Jurnal Geografi Gea

Journal homepage: https://ejournal.upi.edu/index.php/gea

Assesing Habema Lake and Trikora Peak As Mountain Tourism Destinations In Papua Pegunungan Province

Ruslan Budiarto[1], Galih Kusumah[2]

[1,2]Master of Tourism, Graduate School, Universitas Pendidikan Indonesia

Correspondence e-mail: ruslan.budiarto@gmail.com

ABSTRACT

This study investigates the potential of Lake Habema and Puncak Trikora as emerging mountain tourism destinations in Papua, Indonesia, which are starting to be recognized together with Carstensz Pyramid. However, despite their increasing popularity, these two areas face challenges due to weak management and limited research on their tourism development. The purpose of this study is to provide strategic recommendations for sustainable mountain tourism development in the Papuan Highlands, focusing on these two areas. Through field surveys, observations, and interviews, this study identifies the unique attractions of Lake Habema and Puncak Trikora, which are characterized by high-quality landscapes, rich biodiversity, and vibrant local cultures. To realize the tourism potential, it emphasizes the need for sustainable tourism practices and careful planning. Key factors for successful tourism development include: 1) Environmental Conservation; 2) Community-Based Tourism; 3) Long-Term Sustainability; 4) Collaborative Governance; and 5) Safe and Supportive Environment. The study concluded that although the region has significant tourism potential, further research and planning are needed to address current gaps and guide future sustainable tourism development in the region.

ARTICLE INFO

Article History:
Submitted/Received 21 April 2025
First Revised 22 April 2025
Accepted 25 April 2025
First Available online 30 April 2025
Publication Date 30 April 2025

Keyword:
Habema,
Trikora,
Mountain tourism, Papua Pegunungan,
Sustainable development

1. INTRODUCTION

New Guinea is the second largest island in the world, after Greenland, that has a rugged mountain chain stretching for about 1,500 km from the western part (Indonesia) to the eastern part (Papua New Guinea) (Martin et al., 2023). Differ from other mountains in Indonesia, that the majority of which are volcanoes, the mountain chain in Papua has its own characteristics: non-volcanic origins, high elevations, and distinct alpine ecosystems. This offers a unique tourism attraction and is not inferior to the other nature or adventure tourism destinations.

As part of tourism destinations, a mountain tourism first emerged as a new type of tourism in the Encyclopedia of Tourism (Buhalis, 2022) that gradually enhanced its position within the diversity of tourism forms, where this type of tourism has shown significant development. Mountain tourism is considered the second most popular type of tourist destination globally, after coastal tourism (Río-Rama et al., 2019; Kangai et al., 2024). The increasing interest in adventure and ecotourism has driven a surge in the popularity of mountain tourism destinations worldwide. The shift in demand towards mountain tourism is related to the desire for sustainable tourism experiences that focus on nature (Dax and Tamme, 2023; Kangai et al., 2024). The tourist interests in the diversity and challenges offered by mountainous environments makes it a priority destination for tourism. The thrill of exploring difficult terrains and climates (Rojo-Ramos et al., 2020) or the desire to connect with nature and escape from urban life (Kangai et al., 2024) are appealing aspects of this type of tourism (Ridwana et al., 2028). In addition to its unique ecosystems, mountainous areas also boast impressive and spectacular resources, offering breathtaking views, towering cliffs, beautiful ridges, and various geological formations (Kangai et al., 2024). These are the key factors attracting tourists to mountain tourism (Rojo-Ramos et al., 2020). This trend is further reinforced by the combination of natural beauty, outdoor adventure, and cultural experiences offered by mountainous regions (Kangai et al., 2024).

One of the main attractions offered by mountain tourism is trekking, which is a form of modern adventure and geotourism. Trekking has gained significant popularity as an adventure tourism activity in mountainous regions (Różycki and Dryglas, 2014). Challenging terrain, adrenaline spikes, and the desire to explore remote and hard-to-reach locations contribute to the appealing factor of trekking (Różycki and Dryglas, 2014). Adventure tourism in the mountains involves journeys that combine sports activities, outdoor recreation, and ecotourism, emphasizing responsible travel to natural areas that preserve the environment and enhance the well-being of local communities. This combination has elevated the status of mountain tourism as a significant contributor to the global tourism market (Janowski et al., 2021 ; Kangai et al., 2024). Mountain tourism contributes to 15-20% of tourism worldwide, representing between 70 and 90 billion dollars annually (Río-Rama et al., 2019).

This mountain tourism destination is rather different from other tourist attractions due to its location in a high-elevation area. According to the United Nations Environment Programme World Conservation Monitoring Center (UNEP-WCMC), mountainous areas are classified into 7 categories **(Table 1)**.

Table 1. Mountain classification according to the United Nations Environment Programme World Conservation Monitoring Center (UNEP-WCMC) is based on the height of the mountain/local elevation range and slope.

