EcoProfit
EcoProfit: Sustainable and Environment Business
EcoProfit 2(1): 24-36
ISSN 3024-9872

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Local economic development strategy through hiking tourism: A case study of the Selo trail on Mount Merbabu

Muhammad Aqil Hasan[1]*
[1] *Department of Forest Conservation and Ecotourism Resources, Faculty of Forestry and Environment, IPB University, Bogor, West Java 16680, Indonesia.*
*Correspondence: muhamadhasan318@gmail.com

Received Date: May 20, 2024 Revised Date: July 28, 2024 Accepted Date: July 31, 2024

ABSTRACT

Background: The existence of the Selo Hiking Trail tourist attraction also provides job opportunities for the local community to work in various business units. **Method:** Using Multiplier Effect analysis, this study shows that tourism activities along the Selo Trekking Trail significantly impact the livelihoods of the local community. Economically assessed through Multiplier Effect Analysis, the Keynesian Income Multiplier was found to be 0.6, with a Type I Income Multiplier Ratio of 3.3, and a Type II Income Multiplier Ratio of 3.5, highlighting the substantial economic benefits derived from tourism along the Selo Trekking Route. **Result:** The study indicates that the high leakage rates, particularly in transportation and logistics costs outside the tourist destination, encourage the development of new business units such as convenience stores or minimarkets, as well as gas stations to meet the needs of tourists. **Conclusion:** To enhance the broader economic impact of tourism, further research and development are needed, especially in the context of culture-based rural tourism or Community-Based Tourism initiatives. This approach aims to promote sustainable economic benefits while preserving cultural heritage and increasing community participation in tourism activities. **Novelty/Originality of this study:** This study uses Multiplier Effect Analysis to measure the economic impact of nature tourism and provides quantitative evidence of substantial economic benefits to local communities. The study also identifies new business development opportunities to reduce economic leakage, providing a framework for community-based sustainable tourism development.

KEYWORDS: community-based tourism; economic impact; multiplier effect analysis; selo hiking trail; sustainable tourism development.

1. Introduction

Mount Merbabu, located in Central Java, is one of the most popular natural tourist destinations for both local and international visitors. With an altitude of 3,142 meters above sea level, Mount Merbabu offers a variety of natural tourism potentials such as forest tourism, mountain climbing, education, history, adventure, special interest sports, and culture (Santoso, 2013). The most popular activities at Mount Merbabu are trekking and mountain climbing (Satyatama, 2008). The panoramic beauty of Mount Merbabu is well-known; climbers can enjoy the sunrise, sea of louds, and views of other mountain peaks.

Mount Merbabu can be reached through five official hiking trails managed by the Mount Merbabu National Park Office, namely the Cuntel, Thekelan, Suwanting, Wekas, and Selo trails. The Selo trail is a favorite due to its easy access, beautiful scenery, and comfortable hiking conditions (Satyatama, 2008). Visitors to the Merbabu hiking tour are dominated by

Cite This Article:
Hasan, M. A. (2024). Local economic development strategy through hiking tourism: A case study of the selo trail on Mount Merbabu. *EcoProfit: Sustainable and Environment Business*, *2*(1), 24-36. https://doi.org/10.61511/ecoprofit.v2i1.2024.919

students and school children aged 15-24 years. Tourists to Merbabu come from various regions, but the majority come from Central Java and Yogyakarta (Purtanto et al. 2020). Banyak komunitas pendaki gunung yang berafiliasi dengan lembaga pendidikan, baik di tingkat perguruan tinggi maupun sekolah menengah (Prastowo dan Al Rasyid 2019). Hiking tourism on the Selo Trail has a significant economic impact on the local community through income from business units, rental of goods and services, and job opportunities. This also affects the increase in regional income and changes in the social life patterns of the community, including the emergence of social disparities, cultural changes, and lifestyle shifts.

Information on the social and economic impacts of hiking tourism on the Selo Trail is crucial for area managers to provide insights and make better policy choices. This study aims to analyze the positive and negative impacts of hiking tourism on the Selo Trail with a focus on social and economic variables. The research methods include estimating the economic impact using the Multiplier Effect Analysis approach to assess the value of economic benefits and identifying social impacts using a qualitative descriptive approach with a Likert scale.

The existence of Mount Merbabu National Park/*Taman Nasional Gunung Merbabu* (TNGMb) cannot be separated from the surrounding community. Tarubatang Village has a population of 2,730 people, most of whom work as farmers; this can be seen from the land ownership of the community. In addition to being farmers, many people in Tarubatang Village, especially Dusun Genting, also take advantage of tourism by becoming food and beverage providers (food stalls), basecamp managers and transportation service providers. Through tourism activities on the Selo Climbing Trail, TNGMb has direct and indirect impacts on the social and economic aspects of the surrounding community.

