



Community Participation and Geo-Resources in the Kinabalu National Geopark

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Abstract

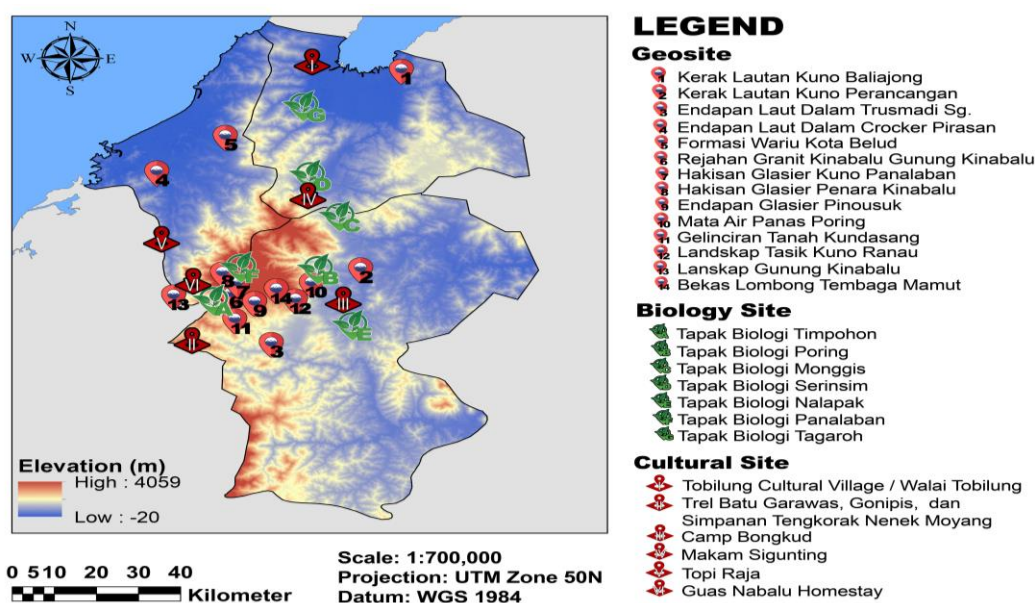
The Kinabalu Geopark is a unique park of national and international importance. It integrates geological, biological, and cultural heritage in its three districts: Kota Marudu (1,775 km²), Kota Belud (1,386.52 km²), and part of Ranau district (1,588 km²). The geopark is endowed with significant scientific heritage, which can be developed as ecotourism and/or geotourism. Community participation within the geopark is one aim of geopark management to enhance its economic and social well-being. Despite this, little is known about the local community's understanding of geopark and geotourism, the current participation and the resources that can be developed as attractions. Hence, this paper aims to explore these areas by adopting an exploratory qualitative research design. The respondents' opinions were collected through semi-structured interviews of 45 local communities from Lohan Ranau and Kota Marudu. Data analysis was driven by interview responses and involved thematic analysis guided by concept of geopark, geo resources, as well as areas and reasons for community participation. Findings reveal many of local community have basic understanding of the concept of geopark and geotourism. There seems to be limited local participation due to lack of interest, age, health issues, full time employment and limited information received as well as time constraint. The findings indicate geological landscape, biological sites and geo heritage have the potential to be developed as a unique geotourism, cultural heritage attraction. The geological landscape can be developed into ecotourism and nature-based activities. Also, local cultural crafts can be developed as geo souvenirs. Findings contribute to an understanding of community engagement and the areas of improvement needed. Recommendations include relevant training and intervention programs for the local community. Suggest collaboration among the Sabah Park, Rural Development Department, and Sabah Tourism to address the issues and enhance the well-being of the local community. It implicates the geopark's sustainability policy in the areas of community engagement, human capital competence and value creation of geographic resources.

Key words : Kinabalu National Geopark; geotourism; local community engagement; product development; training and intervention programs

