



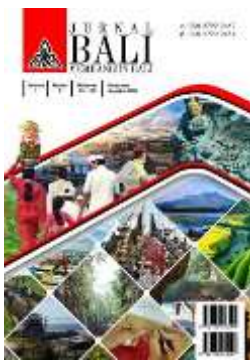
## Climbers' Behavior in Reducing Environmental Damage at Mount Batur

Kadek Holy Campala Trikayanti<sup>1</sup>, I Gede Mudana<sup>2</sup>,

I Made Darma Oka<sup>3</sup>, Indah Utami Chaerunnisah<sup>4</sup>, Made Sudiarta<sup>5</sup>

<sup>1</sup>Su's Cottages Legian, Badung, <sup>2,3,4,5</sup>Tourism Department, Politeknik Negeri Bali

email : <sup>1</sup>[holytrikayanti@gmail.com](mailto:holytrikayanti@gmail.com), <sup>2</sup>[gedemudana@pnb.ac.id](mailto:gedemudana@pnb.ac.id), <sup>3</sup>[madedarmaoka@pnb.ac.id](mailto:madedarmaoka@pnb.ac.id),  
<sup>4</sup>[indahutami@pnb.ac.id](mailto:indahutami@pnb.ac.id), <sup>5</sup>[sudiarta@pnb.ac.id](mailto:sudiarta@pnb.ac.id)



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### Abstract

**Purpose:** This study aims to determine behavior of climbers and to find out the efforts made by the tracking manager to minimize environmental damage caused by climbing or tracking activities as well as maintaining personal safety for climbers in Mount Batur area, Bangli, Bali.

**Research methods:** This study used a qualitative descriptive method. Apart from being a literature study, this research uses observation, in-depth interviews, and documentation.

**Result and discussion:** The results of the study show that the climbers who often say they are nature lovers have awareness of environmental sustainability starting from being aware of the garbage around and complying with the regulations that have been made by the manager to avoid environmental damage and maintain their own safety so that unwanted events in the climbing process can be avoided.

**Implications:** The results of this study are expected to be used as parameters in decision making for the managers of the Mount Batur area and it is also hoped that climbers can jointly maintain and comply with existing regulations for the preservation of this mountain.

**Keywords:** climbers' behavior, environmental damage, mountains, tourism.

### Abstrak

**Tujuan:** Penelitian ini bertujuan untuk mengetahui perilaku para pendaki dan mengetahui upaya-upaya yang dilakukan pengelola tracking untuk meminimalisir kerusakan lingkungan akibat kegiatan pendakian atau tracking serta menjaga keselamatan diri pendaki di kawasan Gunung Batur, Bangli, Bali.

**Metode penelitian:** Penelitian ini menggunakan metode deskriptif kualitatif. Selain sebagai studi pustaka, penelitian ini menggunakan observasi, wawancara mendalam, dan dokumentasi.

**Hasil dan pembahasan:** Hasil penelitian menunjukkan bahwa para pendaki yang sering dikatakan sebagai pecinta alam memiliki kesadaran akan kelestarian lingkungan mulai dari sadar akan sampah yang ada disekitarnya dan mematuhi peraturan yang telah dibuat pengelola agar tidak terjadi kerusakan lingkungan dan menjaga keselamatan diri sendiri agar kejadian yang tidak diinginkan dalam proses pendakian dapat dihindari.

**Implikasi:** Hasil penelitian ini diharapkan dapat dijadikan sebagai parameter dalam pengambilan keputusan bagi para pengelola kawasan Gunung Batur dan diharapkan juga para pendaki dapat bersama-sama menjaga dan mematuhi peraturan yang ada demi kelestarian gunung ini.

**Kata Kunci:** perilaku pendaki, kerusakan lingkungan, gunung, pariwisata.

## INTRODUCTION

Indonesia has many types of interesting tours to enjoy, ranging from nature tourism, historical tourism to cultural tourism. Tourism also has a positive impact on

local communities around tourist destinations and the government, especially in creating employment opportunities and improving welfare and the economy. Indonesia as a developing country in development is trying to build the tourism industry as one of the efforts to achieve a balanced foreign trade balance and it is also hoped that foreign exchange income can increase and improve the economy of its people (Pendit, 2002). One form of tourism, which is currently starting to get widespread attention, is mountain climbing tourism (trekking/climbing tourism). Mountain climbing tourism includes tourism activities carried out to enjoy the beauty of the mountain and its environment. Therefore, this type of tourism is related to nature tourism, rural tourism, alternative tourism, and so on (Mudana et al., 2017).