According to Ismail et al. (2017), tourism activities directly impact the community through the absorption of labour or indirectly, such as business opportunities for selling goods and services. The development of tourist attractions has a positive impact and hurts the community and the area (Yulia, 2017). Therefore, an analysis of the social and economic impacts of climbing tourism activities on the Selo Climbing Trail of TNGMb is needed to make policies beneficial to the local economy and reduce negative consequences for community livelihoods (Aryunda, 2011; Flamin, 2013).

TNGMb is an area that functions as biodiversity protection, hydro-organological function protection, tourism potential, and community empowerment. One of the potential tourism areas in TNGMb is mountain climbing tourism. Mountain climbing tourism is one type of tourism that is popular with young people who love adventure. One of the climbing tourism destinations is Mount Merbabu in Central Java. Mountain climbing tourism in Merbabu can be done through several climbing routes, including the Selo Route TNGMb. Mountain climbing tourism has economic benefits for the surrounding community with the presence of tourists. In addition to the economic value for the community, there are also social impacts for the surrounding community (Avenzora & Teguh, 2013; Hermawan, 2016; Ismail et al., 2017).

This study analyses the positive and negative impacts of mountain climbing tourism activities on the Selo Route from social and economic variables. The stages in this study include estimating the economic impact using the multiplier effect analysis approach to estimate the economic benefit value and identifying the social impacts that may occur due to mountain climbing tourism through a qualitative descriptive approach with a Likert scale. Hiking tourism activities on the Selo Trail provide economic impacts such as income for the community from business unit income, rental of goods and services, absorption of business labour, and increased regional income. Changes in economic terms have also changed social life patterns in the community, such as triggering disputes due to social inequality, cultural changes, and community life patterns. The results of this study are expected to provide information on the social and economic impacts of hiking tourism activities on the Selo Trail TNGMb on the local community. This information is expected to be used as evaluation material for area managers to determine better policy alternatives.

2. Methods

2.1 Types and methods of data collection

This research activity was conducted around the Selo hiking trail tourist attraction at TNGMb, specifically in three villages (Tarubatang Village, Selo Village, and Senden Village), Selo District, Boyolali Regency, Central Java (Figure 1). This study used a questionnaire to collect data from respondents. A questionnaire is a data collection through a form containing questions submitted in writing to a person or group of people to obtain answers or responses and information needed by the researcher (Mardalis 2008). It also utilized tools such as writing instruments, a digital camera, a recording device, and maps related to the research location. Interviews were conducted using two different methodologies: direct (offline) and indirect (online). Direct interviews involved face-to-face interaction with respondents, while online interviews used questionnaires distributed via Google Forms and WhatsApp. Respondents included residents of Ginting Hamlet, Tarubatang Village, Selo District, Boyolali Regency, tourists, business owners, and workers engaged in tourism activities. Interviews were semi-structured for tourists and residents, using a set of predetermined questions that included multiple-choice and open-ended questions, focusing on specific themes and topics.

