



Sustainable Tourism through Coexistence with Natural Capital with a Focus on Hokkaido

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Abstract

Utilizing Hokkaido as a case study, this study explores the potential for sustainable tourism through coexistence with natural capital. Excessive tourism activity often damages natural capital. This study discusses methods for assessing natural capital and strategies for sustainable tourism. Specifically, through case studies of Otaru City and Biei-cho in Hokkaido, the research aims to understand the relationship between natural capital and tourism, proposing concrete steps toward achieving sustainable tourism. Otaru City is renowned for its picturesque canals and historical architecture, attracting numerous tourists. However, increased tourism has led to challenges such as environmental impact and congestion. Similarly, Biei-cho is celebrated for its spectacular natural landscapes and seasonal beauty, yet this scenery is potentially vulnerable to tourism-related impacts. This research investigates the content of tourism websites as a representation of local community perspectives on maintaining tourism sustainability through natural capital stewardship. Furthermore, social media data reflecting tourist sentiments regarding Otaru City and Biei-cho are analyzed. Positive and negative aspects are extracted from tourist emotional expressions concerning natural capital, and the evaluation and utilization of natural capital are discussed. Consequently, in addition to evaluating current tourism industry practices, this study offers a new perspective on how tourism can be harmonized with natural capital to contribute to the sustainable development of local communities.

Keywords: Natural capital, Sustainable tourism, Local community, Reviews

1. Introduction

Natural capital encompasses all tangible natural resources and intangible ecosystem services that contribute to human well-being. Tangible resources include, but are not limited to, water, soil, minerals, forests, and marine biota. Ecosystem services, conversely, comprise functions such as food production, water purification, climate regulation, natural hazard mitigation, aesthetic value, and recreational opportunities. Management of the underpinning of human livelihoods and economic systems, the conservation and sustainable

management of natural capital are crucial for realizing a sustainable society. Critically, natural capital provides multifaceted value to human society through the provision of essential resources and vital ecosystem services. Costanza et al. (1997) extensively discuss natural capital and its value, emphasizing its importance. Natural capital includes not only physical and biological elements but also the ecosystem services it provides. Ecosystem services contribute directly or indirectly to human well-being. Natural capital is an essential foundation for human lives and economic activities (Daily, 1997). Daily (1997) categorizes the ecosystem services provided by natural capital into four categories, describing their importance and diverse roles as follows: The first category is the supply service, encompassing agricultural food production, fisheries, forestry, and so on. It also includes the provision of drinking water for agriculture through rivers, lakes, and groundwater. The second category is the regulatory service, wherein nature conserves the environment. Forests and wetlands absorb carbon dioxide and play climate-regulating roles. In nature, wetlands and forests also carry out water purification, maintaining the quality of drinking water. Furthermore, mangroves and wetlands play important roles in disaster prevention and protecting communities from floods and tsunamis. The third category is the supporting service, maintaining a sustainable environment. Natural capital maintains the health and function of the entire ecosystem through soil generation and fertility, nutrient cycling, and biodiversity maintenance. The fourth category is the cultural service, which enriches human society through its beauty and serenity. Beautiful landscapes provide recreational opportunities for humans. They also have spiritual and educational value as places of aesthetic value and learning provided by nature.

The relationship between tourism and natural capital is characterized by the tourism industry's dependence on and benefit from natural capital. Simultaneously, tourism activities have the potential to negatively impact natural capital, thus highlighting the recognized importance of natural capital protection and management for sustainable tourism. A positive aspect of this relationship is the role of natural capital as a tourism resource. Natural landscapes and ecosystems are key elements attracting tourists. Conversely, a negative aspect is the detrimental effect of overtourism on natural capital. Excessive tourism activities risk degrading natural capital and compromising its services (MEA, 2005). These risks include ecosystem destruction due to large tourist numbers, litter, and increased noise. Sustainable tourism, therefore, aims to provide value to tourists while safeguarding natural capital. This is achieved through specific measures such as environmental protection activities in tourist destinations, the promotion of ecotourism, and cooperation with local communities.

The United Nations World Tourism Organization (UNWTO) defines overtourism as the impact of tourism on a destination, or parts thereof, that excessively influences the perceived quality of life of residents and/or the quality of visitor experiences negatively (Duignan, 2019). Efforts to mitigate overtourism align with the broader goals of sustainable tourism and its effective management at the destination level. As noted by Duignan (2019), the successful implementation of sustainable tourism strategies, including managing visitor growth and behavior, requires a thorough analysis of tourist behavior and its impacts, as well as an understanding of local community perceptions of tourism. Consequently, eliciting the perceptions of local communities, tourists, and tourism operators within destinations is crucial for developing viable sustainable tourism strategies. Particularly, in the contemporary context of ubiquitous social media usage, examining tourism strategies through social media analysis is significant, considering the platform's prominent role as a source of tourism-related information.