Class	Criteria
Class 1	Elevation > 4,500 m
Class 2	Elevation 3,500 – 4,500 m

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

Class 3	Elevation 2,500 – 3,500 m
Class 4	Elevation 1,500 – 2,500 m and slope ≥ 2°
Class 5	Elevation 1,000 – 1,500 m and slope ≥ 5° or local elevation range (7 km radius) > 300 m
Class 6	Elevation 300 – 1,000 m and local elevation range (7 km radius) > 300 m
Class 7	Isolated inner basins and plateaus ≤ 25 km2 that are surrounded by mountains, which do not meet criteria of classes 1-6.

Source: Antonescu et all., (2018) ; Zhang et al., (2016)

Due to the lack of studies on mountain tourism and sustainable tourism, as well as tourism potential in Papua, we briefly review examples of mountain tourism in other countries. Based on the classification in Table 1, several countries are known as mountain tourism destinations, namely Nepal, Andorra, and Austria (Regmi et al., 2023; Romeo et al., 2024). These three countries can be said to be "pure mountain tourism destinations" because mountains are the main driver or attraction of their tourism. Nepal has the eight highest mountains in the world, with an altitude of more than 8,000 meters above sea level, so Nepal is classified as Class 1 as a paradise for mountain climbers. Andorra is a country located on the border of France and Spain, located in part of the Pyrenees Mountains, with an area of about 468 km², 98% of its area is mountains and forests, natural beauty and easy access make it a paradise for nature lovers. The Pyrenees Mountains are a mountain range with an altitude ranging from about 2,000 to 3,400 meters (Class 3 and 4). Meanwhile, Austria has two-thirds of its territory covered by the Alps, so most of the villages and towns there are considered mountain tourism destinations. Austria is located east of the Alps, where the mountain ranges are classified as Class 1, 2, and 3, stretching about 1,200 km through Monaco, France, Switzerland, Italy, Liechtenstein, Germany, Austria, and Slovenia. Not only in the three countries mentioned earlier, mountain tourism has also developed in various parts of the world that have mountain ranges, such as the Rocky Mountains in Canada and North America and the Andes Mountains in South America.

Meanwhile, in Indonesia, there are several mountain ranges that are beginning to develop into tourist destinations. For instance, the Bukit Barisan ranging from elevations of 600 m to 3,805 m in Sumatra (Wirawan et al., 2025), the Southern Mountains and the Tengger Mountains ranging from elevations 600 m to 3,676 m in Java (e.g., Hakim et al., 2008; Putri et al., 2021), the Meratus Mountains ranging from elevations 600 m to 2,278 m in Kalimantan (Anwar et al., 2018; Normelani et al., 2021), the Southern Sulawesi Mountains ranging from 600 m to 3,478 m (Suriamihardja, 2010), and the Central Cordillera ranging from 2,500 m to 4,884 m above sea level in Papua. These mountainous regions are starting to grow as tourist attractions in response to increasing demand from domestic and international travelers.

On the island of Papua itself, where the Central Mountains, a major mountain range, stretch for approximately 1,300 km from west to east in Papua New Guinea **(Figure 1)** (Wiharto, 2015). This mountain range features several peaks, with one of the highest is Jaya peak (4,884 m), also known as Carstensz Pyramid, which dominates the western end. Nearby rises Ngga Pilimsit or G. Idenberg (4,717 m), while in the central and eastern parts stand Trikora (4,730 m) and Mandala (4,760 m) (Rumansara et al., 2015). The Carstenz Pyramid is a well-known mountain tourism destination due to being one of the Seven Summits of the World, the highest mountains on each of the seven continents (Apollo, 2020). In addition to the mountain peaks, about 14 km to north of Trikora peak, there is Habema lake, the highest lake in Indonesia located at ~3,300 m above sea level (asl). This lake has long been recognized

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

as a part of mountain tourism destination located near the Baliem Valley in the Papua Highlands.

