Who gets the benefits of geopark establishment? *A study of Batur Geopark Area, Bali Province, Indonesia*

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**Abstract.** As an important contributor to the improvement of economic and social aspects within communities, tourism is a sector whose development must be paid careful attention to. Tourist attractions, especially for nature based tourism, have been proven to provide employment and a significant contribution to both the GDP and GNP of Indonesia. Various areas in Indonesia have natural tourist attractions. A recent popular type of natural tourism attraction in Indonesia are geoparks, which involve protection and utilization of wide geological heritage areas. One of the geoparks that have been recognized by UNESCO within its Global Geopark Network (GGN) is Batur Geopark, in the province of Bali, Indonesia. The development of a geopark should consider the local economic development within its surrounding area. In addition, the further development of a geopark area that is included within the Global Geopark Network must meet the criteria for social and economic aspects prepared by UNESCO. The establishment of these criteria is intended to ensure that the management of the geopark is also beneficiary for the development of local communities as well as contribute positively to their sustainable development. Indonesia has a number of initiatives to promote the establishment of new geoparks, such as Geopark Merangin, Geopark Ciletuh and Geopark Sewu. The most recent one to be considered is Toba Lake Area. Therefore, taking lessons learned from an existing geopark regarding its economic impacts is important. This study explored the positive and negative impacts of Batur Geopark on the local economic development of its surrounding area after its inclusion in the Global Geopark Network of UNESCO. Further recommendations are and formulated in order to enhance the mutual linkage between tourism development and economic benefits to the communities. Prior to the analyses, a literature review on best practices of geoparks was done. Qualitative analyses were conducted by interviewing 41 stakeholders that were involved in the tourism and local economic development in Bangli Regency of Bali. This study provides descriptive information on types of economic activities that have appeared after the establishment of Batur Geopark.

1. **Introduction**

Tourism is a fundamental sector in the economic development of many countries, as it has positive economic impacts on the balance of payment, generates employment and gross income for local communities [2]. Many developing countries, such as Indonesia, Thailand, the Philippines and Malaysia, rely on tourism as one of the main contributors to their gross domestic product. The tourism sector can generate multipliers. It plays a role in increasing regional revenue and increases the development of small and medium-sized enterprises (SMEs) that support the tourism industry. In general, tourism has three major impacts, i.e. economic, environmental, and socio-cultural, that affect local communities.
within the destination area [1]. Beside positive economic impacts there are also negative economic impacts of tourism. Governmental regulations are needed to reduce the negative impacts. The most important positive economic impacts of tourism are budget revenue increase, local production expansion, investment stimulation, and local population welfare improvement. Among the negative economic impacts of tourism are inflation, financial leakage, infrastructure costs, and economic dependence on tourism [8]. Identifying the positive and negative economic impacts is an important step for national and provincial governments who continually implement, monitor, update and improve policies and regulations regarding tourism, which are designed to increase national/provincial income, personal income, employment and tax revenue.

Recently, geotourism has developed quite fast. Geotourism, a relatively new phenomenon, focuses on geological resources and landscapes [4]. Geoparks are a form of geotourism. Even though they are still relatively new, most influential academic and international organizations accept that geotourism and geoparks are a tool for rural development, local community participation, and poverty reduction that can be applied in developing countries with abundant geological resources. The development of a geopark area should consider local economic development aspects within its surrounding area, because the concept of geotourism and geoparks plays an important role in local economic development of rural areas where geological resources are abundant. One of the best-known examples of a geopark area that has been implemented by community based tourism (CBT) in Indonesia is Batur Geopark, Bangli Regency, Bali Province, Indonesia. This study on identifying positive and negative economic impacts selected Batur Geopark as a case study to assess to what extent Batur Geopark contributes to tourism development in Bangli District and Bali Province. To get a comprehensive picture, a field survey was conducted in Batur Geopark. The local community, local champions, businessmen, tourism actors, local government agencies and scholars in tourism development were asked questions. Also, the potentials and challenges of tourism development of Batur Global Geopark were explored. This was followed by a timeline analysis to show the sequence of economic activities and an explanation of the trends that appear. Additional information on the origin of the business actors is also discussed. The result shows that the development of Batur Geopark as a tourism destination did not affect the whole area the geopark, but only significantly benefitted selected subdistricts, such as Batur, Suter, Kedisan, Trunyan, and Songan. Unfortunately, those areas only represent a small portion of the total Batur Geopark area. Therefore, the challenge is to increase the economic benefit of the geopark to other areas in the district while also maintaining its function. This study comes up with a set of recommendations and strategies to widen the economic impact of the geopark. This set of recommendations is later to be connected with the tourism development plan of Bangli Regency and that of Bali Province.

