
Analysis of The Utilization of Natural Resources as Tourism Objects to Improve Community Income (Case Study of Tarutung Soda Water Bath)

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Abstract

This research analyzes the utilization of natural resources as tourist attractions to increase local community income, with a case study on the Soda Water Baths in Tarutung, one of only two natural soda springs worldwide. Using a qualitative descriptive approach with field methods through in-depth interviews, observation, and documentation, the study finds that this tourist attraction has stimulated the growth of micro-enterprises such as food stalls, souvenir sellers, and parking services, significantly contributing to the local economy. However, the income remains fluctuating and highly dependent on holidays, weather, and major events. Challenges include minimal digital promotion, lack of structured management, limited infrastructure, and privately managed tourism land. Therefore, developing Soda Water Bath tourism requires cross-sector collaboration, digital-based MSME empowerment, and sustainable tourism policies to ensure stable and equitable economic benefits for the local community.

Keywords : *Natural Resources, Local Tourism, Community Income, MSMEs*

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1. Introduction

Indonesia is an archipelagic country with extraordinary natural and cultural resources. Natural wealth such as forests, mountains, and mineral springs holds great potential for the development of the tourism sector. Every region in Indonesia has unique attractions that can be optimized as leading tourist destinations. Tourism development based on natural resources not only supports environmental preservation but also provides economic benefits, particularly in increasing the income of local communities (Wijaya, 2024).

From an economic development perspective, the wise utilization of natural resources can become a driving force for regional growth. Irham et al. (2024) mention that tourism based on natural resources can create jobs, improve local production, and strengthen the regional economic structure. According to Sugianto and Marpaung (2019), regional growth is closely linked to population growth and economic activity. The more developed an area is, the greater the opportunities to improve the welfare of its people. In this context, the tourism sector plays

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a crucial role in increasing Regional Original Income (PAD), creating jobs, improving living standards, and preserving local culture and natural resources.

According to the United Nations World Tourism Organization (UNWTO), ecotourism is nature-based tourism that emphasizes environmental observation and appreciation of traditional culture (Fernando et al., 2023). UNWTO also states that ecotourism has educational value, supports environmental and cultural preservation, and provides economic benefits for local communities (Sandy Sulistiono & Widyawati Boediningsih, 2024). This shows that nature-based tourism is not only tourist-oriented but also values education, sustainability, and socio-economic development.

The Qur'an, in Surah Al-Hijr verses 19–20, explains that Allah SWT created the earth and all its contents to sustain life:

"And We spread out the earth and planted on it mountains, and We grew there everything according to its size" (QS. Al-Hijr: 19).

"And We have made in it sources of life for your needs, and (We also created) creatures whose sustenance you are not the provider of" (QS. Al-Hijr: 20).

These verses emphasize that humans must understand and utilize natural resources responsibly. Empowering communities through the use of local potential is one way to improve living standards, particularly by focusing on vulnerable groups through the development of life skills and entrepreneurship (Haerini Ayatina et al., 2021).

North Tapanuli Regency in North Sumatra Province has diverse natural, historical, and cultural tourist attractions. Destinations such as Hot Springs, Sipoholon Crater, Huta Ginjang, Salib Kasih, and the Palace of Sisingamangaraja XII offer rich and varied tourism experiences. However, many of these potentials have not been fully developed due to limited promotion, infrastructure, and integrated planning (Wenda et al., 2024).

One unique attraction in North Tapanuli is the Tarutung Soda Water Baths, which are found only in two places in the world: Tarutung, Indonesia, and Venezuela (Sinaga et al., 2018). Located in Parbubu I Village, about one kilometer from Tarutung City Center, this soda spring has been known since 1877. Currently, it is independently managed by Minar Sihite (Op. Ridoi Tobing/br. Sihite) and has developed into a recreational destination visited by locals and tourists from outside the area.

The Soda Water Baths have unique potential, not only because of their geological and health-related benefits but also for their contribution to the local economy. Local residents are involved in selling food, beverages, souvenirs, parking services, and even simple accommodations (Nainggolan et al., 2023). This economic activity not only increases household income but also strengthens social and cultural ties within the community, supporting sustainable tourism development.