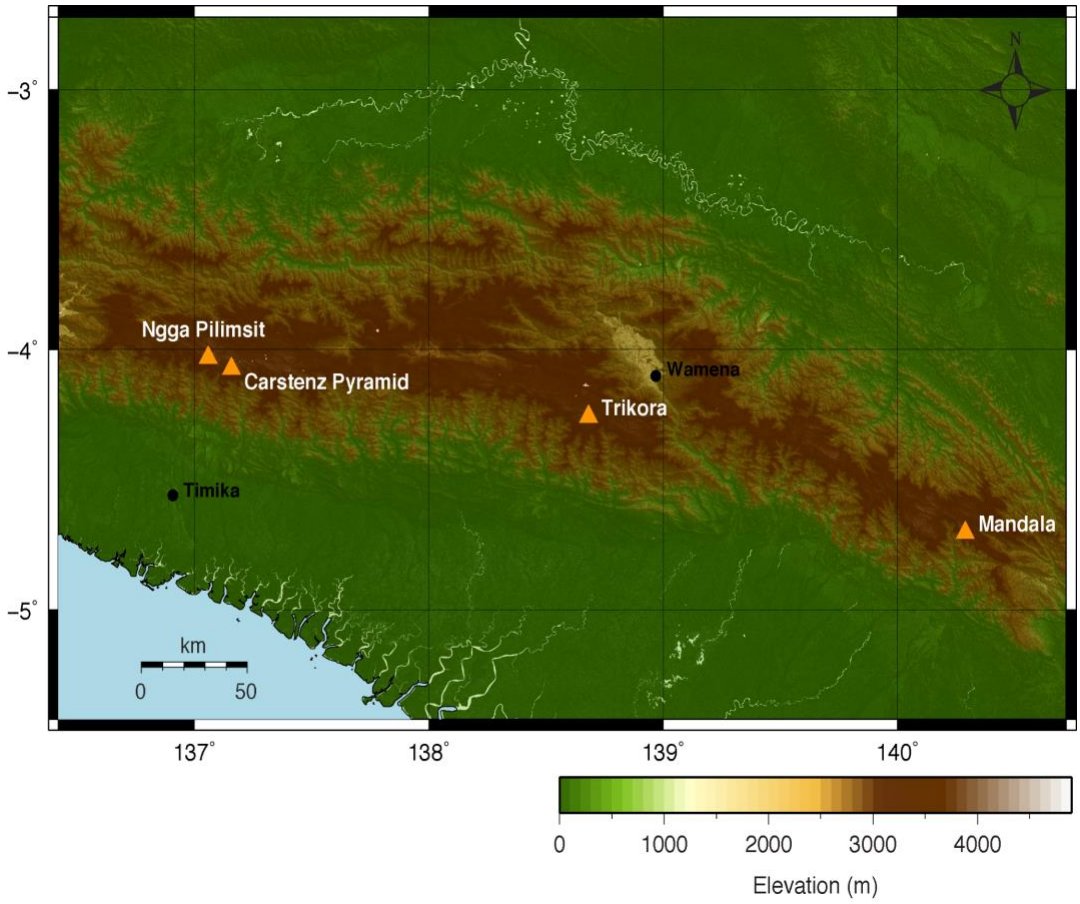

Figure 1. The major mountain range of Papua featuring its several well-known peaks. Source: DEMNAS, 2018.

Lake Habema and Trikora Peak are emerging mountain tourism destinations that are becoming quite well known among the general public, alongside Carstensz Pyramid. These areas are included in the Lorentz National Park whose area of 25,056 km^2 (Summerhayes et al., 2017). However, there is a lack of strong management and limited studies/literatures discussing tourism in these central mountain destinations. Therefore, further research is required on the development of mountain tourism particularly at Lake Habema and Trikora Peak. The aim of this study is to serve as a reference and recommendation for the strategic and sustainable development plan of mountain tourism destinations around Trikora in the Papua Highlands.

2. METHODS

2.1 Field survey and observation

We conducted field surveys and observations at Lake Habema and Trikora for two weeks in August 2024, which is within Lorentz National Park area. The initial information before conducting the field survey and observation was obtain through studying literatures. The observation is focused on three variables: physical condition, accessibility, and social, economic and cultural environment, along with several corresponding indicators as shown in **Table 2**. The author also conducted hiking to the peak of Trikora in attempt for obtaining more obervations on the conditions along the route and at its summit. The hiking route is shown in **Figure 2**. In addition, we also used secondary data (e.g., from the Central Bureau of Statistics Indonesia) to assess several conditions listed in **Table 2**.

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

Tabel 2. Variables dan observation indicators.

Variables	Indicators
Physical conditions	Geographical location
	Geology and morphology of the area
	Climate
	Soil
	Hydrology
	Biodiversity
Accessibility	Activities and width of access roads
	Quality of access roads
	Completeness of access road facilities
Social, economy and culture	Security/Safety
	Customs
	Livelihood