2. Methodology
The purpose of this study is to assess the positive and negative impacts of Batur Geopark, the first global geopark in Indonesia, on the local economic development after its inclusion in the Global Geopark Network of UNESCO and formulate recommendations in order to enhance the mutual linkage between tourism development and economic benefits for the local communities. This research was conducted by conducting surveys and in-depth study on the Batur Geopark area. The survey was conducted between July and August 2017. It consisted of interviews with 41 respondents who are involved in tourism and local economic development in Bangli Regency, Bali Province, such as representatives of local communities, farmers, local vendors, local businessmen, leaders of local working groups (LWG), local and provincial government agencies, scholars in tourism development, and other tourism actors. The selection of respondents was based on the respondents’ main functions, which are related to local economic and tourism development, and also done through references based on snowball sampling, where previous respondents gave suggestions for potential respondents from among their acquaintances. The list of respondents is as follows:
Table 1. List of respondents and reason for selection.

| No | List of Respondents                                      | Reason for Selection                                                                 |
|----|---------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1  | Center for Natural Resources Conservation (BKSDA).      | Main institution that performs conservation tasks within Batur Geopark area. Currently under Indonesian Ministry of Environment and Forestry. |
| 2  | Regional Development Planning Agency (Bali Province and Bangli Regency). | Main institution involved with the planning process of Batur Geopark area.             |
| 3  | Tourism Agency (Bali Province and Bangli Regency).      | Main institution that performs tourism planning for Bali Province and Bangli Regency. |
| 4  | Academician (lecturer from STP Nusa Dua).              | Has experienced and completed research on geopark development.                        |
| 5  | Regional Secretary of Bangli Regency.                  | General Manager of Batur Geopark area.                                               |
| 6  | Public Works Agency of Bangli Regency.                 | Main institution for the development of physical infrastructure supporting Batur Geopark area. |
| 7  | Social Agency of Bangli Regency.                       | Main institution involved in social affairs related to the impacts of tourism activities. |
| 8  | Manpower Agency of Bangli Regency.                     | Main institution involved in manpower affairs, such as regional minimum wage and labor welfare. |
| 9  | Central Bureau of Statistics (BPS).                    | Provided statistical data regarding local economic development.                       |
| 10 | Batur Geopark Museum (BMV).                            | One of the main attractions within Batur Geopark area.                                |
| 11 | Indonesian Hotel and Restaurant Association (PHRI).    | Association that understands the development of tourism activities in Batur Geopark area. |
| 12 | Chairman of the Boat Driver Community.                 | Association that understands current tourism activities, especially around Lake Batur. |
| 13 | Toya Devasya (local business entities).                | One of main attractions within Batur Geopark area.                                    |
| 14 | 3 groups of Local Tourism Initiatives (POKDARWIS).     | Associations that manage several attractions in Batur Geopark area (Batur Tourism Information Centre, POKDARWIS Batur, and cycling community. |
| 15 | 5 groups of Local Working Groups (LWG).                | Tourism management forums in 5 cluster areas (Kintamani, Batur, Suter, Trunyan, and Songan). |
| 16 | 4 village heads.                                      | Stakeholders that understand the scope of social and economic affairs of local communities (villages). |
| 17 | Head of Kintamani Sub-district.                        | Stakeholders that understand the scope of social and economic affairs within Kintamani Sub-district. |
| 18 | Business actors: 2 local merchants, 2 farmers, 2 tourist spot ticket sellers, 4 local guides, and ex-sand miners. | Business actors who have had direct experience with Batur Geopark.                      |
| 22 | Local security (pecalang).                             | Actors involved in maintaining order and security around tourist spots.               |
| 24 | Head of vocational school (SMK) Kintamani 2.           | Actor involved in educational activities, especially to support tourism activities.    |

The collected data were then analyzed to know the economic impacts of Batur Geopark development, and to know who the stakeholders are that get the benefits from the products. The economic impact analysis basically focused on the question: What is the contribution of geotourism activities to the economy of the region?, and it traced tourism business activities, local product development and promotion, income trends, employment/recruitment conditions, and tax revenue/local government income that have either direct, indirect, or induced effects on local economy stakeholders (consisting of other businesses, households, and government) [11]. In this research we focused the economic impact analysis on three aspects, respectively, local business activities (investment conditions, proportion of
business by sector, etc.), income trends (both of local communities and government), and employment conditions (proportion of jobs by sector, unemployment rate, skill improvement effort, etc.).

3. Literature Review

3.1. Definition and scope of geoparks

The geopark is a concept derived from sustainable development for developing a region that integrates three types of diversity: geodiversity, biodiversity, and cultural diversity. The geopark aims to build and develop the welfare of local communities based on conservation of the three aforementioned diversities [3]. The geopark is a good example of geological conservation that covers whole spatial plans and integrates all natural and cultural resources around the site, and empowers local communities and gives them the opportunity to develop cohesive partnerships to promote the area’s significant geological processes, features, historical aspects linked to geology, or outstanding geological beauty [3,14]. A geopark achieves its sustainable development goals by fostering local economic development through a three-pronged approach: conservation, education, and geotourism [12].