One of tourist destinations in Indonesia visited by many tourists is the island of Bali. The island of Bali has a lot of interesting tourist attractions ranging from nature, history, culture to customs. It is not surprising that Bali has developed a paradigm of cultural tourism development since 1970s which cannot be separated from the state of nature, humans, spirituality and divinity as manifested in the concept of tri hita karana (Mudana et al., 2021). One of the most visited areas in Bali is Kintamani, which is located in Bangli Regency. Kintamani area is very famous for its tourist destinations, namely Lake Batur and Mount Batur (Pamularsih, 2021).

Kintamani District is one of sub-districts in Bangli Regency which has an area of 366.92 km<sup>2</sup>, or about 70.45% of Bangli Regency area and is even the largest sub-district in Bali Province (6.51% of the total area of Bali Province). The uniqueness of the sub-district is that it has a Batur caldera geopark measuring about 13.8 × 10 km, and other caldera structures formed in the middle with a diameter of 7.5 km and the tributary of Mount Batur with the highest peak of +1,717 m (Sinarta & Sumanjaya, 2018). In Mount Batur area there is also a lake with the same name, namely Lake Batur which is located in a high area, which is 1,050 meters above sea level with an area of 16 square km with an average depth of 50.8 km (Mudana et al., 2018).



Figure1. Map of Gunung Batur

[Source: [https://www.researchgate.net/figure/Location-map-for-Agung-and-Batur-volcanoes-Simplified-geological-map-of-Bali-Indonesia\\_fig1\\_326354595](https://www.researchgate.net/figure/Location-map-for-Agung-and-Batur-volcanoes-Simplified-geological-map-of-Bali-Indonesia_fig1_326354595)]

Tourism activities around Mount Batur are very dependent on nature and the environment. The environment is a unitary space with all objects, forces, conditions, and living things, including humans and their behavior that affect the survival and welfare of humans and other living creatures. There is a reciprocal relationship between humans and their environment. Humans affect their environment, and vice versa humans are influenced by their environment. Humans exist in their environment and cannot be separated (Undang-undang Republik Indonesia Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup or Environmental Management Law).

In the living environment there is an ecosystem, namely the arrangement of environmental elements which are a comprehensive whole and influence each other in forming environmental balance, stability, and productivity. The causes of environmental damage can be divided into two, namely the result of natural events such as volcanic eruptions and earthquakes, while the second cause of environmental damage is the result of human activities. The damage caused by human activities every day takes place continuously and is getting bigger and more dangerous for human life. Many small things that humans do can actually damage the environment and can have a big impact on their lives now and in the future. One example of a small thing that humans do is littering (Putranto et al., 2020).

The impact of waste generated from climbing activities carried out by various groups is inseparable from the character possessed by each individual. Character can be interpreted as a character that already exists and is inherent in everyone where this character will shape a person's mindset and behaviour. This character does not arise from someone being born but through the process of character building itself gradually (Ardanita et al., 2017). The process in question can be from the learning process, socializing, and other daily activities. Everyone who routinely does something every day will indirectly form a character in himself according to his habits. The character of caring for the environment is an attitude or an action that always strives to care for the environment and prevent damage to the environment, so that the environment is always preserved for its sustainability (Nyimas, 2016).

Mountain climbing is a complete package sport where in addition to being good for endurance, we can also have recreation while overcoming obstacles and even dangers if the terrain is extreme to enjoy beautiful views along the climbing track and of course a bonus at the top. Mountain climbing is an activity that requires careful preparation which includes setting goals, completeness of luggage, time management, group cohesiveness and what must be considered is a sense of caring for the natural

environment that is enjoyed.

Looking at the impacts of the activities described above, it is clear that all of them do not support the preservation of the carrying capacity of the environment and the preservation of the carrying capacity of the environment. Whereas in Law Number 32 of 2009, Article 67 concerning Environmental Protection and Management explains that everyone is obliged to preserve environmental functions and control environmental pollution and/or damage.

Mountaineering activities are very positive activities, but the large number of climbers has the potential for the high amount of garbage heaps, especially at the top of Mount Batur. There are piles of garbage at several points along the ascent of Mount Batur, especially at the top of the mountain. The location of the garbage at this height makes it an additional task for the manager, therefore it is necessary to make regulations regarding the waste produced by mountain climbers. Altitude is the height of an object or point in relation to sea level or ground level. Areas on the earth's surface that are high above mean sea level is called high altitude (Fernandez & Tirtayasa, 2017).

Some of the climbing routes of Mount Batur are damaged due to natural and human factors, namely uncontrolled climbing quotas on certain days. There was vandalism activity or doodles on the rocks found on Mount Batur. For the damage that occurred on the climbing route of Mount Batur, namely the damage to the hiking trail, acts of vandalism, garbage, and forest fires due to natural factors, the actions taken by the manager were to make regulations regarding climbers' luggage up to the limit of the climber's quota per day.