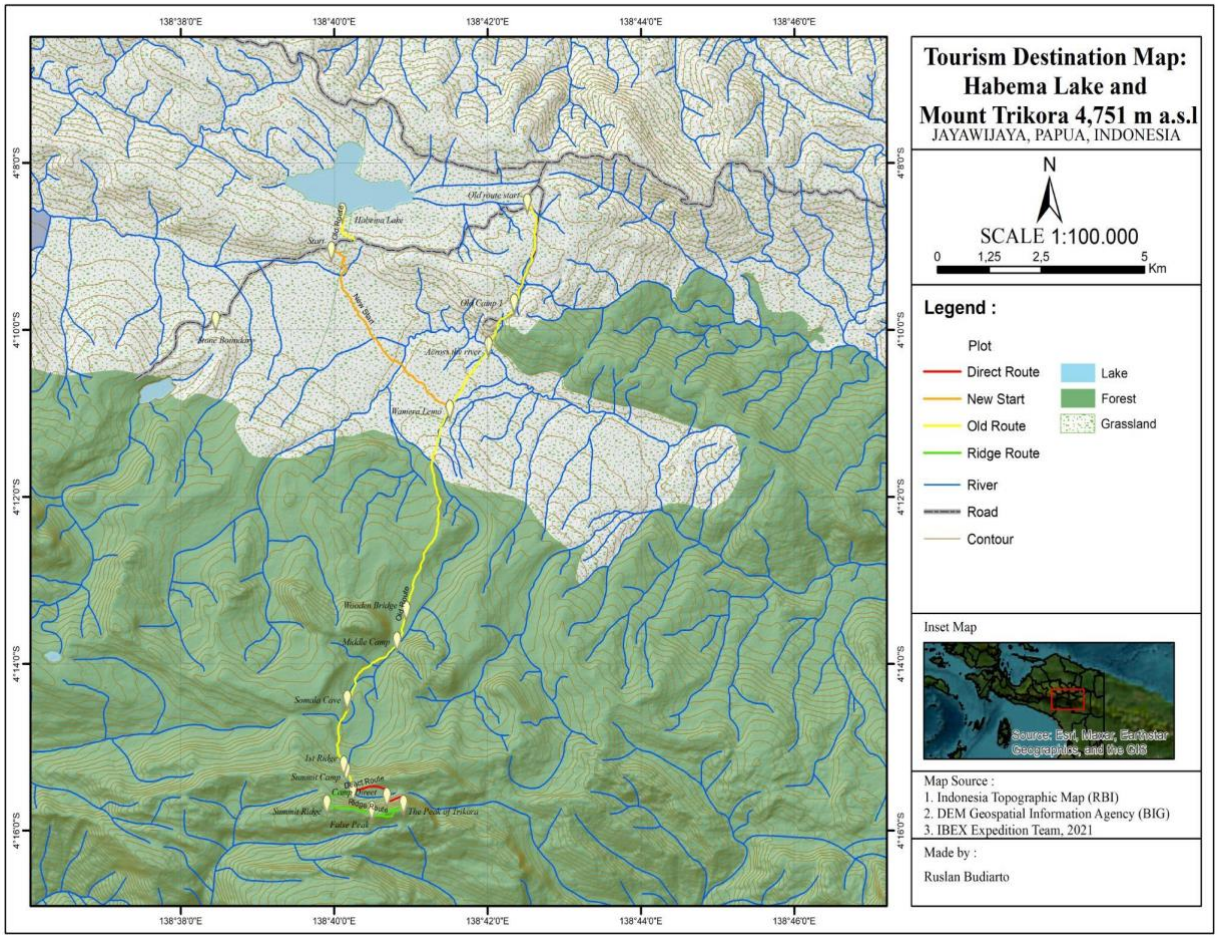

Figure 2. The location of Habema lake and the hiking route to the peak of Trikora.

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

2.2 Interviews

In the same period, we also visited the office of Lorentz National Park in Wamena to obtain general information of the area. In addition, an interview to representative officers of Lorentz National Park was done indirectly (via zoom) in November 2024 to obtain further information regarding the regulation, management, challanges, as well as steps in developing the area for tourism.

2.3 Visitor surveys

Surveys on visitors were done to gain information on their preferences, expectations, and experiences. The information about visitor candidates were obtained from the Lorentz National Park office, those whoe we met during our field survey, and from local tour operators. The data from this survey will help identify what tourists find most attractive about the area and what improvements they desire.

3. RESULTS AND DISCUSSION

3.1 Physical conditions

3.1.1 Geographical location

Geographically, Lake Habema (~3 km x 1 km) is positioned at 138°40'08.57" E, 04°08'16.22" S, while Trikora peak lies at 138°40'54.24" E, 04°15'42.21" S **(Figure 2)**. The two destinations are in close proximity to each other, forming an interconnected geographical area. Figure 2 is a zoom-in into the area showing the central mountainous region of Papua. Administratively, they fall within the Jayawijaya and Lanny Jaya regencies. According to the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), both Habema Lake and Trikora Peak areas are classified within altitude zones ranging from 2,500 to 4,750 meters, corresponding to classes 3 to 1.

3.1.2 Geology and morphology

The area is characterized by a complex geological structure due to the interaction between two major tectonic plates: the Australian Plate and the Pacific Plate. Claystone or shale, sandstone, conglomerate, and volcanic rocks form deposits that dominate the main rocks in this area. Layers of sedimentary rocks form the highest part of the central mountain range in the northern area with a thickness of up to 2,000 meters, consisting of parent rocks in the form of mixed limestone, marl, and sandstone. Most of the area of Lake Habema and Trikora in this central mountain region is composed of Paleogene and Neogene limestone, as well as ophiolite and melange, which are the result of collisions. From south to north, a series of synclines and anticlines can be seen, which are estimated to curve towards the north and cause significant glacial erosion. At the northern end of the area, there is a depression, where Lake Habema is located, that composed of predominantly pale gray sandstone, alternating with stretches of limestone. This depression also features many medium-sized karst sinkholes, which are the remnants of the karst depression from the Baliem Valley. The history of the formation of this complex geological structure contributes to the uniqueness of the area's physiography.

