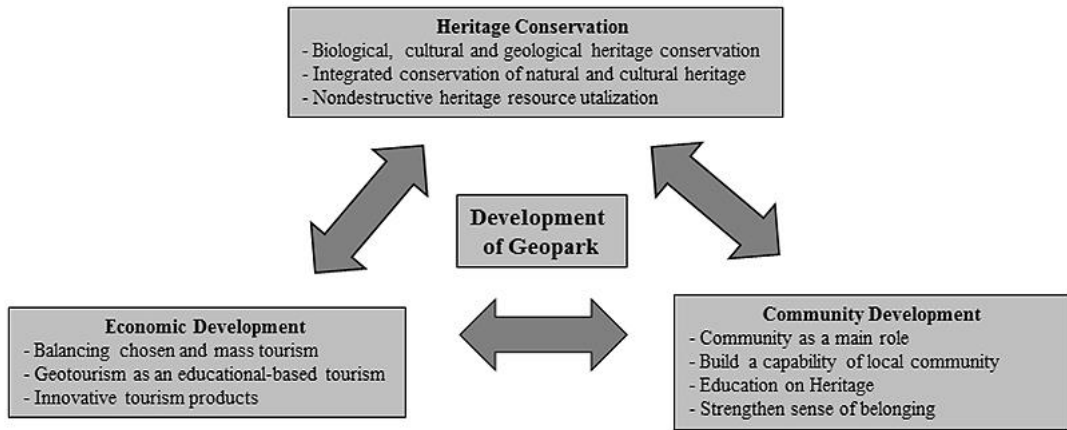


Fig. 1. Geopark Development Framework (Framework shows in focusing the balance within the conservation, economic development, and community aspect)

(Source: Adapted from Komoo, 2010)

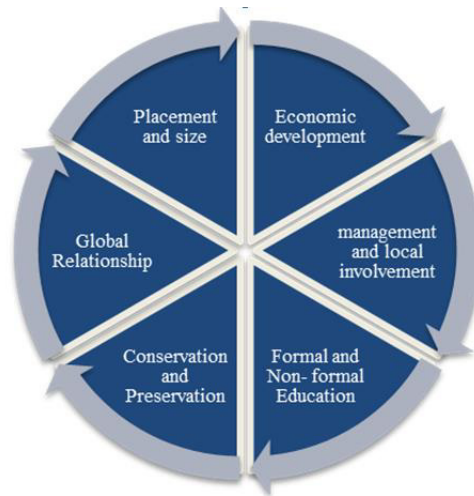


Fig. 2. Six guidelines and criteria for the recognition as the Geopark

(Source: Adapted from Hashim et al., 2010)

Besides, United Nation of Educational, Scientific and Cultural Organization (UNESCO) had also provided a few guidelines and general criteria to determine the area to be given the official Geopark status. The guidelines and the criteria were provided to consider and ensure the quality and importance of those Geo-heritage sites (Hashim, Aziz, Sarah, & Ling, 2010). Each approach plays a significant role in improving each development plan without compromising the issues of protecting the historical aspect.

Basically, Geopark concept was intended on combining the three aspects of the biological, geological and cultural aspect. The Geopark concept was introduced by UNESCO as the main area that involved a Geo-heritage sites that has high scientific, historical significance, rare and has an aesthetic value (Azman, Halim, Liu, Saidin, & Komoo, 2010). According to Ling, Sarah, Hashim, & Aziz (2010), the recognition of an area as a Geopark were

actually focused on the preservation and conservation aspect so that the social and local economic development within the area could be sustainable and well develop. The guideline provided by the Global Geopark Network (GGN) on 2004 as shown in Figure 2 prove that Geopark concept was the idea of developing area that consist of a physical character with a specific area or territory, involving geological, archeological, historical and area that's rich in cultural significance.

4. Indicators affecting the conditions and sustainability of the Geopark

Geopark concept was focused on protecting the Geo - diversity, promoting the Geo-heritage knowledge to the public, and also determines to support sustainable local economic development around the territories (Idilfitri, Rodzi, Mohamad, & Sulaiman, 2015). Therefore, as one of successful eco-tourism destinations, Geopark requires an efficient, flexible and possible management plan or guidelines in order to maintain the originality, quality and sustainability of the Geo-heritage area (Zouros & Valiakos, 2010). The development of Geopark area needs a well – structured plan with various indicators that important in determining the protection and also helps the progress of the whole Geopark. In ensuring standards while developing impressive economic, social and environmental Geopark condition, much effort is being devoted towards indicators which could assess and improve the performances of the whole Geopark area (Jayakumar & Liu, 2007). Then, in order to generate and maintain a good performance of the Geopark, precise long-term planning, continuous maintenance and regular evaluation are essential factors to be considered (GGN, 2006).