Hokkaido's rich natural environment serves as its greatest tourism resource. Its magnificent mountain ranges, beautiful seasonal scenery, abundant wildlife, and other forms of natural capital attract tourists and bolster the local tourism industry. From the lavender fields of Furano to the pristine wilderness of Shiretoko and the snow-covered landscapes of Daisetsuzan, Hokkaido's natural beauty enchants tourists from Japan and abroad. The changing seasons lend unique charm to these scenic wonders. From cherry blossoms in spring to verdant greenery in summer, vibrant autumn foliage in fall, and snowy landscapes in winter, the distinct beauty of each season offers tourists diverse experiences. Moreover, the region's rich biodiversity allows visitors to partake in activities such as bird watching and wildlife observation tours. Outdoor activities like mountain climbing, camping, fishing, and skiing also attract active tourists. Studies on the economic impact of natural-capital-based tourism have yielded diverse results. Firstly, it attracts tourists. Attracting nature-seeking tourists contributes to the revitalization of the local economy. Secondly, it generates high added value, leading to the creation of high-value-added tourism services, such as the development of nature-experience tourism products. Thirdly, it aids in establishing regional brands. Projecting a nature-rich image as a regional brand enhances the competitiveness of tourist destinations.

This study investigates the viability of sustainable tourism through a framework of coexistence with natural capital, employing Hokkaido, Japan, as a case study. Sustainable tourism is a critical paradigm that seeks to balance the economic development of local communities with the imperative of natural capital preservation. Achieving this balance necessitates a holistic understanding of the perspectives held by both local communities and tourists.

This research compares the perceptions and sentiments of these two stakeholder groups concerning natural capital. Utilizing publicly available information from websites and social media platforms, the analysis focuses on two distinct locales within Hokkaido: Otaru City and Biei-cho. Otaru City attracts tourism due to its unique combination of natural and cultural assets, including historical architecture clustered around its canal area. Biei-cho, conversely, draws visitors with its scenic beauty, characterized by harmonious integration of water resources, including waterfalls, and expansive meadows showcasing diverse flora. A key indicator examined in this study is tourist satisfaction as it relates to the coexistence of tourism and natural capital.

This indicator is further contextualized by exploring satisfaction with nature-based experiences and awareness of nature conservation. Through this analysis, the research aims to identify potential discrepancies between local community and tourist perspectives and to propose actionable measures for the realization of sustainable tourism. By offering a novel perspective to the discourse on sustainable tourism, this study anticipates contributing to local community development. Specifically, focusing on the nexus of natural capital and tourism in Hokkaido, this research seeks to address the following key issues: (1) natural capital valuation, including methodologies for assessing its value and measuring the impact of tourism activities; (2) sustainable tourism strategies for enhancing tourist satisfaction while concurrently preserving natural capital; (3) the role of local communities in achieving sustainable tourism; and (4) tourist sentiment regarding natural capital and its influence on their valuation and utilization of these resources.

2. Natural Capital and Sustainable Tourism

Clarke (1997) conducted an extensive survey and analysis of the components and development of different approaches to sustainable tourism. Collins (1999) opined that the

majority of commercial tourism developments currently being discussed are questionable and cannot necessarily be considered truly sustainable. He highlighted the use and abuse of sustainability principles in tourism development from a natural capital perspective. Similarly, Saarinen (2006) analyzes assessments of the sustainability of tourism and the limitations of tourism growth. He critically discusses the relationship between sustainable development and sustainable tourism based on social capital, activities, and communities. He discusses the need for a framework that allows for a comprehensive consideration regarding carrying capacity to achieve sustainable tourism. Thus, the discussion is mainly from an economic framework, and there is not enough discussion from the perspective that social capital is enhanced by tourism activities and leads to an increased sense of well-being for tourists. There is insufficient analysis of the impact of natural capital.

The sustainability of tourism has been a subject of considerable scholarly debate. Hall (2009) posits that the contribution of sustainable tourism should be conceptualized within a degrowth framework, rather than the prevailing economic growth paradigm, exploring the potential for steady-state tourism development to mitigate natural capital depletion. The interdependence of tourism sustainability and environmental sustainability is widely recognized, with tourism development-driven increases in visitation demonstrably impacting sustainable tourism negatively (Azam et al., 2018; Sun et al., 2021). Furthermore, Baloch et al. (2023), through stakeholder surveys, reveal a perceived tension between the socioeconomic benefits derived from tourism development and the concurrent degradation of natural and environmental capital.