3.1.3 Climate

Based on the Schmidt and Ferguson method, the Central Mountains region is included in climate type A (very wet climate). The Central Mountains and Baliem Valley regions (from Lake Habema to Trikora Peak) experience a high mountain climate that especially experiences light rain continuously throughout the year. Based on data from the Central Statistics Agency of Papua Province, 2023. In 2023, the Central Mountains region received a total rainfall of almost 2,000 mm, which is one of the wettest places in the world. Temperatures can sometimes drop below 0°C at an altitude of 4,500 meters above sea level, with humidity levels

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

ranging from 78% to 90%. There are many rivers in the Trikora mountains region that never dry up, so when it rains heavily, the river flow can overflow. The temperature in this region is highly dependent on altitude and is not affected by the proximity of the region to the equator, while the height of the mountains affects wind patterns and rainfall in each region. All existing seasons are determined by differences in rainfall, not temperature, and are influenced by trade winds, westerly winds and easterly winds.

3.1.4 Soil

The Habema Lake area up to the Trikora Peak is covered by several soil orders. Its climatic and geological conditions are the two factors that significantly influence the formation of soil types in this area. The soil types in this region come from several orders such as entisols, inceptisols, alfisols, ultisols, and histosols. The northern part of Lorentz National Park is dominated by several soil orders with both fine and coarse soil textures. Mountain soils tend to be more fertile in the alluvial valley bottoms of rivers. However, soils derived from limestone and sedimentary rocks generally have poor nutrient content. The high rainfall in these areas contributes to soil acidity, resulting in soils rich in aluminum and iron, but heavily leached and nutrient-poor. The least fertile soils are typically found on the slopes around the valleys, where the soil layer is thin and prone to erosion. In the central mountain range, the effective soil depth is generally less than 25 cm, primarily due to the dominance of rocky and calcareous soils formed by the weathering of limestone.

3.1.5 Hydrology

The hydrological system in the area from Lake Habema to the summit of Trikora is classified as part of a zone characterized by steep mountain edges, river valleys, and waterfalls. The prevalence of limestone formations leads to water channels that are often disconnected, with numerous streams disappearing into karst caves before re-emerging as springs and waterfalls from steep rock crevices. In certain parts of the region, the river water appears clear, but it becomes progressively more turbid as it flows downstream. In other areas, the water is naturally murky, likely due to sediment and organic matter from peat. Some river flows around Trikora are not conducive to the presence of many types of aquatic insects due to the alkaline water chemistry. In contrast, Lake Habema itself features water with a relatively neutral pH, and its highly heterogeneous substrate supports a diverse range of aquatic life. The lake's catchment area is well-integrated, with relatively gentle slopes that further promote the development of aquatic biota.

3.2 Biodiversity

The area around Lake Habema extending to Trikora Peak includes a variety of mountain vegetation, transitioning from subalpine tundra to alpine tundra. Within the Lorentz National Park, the Subalpine Zone covers an altitude of 3,200 to 4,170 m above sea level and is divided into the Lower Subalpine Zone (3,200 to 3,650 m above sea level) and the Upper Subalpine Zone (3,650 to 4,170 m above sea level). The Tundra Zone consists of Dry and Wet Alpine Tundra. The Dry Alpine Tundra, located in the young moraine area between 4,230 and 4,600 m above sea level, has been exposed to ongoing thawing over the past 30 years. Mosses and several herbaceous species that thrive in alkaline mineral soils dominate this area. Most of this area is subalpine, with swampy meadows and Nothofagus forests on the northern slopes of the Jayawijaya Mountains, as well as subalpine coniferous forests around Lake Habema and the foothills of Trikora Peak. At higher elevations, usually around 3,000 meters above sea level, clear differences in flora and forest structure become apparent, clearly separating montane forests from subalpine forests. One of the dominant forest types in this region is the Nothofagus forest, which stretches along the Sudirman Mountains. Other important tree

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

species in this forest include Phyllocladus hypophyllus, Papuacedrus papuana, and Dacrycarpus cinctus. These forests are usually found on lithosol soils at altitudes between 1,900 and 3,100 meters above sea level, merging with lower subalpine forests at around 3,200 meters. The fauna in this area includes various species of birds from the Psittacidae family, Turdus poliocephalus, Ptiloprora, Melidectes nouhuysi, and the rat Rattus niobe, which is able to survive at high altitudes. In addition to snakes, the region is also home to species of cuscus, tree kangaroos and birds such as cassowaries.

3.3 Accessibility

The Lake Habema area and its surroundings are the only accessible region by road within Lorentz National Park. The road connecting the city of Wamena to Lake Habema and Trikora peak is in relatively good condition. This road network was constructed as part of a national strategic development project initiated in the 1990s. Lake Habema is approximately 48 km from Wamena, and the journey can be completed in 1.5 to 2 hours by either two-wheeled or four-wheeled vehicles. With ongoing development in the area, the quality of the road network is steadily improving, opening up greater access to other nearby tourist attractions, such as Trikora Peak, Batas Batu, and Elephant Ridge. Despite the improved road access, public transportation options to the Lake Habema and Trikora area remain limited. Visitors typically rely on taxis or chartered 4WD vehicles, which are readily available in Wamena. Historically, the Lorentz National Park has been known for its challenging access, with many areas only reachable by foot or air transport. For example, climbing Carstensz Peak requires a trek of over 14 days on foot. Such extended journeys demand significant time, effort, and financial resources, making activities like climbing relatively expensive.