Introduction

A geopark is unique and different from any other park. Geoparks contribute significantly to the conservation of regions, territories, communities, and economies. According to UNESCO Global Geopark, a geopark is a geographical zone where sites and landscapes of international geological importance are managed according to a holistic concept of protection, education, and sustainable development. The sustainable development of natural, social and economic environments, society, economy and conservation are central to geoparks. The involvement of the local community in the tourism development is very important because it can affect the direction of geotourism as well as the economic development of the whole community (Briedenhann & Wickens, 2004). Geotourism is the core component and activities of geoparks. It serves as an important tool for local economic development and source of income for the local communities (Farsani et al., 2011). Unlike ecotourism or any other form of tourism, geotourism is considered as niche tourism with special interest focuses on geology and landscape formation of the places. Geotourism is defined as tourism that sustains or enhances the geographical character of a place, including its environment, culture, aesthetics, heritage, and the well-being of its residents (Stokes et al.,2003). It consists of geological, biological and cultural aspects together so that information could be provided to the tourists and given a complete picture of the history of the geopark. The goal of geotourism is to maintain the character of place; and about travel to destinations where nature and humans come together to produce a working landscape. It is a knowledge-based tourism which involves an interdisciplinary integration of the tourism industry with conservation and interpretation of attributes of abiotic nature. Declaration of Kinabalu Park as a UNESCO Global Geopark creates value and enhance socio-economic development of the people (Sabah Park, 2019). The declaration recognise the importance of geosite, biology and cultural sites as shown in Map 1 below.

Map 1 The geo resources and sites located in the Kinabalu National Geopark



Kinabalu National Geopark consists of three districts and these districts are blessed with rich and diverse natural attractions, environment and geo heritage that need to be conserve and

preserve. The total population in the Kinabalu Geopark is 291,300: 109,900 for Kota Belud district, 80,000 for Kota Marudu district, and 101,400 for part of Ranau district. The main towns in Kinabalu Geopark are Kota Belud, Kota Marudu, Ranau, and Kundasang. There are approximately 423 villages in the Geopark: 176 are in Kota Belud district, 122 in Kota Marudu district, and 125 in Ranau district. Eight of these villages are listed as indigenous villages, representing the majority ethnic communities living in the Geopark. Of these villages, Kampung Lohan and Takutan in Ranau, Kiau Nuluh and Piasau in Kota Belud, and Marak Parak in Kota Marudu are among the villages where the Dusun people call home; Kampung Rampaian Laut and Taun Gusi in Kota Belud are home to the Irranun and Bajau Samah ethnic group respectively, while Kampung Baliajong in Kota Marudu is home to the Dusun Kimaragang ethnic group (Sabah Park, 2023). Local communities play vital roles within the geopark and the sustainable development of geopark. The rich geo resources and sites shown in **Map 1** have significant value that can be turned into tourist attractions as form of geotourism. The local communities can capitalize and develop these resources by adding values on the existing resources; and promoted as premier ecotourism sites adopting sustainable and responsible tourism concept. These districts have significant geological, ecological, archaeological, cultural, or historical heritage sites that can be developed and promoted as diverse tourism attractions as new ecotourism and geotourism sites. Despite of the rich geo resources and geo sites, it is unclear to what extent the involvement of local communities and the geo resources can be developed as geotourism or attractions that can be leveraged to improve economic and community development.

In response to the aforementioned research gap, the paper aims to provide an insightful understanding by exploring the extent of local communities participation within the geopark districts; and identified the key geo resources that can be developed and promoted by the local communities. Further, there has been limited research in these areas in Malaysia; and such research has important implications for geopark development in term of adding values and enhancing well being of local communities as well as better management of geopark in Malaysia by adopting. It also advances the application of geotourism principles in the context of developing geo products to generate economics benefits and development for the local communities.

Concept of Geoparks

The term geopark was introduced by UNESCO in 2001 with an approach that combines conservation with sustainable development while involving the local community (UNESCO, 2010). It has becoming increasingly popular around the world and a total of 147 UNESCO Global Geoparks in 41 countries have been identified. Currently, there are 8 national geopark located in Malaysia and there are more to be developed.

UNESCO Geoparks are regarded as a unique geological heritage of international value. A geopark achieves its goals through a three-pronged approach: conservation, education and geotourism (UNESCO, 2006b). A geopark is not about the geology of a park. Rather, it is about territories/places and geological heritage, which includes people and culture as well biodiversity. A geopark is recognized as such because it has important geological heritage resources that need to be protected. A geopark is widely accepted as a unique place that co-exists and is co-created from three important aspects, namely the geology, heritage, and biodiversity of a location. A geopark offers both tangible and intangible experiences to visitors.

Geoparks empower the local community and provide opportunities for the development of cohesive partnerships with shared goals of promoting the appreciation of geological processes, features, periods of time, history related to

geology, and aesthetic values of a geological landscape. Geoparks are protected areas with a rich geological heritage and resources. These resources are critical for science, tourism, education and research. Conservation and sustainable land development play a major role in geoparks.

