



Sea-People Relations and Biocultural Ecotourism: A Case Study of Migratory Bird-Based Tourism

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Abstract- The author explores the untapped potential of biocultural ecotourism by focusing on the intricate relationship between marine ecosystems and local communities on Kabashima, a small, accessible fishing island situated in Nagasaki Prefecture, Japan. Although modern ecotourism increasingly emphasizes the critical interconnectedness of biodiversity and local cultural practices, there remains a notable lack of empirical research specifically addressing these dynamics within small island contexts. To address this gap and promote environmental awareness alongside sustainable practices, the researchers developed and evaluated targeted educational programs utilizing Kabashima's unique geographical and cultural assets. The methodology involved designing two distinct ecotourism programs. Program 1 was successfully implemented, offering participants hands-on experiences such as observing migratory Brown Boobies, learning about traditional marine culture, and participating in local dance. The second program was designed and implemented to tackle pressing ecological threats, including marine debris and invasive species. The implementation of Program 1 yielded overwhelmingly positive results; participant feedback revealed a substantially deepened understanding of biocultural diversity and a markedly increased motivation to actively participate in environmental conservation efforts. Ultimately, the research concludes that Kabashima's excellent accessibility, dense concentration of cultural and ecological points of interest, and effectively designed educational experiences make it an ideal hub for small-scale ecotourism. These findings demonstrate that accessible small islands with rich biocultural assets can serve as highly effective, scalable models for developing short-term learning eco-tours applicable to various regions globally.

Keywords: Biocultural Diversity, Ecotourism, Bridged Remote Island, Environmental Education.

I. Introduction

Recent trends in ecotourism have also highlighted the region's biocultural diversity (Kuribayashi 2024). Biocultural diversity is based on the idea that nature and humans interact, utilize and connect with each other, and strive to protect these relationships. Culture has been nurtured based on the biodiversity that thrives in the land and has continued to this day, and there is also an interaction where human cultural activities protect biodiversity. In other words, the two are often discussed as a whole, and conservation and utilization as a whole are essential concepts for the development of a sustainable society.

However, this approach was not understood until recently, and in 1988, the International Society for Ethnobiology announced in the Belém Declaration that 'cultural diversity and biodiversity are inseparable.' At the Berkeley Conference in 1996, there was broad discussion about threats to diversity regarding "endangered languages, endangered knowledge, and endangered environments," and at the 2007 UNEP (in Global Environment Outlook: Environment for Development), biodiversity was recognized internationally for the first time as the concept that biodiversity encompasses cultural diversity (Maffi & Woodley 2010). Subsequently, at the 10th Conference of the Parties to the Convention on Biological Diversity (COP 10) in 2010, the SATOYAMA Initiative was adopted under the leadership of the Japanese government, leading to international recognition of the protection of nature formed and maintained by human hands. While it could be argued that the concept of biocultural diversity has not yet become widely accepted in Japan, it is perceived as being closely related to the concepts of "satoyama" and "satoumi" as alternatives.

In the Japanese context, the concept of "SATOYAMA" has been promoted internationally as a distinctive way of articulating values similar to those associated with biocultural diversity. As a result, the "SATOYAMA Initiative", launched internationally around the time of COP10 in Nagoya in 2010, has become an important international framework for recognizing socio-ecological production landscapes and seascapes shaped by long-term human-nature interactions. The term "Satoyama landscapes" is now used in international research to describe forms of secondary nature maintained through human activities, particularly in rural and peri-urban contexts (MoE 2023). In other words, instead of gaining recognition for the term "biocultural diversity," Japan

has succeeded in spreading essentially the same values worldwide by using separate signboards like "SATOYAMA" or "GIAHS".

Additionally, to preserve the connection between biodiversity and cultural diversity, a collaborative program was launched between UNESCO and the Secretariat of the Convention on Biological Diversity, marking the world's first clear steering in biocultural diversity. The adoption of the Kunming-Montreal Biodiversity Framework for Biological Diversity by 2030 at the 15th Conference of the Parties (COP15) in 2020 highlighted the importance of conservation at the national level (Persic & Scott 2010, Ishikawa Prefecture 2016).

In Japan, the "National Biodiversity Strategy 2023-2030" was approved by the Cabinet on March 31, 2023. In this strategy, the policy to protect biocultural diversity was announced as part of the national strategy in Goals 4-5, highlighting the importance of traditional knowledge (MoE 2023). In the joint program between UNESCO and the Secretariat of the Convention on Biological Diversity, it is recognized that human-created cultures are based on biodiversity (Persic & Scott 2010). Thus, the idea that biodiversity underpins cultural diversity is also recognized worldwide (Agnoletti & Rotherham 2015).

On the other hand, Japan is an island nation that forms an archipelago and is geographically located on the edge of East Asia. Furthermore, the remote islands on the Sea of Japan side, due to their proximity to the Eurasian continent, attract a variety of wild birds from various regions, making them a unique region in ornithology that is always noted during the spring and autumn migration periods (Senzaki et al. 2019). Since birds exhibit various forms depending on their environment and ecology, they were considered sufficient models embodying "biodiversity" (Gill 2007). Moreover, because many species migrate long distances across countries and regions, birds are also valuable subjects for examining biodiversity across multiple regions connected by migratory routes (Kerlinger, 1995).