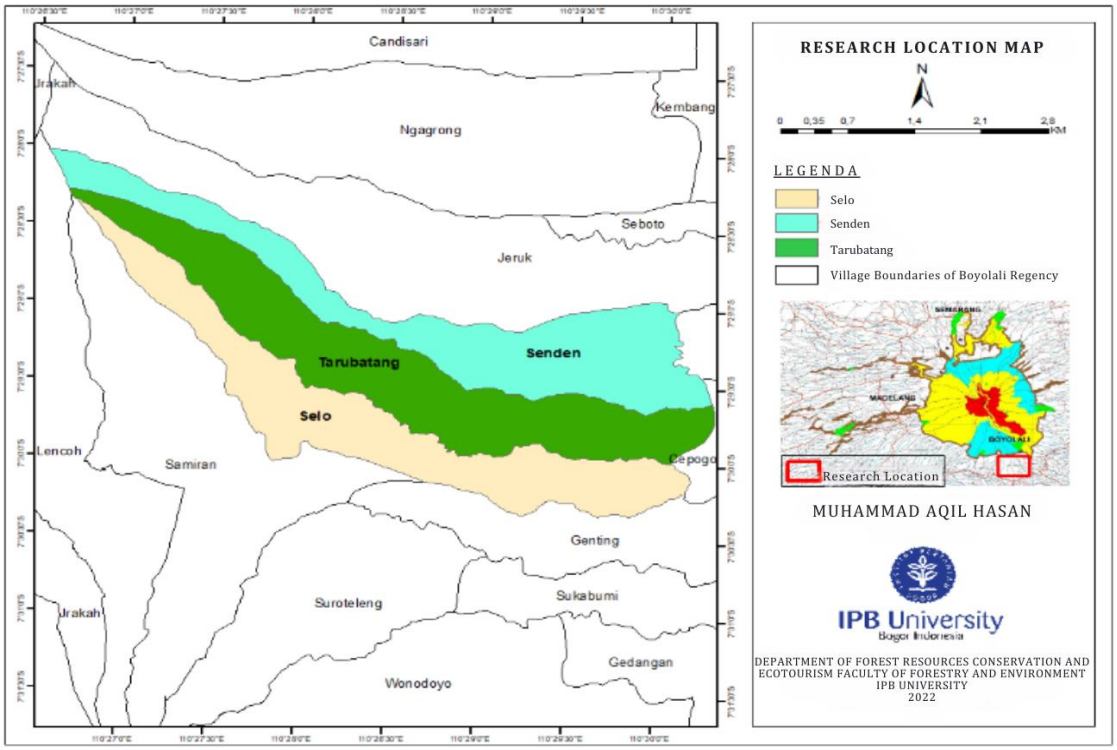

Fig. 1. Location map

To collect social variable data from the residents of Ginting Hamlet, Tarubatang Village, 30 respondents were interviewed. The criteria for selecting respondents used purposive sampling, targeting individuals who had lived in the village for at least a decade, were actively involved in tourism-related activities, and held community leadership roles. Economic variable data were collected through interviews with tourists, business owners, and workers, selected using purposive sampling criteria. Tourist respondents were chosen based on their experience of hiking Mount Merbabu via the Selo trail in the last five years and their willingness to participate in the interview. The number of tourist respondents followed Slovin's formula, derived from the total relevant tourist population.

Business owners and workers were selected based on the nature of their businesses operating around the tourism site, including enterprises such as cafes, hiking equipment

rental services, guide services, souvenir shops, transportation services, base camp management bodies, and parking service providers. Thirty respondents were chosen from each group, representing their respective populations. Additionally, further insights were gathered through interviews with Mount Merbabu National Park managers and affiliated groups related to Mount Merbabu hiking tourism, serving as primary sources of comprehensive data on the social and economic impacts of hiking tourism along the Selo Hiking Trail.

The observation method is a data collection technique involving close observation and sometimes active participation in the investigated situations (Surakhmad, 2004). It was used to collect information regarding tourist attractions, accessibility, accommodation, safety, and supporting infrastructure. Additionally, observation was used to gather data on the socio-economic conditions of the communities around the tourist destination (Prasetyo & Jannah, 2006; Prasetyo & Suryoko, 2018). This method played a role in verifying or cross-verifying the data obtained from interviews with actual conditions in the field.

The literature review aims to strengthen the discussion by analyzing literature and other sources. Its primary objective is to collect data and information related to the research topic, covering the overall characteristics of the Mount Merbabu hiking tourism area (such as geographical features, climate, terrain, vegetation, and accessibility), physical attributes (tourism facilities and trails), the socio-economic status of local communities, area maps, and community involvement in tourism activities.

2.2 Multiplier effect analysis

The Multiplier Effect Analysis was used to assess the economic impact of tourism on the Selo Trail of Mount Merbabu National Park. This analysis targeted tourists, business owners, and workers along the Selo Trail. The economic impact on the local community can be measured using two types of multipliers: (1) the Keynesian Local Income Multiplier, which indicates the extent to which tourist spending influences local income growth (Equation 1); and (2) the Income Multiplier Ratio, which shows the direct impact of tourist spending on the local economy (Equation 2 and Equation 3).

$$\textit{Keynesian Income Multiplier} = \frac{D+N+U}{E} \quad \text{(Eq 1)}$$

$$\textit{Ratio Income Multiplier}, \text{ Tipe I } = \frac{D+N}{D} \quad \text{(Eq 2)}$$

$$\textit{Ratio Income Multiplier}, \text{ Tipe II } = \frac{D+N+U}{D} \quad \text{(Eq 3)}$$

The Keynesian local income multiplier and the income multiplier ratio can be expressed through several key components. E represents tourist expenditure at the tourist site (in IDR), while D denotes the direct local income derived from E (in IDR). Additionally, N indicates the indirect local income generated from E (in IDR), and U signifies the induced local income resulting from E (in IDR). Together, these components illustrate the various levels of income generated within the local economy as a result of tourist expenditure.

The criteria for the Keynesian Income Multiplier, Ratio Income Multiplier Type I, and Ratio Income Multiplier Type II are defined as follows: (1) If the value is at or below zero (≤ 0), the tourist destination has not yet had an economic impact on the community; (2) A value between zero and one ($0 < x < 1$) indicates a relatively low economic impact of the tourist destination on the community; and (3) A value equal to or greater than one (≥ 1) signifies that the tourist destination has effectively provided economic benefits to the community. The matrix of types, data collection methods, and analysis in this study can be seen in Table 1.