Their study proposes a model framework for sustainable ecotourism development, incorporating government-supported policy interventions designed to effectively safeguard environmental and natural resources while maintaining economic viability and local community well-being. According to the World Conservation Union (IUCN), ecotourism involves “Environmentally responsible travel to natural areas, to enjoy and appreciate nature (and accompanying cultural features, both past, and present) that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples”.

This heightened awareness of natural capital and its symbiotic relationship with tourism is posited to contribute to sustainable development. Within the context of ecotourism, both tourists and host communities are expected to exhibit pro-environmental attitudes and behaviors, demonstrating a commitment to the protection and conservation of all constituent elements of the environmental ecosystem. Sustainable tourism is natural resource-based tourism that resembles ecotourism and focuses on creating travel openings with marginal impact and encouraging learning about nature having a low impact, conservation, and valuable consideration for the local community’s well-being (Fennell, 2020; Butowski, 2021). Ecotourism is understood to encompass not only the imperative of natural capital protection but also the significance of social capital for both tourists and host communities. This study examines the sustainability of tourism, focusing specifically on natural capital, through the analysis of selected tourist destinations.

Efforts to achieve sustainable tourism based on natural capital can be categorized based on multiple perspectives including the environmental protection perspective, the economic revitalization perspective, and the social equity perspective. The environmental protection perspective involves the establishment and management of nature reserves, reduction of environmental burden, and ecosystem conservation. By designating valuable natural environments as protected areas, and not only restricting development but also managing it appropriately, both tourism usage and nature conservation can be achieved. This has been

realized in national parks, wildlife sanctuaries, and marine protected areas (Hokkaido Government, 2024). Moreover, efforts should be made to reduce the environmental impact of tourism, including the movement of tourists, the operation of accommodation facilities, and activities. For example, the use of renewable energy, energy conservation, water conservation, waste reduction, and recycling should promote the use of environmentally friendly means of transportation (public transportation, bicycling, walking, etc.). Regarding ecosystem conservation, it is important to maintain the attractiveness of nature as a tourism resource by working to preserve biodiversity, exterminate invasive alien species, and restore ecosystems. Examples include nature restoration projects, afforestation activities, and coral reef conservation.

From the viewpoint of economic revitalization, efforts are made in the areas of eco-tourism, green tourism, and utilization of local resources. It is important to promote tourism that minimizes the impact on the natural environment and contributes to the local economy. For example, there are efforts to balance landscape conservation and tourism in Biei-cho, Hokkaido, through small-group tours, nature guide training, and environmental education programs. Regarding green tourism, it promotes tourism that brings people into contact with nature and culture through stays in rural areas. Specifically, this includes agricultural experiences, farmer lodgings, and sales of local specialty products. By utilizing local specialties and traditional culture for tourism, the local economy is revitalized, leading to job creation and betterment of the lives of residents.

From the perspective of social equity, the following efforts are being made. First, the realization of this goal is based on the participation of residents. By involving residents in tourism development and management and sharing the benefits, we can nurture leaders of sustainable tourism. It is especially important to include consensus building through opinion exchange meetings, workshops, and councils in the activities. Second, realization through respect for culture. Respecting local culture and traditions and deepening mutual understanding with tourists will avoid cultural friction and promote sustainable exchanges. These activities include education for cross-cultural understanding to preserve cultural heritage and pass on traditional performing arts. Third, realization through education and awareness-raising, that is, raising awareness of sustainable tourism through environmental education and awareness of tourist etiquette. This is achieved by understanding the importance of environmental protection, understanding of local culture, and responsible tourism behavior. By comprehensively promoting these initiatives, sustainable tourism can be realized, where the economic and social benefits of tourism are enjoyed while protecting natural capital.

This study focuses on Otaru and Biei-cho in Hokkaido, Japan. In those areas, specific efforts are being made to realize sustainable tourism based on natural capital. First, from the perspective of environmental protection, a “marine education program” is being implemented in the Otaru port area to protect the marine ecosystem. Local schools and tourists are educated about the importance of protecting marine life and sustainable fishing. In addition, Biei-cho is promoting the establishment and management of nature preserves to promote tourism while protecting the local natural environment. In particular, the marshlands in Biei-cho are designated as a special natural monument by the government, and marshland conservation activities are underway.