Table 1. Assessment Methodology in the operation of a Geopark

Item.	Criteria	DWeighting (%)
1.	Geology and Landscape	
	1.1 Territories	5
	1.2 Geoconservation	20
	1.3 Natural and Cultural Heritage	10
2.	Management Structure	25
3.	Interpretation and Environmental Education	15
4.	Geotourism	15
5.	Sustainable Regional Economic Development	10
Total		100

(Source: Adapted from Zouros, Nickolas, Keever, & Patrick, 2008)

Recently, numerous countries had set up a framework to enhance and search the best way in promoting their heritage value, its landscapes, and geological formations. Those planning and framework will determine and witnesses their victory in protecting their history of life. Figure 1 and 2 had shown the best example of main and important elements that will support the Geo-heritage conservation strategy.

For example, Table 2 listed Criteria 1, as the main criteria that the indicators are relevant to assessing the geological and the landscape factors. By referring to these criteria, it's actually more focusing and depends on the overall size and setting of the Geopark area (GGN, 2006). The indicator used as for the assessment of the Geopark area was referring to the management body, an action plan and also involved adequate staff. For instance, Geo-heritage conservation strategy should include the protection towards the elements such as geological, archeological and cultural in a certain area or territory by using and follows the specific guidelines provided (Leman, 2010). In addition, another element that should also need to be considered in this Geo-heritage conservation was land uses, physical development, environmental quality and others that relate to the resources right (Ling et al., 2010). Any progress and new action plan should be precisely measured and monitored in strengthening and further develop the habitats and species around the Geopark area (Young & Choi, 2006).

Table 2. Main component of the Geopark's evaluation document

Item.	Criteria	Weighting	Score
1.	Geology and Landscape Territory Geo-diversity – Geosite identification and documentation Geo-sites with public access, Similarities with existing Geopark Geo-conservation	5	1000
	Geo-site assessment , Legal protection and regulations, Protected geo-sites, Measures against misuse, Damage and natural degradation Natural and Cultural Heritage	20	1000
	Natural and cultural Heritage sites, Link between abiotic, biotic and cultural heritage, Promotion of Natural and Cultural Heritage	10	1000
2.	Management Structure Management structures and Financial resources Master plan components, Marketing Strategy – Components Research activities, Measures for geo-conservation Measures for Geotourism development, Infrastructure - Museums – Info Centers	25	1000
3.	Interpretation and Environmental Education Research programs, Educational programs, Educational material, Promotional material, Published guides, books, videos, etc., Internet sites	15	1000
4.	Geotourism Geotourism infrastructure, Sustainable tourism activities, Interpretation facilities and services, Guided tours and outdoor activities, Public Access and Facilities, Visitor's evaluation	15	1000
5.	Sustainable Regional Economic Development Promotion of Regional food, products, craft, Geo-touristic products and souvenirs, Links with regional business, the services provided from local enterprises, Local networking	10	1000
	Total score	100	1000

(Source: Adapted from Zouros et al., 2008)

Meanwhile, as for the next criteria, the performance and successful Geopark were relying on their establishment and structure of the management plan (Wójtowicz, Strachowka, & Strzyz, 2011). The elements such as tourist activities, accessibility towards geological features, safeguarded and other factors influence the perception of tourist and also reflect the image of the Geopark concept (Rosniza et al., 2012). Organization arrangement, strong management structures, regular maintenance becomes the indicator that will help in determining the result of developing a successful Geopark area that fulfill the objectives of creating a sustainable development and conservation plan. For example, public education regarding appreciation of biodiversity, heritage assets and its links to healthy living through attractive infrastructure design, museums and even with the provided information center could facilitate enjoyment of the tourists (Young & Choi, 2006). Therefore, these indicators will generate ideas, experience and also upgrading knowledge and interest of individuals to appreciate this world treasure (Geo-heritage assets.)

As for the third criteria which regarding the education factor, any activities should relate and could present an impressive knowledge that could generate the public education level and understanding of natural and cultural characteristics through the Geopark elements. According to Zouros & Valiakos (2010), raising public awareness of the importance of protection and preservation of natural heritage could be based on a few indicators such as through

research, games, information board, marketing and others. Therefore, interesting and enjoyable journey and experience, detail explanation from tourist guard, conservation expert could expose the tourist, especially children and young teenagers group to join and strengthen their understanding and knowledge of Geo-heritage conservation and the actual Geopark concept (Azman et al., 2010).

Next, criteria that focus to geo-tourism also plays an important role in supporting the concept of the Geopark. A Geopark should also consist of tourism attraction element, such as markets, tourism activities which is indoor and outdoor games and also any other infrastructure that could entertain and create an exciting vacation for tourist (Zouros et al., 2008). This element would improve visitor's evaluation towards Geo-tourism destination. Nevertheless, the Geopark management body should explore and demonstrate more methods of best practices for conserving the area's geological heritage while balancing economic development and tourism (GGN, 2010). Encourage tourism activities such as volunteering and enjoyment of wildlife and green space could help in promoting the uniqueness and importance of sustainable development and uses of a biodiversity resource (Young & Choi, 2006). Besides, sustainable, regional, and economic development, also are important criteria in the Geopark concept. Local products such as food, souvenirs, and others types of a local product helps in promoting the culture, local identity and also an image of the history and community around the area (Patzak, 2011). The major involvement of a local community had become an important indicator. While promoting the local product to the tourist, it will improve tourism activities and tourist's perception. Originality and experience of the local people give a different view and specialties towards the Geopark area (Azman et al., 2010).