Table 1. Matrix of types, methods of data collection, and analysis

Variable	Criteria	Indicator	Data Source	Data Collection Method	Data Analysis Method
Social	Level of Collaboration Social Values Livelihood	Intensity of Community Interaction Changes in Community Behavior Structure of Livelihoods	Community	Interviews, observation, and literature review	Descriptive analysis using a Likert scale
Ekonomic	Direct Indirect Induced	Tourist Expenditure Business Owners' Expenditure Labor Expenditure	Tourists Business Owners Labor	Interviews, observation, and literature review	Multiplier Effect

3. Results and Discussion

The presence of a tourist destination in an area has an economic impact that measures the scale of financial transactions in that region. The economic impact is measured based on tourist expenditure at the destination (Hermawan, 2016). Tourist expenditure is categorized into two types: expenditure that occurs within the tourist destination and expenditure outside the tourist destination (Karsuwadi, 2019. Rizkiyah & Susamto, 2016). Expenditure outside the tourist destination represents the leakage of economic value from the Selo Hiking Trail tourist site.

In this study, expenditure within the tourist destination includes tourist spending in the Selo District, which serves as a buffer village for TNGMB. Expenditure outside the tourist destination includes transportation costs, logistics purchases, equipment rentals, toll/parking fees, meals, accommodation outside the tourist site, and national park entrance fees. Entrance fees to the national park are considered external expenditure because the revenue generated is classified as Non-Tax State Revenue (PNBP), thus not circulating within the tourist destination area.

Table 2. Proportion of tourist expenditure and leakage at the Selo Climbing Route tourist attraction

Cost	Average expenditure (P) (IDR)	Proporsi (%) (Q=P/c*100)
Expenses outside tourist attractions		
Transportation costs	183,350	31.77
Logistics purchasing	95,500	16.55
Equipment rental	21,500	3.73
Toll and parking fees	17,450	3.02
Eating on the go	28,300	4.90
Lodging	4,000	0.69
Entrance ticket to TN area	20,000	3.47
Total leakage (a)	370,100	64.13
Expenditure within tourist attractions		
Food	50,300	8.72
Logistics purchasing	35,500	6.15
Purchase of souvenirs	39,700	6.89
Lodging	4,200	0.73
Toilet fees	3,830	0.66
Parking fee	5,200	0.90
Equipment rental	5,200	0.90
Porter/guide services	36,500	6.32

Table 2. shows that the largest portion of tourist expenditure at the Selo Hiking Trail tourist destination comes from transportation costs, amounting to 31.77%. This is mainly due to the large number of tourists coming from outside Boyolali Regency who use private motor vehicles or public transportation such as buses, which significantly impacts their travel costs. Furthermore, the location of the Selo Hiking Trail tourist destination, which is far from the city center with limited road access designated only for certain public transportation vehicles, further increases the transportation costs incurred by tourists. The detailed proportion of tourist expenditure can be seen in Table 2.

Table 3. Proportion of tourist expenditure and leakage at the Selo Hiking Trail tourist attraction (continued)

Expense	Average Expenditure (P) (IDR)	Proportion (%) (Q = P/c * 100)
Motorcycle taxi/Car rental services	23,400	4.05
Documentation services	3,200	0.55
Total expenditure within the tourist site (b)	207,030	35.87
Total tourist expenditure (c = a + b)	577,130	100.00
Average annual visits (d) (2017-2020)	48,086	-
Total annual leakage (e = c * proportion a * d)	17,797,276,270	-

Based on the findings presented in Table 3, expenditure on logistics purchases is a significant part of tourists' spending outside the tourist destination, amounting to 16.55%. Mountain hiking tourism requires logistical preparations for the journey within the tourist destination area. The substantial expenditure on logistics outside the Selo Hiking Trail tourist destination is further exacerbated by the limited availability of supply purchase facilities during hiking activities within the tourist area.

According to data from the Mount Merbabu National Park Office (Balai TNGMb), the average annual visits to the Selo Hiking Trail tourist destination from 2017 to 2020 amounted to 48,086 visits. Consequently, the total annual economic leakage amounted to IDR 17,797,276,270. This figure was calculated based on the total tourist expenditure, considering the proportion of leakage and the average annual number of visits. The economic leakage rate from activities in the Selo Hiking Trail tourist destination area is quite high, reaching 64.13%. This leakage includes various expenditures such as transportation costs, logistics purchases, equipment rentals, toll and parking fees, meals during the journey, accommodation during the trip, and national park entrance fees.