Second, from the viewpoint of economic revitalization, Otaru is promoting the restoration and utilization of historical buildings. For example, historical buildings around the Otaru Canal are being restored as tourist attractions to revitalize the local economy. In addition, tourism products using local specialties are being developed. Biei-cho is also working to

revitalize the local economy through agricultural tourism. Experience-based tourism programs using local agricultural products and farmers' direct sales shops are being set up. Third, from a social equity perspective, Otaru works with local communities on tourism projects. Mechanisms are in place for residents to participate in the tourism industry and share in the profits. Cultural education programs for tourists are also being implemented. In Biei-cho, tourism projects are being promoted in cooperation with the local community. Tourism events showcasing local traditional culture and offering opportunities for local youth to participate in the tourism industry are conducted. Through these efforts, Hokkaido is trying to achieve sustainable tourism while taking advantage of its natural capital.

This study will evaluate how activities categorized by these three perspectives are affected by the co-creative relationship between local communities and tourists, based on public information online and word-of-mouth information on social media. We analyze how co-creative activities are practiced in tourism activities based on natural capital, while strengthening the step-by-step relationship with the local community. The results of this study would help clarify how to conduct sustainable tourism activities that are connected to local communities. Through this study, we aim to provide a theoretical framework for tourism activities based on natural capital and new insights into other studies and practices. Furthermore, by analyzing specific initiatives in Otaru and Biei-cho, it is possible to provide a practical model that can be applied in other regions.

3. Proposed Analysis

Shen et al. (2020) explored the intersection of sustainable tourism management requirements, the mitigation of overtourism, advanced technology, and tourist needs and expectations. Similarly, Gretzel et al. (2015) examined the integration of advanced technology and tourism activities, coining the term "smart tourism" to describe the application of information and communication technologies to develop innovative tools and approaches for tourism enhancement. As posited by Munar and Cai (2024), the objective of smart tourism is to foster mutually beneficial and sustainable tourism practices by balancing the satisfaction of both tourists and local communities, thereby forging new connections between these two groups within tourist destinations. While social media data offers potential for extracting positive and negative emotions related to tourism activities, the present study's proposed validation, specifically regarding the extraction of diverse data characteristics such as those related to various forms of natural capital, requires further elaboration.

In this study, information was collected in a way that captured the perspectives of both the tour operators as well as tourists. Tourist websites ("Jalan", 2024a) and local government tourist websites provided information from the perspective of tourist operators. The opinions of tourists were obtained from traveler reviews on tourist websites. Content classification and feature extraction were conducted on the collected information through discussions with several researchers.

Data were collected from publicly available information on tourism websites (representing the tourism operator perspective) and tourist reviews (representing the tourist perspective). Specifically, the analysis proceeded as follows: First, data pertaining to natural capital (e.g., natural landscapes, flora and fauna, climate, and topography) were extracted. Second, information regarding tourism resources (e.g., tourism facilities, activities, and events) from the tourism provider perspective, and information regarding tourism experiences from the tourist perspective were collected. Third, data related to environmental conservation efforts and sustainable tourism initiatives were gathered.

To illustrate the data extraction process, consider tourist reviews of the "Blue Pond" in Biei-cho. From these reviews, elements related to natural capital, tourism experience, and environmental conservation were identified. For natural capital, descriptors such as "beautiful blue color" and "mysterious atmosphere" were extracted. Regarding tourism experience, mentions of a "crowded parking lot," a "great view," and general comments on the "beautiful scenery" were noted. Finally, concerning environmental preservation, expressions indicating a desire to "cooperate in environmental protection" and to "cherish nature" were identified.

Following this classification, the characteristics and interrelationships of each category were analyzed. For instance, the analysis explored whether reviews with frequent references to natural capital correlated with higher satisfaction levels, or whether tourists demonstrating a greater awareness of environmental conservation tended to prioritize specific types of tourism experiences. For example, mentions of "It is really blue" and "I was surprised at how beautiful blue it is" suggest that the distinctive blue hue of the Blue Pond serves as a primary attraction for tourists. Conversely, comments such as "It took quite a long time to park my car in the parking lot" indicate that parking congestion significantly diminishes tourist satisfaction. However, expressions like "I am very satisfied with the Blue Pond itself because the weather was good and the scenery was wonderful" suggest that favorable weather conditions contribute positively to tourist satisfaction with the scenery. Furthermore, the analysis investigated correlations between the frequency of natural capital mentions and overall satisfaction, as well as the relationship between environmental conservation awareness and preferences for specific tourism experiences.

3.1 Site Information Analysis

In the information on tourism sites in Hokkaido, we analyzed publicly available information on efforts to realize sustainable tourism based on natural capital in Otaru and Biei and extracted factors that contribute to sustainable tourism.