Among Japanese prefectures, Nagasaki Prefecture has the most remote islands in Japan (Japan Remote Islands Center, 2019), and has been a key hub for shipping in early modern history, where cultures from Asian countries and various parts of Japan have interacted, with a strong unique culture (Shin-Nagasaki Fudoki Kai, 1981). In earlier periods, maritime transportation was strongly influenced by seasonal winds. For this reason, some islands in the prefecture have been described as "islands waiting for the wind," functioning as temporary anchorage points where sailors stayed until favorable winds allowed them to depart (Suzuki, 2008). Additionally, the waters off Nagasaki Prefecture are considered suitable for fishing, serving as an important supply point for marine products such as 'karasumi (dried mullet roe),' which reportedly even supplied the Edo shogunate. In other words, there is a history of close ties between fishermen and the natural environment (Nagasaki Prefecture 1997). From this situation, it seems that a culture relying on the natural environment and weather has come to the surface.

Since Nagasaki Prefecture has culturally and ornithologically fascinating conditions as an island prefecture, the authors considered it a suitable place for learning about and experiencing biocultural diversity. However, due to the characteristics of remote islands, access from the mainland is often difficult. For example, it may be difficult for students to return home on the same day after participating in experiential learning programs conducted as part of school classes. Therefore, the authors considered bridge-connected remote islands to be more suitable, as they can lower the barriers to participation. Smaller islands also have an advantage because participants can move around a compact area after arriving at the destination. Moreover, rather than having a monotonous environment, such islands may contain various environmental elements, including evergreen forests, deciduous forests, grasslands, wetlands, and rivers (Nomozaki Town, 1973). This highly diverse natural environment is well preserved and offers considerable potential as a place for learning.

Kabashima, located in Nagasaki City, was selected as a site that meets these conditions. Kabashima is a small remote island with an area of approximately 2.2 km². Although it was originally accessible only by boat, a bridge connecting it to mainland Nagasaki Prefecture was completed in 1985, eliminating the need for boat travel and greatly improving accessibility (Japan Remote Islands Center, 2019).

Japan is recognized as an island nation and a global biodiversity hotspot, with many endemic species in the Southwest Islands, Ogasawara, and Tsushima (Ichikawa 2006), each developing its own tourism and the accumulation of many methods (MoE 2016; Ogasawara Ecotourism Council 2018). However, the program has shifted toward tourism projects seeking extraordinary experiences, or has remained independent projects for each implementing organization, and the program has not become a program that enables integrated learning of biocultural diversity in participating regions. Since each activity is based on its own theme, the effectiveness of learning is considered limited.

Kabashima is only about 100 meters from the mainland, and there are no endemic species found in Tsushima, which is also within the prefecture. However, as mentioned above, the island contains diverse natural environments that support a wide range of bird species. Although Kabashima is very small, cultural practices influenced by this natural environment have also developed there. For this reason, the island was considered suitable for small-scale educational tourism that can be accessed by private car or other forms of land transportation. In addition, because visitors can make day trips without depending on boat or airplane schedules, Kabashima has the potential to serve as an ecotourism site specializing in bridge-connected remote islands. It

can also be developed as a place where mountains, rivers, the sea, and the cultures based on them are brought together to support systematic learning. Therefore, to explain the biocultural diversity of Kabashima, this study organized the island's distinctive elements as a small bridge-connected island and developed two programs that would be accessible and understandable for beginners. This study aims to explore how a pilot biocultural ecotourism program on Kabashima, a bridge-connected small island in Nagasaki, can integrate seabirds, marine livelihoods, local cultural practices, and invasive species issues to support participants' awareness, knowledge, and attitudes toward biocultural diversity.

II. Literature Review and Study Site

A. Study Site

Kabashima island, Nagasaki (Kyushu), Japan (Fig.1).

B. Literature Review: "Wild Birds" and "Biocultural Diversity" on Remote Islands

Wild birds are strongly shaped by environmental conditions in terms of their morphology and behavior. They are also generally more mobile than mammals and insects, and some species occupy higher trophic levels, or even the top of local ecosystems (Gill, 2007). Therefore, this paper positions birds as useful indicators for assessing biodiversity based on habitat conditions.

1) Integrated Model of Connector Species, Nutrient Circulation, and TEK via Seabirds

Recent studies in ecology and folklore have revealed the complex roles that seabirds play in understanding the relationships between nature and humans in island ecosystems. This study describes the biocultural diversity of islands by integrating the following three theoretical frameworks.

First, Jones et al. (2010) demonstrated that seabirds function as vectors for transporting nutrients (such as guano) from vast ocean spaces to land, serving as the ecological foundation fundamentally supporting the island's soil and flora. This illustrates the material "circulation model" between sea and land.

Second, Luna-Jorquera et al. (2012) pointed out that these seabird ecological dynamics are closely linked to traditional coastal fisheries (Artisanal fisheries). Fishermen use seabird movements as indicators to read changes in fishing grounds and marine environments, and seabirds have become a source of information supporting the livelihoods of local communities.

Thirdly, Sandin et al. (2022) positioned these seabirds as "connector species" that connect land and sea, discussing the importance of linking them to the traditional knowledge of local residents (TEK: Traditional Ecological Knowledge).

2) Application of Previous Research: Ecological Support for 'Semi-Agricultural, Semi-Fishing' in Kabashima

In Kabashima, the case study site of this study, this integrated framework also forms a strong foundation.

Layered Connector species: Kabashima is home to seasonal and global wild birds, such as the 'booby,' which migrates from the South Seas in winter and overwinters on coastal cliffs (such as Shiratono AnaCave), and the 'rare bird (vagrant),' which arrives from the continent during the spring and autumn migration seasons. These birds can be understood as dynamic connector species that link vast marine and continental ecosystems with a small remote island.