However, field observations reveal that the utilization of natural resources at the Tarutung Soda Water Baths is not yet optimal. Interviews show that the contribution of tourism to local income remains limited and inconsistent, with MSME earnings fluctuating due to seasonal holidays, weather, and specific events. Income, defined as money received by individuals, companies, or organizations in the form of wages, salaries, rent, interest, commissions, fees, and profits (Nurhayati Tariani et al., 2023), plays a crucial role for the local community around Tarutung

Soda Water Baths in fulfilling daily needs, improving welfare, and driving local economic activity. Research by Atika et al. (2023) shows that small businesses utilizing local potential and implementing effective promotional strategies experience significant income growth, which aligns with the economic dynamics surrounding the Soda Water Baths.

According to Sammeng (2001), one important factor in developing tourism is the availability of facilities. Tourists often choose destinations based on the amenities available, such as accommodations, sanitation, and supporting infrastructure. Similarly, Yoeti (2003) argues that tourism facilities are essential to fulfill tourists' needs during their stay. Observations in Tarutung Soda Water Baths indicate that facilities remain minimal, such as toilets, signboards, seating areas, and other supporting infrastructure. Although facilities may not be the main reason for visiting, inadequate facilities can reduce tourist interest. Therefore, improvements in basic facilities—such as toilets, prayer rooms, parking spaces, information centers, and safe access routes—are essential to enhance visitor comfort and improve the destination's image (RN Nugraha & Emanuel Jerubun, 2024).

In addition to facilities, promotion is another important aspect that must be strengthened. According to Kotler and Armstrong (2020), promotion includes activities such as advertising, public relations, direct selling, and digital marketing, all aimed at increasing awareness, generating interest, and encouraging purchase decisions (Ramdhani, 2025). Research by Asrah et al. (2024) shows that digital marketing, especially through social media and e-commerce, can significantly expand market reach and competitiveness for MSMEs. However, Tarutung Soda Water Baths still rely heavily on personal social media without official government or institutional promotion. As Ayub et al. (2021) highlight, successful marketing strategies require collaboration between local governments, businesses, and communities. Therefore, the government should also participate in promoting Tarutung Soda Water Baths, for instance by leveraging official social media platforms with engaging and consistent content to create targeted promotional campaigns.

The role of the government is also critical in sustainable tourism development. According to Subadra (2007), as a service-based industry, tourism requires government involvement in at least four aspects: regional planning, infrastructure development, policy-making, and regulation enforcement. Similarly, Blakely in Kuncoro (2004) argues that local governments play a key role in developing tourism potential. However, interviews with local stall owners at the Soda Water Baths revealed the absence of an official management body or institution overseeing the site. As Pelly et al. (2020) and Maiwa et al. (2025) note, the success of developing natural tourist destinations requires collaboration among various stakeholders to ensure sustainable management. For this reason, the government should establish *Pokdarwis* (tourism awareness groups) as formal managers to ensure professional and transparent governance.

Several studies have discussed tourism potential in North Tapanuli. For instance, Wenda et al. (2024) highlighted the lack of promotion, Sinaga et al. (2018) focused on the content of soda water, and Nainggolan et al. (2023) reviewed local economic activities. However, these studies have not systematically examined the influence of tourism on community income. This research gap highlights the need for further study on the relationship between the utilization of natural resources at the Tarutung Soda Water Baths and improvements in local community income. Based on this background, this study aims to analyze the utilization of natural resources as a tourism object in increasing community income, using the Tarutung Soda Water Baths as a case study.

2. Theoretical Background

Natural resources

Natural resources (SDA) are the overall physical, chemical, biological, and social factors that shape the environment surrounding humans. According to Hunker et al., natural resources encompass all elements originating from the earth, biosphere, and atmosphere, whose existence is greatly influenced by human activities. In this context, environmental components such as seeds, trees, soil, water, air, sunlight, and rivers are categorized as natural resources because they play an important role in fulfilling human needs. In other words, something is considered a natural resource when humans regard it as beneficial—whether as raw material, ecosystem habitat, or ecosystem service (Schellens & Gisladottir, 2018).

From a juridical perspective, the definition of natural resources is listed in Article 1 Paragraph 9 of Law Number 32 of 2009 concerning Environmental Protection and Management, which states that natural resources are elements of the living environment consisting of biological and non-biological resources that together form an ecosystem. Although there are differences in perspective when classifying natural resources, in general, they are divided into two main categories: land and water (Latifah et al., 2023).