3.1 Direct impact

The direct economic impact originates from tourists' expenditures during their visits. This impact is due to commercial transactions between tourists and various businesses operating in the Selo Hiking Trail tourist destination area. The money spent by tourists at these businesses generates direct economic benefits, particularly in the form of income for these businesses. Business units present at the Selo Hiking Trail tourist destination include several types such as basecamps, eateries, car rentals, souvenir shops, and equipment rentals. These establishments operate daily because tourists consistently visit the destination. The direct impact felt by these business units is an increase in the income of business owners. Detailed calculations of the direct economic impact can be seen in Table 4.

The largest direct economic impact is felt by the Basecamp & Restaurant business unit, amounting to IDR 84,000,000. This is primarily due to the high number of tourists requiring rest and meals before and after mountain climbing activities. 100% of tourists spend on food within the tourist destination, indicating that all visitors contribute to the revenue of

Basecamp & dining establishments located at the destination. This explains why the Basecamp & restaurant units have the highest total income compared to other business units. The total value of direct economic impact received by business units is IDR 151,550,000 per month (Table 4). This underscores the significance of the Selo Hiking Trail tourist destination for the local community, especially for business owners.

Table 4. Direct economic impact on the Selo Climbing Route tourist attraction

Type of Business Units (a)	Business Unit Respondents (b)	Jumlah total Number of Business Units (c)	Average Monthly Income (IDR) (d)	Proportion (%) (e=d/g*100)	Direct Economic Impact (IDR) (f=c*d)
Basecamp & Food Stalls	15	15	5,600,000	28.44	84,000,000
Car Rental	6	6	6,091,667	30.94	36,550,000
Souvenir Shops and Equipment Rental	1	1	1,000,000	5.08	1,000,000
Penjual souvenir	2	2	3,000,000	15.23	6,000,000
Equipment Rental	6	6	4,000,000	20.31	24,000,000
Total	30	30	19,691,667	100.00	151,550,000

3.2 Indirect impact

The indirect economic impact is derived from expenditures by businesses within the tourist destination and the income of local workers at the Selo Hiking Trail tourist destination. Data regarding expenditures by businesses within the tourist destination can be seen in Table 5.

Table 5. Business unit expenses per month in the Selo Climbing Route tourist attraction

Type of Business Unit	Average Monthly Expenditure within the Tourist Site (IDR)		Amount (a)	Number of business units (b)	Total expenditure within the tourist attraction (IDR) (c=a*b)
	Purchase of Raw Materials (IDR)	Maintenance of Equipment and Cleanliness (IDR)			
Basecamp & Food Stalls	15,633,333	440,000	16,073,333	15	241,100,000
Car Rental	0	1,500,000	1,500,000	6	9,000,000
Souvenir and Equipment Rental	3,000,000	100,000	3,100,000	1	3,100,000
Souvenir Sellers	7,083,333	166,667	7,250,000	6	43,500,000
Equipment Rental	0	200,000	200,000	2	400,000
Total				30	297,100,000

Table 5 depicts that the Basecamp & restaurant business unit has the highest total monthly expenditures within the tourist destination, amounting to IDR 241,100,000. This is due to the substantial costs incurred for purchasing raw materials by this business unit. The majority of raw material purchases for the Basecamp & restaurant unit are made at the Selo Market, which is part of the Selo Hiking Trail tourist destination area. The boundaries of the Selo Hiking Trail within the TNGMb area include Desa Selo, Desa Senden, and Desa Tarubatang.

According to Table 6, the car rental business unit has the highest total expenditures outside the tourist destination compared to other business units, amounting to IDR 32,600,000. This is because of the nature of the business, which provides transportation services for ferrying tourists to and from areas outside the tourist destination, resulting in the largest expenditures being for fuel purchases. Fuel purchases are mostly made outside the tourist destination area due to the absence of fuel stations within the tourist destination.

Table 6. Business unit expenses per month outside the Selo Climbing Route tourist attraction

Type of Business Unit	Average Monthly Expenditure Outside Tourist Sites (IDR)		Quantity (a)	Number of Business Units (b)	Total Expenditure Outside Tourist Sites (IDR) (c = a * b)
	Electricity (IDR)	Transport (IDR)			
Basecamp & Food Stalls	380,000	20,000	400,000	15	6,000,000
Car Rental	0	5,433,334	5,433,334	6	32,600,000
Souvenir and Equipment Rental	150,000	0	150,000	1	150,000
Souvenir Sellers	116,666	50,000	166,666	6	1,000,000
Equipment Rental	100,000	0	100,000	2	200,000
Total				30	39,950,000

The level of development of society can be seen from the level of motivation to develop and achieve from within the society itself (Martono, 2014). The indirect economic impact arises not only from expenditures by business units in the Selo Hiking Trail tourist destination area but also from the income earned by workers employed in that area. The proportion of workforce income varies depending on the business unit they work for. The total indirect economic impact on the Selo Hiking Trail tourist destination is calculated by combining the total expenditures of business units in that destination and the total income earned by workers. Data on the indirect economic impact can be seen in Table 7.