The Otaru Old Temiya Line Clean-up Walk (Otaru Journal, 2024) in Otaru identified the following factors that contribute to the realization of sustainable tourism. 1) Beautification: By having event participants pick up trash and collect it to clean the environment of the walking paths, they provide a pleasant environment for visiting tourists and citizens. A clean environment improves visitor satisfaction and is expected to increase repeat visits and traffic. 2) Cooperation between citizens and tourists: When local businesses and residents cooperate in clean-up activities, it creates a sense of solidarity throughout the community. This shows that the local community is united in protecting and nurturing tourism resources, and gives visitors a sense of security. 3) Preservation of historical heritage sites: The former Temmiya Line is a railroad heritage site of historical value, and through its preservation activities, the cultural capital of the region is being protected.

When a place of historical value is kept beautiful, its value as a tourist resource is enhanced, leading to sustainable tourism. 4) Education and awareness-raising: Truck associations' community outreach activities (flower planting, traffic safety classes, etc.) serve to raise awareness of environmental protection and safety for residents and visitors. This raises environmental awareness among participants and visitors and contributes to sustainable tourism. These four elements play an important role in achieving sustainable tourism using natural capital.

The Hokkaido Aquarium 2024 (Otaru Aquarium, 2024) project is a district-wide effort to conserve Hokkaido's marine life. Its activities include the following elements that contribute to the realization of sustainable tourism with natural capital. 1) Biodiversity

conservation: It is important to protect Hokkaido's unique ecosystems and maintain an environment where a diversity of organisms can coexist. 2) Education and awareness-raising: It is important to spread knowledge about local wildlife and the natural environment, and to inform tourists about the importance of nature conservation. 3) Mutual utilization: Mutual use of zoo and aquarium facilities and efficient utilization of resources will help to realize sustainable tourism. 4) Mutual training of staff members: It is important for staff members to share their knowledge and skills with each other to provide training for more effective conservation activities. The combination of these four elements will help to achieve sustainable tourism using natural capital.

In Otaru, the sale of crafts for economic revitalization is popular among tourists. Here we collected information on the top three most popular craft sites around Otaru Station (“Jalan”, 2024b). Products in the first site, Otaru iPONTE (Otaru iPONTE, 2024), use local resources. The use of materials unique to Hokkaido, such as blown glass and Ezo deerskin leather, is an effective use of local natural resources and provides tourists with a unique experience. It also includes an educational outreach activity. Through the hands-on experience of making glass and small leather goods, visitors are given the opportunity to learn about traditional techniques and the value of materials.

In second place is the Otaru Music Box Hall Main Store (Otaru Music Box Hall, 2024), an establishment that simultaneously allows the preservation of a historical building and promotes cultural heritage. It is housed in a bank building built in 1893; the presence of the store facilitates the preservation of the historical architecture of the building. Moreover, the store promotes music box culture, and by offering a handmade music box experience, it uses local culture as a tourism resource. In third place is the Creative Glass Studio studio J-45 (Otaru Glass Studio, 2024), which is, first of all, a local craft technique. Through the experience of glass-blowing, the studio introduces visitors to local craft techniques and allows them to experience glass-blowing for themselves. It is also a hands-on tourism experience. In addition, experiential tourism provides tourists with handmade memories and seeks to create a sustainable form of tourism.

Natural parks and forested areas in Biei-cho, as described on the Hokkaido Tourism Organization's official Hokkaido tourism website (Hokkaido Tourism Organization, 2024), are a distinctive natural capital. They are used for the development of sustainable tourism activities as follows. First, the beautiful natural landscape is protected and utilized. Natural parks and forested areas protect the beautiful hilly landscape and flower gardens that are unique to the “hill town” of Biei, allowing visitors to enjoy the natural sceneries of the four seasons. There are also typical sightseeing spots, such as Shirogane Blue Pond and Shirohige no Taki Waterfall, where visitors can experience the beauty of nature by visiting the unique Biei Blue pond. Second, there are eco-tours and nature observation. We promote tourism that takes advantage of the natural capital of the region by offering eco-tours in tractor buses and sightseeing carts to visit flower gardens and hilly areas. Biei-cho provides opportunities for nature observation by creating sightseeing flower gardens where visitors can enjoy diverse flowers from spring to fall and walking paths where visitors can enjoy seasonal views during nature.

Third, in the promotion of sustainable tourism, the “Most Beautiful Villages in Japan” Coalition has been working to preserve the beautiful landscape, environment, and culture of the area and to maintain its attractiveness as a sustainable tourist destination. In addition, Biei-cho is also attracting attention as a workcation and relocation destination, taking advantage of its beautiful natural environment and ease of living. Fourth, there is an increase in the diversity and attractiveness of tourism and the presence of photogenic spots.