Geoparks are places where exceptional geologic heritage landscapes (landscape/environment, people/heritage, and biodiversity) are used to support the sustainable development of parks. Geoparks inform people about the sustainable use and need for natural resources from the environment while promoting respect for the environment. Thus, significant efforts by local communities aimed at conservation, education, and interpretation of geoparks are vital. This is done through the identification of relevant geosites that provide a wide scope for geotourism. Hence, geoparks are key drivers of the development of geotourism. There is a robust connection between geoparks, geotourism, and the local economy. Moreover, geoparks generate benefits for the local community and provide education about the development of local landscapes.

The purposes of a geopark are to explore, develop, and celebrate the links between geological heritage and the natural, cultural, and biodiverse aspects of areas (Elder et al., 2015). It has specific intrinsic, scientific, educational, aesthetic, cultural, and ecological values (Crofts & Gordon, 2015). Geo heritage consists of geological aspect of natural and cultural heritage which can be developed as tourist attractions. Generally, geoheritage is linked to cultural heritage, which is an expression of the way of life developed by a community. These include customs, practices, places, objects, artistic expression, and the built and rural environment. Material and intangible assets contribute to cultural heritage. Geological features refer to caves, landscapes, rivers, deserts, glaciers, volcanoes, and earthquakes. These features are unique tourist attractions for education and learning, escape, and leisure activities and are important resources of geopark that required conservation efforts and the involvement of local communities.

Kinabalu Geopark and Geosites

Kinabalu National Park as world heritage site has been recognised as national geo park in 2019. Kinabalu National Geopark is a comparatively new geopark contain various resource values including geological, geomorphological, biological diversity, historical structures and traditional culture within themselves. Thus, offer visitors an opportunity to learn and experience the uniqueness of geological landscapes with significant scientific and aesthetic value. The Kinabalu National Geopark and the Aspiring Kinabalu UNESCO Global Geopark (AKUGGP) is located in the three districts with a total area of area of 4,750 km². It covers the entire district of Kota Marudu (1,775 km²), Kota Belud (1,386.52 km²) and part of Ranau district (1,588 km²). The Kinabalu Geopark is the integration between geological, biological, and cultural heritage in the three districts (Ranau, Kota Belud and Kota Marudu) around the geopark as the landmark of this AKUGGP. In total, 15 geo-sites, 5 cultural sites and 5 bio-sites identified by the Ministry of Geology and Minerals have geological heritage of international significance. These sites and landscapes of the geopark should be managed according to an overall concept of protection, education and sustainable development. Simply, the geopark offers local community opportunities and potentials to take advantage of the integration between the unique character of the geological heritage and the features and biodiversity. Accordingly, the area has national and international geological heritage sites and has a local community that values natural heritage that is suitable for development as a leading geotourism destination, especially from a domestic tourism perspective (Komoo, 2017). In determining the product development within the geopark, it is important not only to identify geological sites and stories about the sites, but also the potential enhancement that

these sites and stories can deliver through geopark with adequate knowledge and skills of the community. Similarly, the level of involvement of local community and the benefit gained from geosites and resources.

Local community participation in geopark

In general, the local community is a population characterized by geographical boundaries, local zoning and the political system (Squires et al., 2002). On other hand, community involvement derives from the concept of community involvement in development studies (Tosum, 1999). Community involvement in geopark is a critical component of geopark development as they are important stakeholders within the geopark (Azman, et al., 2011). Simply, geopark is a protected areas that is well recognised for its outstanding geological heritage, as well as its ecological, cultural and economic values. Thus, it allows for the inclusion of local knowledge, participation and support in the planning, management and promotion of the geopark, which community play vital roles.

The involvement of local community within the geopark can be deemed as process of social learning, foster a sense of responsibility for nature conservation, promote self-reliance and empower community members through the provision of various forms of assistance and services in tourism development project. Based on the geopark development framework (UNESCO, 2010), the three main elements in a geopark are (a) Heritage conservation, (b) Economic development and (c) Community development. This contributes to the sustainability of the geopark. The importance of the active involvement of the local community and the promotion of sustainable development while preserving the geopark's cultural and natural heritage cannot be overlooked. **Figure 1** shows the areas of community involvement within the geopark.