TEK of the sea, birds, and humans and the "semi-agricultural, half-fishing" cycle model: Before the development and subsequent decline of modern fishing equipment, Kabashima fishers used to interpret rich fishing grounds from "Toriyama," such as boobies, as signs of a bountiful catch (from the perspective of Luna-Jorquera et al.). They also read seasonal winds from migratory birds traveling from the continent, sensing the timing of fishing and farm work. Furthermore, the marine-derived nutrients provided by connector species enriched the soil of the remote islands, which in turn supported the islanders' agriculture (inference from Jones et al.'s perspective). In other words, the "semi-farming, half-fishing" lifestyle seen on Kabashima is not merely a combination of livelihoods, but Jones et al. (2025) mentioned a manifestation of a "circular relationship" in which seabirds mediate the inseparable connection between sea and land, and is a very vivid example of TEK as pointed out by Sandin et al. (2022).

3) Limitations of Previous Research and Originality of This Study

However, many of these existing research models for biocultural diversity conservation remain static approaches based on the implicit assumption of "physically isolated islands" or "settlers." This study overcomes the limitations of previous research in the following three points through Kabashima's unique environment.

First, breaking away from the 'remote sea model' and presenting a new symbiotic model that resists mainland influence. While existing research presents conservation models dependent on 'isolation,' Kabashima is a bridge-built remote island whose physical isolation was reduced by the opening of the bridge in 1986. The Kabashima case is a new model case demonstrating how, despite being bridged and exposed to the waves of

increasing mainland connectivity, we can maintain a unique symbiotic relationship among people, the sea, and birds (the semi-agricultural and semi-fishing cycle model), and transform this into a resource for modern environmental learning. It holds significance for overcoming the geographical limitations of existing research.

Second, addressing the unique vulnerability of 'tiny remote islands connected by bridges' and the inclusion of mobility. Kabashima has become a "remote island connected by land" that can be easily accessed by private car from the mainland without barriers such as ferry schedules. The sudden and short-term influx of day-trip visitors from photographers and anglers for bird photography directly causes friction with the habitats of connector species, such as breeding and resting grounds. This study questions methods for managing real-time environmental impacts in modern island environments, which emphasize "easy access and the coexistence of diverse activities within a limited space."

Third, shifting from 'Transit-Type' to 'Environmental Education': Reconstructing TEK in Day-Trip Tourism. TEK is usually treated as knowledge shared within the community. However, in Kabashima, where aging and fishing are declining, it is important not only to preserve TEK but also to quickly translate and communicate it to "day-trip tourists" who leave the island within a few hours. This study reveals how local guides, such as former fishers, reconstruct the "circulation model connecting sea, land, and birds" into environmental education programs during cruising and birdwatching to observe boobies, transforming consumer tourism into relational tourism.

III. Materials and Methods

In this survey, Heskett et al. (1994) conducted this survey because it was effective to collect participants' opinions through questionnaires and pursue future business development. The program items were as follows.

A. Winter Bonnet Inspection Program and Cultural Lecture

The first program, held on December 20, 2025, consisted of a winter Brown Booby observation cruise, a cultural lecture on Kabashima's maritime traditions, a live performance of the island's traditional folk song and dance, "Kabashima Haiya-bushi," hands-on activities, and interpretive commentary.

Brown Booby (*Sula leucogaster*) is originally a seabird distributed in Southeast Asia and the southwestern islands (Nelson 1978, Marchant & Higgins 1990), but in winter, As the catch in the waters near Nagasaki Prefecture increases, they migrate northward from the southern sea, which is their breeding grounds (Fig.3) (Nagasaki Prefecture Nature Conservation Association 1995; Nagasaki Prefecture 2021). Normally, wild birds migrate south during winter (Kerlinger 1995), but by observing their wonder and the dynamic of catching fish from cruise ships circling the island, the customers can experience firsthand the wonder. Additionally, participants will be deeply impressed by the richness and wonder of nature by witnessing the blue of the natural sea at Shirato no Ana Cave, which can only be reached by boat.

After the cruise, participants attended a cultural lecture given by local cultural figures, including a Buddhist monk, and learned about the lives of islanders who had long treated the sea with respect. They also watched a live performance of "Kabashima Haiya-bushi," a traditional folk song and dance that has been performed on Kabashima since the mid-Edo period. Through commentary and hands-on activities, participants learned how this folk tradition expresses gratitude for the blessings of the sea and favorable winds for maritime transportation, and how it reflects the islanders' close relationship with the sea.

B. Spring Migratory Bird Observation, Beach Cleanup, and Invasive Species Learning Program

The second program, held in May 2026, focused on the relationships and frictions between native species and humans during the spring migration season, as well as beach cleanups and issues related to invasive species, including stray cats and the rapidly increasing wild boar population.

In spring, Kabashima provides many opportunities to observe migratory and vagrant birds traveling across the continent. Kabashima is a small island with forests, rivers, wetlands, the sea, and fishing villages, but it is compactly packed with diverse natural environments. For this reason, it is an island where wild birds with various characteristics tend to inhabit it. Here, the customers can hold nature observation sessions and, guided by a guide, learn about these diverse natural environments through observing various wild birds. Additionally, by observing traces of wild boars that have recently invaded the island and ravaged all kinds of plants and crops, causing damage to the environment and human lives, accompanied by hunters, the book offers an opportunity to reflect on the breaking balance of nature. Lunch in this program includes game dishes. This was designed to help participants understand the benefits of utilizing the meat of harmful animals.

There have also been many cases in which cats brought to the island by humans became feral, preyed on rare wild birds, and caused problems in local living areas through their excrement. By listening to talks by activists involved in feral cat management, participants learned how human-introduced invasive species can threaten biodiversity on small islands and damage bird populations. This activity provided an opportunity to raise awareness of human-caused threats to island biodiversity.