In economic theory, Robert Malthus emphasized that to maintain a balance between population growth and food availability, it is necessary to improve productivity through the optimal management of natural resources in the form of goods and services. To avoid the negative impacts of improper management, the government has set national strategic policy directions.

Based on Regulation of the Minister of Environment and Forestry Number P.18/MenLHK-II/2015, the Directorate General of Pollution and Environmental Damage Control (PPKL) establishes pollution and damage control policies, formulated in the Five-Year Strategic Plan document. The three main policies in the development of natural resources include:

1. Improving the quality of the living environment,
2. Increasing resilience to disasters and climate change, and
3. Mitigating climate change through low-carbon development (Sandy Sulistiono & Widyawati Boediningsih, 2024).

Meanwhile, Jhingan (2013), as cited in Bonaraja Purba et al. (2024), classifies natural resources into three categories based on their characteristics:

1. Renewable natural resources, such as land, forests, and biodiversity, whose availability depends on management methods by humans.
2. Non-renewable natural resources, such as coal, petroleum, and natural gas, which exist in limited amounts and cannot be replenished.
3. Unlimited natural resources, such as sunlight and ocean waves, which are sustainably and perpetually available for use.

The management of natural resources requires significant responsibility to ensure environmental quality and human safety. This includes managing ecosystems sustainably, making wise and long-term use of resources, and using them responsibly so as not to disrupt environmental balance (Kuncoro, 2004).

In practice, natural resource management consists of three main stages: planning, implementation, and monitoring, all of which must be based on a commitment to environmental

sustainability. The planning stage aims to identify potential and risks; implementation involves the productive and sustainable utilization of natural resources; and monitoring functions to evaluate impacts and the effectiveness of activities. These three stages are crucial to ensuring that the utilization of natural resources, especially renewable ones, not only provides economic benefits but also maintains ecological balance and empowers local communities.

Community Income

In the book entitled *Theory of Income*, income is explained as all receipts, both cash and non-cash, resulting from the sale of goods or services within a specific time period. Income is compensation for providing services to others; each person earns income for helping others. Meanwhile, personal income is all types of income, including income earned without doing anything, received by residents of a country. Personal income includes all community income, regardless of whether the income is obtained from providing factors of production or not. According to Kadariyah, the money a person receives is in the form of wages, profits, rent, and others, and is obtained over a specific period of time (Ramadhan et al., 2023).

Community income can be defined as all receipts received by individuals or households within a specific time period. Community income encompasses all types of income, such as wages, profits, and rent, received by the community. Ramadhan et al. (2023) emphasize that income not only reflects economic results but also serves as an indicator of community welfare and purchasing power.

In the context of tourist attractions, there are economic activities such as selling food, souvenirs, parking and guide services. can directly increase community income. The tourism sector also encourages the development of local MSMEs, which strengthens the community - based economy.

Tourism and its Impact on the Community Economy

Tourism is an activity of traveling, carried out repeatedly and involving movement from one place to another, either with or without planning, which aims to provide a comprehensive experience to tourists. From this understanding, it can be concluded that touring activities are an integral part of tourism, where tourism encompasses a broader series of travel-related activities (Rachmad et al., 2021).

According to Cooper et al. (1998), tourism consists of several main components, namely: (1) Tourist attractions, which include everything that can attract tourists, such as natural beauty, culture, and historical sites; (2) Accessibility, which refers to the ease of transportation in reaching tourist destinations; (3) Amenities, which are supporting facilities such as accommodation, restaurants, and shopping centers; and (4) Ancillary services, which include additional services that support tourist comfort, such as tourist information and medical services (Sammeng, 2001).

In Islam, tourism is directed and focused on optimizing the potential of tourism while ensuring it remains in accordance with Islamic values. The Prophet Muhammad (peace be upon him), as a human being, also appreciated pleasure and valued activities that brought joy and positive experiences (Pertiwi et al., 2024).

Currently, the tourism sector is one of the government's development priorities because it contributes significantly to national development. As one of the driving forces of the economy, this sector not only strengthens regional and national income through foreign exchange but also plays an important role in reducing unemployment in society (Aliansyah & Hermawan, 2021).

Tourism creates economic opportunities through various business sectors such as handicrafts, hospitality, culinary, and other services. With the increase in activities within these sectors, community welfare is also improved. This contributes to building a better social and economic structure that is fair and prosperous at local, national, and global levels. As the tourism industry develops, local economies grow, more job opportunities are created, and shifts in livelihoods occur. Tourism activities thus have a real impact on increasing individual income and improving overall community well-being (Purwahita et al., 2021).