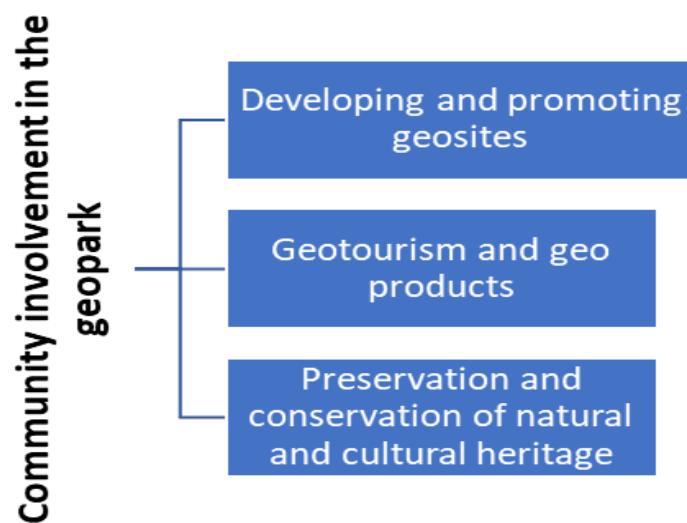


Figure 1 Conceptual framework of community participation in geopark.

Participation of local communities around the geopark is essential to achieve economic and community development within the geopark. It also leads to promotion of sustainable tourism, the preservation of cultural heritage, the enhancement of local economies, and the empowerment of local communities. Accordingly, local community participation is an important way to promote sustainable development of tourism in tourist destinations (Shui, et al., 2012). Effective community participation is deemed as a foundation of sustainable tourism development in any tourist destination. Simply, local community is the guardian of the geopark and the resources.

However, the participation of the local community around the Kinabalu National Geopark is not clear and evidenced. Further, there is limited understanding of factors influencing the local community participation in the geopark. The study of Shui, Xu, Wei and Wong (2012) reveal comparative benefits, community wishes, work opportunity and skills are some of the key influencing factors of community participation in geopark. These factors attribute to the participation of local community. Accordingly, the success of geopark and its development is significantly attributed to the community participation (Sapoetra, et al., 2019). The benefits of local community's engagement of geopark can be termed in three categories: economics development and income generation, cultural and heritage significance of geosites and expansion of educational opportunities through provision of interpretation, both printed and digital, the writing of books and pamphlets and the development of tours and activities all provide potential opportunities for informal education at all age levels. Geological features serve as the basis for many local landmarks and place names as well as the foundation for myths, legends and folktales. These activities stimulate the economic development within the geopark and generate benefits to the local communities.

Concept of geotourism

The geotourism concept introduced in the early 1990s aims to conserve geological and geomorphological heritage by promoting it to tourists (Hose, et al., 2011). Widely recognise as a form a sustainable approach to tourism that values the anutral and cultural heritage of a destination, while promoting conservation and community development (Johunis, et al., 2021). Tourists acquire knowledge and understanding of the geology and geomorphology of an area (including its contribution to the development of earth science) and not just a mere aesthetic appreciation (Mather, 2018). Above all, geotourism is an important component and the foundation for the sustainable development of geoparks (Dowling & Newsome, 2006) through tourism development and economics opportunities and supports sustainable local economic development. It also acts as a tool for sustainable development, especially in the developing world (Hose, 1995); and an economic approach aimed at maximizing tourism returns and managing destinations well. This includes encouraging regional investment, creating new business and employment opportunities, and generating financial benefits for regional or local authorities. It encourages the developing of new tourist sites and the improvement of attractiveness for existing tourist places (Ismail, et al., 2000). The development of geotourism is often concentrated in rural and remote areas with a variety of natural resources that have not been fully explored (Ólafsdóttir & Dowling, 2013) and it tends to have unique properties that are often associated with the protection and conservation of nature and its own cultural heritage (Dowling, 2014; Gordon, 2018; Ólafsdóttir, 2019).

Geotourism can be beneficial for both the tourist and the host because it can provide the tourist with an "authentic" experience while holistically sustaining the destination's unique qualities (Boley et al., 2011). Geotourism was envisioned to be a clear and holistic definition focusing on sustaining all characteristics of the region, thus promoting "all aspects of sustainability in travel" (Stokes et al., 2003). It minimize negative impacts on the environment and maximize the benefits to those communities. Involving working closely with local community including indigenous communities to ensure cultural heritage is preserved. It generates economic benefits to local communities through the development of sustainable tourism infrastructure and geo tours and geo products.