Participants were surveyed to examine trends in environmental awareness. Since the target audience wanted to gather people from diverse backgrounds, we recruited people of all ages interested in nature and learning tours through the websites of the Japan Society for Environmental Education.

C. Program Design Rationale

In designing the program, this study adopted the framework of the Tbilisi Recommendations, which proposes five goals for environmental education: awareness, knowledge, attitudes, skills, and participation. For beginners, we considered that pilot programs should first help participants become aware of environmental issues, acquire basic knowledge, and develop their own attitudes. Once these foundations are established, participants may gradually acquire relevant skills and become motivated to participate in future environmental education and conservation activities. Ultimately, the program aims to nurture citizens who can engage in activities focused on the conservation of biocultural diversity in their respective regions. The National Youth Education Promotion Organization of Japan (2004) and Simmons (2004) evaluated this framework as a significant application of environmental learning, noting that it still plays a central role in practice, and considered it valid for the authors' programs, thus adopting it.

While searching for materials to effectively promote learning, they came across the booby that comes in large numbers in winter. This bird is a large seabird at the top of the surrounding marine ecosystem, and it jumps into the sea in groups to catch fish in a flashy manner, attracting attention and making it ideal for introduction (Nelson 1978, Marchant & Higgins 1990, Watanuki 2022). To secure food resources for this large seabird, the marine ecosystem, including fish, must be rich (Watanuki 2022). As mentioned earlier, the waters off Nagasaki Prefecture, including the waters around Kabashima, are important marine areas in Japan for their large winter fish catches (Nagasaki Prefecture 2021).

Additionally, the Tahara River, a small groundwater-fed river, flows through the area, forming wetlands and shrublands in the lower reaches. Even within a short distance downstream, wild birds with diverse forms and habits migrate under diverse environments brought by water resources, which serves as an indicator of the island's rich natural environment. Since rivers ultimately flow into the sea, the nutrients they transport may contribute to the productivity of surrounding marine ecosystems and support fish resources, which in turn sustain seabirds positioned near the top of the marine food web, such as boobies (Matsunaga, 1993; Tanaka, 2013; Watanuki, 2022). In addition, because boobies form large flocks when feeding, their presence has long served as an indicator of abundant fish for local fishers (Nomozaki Town, 1973; Wakabayashi, 1991).

Kabashima has its own unique culture (Ogawa 1997), including folk dances, shrines, and festivals that express gratitude for marine products and the blessings of the sea (Ogawa, 1997). However, such a culture cannot exist without a sea rich in fish. It is clear that the abundant water resources created by the Tahara River are a key factor in the culture of Kabashima, but in recent years, there has been a significant increase in boar invasion due to limited human involvement (Takahashi 2017). At the same time, introducing cats, an invasive species, has put biodiversity at risk (Watanuki 2022).

In addition, Kabashima is rich in biodiversity and cultural diversity, providing an environmental diversity that serves as a relay point for migrating wild birds. For those who want to learn these things, the advantage of being able to casually enter the island and learn is significant. By implementing programs described above, the study explores whether participants can learn the general principles of biocultural diversity and develop their own environmental awareness. Through programs that examine the relationships among people, the sea, birds, and nature on a bridge-connected small island, this study investigates the potential of small-scale ecotourism as a tool for learning biocultural diversity.

IV. Results and Discussion

A. Results of Program Implementation

The winter program included a total of 12 participants aged 20 to 72, with a varying gender and age composition from various locations in Nagasaki and Fukuoka prefectures. In the spring program, 4 women from Nagasaki and Fukuoka prefectures gathered aged 23 to 51. Recruitment was announced via the website of the Japan Society for Environmental Education, the 'Ayumi Study Tour', an organization that conducts study tours in Nagasaki Prefecture, campus notices at Nagasaki Prefectural University, and the Kabashima Kawos Society (an eco-tour organization) on Instagram.

On the day of both seasonal programs, participants gathered individually at the venue, the "Nagasaki City Kabashima Fureai Center," where the program started at 10:00a.m.. Participants were required to submit pre- and post-survey questionnaires, with 11 responses during the winter season. Regarding the response results, only one respondent was aware of biocultural diversity before participation, while the others were either familiar with biodiversity or completely unfamiliar. We also investigated the recognition of Kabashima. All participants from Nagasaki City answered that they knew it, while Sasebo residents had roughly equal numbers of those who

knew and those who did not, and only two people outside the prefecture knew it, indicating that it is not necessarily a widely known island within Kyushu.

This time, we conducted a preliminary survey scoring interest in everyday nature on a scale of 1 (low) ~ 5 (high). Below is a summary of the implementation status of each program.

1) Winter Program on December 20, 2025

Participants boarded a small fishing boat carrying 12 people and toured the course shown in the diagram. The waters around Kabashima are rich fishing grounds, so many fish gather in winter, and many boobies come from southern waters, including the Southeast Asia and the Southwest Islands of Japan.

On the day of the event, more than 100 boobies gathered on the Shiratono Ana Cave quay, diving into the sea to dynamically catch fish, greatly attracting the interest of participants. The boat then enters the Shirato Ana Cave. This natural sea cave is known for the vivid blue color of the seawater, created light enters the cave. The striking scenery provided participants with a strong visual experience and aesthetic satisfaction. Then, on the way to Korea, we toured the wreckage of a shipwrecked cargo ship and saw the current situation off Kabashima, a still vital shipping route, before returning to port. During the cruise, the captain explained the ecology of boobies, the connection to the former fishing industry where seabirds such as boobies were used as indicators for efficient landing, as well as Shiratono Ana Cave and the surrounding sea area in general.