3.4 Social, economy and culture

Lorentz National Park area has been inhabited for over 24,000 years by several tribal groups in Papua (Lorentz National Park strategic plan 2020-2024). Most of the area is inhabited by the Dani and Nduga tribes, while a portion is occupied by the Lani tribe. These communities reside in narrow valleys at the foot of the mountains, with no settlements found in the higher mountains. Most of the settlements in this area are located in small valleys around river flows, as seen in the Walaik District, Ibele District, and Tailarek District in Jayawijaya Regency. The communities living around Mount Trikora and Lake Habema are still part of the Dani tribe, which is spread across several small villages, namely Pawililo, Tailarek, Ibele, Iniye, Nanggo, Trikora, and Wosak. The Dani people generally refer to Mount Trikora as Ettiakup/Hiriakub. Thus, the Dani people typically name a place in reflection of their daily lives.

Generally, they live from farming, raising pigs/rabbits, and hunting. In terms of utilizing wood forest products, people living in the valley and highland mountain areas use wood to make houses (honai), fences, bows and arrows, farming equipment, and firewood for heating. Almost all people there depend on the natural resources available in the surrounding environment. They utilize the mountain slopes inherited from their ancestors as agricultural land (farming). The agricultural system in the mountainous areas is still largely carried out traditionally, marked by farmers' dependence on local resources and technology. Agricultural products are only sufficient to meet daily needs. Excess harvests are sold at the market located in Wamena City. Limited agricultural production and market access outside the area have resulted in agricultural and economic activities in the area being underdeveloped. One example is the agricultural system in the Baliem Valley carried out by the Dani Tribe, which has been well documented and has high conservation value.

3.5 Tourism reassessment

The area from Lake Habema to Puncak Trikora is a unique destination that attracts tourists not only because of its stunning natural scenery and cultural richness, but also because of its

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

biodiversity. One of its attractions is the Nothofagus forest, which at certain times of the year produces bright red shoots among the vast mountain forests—a sight that is attractive to photographers. The area offers the opportunity to observe endemic bird species, such as the Beautiful Honeyeater (Macgregoria pulchra). The lakes, which are attractive as natural attractions, are popular tourist destinations. Most of these lakes are remnants of the glaciation process that shaped the mountain landscape, serving as natural reservoirs for melted ice from the snow-capped peaks. The unique combination of natural beauty and ecological significance makes this area an extraordinary place for tourism.

Ecotourism activities in the Lake Habema area to Trikora Peak have a long history, predating the region's inclusion in Lorentz National Park. The area has attracted foreign tourists for its unique endemic fauna and the distinctive culture of the surrounding communities. Lake Habema, in particular, has become a prominent tourism icon in the Baliem Valley and its surrounding areas. There are numerous factors that make the Lake Habema region and its surroundings, extending to Trikora Peak, an ideal candidate for development as a strategic mountain tourism destination. Several key factors that support the potential for developing this area as a tourist hub include:

1) The Lake Habema area, one of the highest lakes in Southeast Asia, holds significant potential as a natural tourism destination. Its appeal goes beyond the breathtaking natural landscape; the region is also home to unique biodiversity. Visitors can experience the refreshing coolness of the high mountain forests, a feature that is rare in other parts of Indonesia. These forests are predominantly composed of Nothofagus trees, which, at certain times of the year, produce vibrant red shoots. For bird enthusiasts, this area offers an excellent bird-watching route, where travelers can spot a variety of bird species, including some that are endemic to Papua.
2) Entering the subalpine zone, visitors are greeted with a landscape vastly different from the surrounding mountain forests. Expansive grasslands, with patches of subalpine forests scattered throughout, which is characteristic of subalpine highlands, dominate the scenery. This type of landscape is uncommon in tropical regions, making it a unique attraction for both local and domestic tourists. For international visitors, however, such views are more typical of subtropical countries. Nonetheless, experiencing subtropical landscapes within a tropical region remains a distinct draw for tourists. Additionally, the area's rich biodiversity, with many unique and endemic species of Papua, adds to its appeal, particularly for eco-tourism. Birdwatchers are especially attracted to the region, with species like *Macgregoria pulchra*, *Archboldia papuensis*, *Astarpia sp.,* and others being prime targets for observation.
3) The Trikora Peak adventure tourism is the only high-altitude summit in Papua that can be climbed in a relatively short amount of time. Although the trek to Trikora Peak is less popular compared to the more famous Carstensz Pyramid, which remains the primary destination for global climbers, Trikora Peak offers a more affordable alternative. Unlike the challenging ascent of Carstensz Pyramid, the trek to Trikora Peak typically takes around 6-7 days, making it a shorter and less expensive expedition. The accessibility of the route further supports its appeal, as there is a road connecting the town of Wamena to Lake Habema, which serves as the entry point for the climb to Trikora Peak.
4) The Jayawijaya and Sudirman mountain ranges are home to some of the highest peaks in the world, recognized internationally. Carstensz Pyramid (4,884 meters above sea level) is well known as one of the highest peaks in the Seven Summits challenge, which includes the tallest mountains on each continent. Additionally, there is Mandala Peak

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

(4,760 meters), recognized as part of the Seven Second Summits, and Trikora Peak (4,750 meters), which is listed as the third highest in the Seven Third Summits. These iconic peaks have earned international recognition and are highly sought after by both domestic and international climbers.