The initial geopark program was established within Agenda 21, which was sounded at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in June 1992. The Global Geopark Network (GGN) was established in 2004 by UNESCO. It actively promotes activities around geoparks, which include geotourism and conservation, and also encourages research and development that will benefit local communities within the geopark area. The organization also seeks the membership of geoparks and has set criteria for the member selection process. Some of UNESCO’s criteria are [13]: (1) the geopark must have a territory encompassing one or more sites of scientific importance, not only for geological reasons but also because of its archaeological, ecological and cultural values; (2) it has a management plan designed to support the sustainable development of socio-economic aspects within the local community; (3) it demonstrates methods that are able to conserve and enhance the sustainable use of the geological heritage and provide knowledge on geoscientific and environmental disciplines; (4) joint proposals are submitted by various stakeholders from government and private sector parties that formulate sustainable development strategies; (5) it is part of a global network that is able to share best practices regarding sustainable development strategies to other members. Evaluation based on these criteria is carried out every two years by the Geopark Committee at the International Conference on Geoparks, which was held for the first time in 2004.

3.2. Definition and scope of geoparks

The roots of geotourism can be traced back to the 1990s, when there was an initiative for the development of geoparks by UNESCO, supported by many countries, in which they agreed on a conservation plan of various geological heritages and past civilization relics. According to Farsani (2011), the establishment of geoparks can generate new jobs, economic opportunities and additional sources of income, especially in rural areas [5]. At the grassroot level, geopark development encourages small and medium-sized enterprises to produce local products and handicrafts related to geotourism. Nowadays, geotourism is seen as the best form of sustainable rural tourism marketing compared to other approaches [5-7]. One of the methods that distinguishes geotourism from other approaches is the existence of a form of cooperation between different stakeholders, ranging from the government, the private sector, academics, local businesses, local residents, outdoor companies, tour agencies, restaurants, and accommodations within geotourism development. This partnership is welcomed because it makes good economic sense and can benefit all partners [4]. There is an emergant process within geopark areas that creates new products, new jobs, and new recreational activities for local communities to foster local economic development [9].

Since geotourism and geopark development are opportunities for local economic development, they have prospects to foster employment and reducing poverty through engaging local communities in various geopark initiatives. To support the goals for local economic development, tourism and geopark authorities have to adopt regulations and policies to encourage the participation of local people.
According to Farsani (2011), various geopark authorities have adopted policies toward stimulating locals’ participation for local economic prosperity and preservation of natural resources, with a positive result on local economic indicators and conservation progress within geopark areas [5]. Recent trends show an increasing interest in research and understanding on the supply side of geotourism and geopark development, but relatively less is known about the demand side for geopark products [9]. Therefore, there is a need for further research and investigation into the impacts of geotourism and geopark development, and local communities’ responses towards geopark products in their area.

4. Result and Discussion

4.1. Regional overview

Batur Geopark was accepted as a member of UNESCO Global Geopark Network (GGN) on September 20, 2012 at Auroca Global Geopark, making Indonesia the 91th country in the world and the third in Southeast Asia to become a member of GGN. The official name is ‘Batur Global Geopark’ (BUGG). It is situated in the northeastern part of Bali Island, 70 km north of Denpasar. The caldera is bounded by latitudes 8°05’00’’ and 8°40’00’’ S, longitudes 115°11’00’’ and 115°30’00’’ E. Administratively, BUGG is located in Kintamani district, Bangli regency, Bali province. There are approximately six access routes to reach BUGG from Denpasar and one route from Singaraja.

Geologically, the Batur Geopark area has an important position within the geological history of Bali island. Past geological processes in Mount Batur and Mount Agung deposited various types of rocks in the sea and then uplifted them to become the mainland of Bali. According to Purbo-Hadiwidjojo (1971), due to these geological processes the morphology of Bali island generally has a north-south cross-section that is not symmetric, with slopes more prevalent in the south than in the north [3,10]. A very long time span of the geological processes has formed Batur Geopark area as we see can see it now. At least 25 well-documented eruptions of Mount Batur have been recorded in the years 1849, 1888, 1904, 1905, 1921, 1926, 1963, 1968, and 1974. A number of geoheritage sites within Batur Geopark are the basis of the development of the BUGG concept. One of the most well-known hallmarks of Batur Geopark is the panorama of the whole geopark that can be seen from Penelokan. Combined with the view of the lake and Mount Batur itself, this active volcanic area is rich with elements of macro- and micro-volcanic landscapes, besides volcanic rocks. In local Balinese philosophy, Mount Batur is believed to contain the four main elements of the earth: soil, water, fire, and air as the important spiritual elements of nature. Many temples have been built along the slopes as places of worship for local communities.
Figure 1. Map of Batur UNESCO Global Geo-park [3].