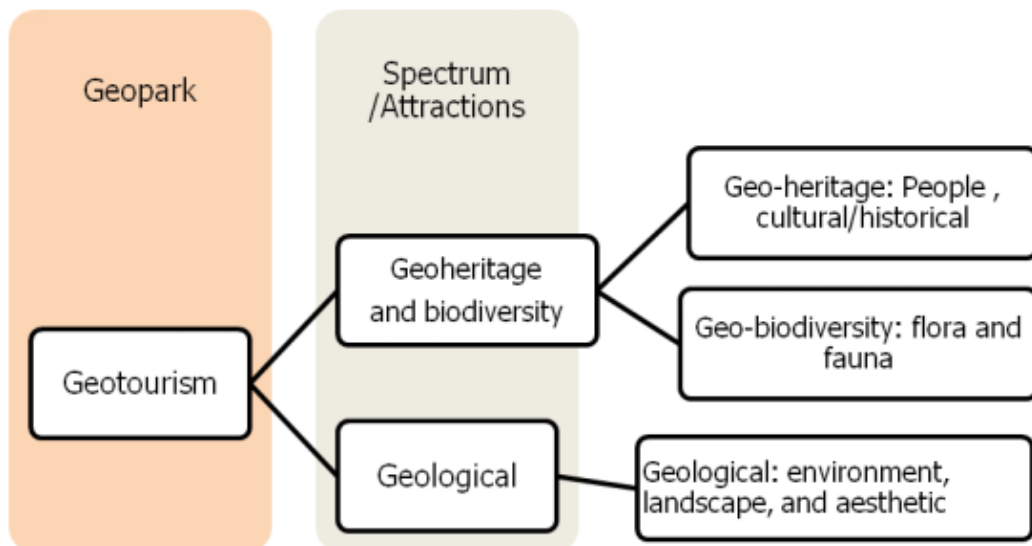


Figure 1 Conceptual framework of geo-resources as geotourism
(source : adopted from Guide to geotourism at Kota Marudu, 2022)

Research method

This paper uses exploratory qualitative research to explore the understanding of geopark and geotourism, the involvement of local community and the potential of tourism products within the Kinabalu National Geopark. The qualitative inductive approach helps understand individual perspectives regarding their participation and potential tourism products that can be developed. The data collection covered the two districts, namely the Kota Marudu and Lohan Ranau. The respondents' opinions were collected through semi-structured interviews with local communities resided within the two districts from February to April 2021. Convenience sampling technique using lists of local residents available. The interviews were carried at the local community hall and lasted 45-60 minutes. Key questions asked include the understanding of geopark and geotourism, the areas of participation and the types of tourism products can be developed and promoted. Data analysis was driven by the interview responses, and thematic analysis.

Table 1. Demographic Profile for Lohan, Ranau.

Demographic	Variables	Respondents (n=26)
Age	18-24	7
	25-34	5
	35-44	7
	45-54	4
	55-64	3
	Above 65	0
Gender	Male	14
	Female	12
Race	Melayu	1
	Dusun	24
	Bajau	0
	Chinese mix	1
Status	Married	11
	Single	15
	Divorced	0
Education level	No formal	0
	Primary	3

	Secondary	12
	Diploma/Matriculation	8
	Bachelor	3
Occupation	Laborer	1
	Civil Servant	7
	Farmers	5
	Business/Entrepreneur	2
	Student	4
	Retired	1
	Housewife	4
	Private Sector	2
Monthly Income	No Income	2
	Less than RM1000	15
	RM1001-RM2000	3
	RM2001 – RM3000	3
	RM3001 – RM4000	2
	RM4001 – RM5000	1
	>RM 5000	0

As shown in **Table 1**, of respondents from the surveys conducted, it comprised a total number of 26 respondents from Lohan, Ranau. The largest group of age range were scored equally between the ages of 18 to 24 years old and 35 to 44 years old. The populations were mostly male and majority of the respondents identified themselves as Dusun, followed closely by Melayu and Chinese mix. Overall, most of the respondents were still single and the rest are married. Furthermore, the largest portion studied up to secondary for their education level, followed by a few who managed to pursue higher education and graduated with a Diploma and a Bachelor Degree. As for the occupation, the highest group are working as a civil servant, and the others work as farmers, students, housewives, labourer and a couple were working in the private sectors. When looking at the monthly income, majority earn less than RM1000.

Table 2. Demographic Profile for Kota Marudu.