5) The development of nature-based tourism in the Lake Habema to Trikora Peak area can provide a new source of income for the surrounding communities. Community-based tourism development plays a crucial role, as this region has long been part of the customary land rights of the indigenous peoples who have lived in the area, even before it was designated as a national park. The tourism development area is also part of the traditional hunting and forest resource-gathering territory of these indigenous communities. Therefore, the development approach should prioritize benefits for the local indigenous populations. Communities can play an active role as stakeholders or business partners in the nature tourism industry, as well as in supporting sectors. Business opportunities include roles as trekking operators, accommodation providers, souvenir sellers, guides, porters, transport services, and other tourism-related ventures that can be developed in parallel.

3.6 Obstacles in tourism development in this area

1) Security Instability
   The security conditions in some areas of the Papua Highlands, coupled with the spread of negative rumors, have significantly impacted tourism development around Lake Habema and Trikora Peak. This instability has created an environment that is less conducive to promoting the region as a tourist destination.
2) Human Resource Quality and Lack of Future Leadership
   A key factor in tourism development is human resources. The lack of skilled human resources in this region remains a major obstacle to the growth of the tourism industry in the Central Highlands. This is evident in the limited involvement and active participation of the local community in tourism activities. Additionally, the absence of local tourism leaders has indirectly slowed the development of tourism in the Lake Habema and Trikora Peak areas.
3) Infrastructure and Facilities
   The availability of proper infrastructure and facilities plays a crucial role in tourism development. In the Central Highlands, particularly around the tourism destinations, supporting infrastructure remains insufficient. This gap in facilities hinders the region's potential to accommodate and attract tourists effectively.
4) Policies and Regulations
   Policies and Regulations
   The policies and regulations set by the area management authorities, including the National Park management and local governments, still do not fully support tourism development in the Lake Habema and Puncak Trikora Papua areas.

4. CONCLUSIONS

This study highlights the potential of Lake Habema and Trikora Peak as emerging mountain tourism destinations in the Papua Highlands of Indonesia. Both locations possess exceptional natural and cultural resources, including striking highland landscapes, rich biodiversity, and the unique heritage of indigenous Papuan communities. The combination of ecological integrity, adventure opportunities, and cultural authenticity positions this region as a valuable asset in Indonesia’s ecotourism portfolio. The findings indicate that the area's strengths lie in its high elevation zones, distinctive alpine ecosystems, endemic flora and fauna, and the presence of cultural groups like the Dani tribe who maintain traditional lifestyles and

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

knowledge systems. These attributes align closely with global trends in sustainable and nature-based tourism, particularly for adventure travelers, trekkers, and eco-tourists seeking remote and pristine environments. However, several critical challenges must be addressed to realize the region's tourism potential sustainably. These include limited infrastructure, insufficient human resource capacity in tourism services, security concerns, inadequate policy support, and low community participation. The current state of tourism in the Lake Habema–Trikora region remains largely underdeveloped and fragmented, with minimal strategic coordination among stakeholders. Further research and ongoing stakeholder collaboration will be essential to transform these highlands into a premier destination on the national and international tourism map.

5. RECOMMENDATIONS

Lake Habema and Trikora Peak are areas with significant potential as mountain tourism destinations in Indonesia. These regions boast high-quality landscapes, rich biodiversity, and vibrant local cultures. However, to realize this potential as a premier tourist destination, careful planning and the implementation of sustainable tourism practices are essential. When developing a mountain tourism destination, there are several key factors that should be considered for successful execution, including the following:

1) Environmental Conservation: protecting the fragile ecosystems in the area through responsible tourism practices and environmentally friendly infrastructure development.
2) Community-Based: involving local communities in decision-making processes and ensuring they benefit from tourism activities.
3) Long-Term Sustainability: creating a tourism model that balances economic development with the preservation of the environment and culture for future generations.
4) Collaborative Government: in this context, the National Park authority and local government collaborate with various stakeholders, such as the private sector, communities, non-governmental organizations, and local residents, to address challenges in the development of mountain tourism destinations.
5) Safe and Supportive Environment: creating a conducive and safe environment requires the participation of various parties, including the government, local communities, and the private sector.

This study of the mountain tourism destinations at Lake Habema and Trikora Peak has identified several limitations and gaps. Therefore, further research is needed on mountain tourism and development patterns to provide clearer insights for future tourism development in the region.