Batur Geopark area has a considerable biodiversity within its natural tourism park. Species of vegetation are mostly forest plants, including puspa (Schima noronhaea), tusam (Pinus merkusii), ampupu (Eucalyptus urophylla), mahogany (Swietenia macrophylla), sengon (Paraserpenthis falcataaria), sonokeling (Dalbergia latifolia), acacia (Acacia decurens), segawe (Adenanhera paronina), pine (Casuarina equisetofolio), hibiscus (Hibiscus tilaceous), and dadap (Erytrina variegata). For the fauna, Batur Geopark area has approximately 30 species, including green jungle fowl (Gallus varius), cuckoo (Streptopelia chinensis), terocok (Gouvier ahalis), kacer (Copsycus saularis), ferret (Paradoxurus hermaproditus), porcupine (Hystrix branchura), trenggiling (Manis javanica), squirrel (Tupaia javanica), and monkey (Macaca fascicularis). Batur Geopark area is designated as a nature reserve area through the decree of the Head of Geological Agency, Ministry of Energy, Republic of Indonesia No. 37.K/73/NGL/2012.

Culturally, Batur Geopark, which covers an area of approximately 100 square kilometers and includes Mount and Lake Batur, represents the cultural diversity of processes and products related to them. The most famous and important points of interests that attract many visitors around the Batur Geopark area are Trunyan Village, Pula Hulun Danu Batur, Pura Ulun Danu Songan, Pura Dalem Balingkang, Subak, and Barong Berutuk. In terms of education on the economic value for local communities, there are some programs manifested through the interpretation of protected geological sites, establishment of a geopark museum, an information center, geotrails, a guided trip, making simple delivery media such as popular books, maps, educational materials and displays, and others. There are several community development programs, one of which trains professional guides that explain the volcanology, landscape, and human culture to the visitors of Batur Geopark area.
Figure 2. Landscape panorama from Panelokan area.

Geotourism consists of touring activities utilizing the geological phenomena in an area, mixed with its beauty, uniqueness, rarity, as well as its environment, as the main attractions [3]. The growing trend of geotourism in the Batur Geopark area is an alternative form of tourism based on the use of natural resources (geological resources) safely and sustainably. As of 2014, there are 21 geosites located in Batur Geopark area. They attract tourists for undertaking geotourism activities such as geotreking. Scenic viewpoints are regarded as the most popular locations for tourists enjoying the natural landscape of the area and are mostly located on hills, slopes, or the highest part of a region, representing the beauty of the area in a comprehensive way. In Batur Geopark area, the most representative scenic viewpoint is located at Penelokan. The Penelokan area is filled with merchandize sellers every day and on the edges of the slopes local businessmen have built restaurants and hotels. However, in the rising trend of geotourism, most local communities feel that the benefit of tourism is not distributed equally to all villages in the Batur Geopark area. Based on observations in July 2017, farming is still the major livelihood activity, where children dropping out of school to help their parents to work in the field is still prevalent within local communities. Also geotourism is not so influential and has had minimum impact in several villages that still depend on the extractive sector, such as excavation type-C in Songan A and B villages. There is also the classic reason of the difficulty of finding a job that makes many children drop out of school after graduating from junior high school to pursue work in the field. However, much potential of geotourism can still be developed in the Batur Geopark area if managed properly. All these conditions require a solution to empower the local community to manage the abundance of geological resources to increase their living standard and utilize their local economic potentials within a sustainable development framework.

4.2. The current local economic development of Batur Global Geopark

Figure 3. Restaurant and souvenir shop in Penelokan area.

Since the inauguration of Batur Global Geopark in 2012, the Batur Geopark area itself has experienced significant improvements in terms of economic and infrastructure development. Advancement can be seen from the growing number of restaurants, hotels, and other accommodations, especially around Penelokan area. Most of the already built restaurants, hotels, and other accommodations utilize the
panoramic view from Penelokan as the main attraction for their guests. Most visitors, both local and international, prefer a one-day trip to visit Batur Geopark instead of staying overnight, as the area is located between the main road connecting southern and northern Bali. Points of interests for the visitor in Batur Geopark area are adat villages (traditional villages) and hot springs. Some attractions in the Batur Geopark area, including the hot springs, are managed daily by adat villages. Revenue from tourism management is used by the adat villages for common purposes, such as environmental management, preparation of prayer equipment, and adat ceremonies. One example of an adat village in the area of the geopark area is Panglipuran Adat Village and Batur Adat Village. Batur Adat Village currently employs more than 100 people from local villages (North Batur, Central and South Batur Village). Batur Adat Village has a form of professional operational and financial management, and has allocated its income to the construction of supporting infrastructure, operations and salaries of employees, as well as maintenance of Ulun Danu Batur Temple, which is one of the main temples in the Bangli region and Bali.

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"At this time, revenue from here (customary village management) is still used for the construction of supporting infrastructure for the hot springs owned by Banjar Batur in the lower regions. The details of the revenue use are as follows: 30% for employee salaries, 30% for Banjar Batur, 30% for operational costs, and 10% for maintenance of Ulun Danu Batur Temple."