Connection Tourism and Local Economy

Tourism has been shown to play a significant role in driving local economic growth through the creation of business opportunities, employment, and increased community income (Subadra, 2007). Fletcher's (1989) *Tourism Multiplier Effect Theory* explains that every tourism activity creates a chain effect on other economic sectors such as trade, transportation, and accommodation. This theory is reinforced by Hermawan's (2016) research in Nglanggeran Tourism Village, which found that village tourism can create jobs and increase community income through the management of homestays, guide services, and culinary and craft products. Firdaus (2022) also noted that the development of Tangkas Lake tourism has a positive impact on community income, particularly through local economic activities and contributions to Village Original Income (PAD).

Qotrunnada & Ansori's (2023) research in the Mulyaharja Organic Agro-Educational Tourism Village adds an important dimension: the level of community participation, particularly during the implementation phase, significantly impacts the local economy. This participation encompasses active involvement in tourism implementation, environmental sustainability, and providing services to tourists. The results are increased income, job creation, and an improved standard of living for the community (Kotler, P., & Armstrong, G., 2020).

This finding aligns with Blakely & Leigh's (2010) *Local Economic Theory*, which emphasizes that strengthening community capacity to manage local resources is key to sustainable regional economic development. Therefore, developing natural resource-based tourism, such as the Tarutung Soda Water Baths, has significant potential to become a driving force for the local economy if managed with a participatory and collaborative approach.

3. Methodology

This study uses a qualitative descriptive approach with a fieldwork method conducted directly at the research location, namely the Tarutung Soda Water Baths tourist area. This approach aims to critically explain and describe the phenomena of socio-economic interactions that occur within the local community, with the objective of finding deeper meaning in the real context. Through this approach, the researcher seeks to thoroughly understand social reality as it exists in the field (Aisyah, 2020).

Data collection techniques were carried out through in-depth interviews with MSME actors and village leaders, direct observations of tourism and economic activities in the community around the baths, and documentation in the form of photos and field notes. The combination of these techniques allows researchers to obtain a comprehensive and objective understanding of the phenomena under study (Rahmani et al., 2024).

4. Empirical Findings/Result

MSMEs in the Tarutung Soda Water Baths Tourist Area

Based on field observations, there are around six MSME actors operating in the Tarutung Soda Water Baths area. Their businesses include roadside food and beverage stalls, souvenir sellers specializing in Soda Water products, and parking services. This research involved three informants, consisting of two culinary traders or food stall owners in the tourist area and one representative of the Parbubu I village apparatus.

The presence of these MSMEs demonstrates the real contribution of the tourism sector to job creation and the improvement of community income. This aligns with Wenda et al. (2024), who argue that tourism development based on local potential can encourage the growth of micro, small, and medium enterprises (MSMEs), while also strengthening community economic structures both directly and indirectly.

Internal Constraints in the Management of Tarutung Soda Water Baths Tourism

Under the development of nature-based tourism at Tarutung Soda Water Baths, MSMEs play an important role in driving local economic growth. However, field observations and in-depth interviews revealed that they face several complex obstacles in running their businesses. These obstacles can be categorized as follows:

a. Constraints from the Perspective of MSME Actors

1. **Dependence on Weather Conditions** : The most dominant challenge faced by MSME actors is their dependence on unpredictable weather. Many business owners reported a significant decline in visitor numbers during rainy conditions, which directly affects their daily turnover. Most businesses are informal and operate traditionally with poorly protected stalls. During heavy rain and strong winds, rainwater often enters the stalls, damaging merchandise and making seating areas uncomfortable. As a result, many visitors leave early. This phenomenon shows that the sustainability of tourism-related economic activities is highly dependent on environmental conditions, particularly unpredictable weather. It highlights the urgent need for weather-resilient, adaptive, and eco-friendly tourism infrastructure to protect both local economies and visitor comfort throughout the year.
2. **Unfair Business Competition** : Another problem hindering MSME development is unhealthy competition. Traders admitted that rivalry occurs not only in attracting tourists to their stalls but also in extreme price undercutting, which harms other business owners. One souvenir trader revealed: *“Sometimes someone sets the price too cheap, so the rest of us follow by lowering prices too. Even though our materials are expensive.”* This practice creates unproductive competition and reduces the quality of service offered to tourists. The absence of clear business zone management by village authorities worsens the situation, as MSMEs compete freely without coordination. This condition increases the potential for conflicts among traders and diminishes the overall tourist experience.
3. **Limited Digital Capacity and Promotion** : In the digital era, social media and online platforms are crucial tools for tourism and product promotion. However, many MSME actors admitted they lack digital literacy and have not been able to use these tools effectively. One business owner stated: *“We don’t know how to make Instagram or online sales. There has been no training from the village or anyone else.”* (Interview, 2025). The absence of technical training and mentoring from the government, educational institutions, or social organizations further aggravates this limitation. In fact, digital marketing could serve as an effective solution to expand market reach, promote local products, and increase MSME income, especially in attracting visitors