Demographic	Variables	Respondents (n=24)
Age	18-24	1
	25-34	4
	35-44	2
	45-54	5
	55-64	9
	Above 65	3
Gender	Male	17
	Female	7
Race	Melayu	0
	Dusun	20
	Bajau	4
	Chinese mix	0
Status	Married	4
	Single	19
	Divorced	1
Education level	No formal	1
	Primary	9
	Secondary	5
	Diploma/Matriculation	3

	Bachelor	6
Occupation	Tour Guide	1
	Government Servant	5
	Farmer	9
	Businessman/woman	4
	Farmer & Businessman	4
	Others (Student, Retiree, Fisherman)	1
Monthly Income	No Income	0
	Less than RM1000	11
	RM1001-RM2000	4
	RM2001 – RM3000	1
	RM3001 – RM4000	4
	RM4001 – RM5000	3
	>RM 5000	1

Referring to **Table 2**, a total number of 24 respondents were collected from Kota Marudu. Most of the respondents were aged between 55 to 64 years old, and majorly were male. As for their race, most of the population came from Dusun family background, and the others were Bajau race. Furthermore, the population are mostly single, and the rest are either married or divorced. Besides that, the largest portion also studied up to only primary level for their formal education, followed by a bachelor degree, high school, diploma, and some never even have any formal education. As for the occupation, mostly work as a farmer, followed by businessman, government servant, and also as a tour guide. Last but not least, the majority of the respondents earn less than RM1000 and only one respondent earn more than RM5000 for their monthly income.

Findings on knowledge of geopark and geotourism

The respondents' knowledge on geopark and geotourism for Lohan, Ranau and Kota Marudu is shown in Table 3 below:

Table 3 Respondents' knowledge on geopark and geotourism

Item	Lohan Ranau (n=26)	Kota Marudu (n=24)
Knowledge on geopark	Basic knowledge : 15 Heritage and Geology Natural resources Places that was protected Ecotourism Development Recourses Tourism Conservation, education and sustainable development Don't Know :11	Basic knowledge related to tourism and heritage : 15 Don't Know : 9
Knowledge on geotourism	Related to tourism, natural environment and awareness : 21 Don't Know/Not sure: 5	Related to tourism and product: 9 Natural Nature Attraction: 3 Preserve & Conserve: 1 Don't Know: 11

The finding shows that majority of the respondents have basic understanding of geopark. It seems that respondents from Lohan Ranau appear to have higher number of respondents with limited understanding of the geopark than respondents from Kota Marudu. The empirical reveals that the knowledge of geopark is associated with themes: heritage, geology, natural resources, protections, ecotourism, conservation, education and sustainable development. These themes are well aligned with the concept of geopark.

In terms of knowledge on geotourism, majority of respondents from Loahn Ranau tend to have higher number of respondents as compared to respondents from Kota Marudu. In general, the key themes of geotourism emerged from responses are related to tourism, natural environment and attractions. Many indicated that geotourism is a form of nature tourism and attraction; and they are aware of it as new form of tourism with limited knowledge of it.

Based on the emerged themes of geopark and geotourism, it implies that respondents seem to have interpreted both geopark and geotourism are the same. Respondents tend to understand geopark as a means of conservation and preservation of heritage, geology and culture of the geopark area. It is a form of tourist attraction and important geological sites. Hence, these findings correspond well with the purposes of geopark which are to:

- Preserve a healthy environment (to protect the earth's heritage)
- Learning and teaching geosciences in large scale
- Improving the stable development in local dimensions (geotourism)

Findings on areas of community participation and its reasons

The community involvement is being analysed in term of sector and reasons. These are presented in Table 4 below.

Table 4 Sectors and reasons of community participation

Areas of participation at Lohan, Ranau	Areas of participation at Kota Marudu
Types of involvement : Accommodation operators Homestays	Types of involvement : Banana Chips Entrepreneur Tourism products : Crocodile farm Homestays Tourism leisure activities Historical sites and attractions Leisure and camping
Reasons involvement : Source of income Interest Friend	Reasons of involvement: Source of Income and interest Part of community Follow Friends Employee in government agency
Reasons not involved: Did not receive any information. Not interested Age Permanent job Time constraint Health	Reasons not involved : Age factor Full time employment Not interested

The finding reveals several areas of community involvement within the two locations. At Lohan Ranau, the community involvement is limited to accommodation sector. Community at Kota Marudu involve in the sectors of agriculture, tourism products and attractions. These include crocodile farm, homestays, leisure activities, historical and camping.

It seems that there are different levels of community involvement in the two locations, with Lohan Ranau focusing mainly on the accommodation sector while Kota Marudu involves in various sectors which include agriculture, tourism products and attractions. The key tourism products include homestays, historical, camping and leisure activities at the geosites. Imperatively, community involvement can have a significant impact on the success of generating economics benefits and community development. Also, by actively involving the local community, it can help to create a sense of ownership and pride in the development of their area, as well as contribute to the preservation of local culture and heritage. This supports the geopark management plan.