Photo spots such as the Road of Patchwork, the Ken and Mary Tree, and the Seven Star Tree, which offer unique views of Biei, are provided to realize a variety of tourism experiences. It is also the existence of Shikisai-no-oka, Zerubu-no-oka and Atumu-no-oka. Each season brings different flowers in bloom, always offering new attractions to visitors.

Tourism activities from an economic perspective toward tourism, introduced on the website of Biei-cho, Hokkaido (“Biei-cho”, 2024a), are also diverse. The first is tourism that takes advantage of the colorful natural scenery of the four seasons and the characteristics of local resources. Biei-cho attracts many tourists through its beautiful seasonal scenery, for example, by promoting the rural landscape of Biei-cho and Shirogane Blue Pond. Second, tourism is coupled with the rediscovery of tourism resources and the promotion of rural and agricultural experiences. Third, measures are implemented to address tourism etiquette issues.

Measures are taken to address tourism etiquette issues such as unauthorized entry into agricultural lands and illegal dumping of garbage to maintain a sustainable tourism environment. Fourth, festivals and events are conducted. Biei-cho hosts attractive events in the beautiful rural landscape, a regional resource, to attract new Biei fans and increase the number of people interacting with the town residents. Fifth, regional resources are organically linked. Biei-cho aims to organically link local resources such as the Shirogane area to create a refreshment zone that provides health and healing. Through these elements, Biei-cho is working to realize sustainable tourism by utilizing its natural capital.

From the perspective of social equity, we extracted six features from a festival and event site (“Biei-cho”, 2024b) in Biei-cho.

- 1 Utilization of local resources: Tourism activities utilizing seasonal natural scenery, for example, the Biei Cherry Blossom Festival and the Night Cherry Blossom Light-up make the most of Biei-cho's natural resources and allow visitors to experience the beauty of the seasons. In addition, agricultural products are promoted. The “Dokkanto Agricultural Festival” and “Cooking Contest” introduce Biei's fresh agricultural products and support local agriculture.
- 2 Exploration of tourism resources: The Nachi Biei Fire Festival and the JR Biei Station Light-Up Festival, aimed at passing on history and culture, highlight Biei's historical and cultural resources and offer them to tourists.
- 3 Revitalization of the local economy: As activities to promote the use of local products, the summer Be-Coin Thanksgiving Festival and Snow Lantern Night promote payment at local Be-Coin handling stores, contributing to the revitalization of the local economy.
- 4 Integration of community and tourism: Resident-participatory events, such as “Viei de Halloween” and open events, strengthen the local community by bringing residents and tourists together.
- 5 Environment- friendly tourism: Illuminations and environmentally friendly lighting events raise awareness of environmental protection while allowing visitors to enjoy beautiful scenery.
- 6 Diverse experience programs: As a winter activity, Biei Snow Play Plaza provides winter visitors with opportunities to enjoy snow play and illumination to promote seasonal tourism. Through these six elements, Biei-cho is working to realize sustainable tourism by utilizing its natural capital.

Thus, in Hokkaido, activities to realize sustainable tourism using natural capital that can be collected from websites consist of two elements. The first element is the protection of natural capital and holding activities to preserve local history and culture closely related to natural capital. This consists of beautification of tourist attractions through litter pickup and environmental maintenance, and the protection of local ecosystems and the maintenance of biodiversity. It also involves the protection of historical buildings and traditional industries, and the introduction and transmission of local culture and traditions. Tourism activities offering eco-tours and nature observation are linked to sustainable tourism. The second element is the revitalization of the local economy and human resource development activities. This lies in the promotion of local products and support for the local economy, as well as in the implementation of educational and awareness-raising activities related to environmental protection and biodiversity, and the dissemination of the value of natural capital through experience programs. Thus, a wide range of activities are undertaken to utilize natural capital and realize sustainable tourism.

3.2 Tourist Review Analysis

Local community activities for sustainable tourism using natural capital have been evaluated from websites. On the other hand, word-of-mouth information from websites is used as tourist evaluations. Natural capital classifies tourist ratings to promote sustainable tourism. From the "Website "Otaru/Kiroro/Shakotan Travel Guide" ("Jalan", 2024c) and "Furano/Biei/Tomamu Travel Guide" ("Jalan", 2024d), we collected and analyzed 20 reviews for the top two tourist destinations in Otaru, Otaru Canal and Otaru ilPONTE, and the top three tourist destinations in Biei-cho. The top three most popular destinations—Blue Pond, Farm Tomita, and Shikisaino-Oka—are taken as examples here. The tourist reviews represent the honest feelings of the tourists, and we categorized and extracted positive and negative sentiments for each tourist attraction.