- person in charge of Tourism Information Center, Batur Adat Village

Aside from the adat villages, there are several hotels and hot springs that are mostly owned by local businessmen. One of the most notable hotels and hot springs owned by local businessmen is Toya Devasya, located in the Toya Bungkah area, Songan B village. Toya Devasya currently employs approximately 200 employees, 99% of whom are local people from the Batur Geopark area. Toya Devasya has signed agreements with local tourism educational institutions regarding employment opportunities for graduates. Beside the local people, employees come from other cities in Bali and several come from Java and Sulawesi. Some workers from outside the island are employed because of cultural problems, such as Balinese people not wanting to work in the field of hygiene, particularly cleaning bathrooms.

"The workers here, 99% are local resources that we absorb from several tourism education institutions in Bangli District. The remaining are 1 from Bogor and 1 from Manado and some from Denpasar. These workers occupy all levels of staffs."

- owner of one of Toya Devasya
In terms of geotourism, since the establishment of Batur Geopark, the number of tourists continues to increase. Proportionately, the number of street merchants that flock several spots in the Batur Geopark area, such as Penelokan, Batur Lake Port, and around the main road in Batur Village (North, Central, and South Batur Village) increases as well. However, the souvenirs they sell are mostly made outside the Batur Geopark area/Bangli Regency. This trade of non-local made goods by street merchants shows that products made by local craftsmen are still less preferred. This is probably due to the absence of special and unique crafts itself from the Batur Geopark area, so there is no special demand for local crafts. Also for plantation products such as oranges, the street vendors tend to prefer to sell oranges from Java rather than local produce. They choose Javanese oranges because they are cheaper and taste sweeter (Kintamani oranges tend to have a sour taste). In addition, because of management problems related to plantation products in Kintamani it is still difficult to manage the production chain and the selling price of plantation products, especially for local orange commodities. This condition causes many local sellers to prefer selling produce imported from other regions.

“There are coffee, oranges, but the added value of the commodity is not there. Coffee, for example, has added value in Surabaya. So we only produce raw coffee and then we bring it out. It's outsiders who enjoy the added value. In addition, we lose competitiveness with oranges from the island of Java. Oranges from Java are cheap and sweet. We have no certainty from the side of the production chain. If there is an agency that specifically manages the production of those commodities we can start to make strategic plans, for example to set which area is best to sell our production commodities.” – youth activist from Central Batur Village

Figure 4. Street merchants in Penelokan area.

Table 2. Conditions and descriptions of local economic development.

| No | Conditions of Local Economic Development | Descriptions |
|----|----------------------------------------|--------------|
| 1  | Growing number of various restaurants, hotels and other accommodations, especially around Penelokan. | Local entrepreneurs tend to open restaurants and hotels around Penelokan because of its panoramic attraction, in spite of prohibitions from the Bangli Regency government due to vulnerable conditions on the edge of a cliff. Meanwhile, many restaurant and hotel buildings on the west side of the street are abandoned by their owners. |
| 2  | Some attractions in the Batur Geopark area, including hot springs, are managed daily by the adat village. | Revenue from tourism management is used by adat villages for common purposes, such as environmental management, preparation of prayer equipment, and some adat ceremonies. |
| 3  | Most hotels, hot springs, and other businesses in the Batur Geopark area owned and operated by local businessmen, and employ local people. | Local businessmen already have agreements with local tourism education institutions, consisting of LPKs (course institutions) and SMKs (vocational schools), regarding employment opportunities for local human resources. Some workers from outside Bali Province also work in local hotels and restaurants. |
|   |   |
|---|---|
| 4 | Increasing number of street merchants around Penelokan and several tourism spots. |
|   | Street merchants flock several spots in the Batur Geopark area, such as Penelokan, Batur Lake Port, and around main road in Batur Villages (North, Central, and South Batur Village). They come from Bangli and other parts of Bali Province. |
| 5 | Souvenirs and plantation products (such as oranges and coffee) sold mostly come from outside of Bangli Regency. |
|   | Local craftsmen are still less preferred. This is probably due to the absence of special and unique crafts from the Batur Geopark area itself, so there is no special demand for local crafts. Also for plantation products such as oranges, street vendors tend to prefer to sell oranges from Java rather than local commodities. |
| 6 | Difficulties to manage the production chain and the selling price of plantation products. |
|   | Most farmers and plantation businessmen argue that the ones that regulate the prices of plantation products come from outside of the Batur Geopark area and even outside of Bali Province. |

With these complex conditions in the Batur Geopark area, it is clear that local economic development has not been implemented evenly and in accordance with the original goals of the geopark, which emphasizes the sustainability and empowerment of all local communities. Thus, appropriate strategies are needed for the development of the tourism sector to benefit all parties involved. Table 2 provides a summary of the conditions and descriptions of local economic development in Batur Geopark. The economic impacts observed in Batur Geopark are somewhat predicted, as also observed in some other tourism developments [2,3].