from outside the region. However, without adequate skills and support, MSMEs remain unable to fully utilize this potential.

Constraints from the Perspective of the Village Government

Interviews with the Head of Parbubu I Village, Mr. Mario T. A. Lumban Tobing, revealed that the management of Tarutung Soda Water Baths also faces obstacles related to governance and authority. The most pressing issue is the land ownership status, which is still under private ownership.

Because the land has not been registered as a village asset, the local government lacks authority to develop infrastructure, establish business zoning regulations, or access village funds for tourism development programs. This situation has led to management stagnation, despite the site's high economic and social potential.

As stated by the village head: *"We have proposed for the land to be granted so it can be managed together, but it has not been approved. Promotion is also still lacking, even though nowadays people look for tourism through their phones."* (Interview with Parbubu I Village Apparatus, 2025).

This confirms that while the village government has initiated efforts to build a more systematic tourism governance framework, these efforts are hindered by unresolved legal and structural issues. The lack of land ownership also limits the village's ability to form partnerships with external agencies, such as tourism services or external investors.

In addition, digital promotion managed at the institutional level is still minimal. Currently, there is no dedicated team or officer consistently managing official social media accounts for either the village or the Tarutung Soda Water Baths tourist site. In the digital era, this absence becomes a major obstacle, as most potential tourists rely on online platforms to search for destinations.

The lack of structured online promotion results in the Soda Water Baths being less widely recognized, especially among prospective visitors outside the local region. This underscores the importance of a tourism digitalization strategy, supported not only by individual MSMEs but also by strong institutional structures at the village level.

The role of local government and the community in supporting the development of Soda Water Baths

a. The Role of Local Government

Based on an interview with Mrs. Yedijah Trinita Br. Simanjuntak, it is revealed that the role of the local government in the development of the Tarutung Soda Water Baths tourist attraction is still very limited. The only tangible contribution made so far is the construction of basic infrastructure, namely the retaining wall surrounding the main soda water pool and the implementation of an entrance ticket system. The retaining wall functions as protection against potential landslides or erosion, considering that the bathing site is located on a steep slope that is vulnerable to land movement.

Meanwhile, the entrance ticket system at the Tarutung Soda Water Baths is still not officially managed by the village government. The ticket collection mechanism is informal and coordinated by stall owners at the entrance gate of the tourist area. There is no institutional structure or formal regulation governing the collection, management, or reporting of ticket

revenues. Consequently, ticket sales revenues become the personal income of stall managers or gatekeepers, without contributing to the village treasury or to the development of public facilities.

This situation indicates that the potential of entrance tickets as a source of village revenue has not been maximized. The absence of a proper financial recording and reporting system has resulted in unaccountable and poorly supervised financial management of the tourist site. In addition, the lack of village government involvement in ticket management reflects weak participatory and equitable tourism governance. Such inequality may trigger social tensions among the local community, especially MSME actors who are not involved in ticket management yet still depend on the sustainability of the tourism sector.

b. The Role of Local Communities

The local community demonstrates active participation in the tourism economy, albeit informally and without structured organization. Residents are engaged in various small-scale businesses such as food and beverage stalls, inflatable ring rentals, and the sale of local souvenirs. One trader interviewed stated:

"We opened our businesses because many tourists come, but we do everything ourselves. There are no cooperatives or groups, so we each go our own way." (Interview with Stall Vendor, 2025)

In addition to economic activities, the community also participates in maintaining the cleanliness and comfort of the tourist area through mutual cooperation. However, this contribution is not yet supported by a strong institutional framework. The absence of community-based tourism management institutions limits coordination among local economic actors.