3.3 Otaru City

1) Otaru Canal

The Otaru Canal is characterized by historical buildings and stone warehouses. It is especially attractive when illuminated at night, and the scenery changes from season to season. The first positive information about the natural capital that leads to the sustainable development of tourism is its beautiful scenery and lighting. The Otaru Canal offers beautiful scenery in all four seasons and is especially popular with tourists for its nighttime lighting. In addition, special seasonal events such as the Blue Canal and Snow Light Path are held.

The second positive feature encompasses cultural exchange and local attractions. Many foreign tourists visit Otaru, and the attractive scenery and atmosphere of Otaru makes it an ideal place for cross-cultural exchange. Negative information about Otaru is that activities are often disrupted by the weather. Night and daytime cruises may not go as planned, as the cruise may be cancelled. Cruises may have to be abandoned, especially during cold weather. Factors other than the natural capital were the crowds and the darkness underfoot, which were often disappointing. Evaluations regarding the quality of the lighting and atmosphere vary from person to person.

2) Otaru ilPONTE

Otaru ilPONTE is popular among families and couples, especially for making original glasses through the glass blowing experience. It is known as a place where visitors can enjoy glass crafting amidst beautiful scenery. The first positive evaluation about the natural capital that leads to the sustainable development of tourism is the importance of cultural

experience activities. The glass blowing experience has become a popular tourism resource as it allows visitors to learn about traditional craft techniques. Second, it is a memory-making experience. It can be enjoyed by people of all ages, from children to adults, and the whole family can participate. In addition, creating a one-of-a-kind original work of art is often a special memory for visitors. The experience is especially appreciated by beginners due to the attentive staff. One negative aspect pointed out by tourists is inadequate safety considerations. Particular attention is required when children and the elderly participate. Another negative aspect is that additional fees are charged for hands-on activities depending on the pattern and color, which can add to the cost. There are also complaints about the handling of crowds.

3.3.1 Biei Town

1) Blue Pond

The Blue Pond is a beautiful pond with clear blue water and a fantastic view that varies with the season and weather. The blue color of the water is created by the aluminum component reflecting light. The first positive information about the natural capital that leads to the sustainable development of tourism is its beautiful scenery. The clear blue color of the pond attracts visitors and makes it a wonderful photo spot. Visitors can also enjoy different sceneries depending on the season and weather. Second, it has become a tourist attraction.

The parking lot and surrounding paths are well maintained, making it easy for tourists to visit. In addition, products associated with the blue pond (soft ice cream, jelly, etc.) are sold at the stores, enriching the tourist experience. Third, visitors are in contact with nature. The chirping of birds and encounters with wildlife such as foxes create special and memorable moments. In addition, the natural environment around the pond is well maintained and offers a relaxing experience.

One negative factor noted from the natural capital is the impact of weather. After heavy rains, the pond can become muddy and no longer look blue. In addition, the landscape may vary depending on the season and weather conditions, and the experience may not be as expected. It is not directly the impact of negative elements from the natural capital, but rather the inadequacy of the tourist attraction. Specifically, these are parking congestion and overcrowding of tourists. Too many tourists are overcrowded, and it is often difficult to relax and enjoy the sights.

2) Farm Tomita

Farm Tomita is a beautiful tourist destination with early-blooming lavender and a wide variety of flower fields, offering a different floral landscape each season. Souvenirs and sweets are also popular points of interest. The first positive information about the natural capital that leads to sustainable development of tourism is its beautiful natural scenery. Early-blooming lavender and colorful flower fields are appreciated for their beauty. Visitors are also attracted by the spectacular views from the observatory and the vivid carpet-like landscape.

Second, the natural capital brings a boost to the local economy. It is popular among tourists as a place to enjoy melons, melon bread, soft ice cream, and other sweets. In addition, the convenient home delivery and shipping service for souvenirs is well received by tourists. Furthermore, the staff is numerous and courteous in caring for and providing services to tourists. Third is the enjoyment of the different seasons.

Even after the lavender season has passed, other flower fields can still be enjoyed, making it attractive regardless of the time of year. Negative information about the natural capital points to the lack of flowers in different seasons. Depending on the time of year you visit, there may be few flowers, which can be disappointing. Visitors, especially when the height of the lavender season has passed, complain about not being able to see the lavender fields. Although not directly linked to the natural capital, negative information points to crowding and high numbers of foreign tourists, as well as poor sanitation of the facilities.