4.3. The economic impacts of geotourism to local communities and stakeholders in Batur Geopark

The influence of the development of the Batur Geopark area has been felt in several areas located at the south and southwest of Mount and Lake Batur. Some villages experienced rapid development, such as North Batur Village, Central Batur, South Batur, Buahan, Trunyan, Kedisan, and Toya Bungkah area in the village of Sangan B. Meanwhile, other villages, such as Kintamani Village, Pinggan, and Sukawarna are not yet considered to get significant benefits from the development of tourism in Batur Geopark. Some of these villages do not get significant benefits due to their relatively distant position from the main road passing through Batur Geopark as well as potential tourist objects that have not been commercialized.

"The geopark has benefited some villages, such as Toya Devasya in Sangan Village, which has good development. Also in Batur there is Batur Natural Hot Spring. If this geopark is successful then who will enjoy benefits here are Buahan, Trunyan, Kedisan, Toya Bungkah. But for Kintamani, Pinggan and Sukawarna, they do not get a significant benefit. So if the question is whether the geopark has brought change (in terms of local economic development), the answer is yes. Significant or not, I would say not yet. This geopark program is like nutrition that educates people" – youth activist from Central Batur Village

Geotourism activities in the Batur Geopark area also provide benefits for the next generation. Many young people in the Batur Geopark area are currently studying, both in primary, secondary and vocational schools, and take the time to work in part-time jobs as freelance guides or provide informant services for tourists. These activities can improve their soft skills in tourism, including English language skills. In addition, these activities also motivate students to improve the level of their education.

"Some of our students are either freelance guides outside school hours, or simply offering services and information to tourists for hot springs or climbing. Some of them are using free time outside school to become a daily worker in some inn or restaurant in the Sangan A Village area. I think it motivates our students to raise their level of education to a higher level because they already have clarity from their field experience on how the Batur Geopark area can be utilized to generate income for themselves.” – Headmaster of SMKN 2 Kintamani (Vocational school)
However, some economic sectors, such as mining, have a negative impact from geotourism activities in the Batur Geopark area. Several mining activities conducted in Songan A and B villages currently begin to be restricted by local regulations, with fines as punishment. The miners think that the tourism sector in Batur Geopark area, although growing rapidly, is not yet accessible to all community groups. For example, for trekking activities in the natural conservation area of Mount Batur, the existing track has been monopolized by P3GB, a local initiative that has been legalized by BKSDA, the institution that manages the Batur Mountain conservation area.

“In relation to the geopark, if seen from the territorial basis of activities more home to industry activities, such as handicrafts, the geopark is like a tourism area in general, actually. But also with the existence of protected areas, it becomes less profitable for the local community as well (especially the farming and mining). Like before, there is excavation type-C mining in the Songan area. Since the establishment of BUGG it has begun to be restricted by the Bangli government. So, economically, there is also a decline in this sector as well. We see it from the whole” – Head of Industrial Relations, Cooperatives and Labor Agency of Batur Regency

![Figure 5. Excavation Type-C Mining Site in Songan B Village, and Sand Truck in Penelokan.](image)

In terms of employment, the majority of the businesses engaged in geotourism generally employ local residents as their employees. The raise of the regional economic level can be seen from the rapid increase of the minimum wage every year. In addition, several Bangli District government offices seek to foster local small and medium sized enterprises (SMEs) through entrepreneurship training. This is one of the strategic steps to increase local economic growth, considering that the UMKM sector represents the largest proportion in terms of number of entities in Bangli Regency, especially in the Batur Geopark area.

“We can only nurture through entrepreneurship training, especially for SMEs. Based on the data of 2016, our minimum wage (UMK) is approximately 1,957,734, always increasing rapidly every year since 2012 (the year of BUGG establishment).” – Head of Industrial Relations, Cooperatives and Labor Agency of Batur Regency

Various efforts have been made by the parties involved in the development of the Batur Geopark area at this time, even though there are not yet benefits for all. However, these steps are part of gradual efforts to achieve goals through the development of the Batur Geopark area, which put forward the principle of sustainable development by empowering the local communities in the area.
Table 3. Economic impacts of geotourism activities and descriptions.

| No | Economic impacts of geotourism | Descriptions |
|----|--------------------------------|--------------|
| 1  | The benefits of geopark development are not felt thoroughly by all villages in the Batur Geopark area. | Some villages are experiencing rapid development of areas such as North Batur Village, Central Batur, South Batur, Buahan, Trunyan, Kedisan, and Toya Bungkah area in the village of Songan B. Meanwhile, other villages, such as Kintamani Village, Pinggan, and Sukawarna, are considered to not yet get significant benefits from the development of tourism in the Batur Geopark area. |
| 2  | Geotourism activities in the Batur Geopark area also provide benefits for young people. | Many young people in the Batur Geopark area are currently studying, both in primary, secondary and vocational schools, and take the time to work part-time jobs as freelance guide or offer information services to tourists. These activities can improve their soft skills in tourism, including English language and communication skills. |
| 3  | Some economic sectors, such as mining and farming, experience negative impacts from geotourism activities in Batur Geopark area. | Geotourism in the Batur Geopark area, although growing rapidly, is not accessible yet to all community groups. Several geotourism activities, such as trekking within the conservation area, are monopolized by some groups. |
| 4  | The raise of the regional economic level can be seen from the rapid increase of the minimum wage every year. | Bangli District government offices seek to foster local SMEs through entrepreneurship training. This is one of the strategic steps to increase local economic growth, considering that the UMKM sector has the largest proportion in terms of number of entities in Bangli Regency, especially in the Batur Geopark area. |