Table 7. Indirect economic impact on the Selo Climbing Route tourist attraction

Type of Labor and Business Unit	Number of Workers (a)	Average Worker Income (IDR) (b)	Total Worker Income (IDR) (c = a * b)	Total Business Unit Expenditure within Tourist Sites (IDR) (d)	Total Indirect Economic Impact (IDR) (e = c + d)
Guide & Porter Business Units	15	1,726,667	25,900,000	0	25,900,000
Basecamp & Food Stalls	7	1,257,143	8,800,000	241,100,000	249,900,000
Car Rental	8	1,612,500	12,900,000	9,000,000	21,900,000
Souvenir & Equipment Rental	0	0	0	3,100,000	3,100,000
Souvenir Sellers	0	0	0	43,500,000	43,500,000
Equipment Rental	0	0	0	400,000	400,000
Total	30	4,596,310	47,600,000	297,100,000	344,700,000

Based on Table 7, the largest indirect economic impact at the Selo Hiking Trail tourist destination comes from the Basecamp & Restaurant business unit, totaling IDR 249,900,000. This is due to the higher economic value generated by the Basecamp & Restaurant compared to other business units, as evidenced by the income and expenditures of the workforce in that tourist destination. Conversely, the business unit with the smallest indirect economic impact includes equipment rental, which amounts to only IDR 400,000. This minimal impact is attributed to low expenditures on equipment maintenance, which occurs only when repairs are needed (Yoeti, 2008; Zulfikar, 2013). Equipment rental and souvenir sales units operate without hired labor and are self-managed. The total indirect economic impact on the Selo Hiking Trail tourist destination amounts to IDR 344,700,000 per month.

3.3 Continued impact

Work time expenditure is the intensity of workers' attention to their work that can affect the success of management and economic value (Fauziyah et al., 2014). This is particularly relevant in the context of downstream economic impacts, which refer to the economic consequences arising from the expenditures made by workers within a tourism destination. When workers allocate their time and attention effectively, the positive impacts on their expenditures can increase the economic value and success of management in the area.According to this study, these expenditures include costs such as daily necessities, transportation, children's education expenses, and electricity costs. A detailed breakdown of the proportions of these expenditures is outlined in Table 8.

Table 8. Average proportion of labor expenditure per month at the Selo Climbing Route tourist attraction

Type of Labor	Proportion of Monthly Expenditure Within Tourist Sites (%)				Proportion of Monthly Expenditure Outside Tourist Sites (%)	
	Food Costs (a)	Transportation Costs (b)	Children's School Fees (c)	Total (%)	Electricity Costs (d)	Total (%)
Stall of Attendant	62.5	13.82	11.84	88.16	11.84	11.84
Driver	63.03	12.68	9.51	85.22	14.78	14.78
Guide & Porter	70.24	9.05	8.57	87.86	12.14	12.14
Basecamp Attendant	100	0	0	100	0	0
Average	73.94	8.89	7.48	90.31	9.69	9.69

Based on the information from Table 8, it is evident that expenditures within the tourist destination are larger compared to expenditures outside the tourist destination. This is primarily due to the majority of the workforce being local residents in the surrounding area, thus daily living expenses continue within the tourist destination. The largest proportion of workforce expenditures is for food costs, reaching 73.94%, while transportation costs and children's education expenses each account for 8.89% and 7.48% respectively. Electricity costs, which constitute leakage and whose revenues go to the State Electricity Company (PLN), are not included in expenditures within the tourist destination.

The continued economic impact at the Selo Climbing Route tourist destination is estimated based on total workforce, average workforce expenditures, and recorded expenditure proportions. According to this calculation, significant continued economic impact comes from the professions of guides and porters, amounting to IDR 19,450,000.00 per month (Table 9). This is due to the large number of respondents actively working as guides and porters in the tourist area. These professions are the primary choices for local residents, with the current total number reaching 70 individuals. In total, the continued economic impact at the Selo Climbing Route tourist destination amounts to IDR37,450,000.00 per month.

Table 9. Further economic impacts on the Selo Climbing Route tourist attraction

Type of Labor	Number of Workers (a)	Average Total Expenditure Within Tourist Sites (IDR) (b)	Proportion of Expenditure Within Tourist Sites (%) (c)	Further Economic Impact (IDR) (d = a * b * c)
Stall of Attendant	6	1,266,667	88.16	6,700,000
Driver	8	1,775,000	85.22	12,100,000
Guide & Porter	15	1,400,000	87.86	18,450,000
Basecamp Attendant	1	200,000	100	200,000
Total				37,450,000

3.4 Economic value of the multiplier effect

The multiplier effect value is used to measure the extent of economic impact on the local community surrounding tourist destinations. According to Marine Ecotourism for Atlantic Area (META) (2001), the economic impact of tourism on the local community is categorized into two types: (1) Keynesian Local Income Multiplier, which indicates the extent of tourism expenditure contributing to local income growth, and (2) Income Multiplier Ratio, which measures the direct impact of tourist expenditure on the local economy. These methods assess both indirect and subsequent impacts. More detailed data on the multiplier effect values can be found in Table 10.