Furthermore, community members expressed their hope for greater government involvement in providing training and guidance, particularly in digitalization and business management. One community leader emphasized:

"We actually want training so we can learn how to better serve tourists. But so far, there's been no guidance from the government." (Interview with Community Leader, Parbubu I, 2025).

Utilization of natural resources to increase community income

Utilization of Natural Resources as a Tourist Attraction

The utilization of natural resources as a tourist attraction is one of the strategies for developing the local economy based on regional potential. In the case of the Tarutung Soda Water Baths, the presence of natural soda water—an extremely rare phenomenon in Indonesia—has had a positive impact on the economic activities of surrounding communities. Field research findings indicate that local residents use this tourist attraction as a new source of livelihood, both directly and indirectly.

a. Utilization of Soda Water as a Tourist Attraction

The natural soda water, which contains carbonation bubbles and produces a sensation similar to sparkling water, is the main attraction of this tourist site. Such uniqueness is rarely found in other regions, making it a magnet for visitors from various areas, including outside North Sumatra. The direct experience of bathing in natural soda water highlights the potential of this site to be managed sustainably as a nature-based tourist destination.

Observations and interviews reveal that this natural attraction stimulates diverse economic activities in the surrounding area. Local residents have developed several types of businesses, including:

1. Food and beverage stalls serving tourists,
2. Sales of local souvenirs such as T-shirts labeled “*Tarutung Soda Water*” and handmade crafts,
3. Rental services for tires, floats, and mats for visitors who wish to bathe or relax,
4. Parking services managed in turns by nearby residents.

These activities demonstrate how the uniqueness of soda water has encouraged the growth of community-based economic initiatives around the tourist area.

b. Impact on Community Income

Interviews with MSME actors around the tourist site indicate that most of them rely on soda water tourism as their main source of income, particularly during holiday and peak seasons. The following table presents income data from three local MSME actors over the last six months:

Table 1. Income

Month & Year	Yedijah Trinita Simanjuntak	Jenita Purba	Lapodian Rancang Tobing (Parking)
October 2024	IDR 4,500,000	IDR 3,700,000	IDR 1,600,000
November 2024	IDR 5,100,000	IDR 4,000,000	IDR 1,400,000
December 2024	IDR 28,000,000	IDR 20,000,000	IDR 2,400,000
January 2025	IDR 24,700,000	IDR 17,500,000	IDR 2,000,000
February 2025	IDR 6,000,000	IDR 4,000,000	IDR 1,300,000
March 2025	IDR 5,000,000	IDR 4,200,000	IDR 1,100,000

Based on the data above, there are significant fluctuations in the income of local MSME actors. For example, Yedijah Trinita Simanjuntak earned IDR 28,000,000 in December 2024, a sharp increase compared to IDR 4,500,000 in October 2024. A similar pattern is seen with Jenita Purba, whose income rose to IDR 20,000,000 in December from IDR 3,700,000 in October. Likewise, Lapodian Rancang Tobing, despite operating on a smaller scale, also experienced an increase in December, reaching IDR 2,400,000 compared to IDR 1,600,000 in October.

The findings indicate that the utilization of natural resources as a tourist attraction has had a tangible positive impact on the income of surrounding communities. The unique appeal of the Tarutung Soda Water Baths has generated new economic opportunities for locals, especially in the informal sector such as food stalls, souvenir sales, parking services, and rental of recreational equipment.

Nevertheless, the increase in income remains seasonal and uneven. During months with lower tourist visits, such as February and March, income declined sharply due to the absence of major holidays and the entry into Ramadan, when recreational activities generally decrease. This shows that the community’s dependence on the tourism sector is still highly seasonal and vulnerable to fluctuations caused by time, weather, and religious events.

5. Discussion

The development of the Tarutung Soda Water Baths illustrates the complex interaction between local government, community participation, MSMEs, and the utilization of natural resources in

promoting local economic growth. Findings from this study show that MSMEs play a central role in sustaining the tourism economy through small-scale businesses such as food and beverage stalls, souvenir sales, parking services, and rental of bathing equipment. These activities provide direct employment and household income, which confirms the argument of Wenda et al. (2024) that tourism development based on local potential stimulates the growth of MSMEs and strengthens community economic structures. However, the data also reveal significant challenges, including dependence on seasonal tourist visits, unfair competition, and the lack of digital marketing capacity. This condition is consistent with Aisyah (2020) and Asrah et al. (2024), who emphasize the vulnerability of Indonesian MSMEs due to limited digital adaptation and the urgent need for training and mentoring to enhance competitiveness.