4.4. Recommended strategies for Batur Global Geopark’s local economic development

Table 4. Observed problems and recommendations.

| No | Observed Problems | Recommendations |
|----|-------------------|-----------------|
| 1  | - Difficulties to manage the production chain, set selling prices and marketing strategies of local craft and plantation products. - Some economic sectors, such as mining and farming, experience negative impacts from geotourism activities in the Batur Geopark area. - The increasing number of street merchants around the Penelokan area and several tourism spots. | The need to stipulate a special law that regulates the economic development of geoparks. The authorities should include within the special law: local handicraft and commodity management, including the setting of strategies for business diversification, pricing, promotion, and marketing. This law should also have the authority to manage local street merchants within the Batur Geopark area. |
| 2  | The souvenirs and plantation products (such as oranges and coffees) sold mostly come from outside of Bangli Regency. | A regulation is required that can promote economic benefits for local communities. For example by creating a guideline to train people within the geopark to be able to play a more active role. For example, besides maintaining the geopark, they can also guide tourists, make products, or develop new attractions. |
| 3  | Overlapping authorities between government institutions regarding the management of the conservation area. | Strengthen coordination so the roles between central, provincial, district agencies are well established and they can support each other. This can prevent governmental cross-border/administration issues. |
| 4  | The benefits of geopark development are not felt thoroughly by all villages in Batur Geopark area. | Establish a special geopark management body/institution. This special body/institution should also create a new benchmark for all geopark regions in Indonesia, because many of the new national geoparks are developing rapidly in Indonesia. |
The growth of various restaurants, hotels and other accommodations, especially around Penelokan, despite a prohibition from Bangli Regency government due to vulnerable conditions on the edge of a cliff.

Synchronize the Batur Geopark area planning with existing planning documents such as the Spatial Plan and Detailed Spatial Plan for the region. Synchronization with planning documents is important for establishing land use maps, which will facilitate the permit process within the Batur Geopark area.

One of the important strategies that must be implemented so that the development of geopark areas can be optimized, is the need to stipulate a special law that regulates the local economic development of geopark areas, apart from any institution and their own regulations that are involved in the development of geopark areas in particular. This law is important to regulate the management of commodities produced within geopark areas, as well as provide criteria that must be met by local businessmen, not only in Batur Geopark but also in geoparks across Indonesia, where it is necessary to ensure the participation of all local communities. The authorities within the special law should include local handicraft and commodity management, including the setting of strategies for business diversification, pricing, promotion, and marketing. This law should also have the authority to manage local street merchants. Also, a regulation is required that can promote economic benefits for local communities, for example by creating a guideline to train people within the geopark to be able to play a more active role. For example, besides maintaining the geopark, they can also guide tourists, make products, or develop new attractions.

In addition, the development of the Batur Geopark area is often obstructed by bureaucracy or different rules from different agencies that have their own special authority, territorial rights, or land tenure, so that whatever strategy is applied, as long as the agencies do not support each other, it will be in vain. For example, Batur Geopark is managed by the local government but Mount Batur itself (conservation area) is managed by BKSDA and the Ministry of Environment and Forestry using different guidelines, which overlap each other. Therefore, there is a need to strengthen coordination, so that the roles between central, provincial, district governments are well established, and they can support each other. This can overcome governmental cross-border/administration issues.

One of the management strategies that can be used to enhance the development process of the Batur Geopark area is the establishment of a special geopark management body/institution. This special body/institution will also create a new benchmark for all other geopark regions in Indonesia, because many of the new national geoparks are developing rapidly in Indonesia. Networks among geopark management bodies in Indonesia are expected to help each other in solving the problems of geopark development through solutions proposed by groups or agencies that have an interest in a geopark. If a special body of geopark managers has been established that is reinforced by the special law, then the empowerment of local communities is necessary through venues that support such specialized bodies, such as representatives/LWG, and partly, the improvement of budgeting capabilities through training for stakeholders to increase their ability in budgeting for improvement and physical development.

Once the special geopark management body/institution is established, it could coordinate with local government agencies related to spatial planning, such as Bangli Planning Agency, to synchronize Batur Geopark area planning with existing planning documents, such as the Spatial Plan and Detailed Spatial Plan. Synchronization with planning documents is important for establishing land use maps, which will facilitate the permit process within the Batur Geopark area.