Based on the findings, it appears to be a limited level of community involvement in geopark-related activities in Lohan Ranau, in contrast to the community in Kota Marudu. This disparity may be due to a lack of understanding regarding the concept of geopark and geotourism as evidenced from the responses. Nevertheless, the reasons for community involvement are quite similar for both communities, with income, interest, influence from friends and a sense of community spirit being among the key motivating factors. Majority of the respondents stated that incomes and interest are the reasons to be involved in the geopark-related activities, as stated, “income and interest are the reasons for me to participate ..” (LR 10); “personal interest is the reason...”(LR4, LR5); “ income seems to be reason..” (KM2), : I think is my interest ..” (KM7), “ being influenced by my friends..” (KM11). Few respondents agreed that being a community should get involved , “ to play the role of as local community..” (KM 12); “ as one of local people, I should involve ..” (KM14). Another respondent remarked that: “working as officer in the local district office, I should get involve ..” (KM17), another expressed that, “actively involved in geopark related activities as this is part of my job..” (KM18).

The findings reveal several reasons why the community is not involved in geoparks-related activities. Age, full time employment, and lack of interest, no knowledge and health were cited as the primary reasons for not participating. This is evidenced from the response by one of the respondents from Lohan Ranau (LR2), who stated, “I am too old to be involved in geopark -related tourism activities, and another respondent who remarked, “I am employed full time and don’t have time to participate”(KM3). Lack of interest emerged from the respondent (LR1) who stated that, “ I am not interested, also there is little information about how ?. Similarly, there are few respondents from Kota Marudu expressed the similar reasons, “I am not interested to get myself involve.. (KM5) or “have little knowledge and not interested to get involve ..” (KM 10).

There seems that there is limited involvement of community resided within geopark at Lohan Ranau in comparison to community at Kota Marudu. This may be attributed to the lack of understanding about the concept of geopark and geotourism. Nevertheless, the reasons for involvement are quite similar for both communities. Their reasons of involvement are attributed to incomes, interest, influenced by friends or as part of community. Age factors, full time employment and not interested are deemed as the key reasons emerged from the responses. As pointed by one of the respondents from Lohan Ranau (LR2) that: “I am too old to involve in any tourism activities”, “the reason is my old age (LR5). Another respondent stated that: “ I have full time employment and not time to get involve in tourism activities.”(KM3)

Table 5 Geo resources for tourist attractions

Geo Resources at Lohan Ranau	Types of tourism attractions and activities	Geo Resources at Kota Marudu	Types of tourism attractions and activities
Geological landscape	Leisure activities: Hiking, camping , paragliding	Nature sites : Marudu Bay, beaches, jungle, river, maountain, water fall, cave rock	Leisure and adventurous activities: hiking, trekking, camping, sunset viewing, swimming
Biodiversity and natural resources/ environment	Flora and fauna, rafflesia, reserve forest and the nature environment	Biodiversity and wildlife	Flora & Faunas : Proboscis Monkey, Mangroves, Nipah Trees, Fireflies ,Crocodile, capture Marine Products)
Local houses	Homestays or accommodation	Geoheritage	Local culture and heritage attractions, traditional food, dances and games at Walai Tobilung
		Historical goesite	Shariff Osman Cemetery, Si Ganting Cemetery, abounded British Railways
		Local house	Home stay and local accommodation: Sulap Tokou, Panorama Paradise

The findings reveals that there are three types of geo resources within the geopark can be developed as tourist attractions, as presented in **Table 5** above. Majority of the respondents indicate that geological landscape can be developed as leisure and adventurous activities depending on the condition and features of the sites. It seems geo biodiversity which consist of flora and fauna are deemed as unique and interesting tourist attraction. Both respondents at Kota Marudu and Ranau indicate the local homes can be developed as forms of accommodation for the tourists. Many respondents at Kota Marudu pointed that historical sites – cemeteries and abandoned railways are part of significance history of the place and can be developed as historical attractions.