Table 10. Multiplier effect value of tourist expenditure on the Selo Climbing Route tourist attraction

Multiplier	Value
Keynesian Income Multiplier	0.6
Ratio Income Multiplier Tipe I	3.3
Ratio Income Multiplier Tipe II	3.5

Based on Table 10, the Keynesian Income Multiplier value for the Jalur Pendakian Selo tourist destination is 0.6, indicating that every unit increase in tourist expenditure results in a 0.6 unit impact on the local economy. The Ratio Income Multiplier Type I value is 3.3, meaning that a 1-unit increase in business income leads to a 3.3 unit increase in income for business owners and workers at the tourist destination. Similarly, the Ratio Income Multiplier Type II value is 3.5, indicating that a 1-unit increase in business income results in a 3.5 unit increase in income for business owners, workers, and labor expenditure at the tourist destination.

Based on the data in Table 10, the Jalur Pendakian Selo tourist destination still has relatively low economic impact as indicated by the Keynesian Income Multiplier value between 0 and 1 ($0 < x < 1$) (META 2001). This is due to the higher proportion of leakage or tourist expenditure outside the tourism destination compared to expenditure within the destination. However, based on the obtained values of Ratio Income Multiplier Type I and Type II, the Jalur Pendakian Selo tourist destination is capable of providing economic benefits to the surrounding community, as these values exceed 1 (≥ 1) (META 2001). This demonstrates that the presence of the Jalur Pendakian Selo tourist destination is crucial for the local economy and requires preservation. To enhance economic impact, efforts should focus on minimizing leakage or tourist expenditure outside the tourism destination by improving facilities and businesses (Safriana, 2018; Sidharta, 2002; Surakhmad, 2004).

4. Conclusions

The economic impact perceived by the community based on the Keynesian Income Multiplier value is relatively low at 0.6. This is due to the higher proportion of leakage or tourist expenditures occurring outside the tourist destination compared to expenditures within the destination itself. In contrast, the Ratio Income Multiplier Type I value of 3.3 and Ratio Income Multiplier Type II value of 3.5 indicate that the Selo Hiking Trail tourist destination indeed makes a significant contribution to the local economy.

Research shows that the high leakage rate, particularly in transportation and logistics costs outside the tourist destination, forms the basis for innovative new business units such as convenience stores or minimarkets, and gas stations that can meet the needs of tourists. Furthermore, to enhance the economic impact of tourism on a broader scale, further research and development are necessary, especially in culturally based rural tourism or Community-Based Tourism initiatives. This approach aims to foster sustainable economic benefits while preserving cultural heritage and promoting community involvement in tourism activities. To increase the economic impact of tourism in the broader community, further research is needed regarding cultural-based tourism in villages or Community-based Tourism.

Acknowledgement
The author would like to express sincere gratitude to the reviewers for invaluable feedback and constructive suggestions, which have significantly enhanced the quality of this research.

Author Contribution
M. A. H contribute fully to the conception, design, research, analysis, interpretation of data, drafting, and revising of this article. M.A.H approved the final version to be published and are accountable for all aspects of the work.

Funding
This research received no external funding.

Ethical Review Board Statement
Not available.

Informed Consent Statement
Not available.

Data Availability Statement
Not available.

Conflicts of Interest
The author declares no conflict of interest.

References
Aryunda, H. (2011). Dampak ekonomi pengembangan kawasan ekowisata Kepulauan Seribu. *Jurnal Perencanaan Wilayah dan Kota, 22*(1), 1-16. https://doi.org/10.5614/jpwk.2011.22.1.1

Teguh, Frans, 1966- & Avenzora, Ricky & Indonesia. Kementerian Pariwisata dan Ekonomi Kreatif. (2013). Ecotourism and sustainable tourism development in Indonesia : the potentials, lessons, and best practices / editors, Dr. Frans Teguh, M.A. and Dr. Ir. Ricky Avenzora, M.Sc.F. [Jakarta] : Ministry of Tourism and Creative Economy

Balai Taman Nasional Gunung Merbabu. (2010). Z*onasi Taman Nasional Gunung Merbabu. Boyolali: Balai TNGMb.* https://tngunungmerbabu.org/