This study is to inform the management of several things that can be done to minimize plastic waste, stop vandalism activities and maintain the safety of the hiking trail. The results of this study are expected to provide an understanding for climbers and managers of the importance of maintaining behaviour in nature for the sake of sustainable nature conservation and of course free from waste which will later be voiced to the local and central government stages.

## RESEARCH METHODS

The researchers use a qualitative analysis approach with sustainable tourism studies for data collection through an online questionnaire (Google form) to climbers and managers of Mount Batur. The research instrument was the researchers who were equipped with an interview guide. Data collection techniques through observation, documentation, and in-depth interviews with climbers and managers of Mount Batur and respondents.

Research data obtained through direct surveys in the field. To obtain this data, Mount Batur must be climbed to conduct a field survey. The survey was carried out by tracking the Mount Batur climbing route. The samples obtained in this study came from various groups, namely students, students, office workers, teachers, nature lovers, etc. Based on 40 samples that have been obtained respondents are students, student respondents, employee respondents.

## RESULTS AND DISCUSSION

In Bali there are 10 highest mountain peaks which have a height of more than 1,500 meters above sea level (masl). First, Mount Agung, 3142 masl; second, Mount Batukaru, 2,276 masl; third, Gunung Abang, 2,151 masl; fourth, Pucak Mangu, 2,096 masl; fifth, Mount Sangiyang, 2,087 masl; sixth, Mount Pohen, 2,063 masl; seventh, Mount Tapak, 1909 masl; eighth, Mount Lesung, 1,865 masl; the ninth, Pucak Adeng, 1,826 masl; the last one, Mount Batur, 1,717 masl (Mudana et al., 2018).

Mount Batur is located in the village of Kintamani, Bangli district. Mount Batur is a mountain that is one of the favorites for local and foreign climbers because of the hiking trails and very beautiful scenery where from the top climbers can see the beauty of Lake Batur, the majesty of Mount Agung and the warm sunrise. Mount Batur is a volcano that is in the Pacific Ring of Fire where this mountain is classified as an ancient mountain which has a height of (1717 meters above sea level) and has a caldera I measuring 13.8 x 10 km. Caldera II is circular in shape with a diameter of approximately 7 km which is one of the largest and most beautiful in the world. The Mount Batur Caldera area has been designated by UNESCO as part of the Global Geopark Network (GGN) Earth Park network, because of its natural beauty, archaeological and geological traces. UNESCO (United Nations Educational, Scientific and Cultural Organization) defines a geopark as an area with clearly defined boundaries and has a large enough surface area for local economic development (Setyadi, 2012). Mount Batur has experienced 26 major eruptions from 1804 to 2000. The greatest eruption occurred in 1926, where the lava that came out buried the entire Ancient Batur Village located at the foot of the mountain (Narendra, 2012). Geoparks consist of a number of geological diversity sites of special scientific importance, rarity and beauty known as Geological Heritage. Geoparks are not only related to geological diversity, but also archaeological, ecological, historical and cultural values. Geopark is a geographical area where geological heritage sites become areas of the concept of protection, education and holistic sustainable development.

Geopark according to Nurjani (2020) is an area that has meaning as a geological heritage (so it needs to be preserved) as well as a place to apply

sustainable economic development strategies that are carried out through good and realistic management structures. Geopark contains a number of geological sites (geocide) which have meaning in terms of science, rarity, beauty (aesthetics) and education. Activities in the geopark include aspects of geology, archaeology, ecology, history and culture.

Due to the relatively normal climbing time, it is very suitable for beginners, only because the terrain is quite heavy, complete preparation is needed, starting from physical health, adequate logistics, warm clothes, shoes that match the natural terrain, flashlights and climbing sticks. According to Witarsana et al (2017) there are many things that motivate the wider community to climb Mount Agung, namely wanting to get a different atmosphere, wanting to do new things such as mountain trekking and wanting to relax at the top with beautiful and calm views.



Figure 2. Appearance of the peak of Mount Batur  
[Source: <https://www.jenderalist.com/solo-hiking-gunung-batur/>, 2021]

The charm of the beauty of Mount Batur causes addiction that makes people not bored climbing here and will even come again and again, but unfortunately the arrival that is always presented with beautiful views is not always balanced with environmentally conscious behavior on the path or mountain peak. This can be evidenced by the amount of garbage at the top and the doodles of rocks around the climbing area. As we know that environmental damage can be caused by two factors, namely natural disasters and human activities. The decline in the quality of cleanliness and damage in several paths is certainly greatly influenced by climbing activities due to a lack of self-awareness to preserve the environment.

Climbers tend to leave trash on the hiking trail or peak because of the lazy mindset to bring the garbage down and at the top. There is one point that looks like a garbage shelter and the air is quite cold. This generally makes climbers easy to urinate. The amount of tissue waste found around the hiking trail. Some hiking trails also

suffered damage caused by the number of climbers increasing per day without any restrictions on the daily climbing quota. Other damage was that some climbers were still doing doodles on the rock and some were picking edelweiss flowers along the hiking trail.