Table 6 List of geosites at Ranau and Kota Marudu

KOTA MARUDU			
No.	Product	Location	Site Category
1	<i>Tapak Biologi Serinsim</i>	Kg. Serinsim	Biological
2	<i>Tapak Biologi Tagaroh</i>	Kg. Tagaroh	Biological
3	<i>Tapak Biologi Gunung Cochrane</i>	Kota Marudu	Biological
4	<i>Tapak Biologi Lingkabau</i>	Jalan Poring - Marak Parak	Biological
5	<i>Tapak Biologi Teluk Marudu</i>	Teluk Marudu	Biological

6	Tobilung Cultural Village / <i>Walai Tobilung</i>	Kg. Minansad, K. Marudu	Cultural
7	<i>Makam Sigunting</i>	Kg. Serinsim, K. Marudu	Cultural
RANAU			
1	<i>Tapak Biologi Timpohon</i>	Timpohon Gate	Biological
2	<i>Tapak Biologi Poring</i>	Kg. Poring	Biological
3	<i>Tapak Biologi Monggis</i>	Sub-Stesen Monggis	Biological
4	<i>Tapak Biologi Nalapak</i>	Kg. Nalapak, Ranau	Biological
5	<i>Tapak Biologi Panalaban</i>	Gunung Kinabalu	Biological
6	<i>Trel Batu Garawas, Gonipis, dan Simpanan Tengkorak Nenek Moyang</i>	Kg. Kinasaraban, Kundasang	Cultural
7	Camp Bongkud	Kg. Bongkud, Ranau	Cultural

The **Table 6** above shows the list of geosites located at Ranau and Kota Marudu. A total of 5 biological sites and 2 cultural sites located at Kota Marudu and Ranau. Thus, there are vast potential of geotourism for regional and economic development at Lohan Ranau and Kota Marudu. It suggests that efforts should be given to enhance the community involvement through the geotourism. Simply the identified geosites have yet to be fully developed and promoted. It is vital to focus on enhancing community involvement to fully realize the potential of geotourism. Simply, geotourism is an important tool for economic development and sustainable management plan for geopark. This can be done through various means, such as community -based tourism initiative, capacity building program, and partnership between tourism business operators and local community groups. In order to enhance the community participation within the Kinabalu Geopark, it recommends collaboration among the Sabah Park, Rural Development Department, and Sabah Tourism to capitalize the existing geosites as geotourism and develop geo products to enhance community development and the well-being of the local community. The findings implicates the geopark's sustainability policy in the areas of community engagement, human capital competence and value creation of geographic resources.

In addition to community involvement, effective promotion and development of geosites are also crucial to the success of geotourism. This implies improving accessibility, developing interpretive materials, and creating memorable quality visitor experiences. In short, geotourism has the potential to bring significant benefits to the communities in both locations. Further, continuous efforts to promote and develop geotourism as the core component of geopark is crucial.

Conclusion and limitations

The findings of the research seem to indicate moderate understanding of geopark and geotourism from the respondents within the Lohan and Kota Marudu. In view of this, there seems to be less participation or involvement of the local community. The evidence showed that the majority of respondents provide recreation and adventure activities based on the existing geological landscape and geological biodiversity. Geo heritage was considered an important resource by the respondents in Kota Marudu only. This implies that more efforts should be given to explore the heritage aspects of the indigenous groups within Lohan Ranau and Kota Marudu. It strongly suggests that local community should explore the potential of expanding the indigenous cultural heritage such as food, dance and crafts as form of

geotourism and develop some of the crafts as geo products. These are vital for community development and generating incomes to the local people. It also provide opportunities to expand the awareness and education on indigenous groups in these two locations. Subsequently, an interesting and authentic geotourism package can be developed and promoted by the local community.

The findings have practical implication on the improvement of community development and of management of Kinabalu Geopark. First, it suggests that greater awareness and understanding of the concept of geopark and geotourism for the local community is necessary. With the good understanding of these concept, community involvement can be enhanced and they can play vital roles in geopark sustainable management and maintenance the status of Kinabalu Geopark. Simply, community involvement and development are one of the three criteria to the concept of geopark. Likewise, there are vast potential for the local community to generate economic benefits through the development of geotourism tours by capitalizing the geological landscape at the geosites, bio site and cultural sites identified at Lohan Ranau and Kota Marudu. In particular, Kota Marudu is rich in both indigenous cultural heritage and biodiversity. In order to strengthen the community development and geotourism, the paper suggest that relevant educational and intervention programs should be introduced to community at both areas.

The paper provides a deep understanding of the involvement of local communities and the potential of geo products that can be developed to strengthen economic development within the geopark. While the results seem beneficial for geopark management, they have some limitations. Community participation in the Kinabalu National Geopark is relatively low and the sample size is quite small, which may limit the analysis of the community participation and the influencing factors. Moreover, qualitative exploration as a research method and based on two districts under Kinabalu National Geopark limits the generalisation of the results. It suggests that more research work should focus on other location such as Kota Belud which is one of the districts of Kinabalu Geopark and similar research may expand to other geoparks in Malaysia. Adopting mixed methods research may provide a more well-rounded findings.

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