Balai Taman Nasional Gunung Merbabu. (2014). Z*onasi Taman Nasional Gunung Merbabu. Boyolali: Balai TNGMb.* https://astekita.files.wordpress.com/2015/02/zonasi_2014_publish.pdf

Balai Taman Nasional Gunung Merbabu. (2018). Statistik Balai Taman Nasional Gunung Merbabu Tahun 2018. Balai TNGMb. https://tngunungmerbabu.org/statistik/

Flamin, A. (2013). Potensi ekowisata dan strategi pengembangan Tahura Nipa-Nipa, Kota Kendari, Sulawesi Tenggara. *Jurnal Penelitian Kehutanan Wallacea, 2*(2), 154-168. https://doi.org/10.18330/jwallacea.2013.vol2iss2pp154-168

Hermawan, H. (2016). Dampak pengembangan desa wisata Nglanggeran terhadap ekonomi masyarakat lokal. *Jurnal Pariwisata, 3*(2), 105-117. https://doi.org/10.31294/par.v3i2.1383

Ismail, M. K. J. F., Mawardi, M. K., & Iqbal, M. (2017). Analisis dampak sosial ekonomi pengembangan pariwisata Kota Batu bagi kawasan sekitar. Jurnal Administrasi Bisnis, *51*(1). https://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/view/2099

Karsuwadi, R. R. (2019). *Dampak sosial, ekonomi, dan lingkungan Wana Wisata Bukit Bintang di KPH Bogor.* Institut Pertanian Bogor. https://repository.ipb.ac.id/jspui/handle/123456789/101271?mode=full

Marine Ecotourism for the Atlantic Area. (2001). P*lanning for marine ecotourism in the EU Atlantic Area.* University of The West Of England. https://uwe-repository.worktribe.com/output/1089277

Prasetyo, B., & Jannah, M. L. (2006). *Metode Penelitian Kuantitatif (Teori dan Aplikasi)*. PT. Raja Grafindo Persada.

Prasetyo, B., & Suryoko, S. (2018). Dampak pengembangan pariwisata terhadap perkembangan UMKM pada Kawasan Wisata Dieng. *Jurnal Ilmu Administrasi Bisnis, 7*(4), 310-320. https://ejournal3.undip.ac.id/index.php/jiab/article/view/22034

Rizkiyah, E., Susanto, N., & WP, S. N. (2016). Perbedaan persepsi risiko ditinjau dari gender pada kegiatan pendakian gunung. *Industrial Engineering Online Journal, 5*(4). https://ejournal3.undip.ac.id/index.php/ieoj/article/view/14115/13649

Safriana, R. (2018). *Dampak sosial ekonomi pengelolaan pariwisata pemerintah dan swasta terhadap kondisi masyarakat local (studi kasus: obyek wisata Small World Ketenger Baturraden Banyumas)*. IAIN Purwokerto. https://repository.uinsaizu.ac.id/4831/

Santoso, B. (2013). *Strategi kampanye pengelolaan Taman Nasional Gunung Merbabu.* Institut Pertanian Bogor. https://repository.ipb.ac.id/handle/123456789/65253?show=full

Satyatama, T. R. I. (2008). *Perencanaan beberapa jalur interpretasi alam di Taman Nasional Gunung Merbabu Jawa Tengah dengan menggunakan sistem informasi geografis*. Institut Pertanian Bogor. https://repository.ipb.ac.id/handle/123456789/11094

Surakhmad, W. (2004). Pengantar Penelitian Ilmiah Dasar Metode Teknik. Tarsito Pr.

Wells, M. P. (1997). Economic perspectives on nature tourism, conservation, and development. *Environment Department Paper No. 5, Pollution and Environmental Economics Division.* Washington (US): World Bank. https://documents.worldbank.org/curated/en/478461468741359434/pdf/multi-page.pdf

Yoeti, O. A. (2008). *Ekonomi Pariwisata*. PT Kompas Media Nusantara. https://opac.perpusnas.go.id/DetailOpac.aspx?id=408576

Yulia, Y. (2017). *Analisis dampak ekonomi dan lingkungan kegiatan wisata di Objek Wisata Pantai Alam Indah, Kota Tegal, Provinsi Jawa Tengah*. Institut Pertanian Bogor. https://repository.ipb.ac.id/handle/123456789/90246

Zulfikar, M. (2013). *Analisis stakeholder dalam pengelolaan wisata alam di Kabupaten Brebes Provinsi Jawa Tengah.* Institut Pertanian Bogor. https://repository.ipb.ac.id/handle/123456789/63378

Biographies of Author

Muhammad Aqil Hasan, Department of Forest Conservation and Ecotourism Resources, Faculty of Forestry and Environment, IPB University, Bogor, West Java 16680, Indonesia.

- Email: muhamadhasan318@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A