After returning to port, participants experienced hands-on learning activities involving fieldwork on the cultural heritage scattered across the island. First, participants went to the Iwashu Shrine. This monument is maintained by the islanders as a monument where fishermen deify the fish caught on the island and express gratitude for the blessings of the sea they provide. Although it is called 'iwashi (sardine)', this is because the island's main fishery resource is the sardine, so it symbolically treats the iwashi as the 'representative' of all fish, and it does not enshrine only this.

After that, participants moved to Ebisu Shrine for an explanation. 'Ebisu' is a deity who governs abundant fishing and is widely worshipped in Japan (Oi 2013). Participants received explanations about the cultural and religious background of fishing deeply connected to the lives of island residents. After that, we headed to the nationally designated natural monument, the 'Great Eel Well.' The giant eel well is a unique phenomenon where the giant eel traveled upstream from the sea, entered through gaps in the stone structure of the well, settled, and was unable to escape as it grew. Therefore, it is designated as a natural monument, and it should be noted that neither the giant eel nor the well is designated separately (Toyama 1966). Here again, the phenomenon of fish migrating upstream reveals the connection between the sea and underground waterways, as well as the people who have valued and protected nature.

Because the Giant mottled eels (*Anguilla marmorata*) die from lifespans or illnesses, they have been passed down one after another. Counting from the Taisho era (1912-1926), the ninth generation is still alive, but due to deteriorating well water quality and low oxygen levels, they are now kept as evacuation in the adjacent tank. This eel here is affectionately known as 'Unataro' among the islanders, and the eighth generation who passed away are deified with graves, and visiting the shrine with the catchphrase 'Unsei Unagi Nobori' (a Japanese idiom showing how life progresses with the same momentum as an eel ascending the river) is used. It is popular among tourists for being believed to receive blessings that can improve lives.

For lunch, a bento shop near the island served Nagasaki's local dish, 'TorukoRice'. This is a dish invented in Nagasaki where tonkatsu (fried pork), fried rice, and spaghetti are served on a single plate. There are various theories about its origin, but since the dishes are made up of Western and Chinese cuisine, presenting both Eastern and Western dishes together, it is regarded as a symbol of Nagasaki's culture, which has opened doors to foreign and cultural realities (Takeno 2003), and was considered ideal for this project. By outsourcing cooking to bento shops as close to the island as possible, the aim is to reduce food mileage and the risk of food poisoning over time, while also offering Nagasaki's unique local cuisine, fostering a growing attachment to local cuisine from both environmental awareness and cultural perspectives.

A dance performance by members of the Kabashima Haiyabushi Preservation Society was held. Each dance movement and the background of the lyrics have their own meaning. Below are the lyrics and meanings following the dance movements.

At Muryo-ji Temple, a prominent monk from the island gave a lecture on the culture of offering animals based on Buddhist teachings. As an example, the funeral was held when the eighth-generation Unataro, who was raised in a giant eel well, passed away and was given a Buddhist name with the same rank as a human. The lecture explained to participants the background of the long-established 'Iso memorial service,' which fosters reverence for the beings that support human food, through the words and philosophy of the Buddhism.

In other words, 'animal memorial service' is the idea of expressing gratitude to those who support human life and daily life, and gratefully accepting their lives—distinctive culture nurtured within Japan's religious and cultural context nurtured within Japan's cultural climate. This was also emphasized that the abundant marine resources laid the foundation for Kabashima's formation.



Participants were asked to submit a questionnaire after the tour ended, and the responses received within one month were as follows. 10 out of 12 respondents.

*Activity announcements are necessary. I felt the need for the ability to enjoy, learn, and communicate.

The aim of this program is summarized in a diagram (Fig. 5).

2) Spring Program on May 2, 2026

The second program, titled "Spring Migration of Rare Birds, Vagrants, and the Threats Surrounding Kabashima," was conducted on May 2, 2026. Four participants took part in the program. The aims of each activity and the expected behavioral changes are described below.

As mentioned earlier, Kabashima is a point where wild birds crossing Eurasia and North America pass during spring. Participants observed wild birds that appeared along the course shown in the diagram, explaining the diversity of their species and the island's natural environment.

In addition, participants observed feeding traces left by wild boars rapidly increasing in number were discovered on the hunter trail connected to the Nagasaki Peninsula, allowing visitors to witness firsthand the actual damage to the island's agriculture caused by reduced human involvement with nature.

During the observation session, participants also observed drifting debris along the coast, and although it will be brief, conducted a brief cleanup activity. This allows direct confirmation of the impact of plastic and other waste discarded by humans on nature.

Expected behavioral change: Participants were expected to understand that Kabashima's diverse natural environment serves as a habitat and resource base for numerous wild birds. They were also expected to recognize that damage caused by wild boars entering this rich natural environment, the disruption of the delicate ecological balance caused by the excessive increase of certain species, even native species, and pollution from careless human waste disposal can all disturb living habitats. Through these observations, participants were expected to understand that maintaining ecological balance requires continuous human effort.

For lunch, they serve curry rice made with wild boar meat from Nagasaki Prefecture and local ingredients. Although wild boars are rapidly increasing pests, their meat is high-protein, rich in B vitamins, making it a valuable food source. By eating such meat, participants were expected to recognize that reframing it as an ingredient can create a completely different value. Additionally, curry rice is highly nutritious with meat, vegetables, and spices, and can be prepared hygienically when properly cooked. It does not require complex preparation steps, making it a popular choice for Japanese school lunches and large outdoor activities as a dish that even beginners can prepare in large quantities using the same method (Takano 2016). Here, using vitamin-rich wild boar meat in curry rice allows it to appeal to participants' preferences.