3) Shikisai-no-oka (Hill of Four Seasons)

Shikisai-no-oka is a flower garden in Biei that boasts about 30 different kinds of flowers and grasses blooming throughout the year and is a place where visitors can enjoy a colorful landscape that varies from season to season. Activities such as a park bus and tractor are also attractive. The first positive aspect about the natural capital that leads to sustainable development of tourism is the variety of flower gardens. At Shikisai-no-oka, numerous species of flowers and grasses, including lavender, lupine, cosmos, and sunflowers, bloom throughout the year, providing a beautiful spectacle. Even if you miss the lavender season, other colorful flowers will delight visitors.

Second, the park is well maintained and the view of the flower fields is admired by visitors. Visitors also appreciate the fact that admission to the park is free of charge. Third, it is an attractive photo spot. The colorful flower fields and hills are popular as photogenic spots. In addition, the park's bus service, which stops at the park to ensure that visitors do not miss any shutterbug opportunities, is also highly utilized.

On the other hand, one negative piece of information about the natural capital is the lack of seasonal flowers. If you miss the lavender season and visit during the low-flower season, you may be disappointed. Although not directly related to natural capital, as a cost burden issue, it is pointed out that parking and park entrance fees and activities (e.g. balloon rides) are expensive. In addition, crowding and sanitation issues have been noted.

3.3.2 Evaluation Results

This study is different from previous studies as it uses word-of-mouth information from tourists. While conventional studies have mainly used questionnaires and interviews, this study uses reviews and comments left by tourists on websites to analyze their feelings and evaluations. In addition, specific tourist attractions in Hokkaido (Otaru Canal, Otaru iPONTE, Blue Pond, Farm Tomita, and Shikisai-no-Oka) are taken as specific case analyses and evaluated in detail. Furthermore, the study focuses on natural capital.

It emphasizes the impact of the use of natural capital (e.g., beautiful landscapes, biodiversity, and the development of the natural environment) on the sustainable development of tourist destinations and categorizes the positive and negative tourist evaluations. A new finding is the unique evaluation of each tourist destination. Specific positive and negative evaluations for each tourist destination are extracted to identify the role and challenges of natural capital. The study also discusses the various uses of tourism resources. We evaluate the multifaceted use of natural capital, including the beauty of natural scenery, cultural experience activities, and the revitalization of the local economy. Furthermore, the study identifies the impact of tourism. We point out specific issues associated with the conversion to a tourist destination, such as parking congestion and seasonal and weather-related impacts.

3.4 Advanced Practical Research

Future research directions include the development of practical applications. One such application is the refinement of tourism resources through collaborative regional partnerships. This can be achieved by developing tourism programs and experiential content leveraging natural capital, engaging diverse stakeholders including, but not limited to, tourism operators, residents, non-profit organizations, educational institutions, and governmental bodies. Beyond existing tourism resources such as local history, culture, traditional industries, food, and festivals, this approach facilitates the identification of novel resources, including the region's unique natural environment (e.g., scenery, flora, fauna), and lifestyle and cultural attributes.

Furthermore, participatory and experiential tourism programs can be developed, enabling tourists to engage directly with nature and local culture. Analysis of these initiatives can inform strategies for enhancing tourist satisfaction. Differentiated sightseeing plans and services can be offered, catering to diverse tourist demographics (e.g., age, interests, travel style). Enhanced information dissemination can provide tourists with accessible and timely information. Finally, facilitating interaction between tourists and residents can foster place attachment and deepen regional understanding.

4. Conclusion

This study explores the potential for sustainable tourism through coexistence with natural capital, using Otaru City and Biei-cho in Hokkaido as case studies. In both regions, various efforts have been undertaken to develop tourism that utilizes natural capital. This study evaluates these activities from the perspectives of local economic revitalization, environmental protection, and social equity.

In Otaru City, the restoration of historical buildings and tourism development capitalizing on the charm of the Otaru Canal are being promoted, with tourism projects implemented in cooperation with local communities. Conversely, Biei-cho promotes tourism while prioritizing environmental protection through agricultural tourism and nature reserves. Analysis of tourist comments and reviews yielded specific evaluations, revealing both positive and negative aspects of the Otaru Canal and Biei-cho.

These evaluations provide valuable data for proposing concrete steps toward the realization of sustainable tourism. Finally, this study concludes that it is possible to provide a model for sustainable tourism that utilizes natural capital while strengthening the co-creative relationship between local communities and tourists. This model is applicable to other regions and offers a new perspective on sustainable tourism.

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