The role of local government, meanwhile, remains limited to the provision of basic infrastructure such as retaining walls, while the ticketing system has yet to be managed formally. Revenues from ticket sales currently flow to individual stall owners without being reported or allocated to community development funds, reflecting the absence of accountability and weakening the potential of tourism as a sustainable source of village income. Nugraha & Enga (2021) as well as Subadra (2007) similarly note that weak institutional capacity and unclear regulations often hinder the formalization of natural tourism management, thereby reducing the benefits that could be distributed more equitably.

On the other hand, the local community has shown active participation through informal initiatives such as maintaining cleanliness and providing services to tourists. However, the absence of a community-based tourism management institution limits coordination and exacerbates competition among local actors. This finding resonates with Qotrunnada & Ansori (2023), who argue that the level of community participation strongly determines the effectiveness of local economic outcomes. Community aspirations for training in digitalization and business management, as revealed in interviews, highlight the untapped potential that could be realized through capacity building, as also emphasized by Fernando et al. (2023).

The uniqueness of natural soda water, which is rare in Indonesia, has become the main attraction that draws visitors from both within and outside North Sumatra, thereby generating significant economic opportunities for the community. This finding aligns with Sandy Sulistiono & Boediningsih (2024) and Irham et al. (2024), who stress the role of natural resources as economic drivers in regional tourism. Nonetheless, the income of local businesses fluctuates sharply depending on the tourist season, indicating that the tourism-based economy in Tarutung remains highly vulnerable to temporal, weather-related, and cultural-religious dynamics. This seasonal dependency reflects the observations of AAA Ribeka et al. (2021) regarding the fragility of tourism-dependent economies when faced with external shocks.

Overall, the study underlines that the Tarutung Soda Water Baths hold considerable economic potential but require more sustainable governance to ensure long-term benefits. As Maiwa et al. (2025) and Wijaya (2024) highlight, the success of natural tourism development depends on effective collaboration among communities, governments, and other stakeholders, as well as the application of local wisdom in managing natural resources. To achieve this, several steps are essential, namely strengthening MSME competitiveness through digital training, formalizing government involvement in ticketing and revenue management, establishing community-based tourism institutions, and implementing strategies to mitigate seasonality. Only through such measures can the Tarutung Soda Water Baths evolve from an informally managed attraction into a sustainable tourism destination that supports inclusive and equitable local economic development.

6. Conclusion

This study concludes that the utilization of natural resources, particularly the rare natural soda spring in Tarutung, plays a strategic role in enhancing the income of local communities. The uniqueness of this attraction has successfully drawn tourists and stimulated the growth of informal sectors such as culinary MSMEs, souvenir sales, parking services, and recreational equipment rentals. Tourism activities contribute significantly to the local economy, especially during peak holiday seasons like Christmas and New Year. However, income patterns remain unstable with sharp declines in low-visit months, such as February and March, showing that the tourism-based economy is seasonal and vulnerable to fluctuations in time, weather, and religious events. Other challenges also arise, including limited supporting facilities, low digital literacy, weak promotion strategies, and the absence of structured tourism management, with community involvement still informal and government roles not yet optimal. Therefore, while the Tarutung Soda Water Baths hold great potential to drive local economic growth, long-term sustainability requires careful planning, community empowerment, digital-based capacity building, and multi-stakeholder collaboration to ensure inclusive and continuous benefits.

Based on these findings, it is suggested that the settlement of land ownership status between the village government and landowners be prioritized through legal agreements to open opportunities for greater development support. Multi-party collaboration involving the local government, tourism offices, MSME actors, and community institutions is essential to ensure mentoring, sustainable evaluation, and data-driven policies. The development of adaptive infrastructure and weatherproof facilities such as covered food stalls, shelters, and comfortable dining spaces is also recommended to reduce dependence on seasonal conditions and stabilize local income. Furthermore, strengthening digital literacy and technology-based promotion through government-led training is needed to enable MSME actors to optimize social media, marketplaces, and digital platforms, thereby expanding tourism reach, attracting more visitors, and reducing income fluctuations.

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