Kabashima had not implemented systematic spaying and neutering measures for stray cats. As a result, cats that had become dependent on inappropriate human feeding reproduced, and their population increased. The increase in stray cats has caused problems in nearby residential areas, including feces and urine damage. In addition, these cats prey on rare migratory birds visiting the island and native species originally inhabiting the island, thereby causing serious damage to local biodiversity.

To reduce such damage, conserve biodiversity, and facilitate smooth community management, "Community Cat Activities" are widely practiced in Japan by activists with animal welfare beliefs, achieving a certain level of success. While some municipalities in Japan reduce damage by hunting stray cats, hunting stray cats is not permitted in Nagasaki Prefecture, and actual measures are limited to slow-paced damage reduction through community cat activities. The program invited activists who are engaged in neutering and neutering stray cats on this island and explained the outline of their activities on the island. Additionally, it explains these distortions in the proper human-animal relationship from the perspective of cherishing life. This helps people understand that the disorderly increase in invasive species is caused by humans. From a broader perspective, this also leads to disregard for life.

Through this program, participants were able to relearn and reflect on the connections between people, living things, nature, and culture. If there were any activities like this happening, "I would like to join again".

Impressions and feedback were generally positive. Even on islands with limited tourism resources, there is a possibility of receiving high praise depending on how you present your experiences. However, since the sample size is very small this time, it should be noted that this is only a trial operation as a "monitor tour". The aim of this program is summarized in a diagram (Fig. 6).

Although these two programs had only 16 participants in total, they generally gave high evaluations among participants regardless of gender or age (20~72 years old), with both satisfaction and motivation being highly rated. The overall evaluation of participants is shown in Figure 7.

B. Discussion

Building on the review of previous studies up to the previous chapter, this section develops a counterargument against the critical perspective that "small-scale bridge remote islands are unsuitable for ecotourism," and proves the validity of the approach in this study.

1) The 'Loss of Islandness' from Bridge Building and the Nonconformity Theory for Ecotourism

There has been strong criticism of tourism development on small-scale bridge-connected remote islands, based on the argument that bridge construction undermines the foundations of ecotourism. Barthón (2007) points out that the completion of bridges can accelerate the uncontrolled influx of tourists and make sustainable environmental management more difficult. In the Japanese context, Takahashi (2020) shows that bridge construction often leads to "day-trip" or "pass-through" tourism. Following this logic, it may be difficult to establish ecotourism based on deep regional immersion on small-scale bridge-connected islands that have become easily accessible.

2) Creating New Island-like Characteristics and Practicing Tourism Based on the Circulation Model Seen in Kabashima

However, the non-compliant theory mentioned above has the limitation of assessing isolation solely based on "physical isolation," while overlooking micro-ecosystems within the island. First, the "semi-agricultural and semi-fishing" lifestyle observed on Kabashima can be understood as a socio-ecological ecosystem supported by the perspectives of Jones et al. (2025) and Luna-Jorquera et al. (2012). Even after the bridge was built, the traditional knowledge (TEK) that once functioned as the lifeline of this ecosystem and connected the sea, land, and birds is considered a cultural heritage still passed down on the island.

Second, placing this "circular seabird economy" at the core of the experience acts as a powerful brake on the fate of "transit-based tourism." This is seen as the fate of building bridges to remote islands. It is essentially impossible to observe seabird ecology and understand related semi-agricultural and fishing activities in a short period. If the collaborative design approach proposed by Wu and Yao (2025) is applied to Kabashima and a system is established for local guides to translate and communicate TEK to day-trip tourists, accessibility (bridging) will not be a disadvantage; rather, it will provide positive conditions for smoothly drawing urban residents into the island's unique natural timeline.

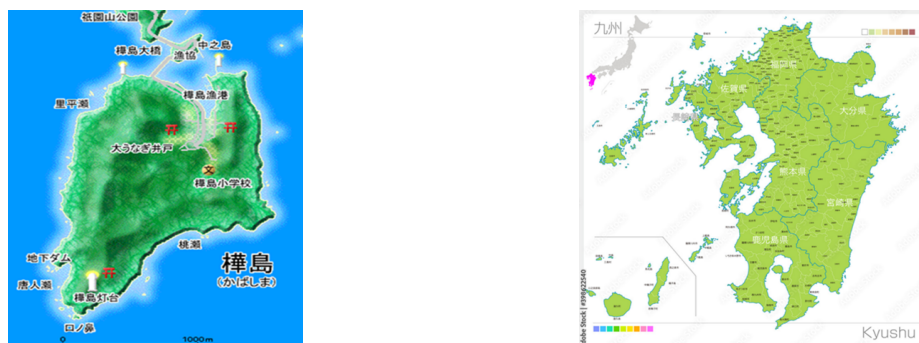


Figure 1. Map of Kabashima in Kyushu

(Map reprinted from this website: <https://nihonshima.net/sima4/nagasaki/kabasima2.html>).



Figure 2. Biocultural Circular Model.



Figure 3. Brown Boobies



Figure 4. Kabashima Haiyabush folk dance.