6. REFERENCES

Anwar, M. A., Noor, G. S., Maulana, A. Z., Putryanda, Y., & Siska, D. (2018). Kajian Pegunungan Meratus Sebagai Geopark Nasional. *Jurnal Kebijakan Pembangunan*, *13*(1), 73-84.

Antonescu, D. (2018). Biodiversity of the natural mountains heritage–present challenges and sustainable perspectives.

Apollo, M., & Andreychouk, V. (2020). Mountaineering and the natural environment in developing countries: an insight to a comprehensive approach. *International Journal of Environmental Studies*, *77*(6), 942-953.

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529

Buhalis, D. (2022). *Encyclopedia of tourism management and marketing*. Edward Elgar Publishing.

Dax, T., & Tamme, O. (2023). Attractive landscape features as drivers for sustainable mountain tourism experiences. *Tourism and Hospitality*, *4*(3), 374-389.

Hakim, L., Hong, S. K., Kim, J. E., & Nakagoshi, N. (2008). Tourism and cultural landscape at the Tengger, East Java, Indonesia: the implications for ecotourism planning. *Korean Journal of Environment and Ecology*, *22*(3), 207-220.

Janowski, I., Gardiner, S., & Kwek, A. (2021). Dimensions of adventure tourism. *Tourism Management Perspectives*, *37*, 100776.

Kangai, D., Aman, E. E., Papp-Váry, Á. F., & Szente, V. (2024). The Role of Mountain Tourism Activities and Facilities on Domestic Tourism Consumption in Tourism Destinations.

Martin, P. E., Macdonald, F. A., McQuarrie, N., Flowers, R. M., & Maffre, P. J. (2023). The rise of New Guinea and the fall of Neogene global temperatures. *Proceedings of the National Academy of Sciences*, *120*(40).

Normelani, E., Riadi, S., Noortyani, R., Endarto, E., Nayan, N., Febriyan, G. M. S., & Safitri, I. (2021). Ecotourism potential in Meratus geopark, South Kalimantan.

Putri, D. A., Susilowati, M. H. D., & Semedi, J. M. (2021). Tourist attraction and tourist motivation in the Patuha Mountain Area, West Java. *Indonesian Journal of Geography*, *53*(1), 95-102.

Regmi, D., Bhatta, K., & Dahal, S. (2023). Mountain Tourism and Hazards: A Proposal for a New Direction of Mountain Tourism in Nepal. *Glob. Environ. Res*, *27*, 133-138.

Ridwana, R., Maryani, E., & Nandi, N. (2018). Pengembangan kawasan Situ Gede sebagai objek wisata andalan kota Tasikmalaya. *Jurnal Geografi Gea*, 18(2), 135-146.

Río-Rama, M., Maldonado-Erazo, C., Durán-Sánchez, A., & Álvarez-García, J. (2019). Mountain tourism research. A review. *European Journal of Tourism Research*, *22*(2019), 130-150.

Romeo, R., Manuelli, S., & Abear, S. (2024). The Mountain Partnership: a global alliance for accelerating action in mountains. In *Safeguarding Mountain Social-Ecological Systems* (pp. 143-148). Elsevier.

Rojo-Ramos, J., Martín-Carmona, R., Galán-Arroyo, C., Manzano-Redondo, F., García-Gordillo, M. Á., & Adsuar, J. C. (2020). Trekking tourism in Spain: analysis of the sociodemographic profile of trekking tourists for the design of sustainable tourism services. *Sustainability*, *12*(21), 9113.

Rumansara, E. H. (2015). Memahami kebudayaan lokal Papua: suatu pendekatan pembangunan yang manusiawi di tanah Papua. *Jurnal Ekologi Birokrasi*, *1*(1), 47-58.

Summerhayes, G. R., Field, J. H., Shaw, B., & Gaffney, D. (2017). The archaeology of forest exploitation and change in the tropics during the Pleistocene: The case of Northern Sahul (Pleistocene New Guinea). *Quaternary International*, *448*, 14-30

Suriamihardja, D. (2010). Sustainable Tourism: the Case in South Sulawesi. HAKU Conference on the Earth and Space Sciences.

Wiharto, M. (2015). Kawasan tropis pegunungan sebagai kawasan rawan bencana dengan nilai ekologi tinggi dan upaya pelestariannya. *Jurnal Bionature*, *16*(1).

Wirawan, M. Y., Nurikah, N., & Jazuli, H. E. R. (2025). Taman Nasional Bukit Barisan Selatan Sebagai Destinasi Wisata di Kabupaten Tanggamus. *Sibatik Journal: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan*, *4*(4), 223-234.

Zhang, S., Zhang, B., Yao, Y., Zhao, F., Qi, W., He, W., & Wang, J. (2016). Magnitude and forming factors of mass elevation effect on Qinghai-Tibet Plateau. *Chinese Geographical Science*, *26*, 745-754.

DOI: https://doi.org/10.17509/gea.v25i1.82471
p-ISSN 1412-0313 e- ISSN 2549-7529