Hence, based on the above-stated list of criteria, there are many examples of indicators that help in improving Geo-heritage conservation in Geopark area. All types of indicators are not restricted to any specific limitation as long as it will bring positive results towards developing Geopark area and conserving our historical assets. Each indicator could determine the performance of the management body, development plan and also encourage human appreciation towards natural and cultural elements.

5. The best indicators toward Geopark performances

Based on the previous list of guidelines and various criteria stated for the best practices in Geopark development, each indicator plays an important role. As an ecotourism destination, Geopark should include more interesting Geo-tourism factors that will give attraction towards tourist and others in their initiatives for conservation work. Geo-tourism factors that include an interesting Geopark's design, facilities and activities were the main support that could also contribute and work as the main effort in improving Geo-heritage conservation plans and ideas.

While analyzing the ideas of Geo-heritage conservation in the development of Geo-tourism in the Geopark area, it is interesting to identify and include all the indicators that will mostly contribute towards the keys to the initiative success of the Geopark. There are many important factors and main elements that will explain and support the effort in Geo-heritage conservation idea which fulfills the above guidelines and criteria. The indicators could be specified as follows:

i. Branding and marketing the local product

By promoting the local product, it plays an important role in developing sustainable destination and management. Geo-tourism must not destroy what it values most. For example, Geopark area should have exhibition area, kiosk and also some stall that will give chances to the local community to selling their product. While improving community activities and economic, this will help in promoting the specialties and uniqueness of the local product. The local product will actually introduced the image, identity, culture and also the uniqueness of the area.

ii. Wide range of service offered

Each Geopark has its own uniqueness. As for the Geo-heritage conservation effort, a wide range of Geo-tourism services offered will become a main contributor towards conservation work. More outdoor activities, good access to most of Geopark area, best accommodation and infrastructure provided such as restaurants, transport connection, pedestrian access and other will attract visitors to be more active in exploring the activities and the area while appreciating the uniqueness and importance of the Geopark area.

iii. Geopark's ideas, knowledge, and education

As an important natural and cultural resources and valued area, Geopark should be provided with various types of initiatives that will help in promoting the importance of the whole Geopark area and increase the awareness of local community and tourist towards the heritage assets. General public and even the local community itself were sometimes not too realized and show some concern towards the importance of their surrounding environment. Therefore, information and knowledge provided by the existence of information center, gallery, museum, workshop, campaign and motivation session were really important to give them some idea towards the importance of Geopark that serve Geo-heritage conservation effort. These elements will improve and automatically display an important role of the Geopark in Geo-heritage conservation idea. By giving some motivation and knowledge towards the public, this will affect their activity and desire to protect and promote the heritage.

iv. Organizing and managing tourism activities

As a protected and sensitive area, Geopark should be provided with better management and controlling aspect. The fact that Geopark is an ecotourism destination, the natural, cultural and surrounding environment should be well-protected. For example, regular maintenance and evaluation should be arranged in order to control the activities of the whole area for not to disturb the surrounding ecosystem. Tourist capacity, types of activities and also the facilities provided should be well-monitored in order to control the balance ecosystem and activities for not too disturbing the area.

Therefore, by managing and developing Geopark area by following those aspects, guidelines and criteria, it should help in ensuring the condition and sustainability of the whole Geopark area. General basic of the three aspects which are the heritage conservation, community development, and economic aspect was the best guidelines that should first to be followed in identifying the most suitable indicators for each Geopark.

6. Conclusion

Geo-heritage conservation is an important aspect and one of the main objectives of the development strategy for Geopark area. It requires a few criteria and guidelines that has been identified and provided by experts while continuous assessment were required in order to maintain the performance and protection of the historical value around the Geopark area. In general, Geopark concept will consider three main aspects: heritage conservation, economic development, and community involvement. Based on the Geopark concepts and those aspects, a few criteria and framework has been provided and could clearly show the general idea of developing a successful Geoparks. Therefore, according to the criteria, there are many types of indicators could be introduced in strengthening the Geo-heritage conservation aspect around Geopark. By understanding the elements and aimed at the Geopark concepts, full involvement of the local community and also an efficient management body with the flexible development plan were actually a major and the best indicator that contribute in a great condition and ensures that sustainability of the Geopark. Successful and interesting design concept, regular maintenance and also impressive management body would be perfect with the involvement of the local community and tourist. All the aspects were the best indicators that should be considered in determining the geo-heritage conservation of a Geopark.

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