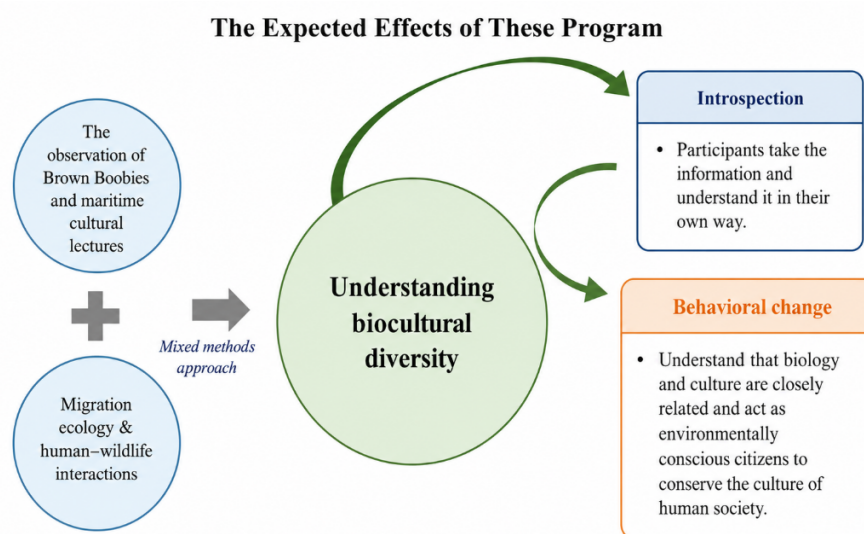


Figure 5. The expected effect of these program.

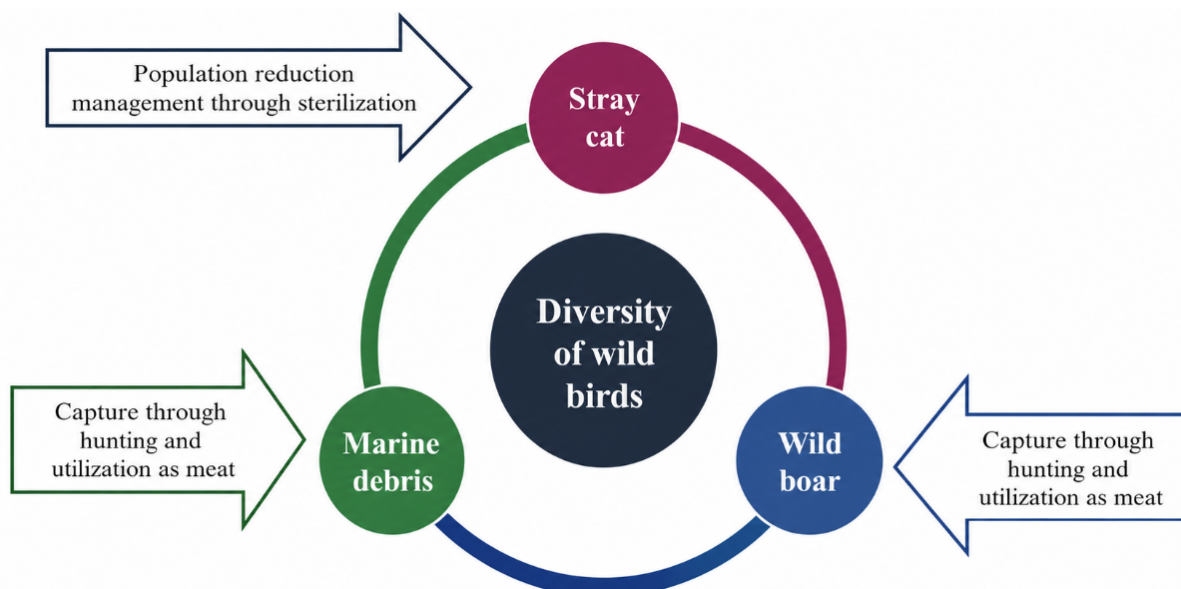


Figure 6. Understanding the threats that threaten the diversity of wild birds on Kabashima.

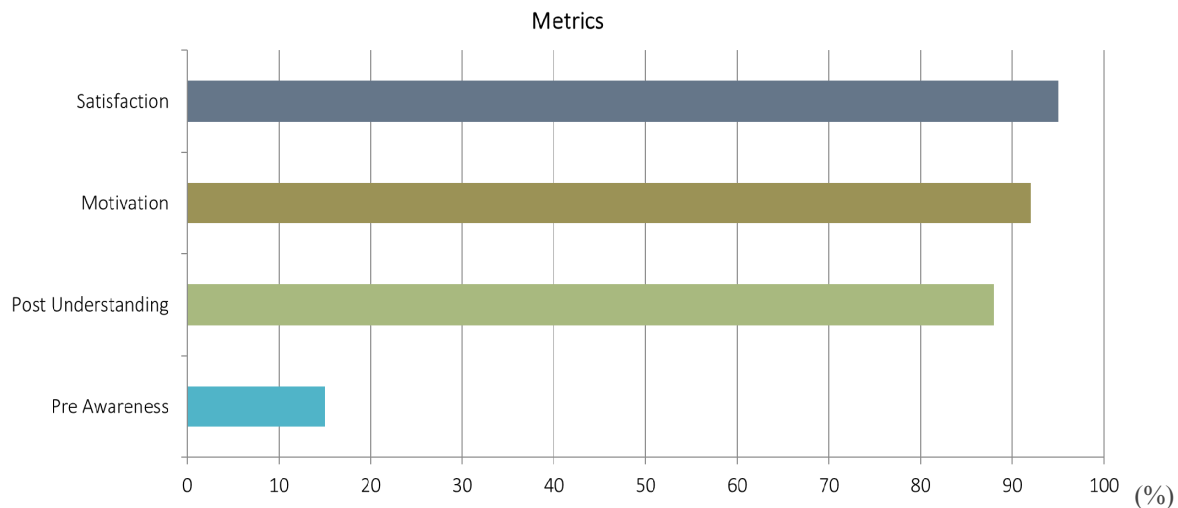


Figure 7. Educational Impact Metrics

Participant Pre Survey Results Summary (Winter program)