5. Conclusions
This paper discussed the benefits that the Batur Geopark area gains from the local economic development of geotourism. We found that the perceived benefits of geotourism activities so far have not been felt thoroughly by all community groups. Geotourism is seen through different perspectives by different actors. Local communities that are engaged in farming and mining have experienced that geotourism activities tend to have negative impacts on their businesses, as the Bangli Government tries to limited their activities to make room for the development of geotourism. In addition, there is the fact...
that the some of the current tourism sector is still monopolized by certain communities (e.g. P3GB that monopolizes trekking routes within the conservation area of Batur Geopark). Other activities include farming and plantation, which do not fit well with the geopark’s aims. However, most stakeholders agree that the development of Batur Geopark is a gradual process whose benefits will be felt in the future. The roles of local leaders and communities are obviously important within the grassroots development of the Batur Geopark area. To address the challenges in the local economic development of the Batur Geopark area, a number of actions should be considered: (i) seminars and trainings, in collaboration with local universities, research institutions, and associations such as PHRI, on the importance of entrepreneurial skills for local communities, (ii) establishing a special geopark management body/institution, (iii) creating special regulations on the management of local economic development of the geopark area, which also regulate strategies of promotion and marketing of local products, (iv) creating a guideline to train people within the geopark to play a more active role, for example, besides maintaining the geopark, they can also guide tourists, make products, or develop new attractions, (v) creating participatory-planning activities that will engage local communities, (vi) establishing regulations that could strengthen coordination between central, provincial, and district agencies, (vii) synchronizing the planning of the Batur Geopark area with government planning documents such as the Spatial Plan and Detailed Spatial Plan.

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References
[1] Cooper C P, Fletcher J E, Gilbert D C and Wanhill, S 2008 Tourism: principles and practice (Harlow (England) : Prentice Hall Financial Times)
[2] Creaco S and Querini G The role of tourism in sustainable economic development Proc. of the 43rd Congress of the European Regional Science Association 2003 Aug 27 – 30 Jyväskylä, Finland Available from: https://www.econstor.eu/handle/10419/115956.
[3] Taman Bumi Global Batur, Indonesia 2014 Dinas Kebudayaan dan Pariwisata Kabupaten Bangli
[4] Dowling R. K. 2010 Geotourism’s global growth Geotheritage 3(1): 1-13.
[5] Farsani N T, Coelho C, Costa C 2011 Geotourism and geoparks as novel strategies for socio-economic development in rural areas. Int. J. of Tourism Res. 13(1): 68-81.
[6] Farsani N T, Lima J, Eusêbio C, Costa C and Coelho C 2013 Green Economy in Rural Areas through Geotourism and Geoparks Guy Boscarrino and Derek Notte (Eds.) Economic Developments and Emerging Markets of the 21st Century: Global Practices, Strategies, and Challenges (USA: Nova Science Publishers) p. 211-229.
[7] Hose T A 2003 Geotourism in England: a Two-region Case Study Analysis (Birmingham (England): University of Birmingham)
[8] Kumar J, Hussain K and Kannan S Positive Vs Negative Economic Impacts Of Tourism Development: A Review Of Economic Impact Studies. Proc. of the 21st Asia Pacific Tourism Association Annual Conference; 2015 May 14 – 17; Kuala Lumpur, Malaysia. Available from: https://www.researchgate.net/profile/Jeetesh_Kumar/publication/277411573_POSITIVE_VS_NEGATIVE_ECONOMIC_IMPACTS_OF_TOURISM_DEVELOPMENT_A_REVIEW_OF_ECONOMIC_IMPACT_STUDIES/pdf
[9] Ngwira P. M. 2015 Geotourism and geoparks: Africa’s current prospects for sustainable rural development and poverty alleviation In: Errami E, Brocx M, Semeniuk V, editors From Geoheritage to Geoparks (Switzerland: Springer International Publishing) p. 25-33.

[10] Purbo-Hadiwidjojo M. The geologic map of Bali, Indonesia, scale 1:250.000. Geological Survey of Indonesia; 1972.

[11] Stynes, D. J. 1997 Economic impacts of tourism: a handbook for tourism professionals (Urbana, IL: University of Illinois, Tourism Research Laboratory) p. 1-32.

[12] UNESCO 2006 Global geoparks network (Paris: UNESCO Division of Ecological and Earth Sciences Global Earth Observation Section Geoparks Secretariat) Available from http://unesdoc.unesco.org/images/0015/001500/150007e.pdf.

[13] UNESCO 2006 Guidelines and Criteria for National Geoparks seeking UNESCO’s assistance to join the Global Geoparks Network (Paris: UNESCO) Internal document.

[14] UNESCO 2016 Final Report of United Nations Educational, Scientific and Cultural Organization UNESCO Global Geoparks Council (1st Session, 24 – 25 September 2016) (Torquay(England): UNESCO) Final Report.