Figure 3. Hikers unloading plastic waste from the top of Mount Batur  
[Source: Trikayanti, 2021]

Looking at the current environmental conditions, it certainly feels increasingly alarming. This can be caused by the tendency of humans who understand the consequences but deliberately over-exploit natural resources. Conditions like this are certainly closely related to human behaviour which tends not to care about the condition of natural resources and the environment that is maintained in its sustainability. Therefore, human behaviour and character is an important and main priority in overcoming the current environmental crisis. Photo in Figure 3 was taken when a group of young climbers unloaded their personal waste and collected the plastic waste left by the previous climbers according to the load that could be carried down and finally the garbage was collected at the ticket post.

The positive influence of climbing activities on Mount Batur (the economic sector will increase with climbing activities because Mount Batur itself presents a very complete view where a combination of ancient volcanoes and beautiful Lake Batur is added with a green forest atmosphere. Foreign tourists who like challenges or activities Those who smell nature or sports can do tracking, climbing, camping, fishing, hot spring activities or around the Mount Batur area.

Efforts are being made to reduce environmental damage that occurs on Mount Batur and an alternative accident prevention for mountain climbers. (1) Damage to

hiking trails: Organizing the number of climbs per day so that there is no overload that causes damage to the climbing route. (2) Vandalism: The management of Mount Batur made regulations by forbidding climbers to bring equipment commonly used for vandalism activities, namely markers, pilox, and other stationery or dyes. The manager together with nature lover volunteers will also clean up the graffiti done by climbers by using a liquid that can be used to remove writing marks or scribbles left by climbers. (3) Trash: Carrying out mountain cleaning activities with the nature lover community which is routinely carried out every year where the last was carried out on October 24, 2020. Checking the luggage of the climbers at the main post and then the climbers are asked to fill in the blanks regarding what items are brought. The manager always provides briefing and socialization to each climber to bring down the waste generated during the climb. (4) Alternative accident prevention: To avoid accidents in the implementation and post-climbing, there are four conditions that are recommended for people who want to climb, namely: have good physical and mental conditions, have knowledge of the mountain to climb and good skills, have careful planning, and are supported by adequate equipment (Sukarmin, 1995).



Figure 4. Climbing Mount Batur by keeping it clean from garbage.  
[Source: Trikayanti, 2021]

The condition of the peak of Mount Batur is dense because there is no information about how many people climb on May 15, 2021. Many climbers enjoy the beauty of the sunrise at the top resulting in soil conditions or some points being



damaged and this is very dangerous for the safety of climbers, this is which is the background that data collection on the number of climbers every day is very important so that related parties know the ideal number of climbers per day for the preservation of the nature of Mount Batur and have an impact on the comfort and safety of climbers. For that, before climbing Mount Batur or any mountain, anyone should pay attention to this. (1) Have good physical and mental condition. Climbing a mountain is a hard and strenuous sport, therefore it is only natural that it demands excellent physical and mental abilities from climbers so that they are not easily discouraged if they encounter difficulties on the way so that they are successful in carrying out their mission. (2) Have knowledge and be able to practically apply skills in the mountains. This includes: reading maps, using ropes, compasses, first aid kits, getting clean water, cooking, setting up tents, and knowledge of the mountains, flora and fauna on the mountain to be climbed. (3) There is good and detailed planning. This concerns licensing issues, travel routes, stopping points, departing, getting back off, and knowing the prohibitions that have been set. (4) Supported by adequate equipment such as: backpacks, clothes, sleeping bags, easy-to-cook and durable food, first aid kits, lighting, and tents.

## CONCLUSION

Based on the results of the research that underlying the climbing activity to Mount Batur is the beauty of the sunrise from the top of the mountain, the skywave that can only be seen from the top of the mountain, the relatively short climbing time of 2-3 hours and the climbing terrain that can be reached by vulnerable ages ranging from children. until adulthood. This reason triggers variations in the characteristics of climbers as well as luggage carried and trash left behind. This should be considered by the manager to tighten the checking of goods carried up, which is expected to be the same as the results of the waste brought down and of course the awareness of the climbers themselves needs to be increased.

Mount Batur is often enjoyed by groups of climbers from companies consisting of families ranging from mothers, fathers and children which results in a lack of focus for each individual on the waste produced which should be the personal responsibility to take down. It is hoped that in further research the flow of climbing preparation can be digitized to make it easier for climbers to see information about what items can be brought to climb Mount Batur in order to reduce the waste generated from the implementation of the climb and can register climbing through the official website of Mount Batur so that climbers know what is the limit of people who can climb every day and this serves as a reference for the manager to know the ideal number of climbers each day so that carrying capacity can be recorded.

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