Total Respondents: 11 participants

Table 1. Knowledge Level Regarding Biocultural Diversity

Survey Question / Response Options	Number of Respondents
Knows about "Biocultural Diversity"	1
Knows about "Biodiversity" only	5
Does not know either term at all	5
Total Respondents	11

Table 2. Recognition and Awareness of Kabashima Island

Respondent Demographics	Awareness Status & Key Findings
Nagasaki City Residents	100% Awareness (All respondents answered that they know the island).
Sasebo City Residents	Split Awareness (The number of respondents who know and do not know is roughly equal).
Residents Outside Nagasaki Pref.	Low Awareness (Only 2 respondents answered that they know the island).
Key Conclusion	Kabashima Island is localized and not necessarily widely recognized or known across the broader Kyushu region.

Table 3. Pre-Survey Interest Scores (Scale of 1 to 5)

Interest Category	Minimum Score	Aggregated Score	Observed Analytical Trend
Interest in Daily Nature	3	48	All participants showed moderate-to-high interest (score ≥ 3), representing a strong baseline connection to nature.
Interest in Regional Culture	3	44	All participants scored 3 or higher, but the overall aggregate is lower, indicating less enthusiasm compared to daily nature.

Table 4. Participant Expectations for Remote Island Eco-Tours

Expected Tour Element (Multiple Choice Allowed)	Votes / Count	Overall Behavioral Trend
Island-specific extraordinary / non-daily experiences	10	
Richness and abundance of nature	9	
Local gourmet food / specialty dishes	6	
Interaction and engagement with local residents	5	
Summary of Motivation	-	Participants display a clear tendency to seek elements and experiences that contrast with their daily, realistic lives in their home regions.

Post-Tour Participant Survey Results (Winter program)

Respondents: 10 out of 12 participants

Table 5. Overall Evaluation & Impressions

Topic / Question	Quantitative Results	Qualitative Feedback (Summary)
Overall Satisfaction (Scale 1-5)	Score 5: 8 pax Score 4: 1 pax Score 3: 1 pax	Participants highly appreciated nature, culture, and new discoveries (e.g., Booby birds, Haiya dance). Some requested more academic explanations.
Impression of Kabashima	-	Accessible by car, but hard to interact with locals or find places independently without a tour. Great potential for exploration.
Price Setting (3,600 JPY)	Cheap: 6 pax Reasonable: 3 pax Expensive: 1 pax	Generally considered highly cost-effective and a great value for the experience.
Intention to Return	Want to go: 9 pax Do not want to go: 1 pax	High willingness to return to see more. One participant felt one visit was sufficient.

Table 6. Activity Evaluation & Rankings

Activity	Rankings	Participant Feedback
a: Booby Bird & Cave Experience Cruise	1st: 8 pax 2nd: 1 pax	Highly rated for the spectacular flight of the birds and the captain's guidance. Provided a rare perspective from the sea.
b: Walk to Giant Eel Well & Monuments	1st: 2 pax 2nd: 5 pax 3rd: 3 pax	Enjoyed the mysterious atmosphere and seeing the giant eel. Exploring the island on foot with others was well received.
c: Haiya-bushi Dance Live & Experience	1st: 3 pax 2nd: 2 pax 3rd: 2 pax 4th: 3 pax	Dancing and learning the meaning behind the movements was fun and energizing. Allowed for great interaction with locals.
d: Historical Lecture at Muryoji Temple	1st: 2 pax 2nd: 1 pax 3rd: 2 pax 4th: 5 pax	Deepened understanding of the island's deep history and the link between nature and religion. A few found it relaxing but sleep-inducing.



Table 8. Operations (Lunch & Schedule)

Topic / Question	Quantitative Results	Qualitative Feedback (Summary)
Lunch Satisfaction (Turkish Rice Bento)	Highly Satisfied: 8 pax Somewhat: 1 pax Neutral: 1 pax	Delicious, filling, and appreciated as a local specialty. A few mentioned the portion was slightly too large.
Future Meal Provision	Should be provided: 10 pax	Highly convenient, reduces preparation effort, and allows participants to share the joy of eating local food together.
Activity Volume (1: Few to 5: Many)	Score 3 (Optimal): 7 pax Score 2: 2 pax Score 5: 1 pax	Well-balanced mix of active and seated activities. A few felt it was densely packed and suggested splitting the tour to allow more relaxation.

Table 9. Educational & Social Impact

Topic / Question	Quantitative Results	Qualitative Feedback (Summary)
Understanding of Biocultural Diversity	Deepened: 8 pax Neutral: 2 pax	Realized the deep connection between local life, nature, and culture. A few lacked a learning mindset or found the lecture difficult to follow.
Motivation for Environmental Action	Motivated: 5 pax Neutral: 4 pax Not Motivated: 1 pax	Inspired by the traditional sustainable lifestyles and the visible decline of local fish. Some are already taking action independently.
Motivation for Cultural Preservation	Motivated: 7 pax Neutral: 1 pax Not Motivated: 1 pax (No Answer: 1 pax)	Felt a strong need to pass on traditions like Haiya-bushi due to depopulation. A few felt this should be left to those who are strongly passionate.

Table 10. Participant Survey Results: Environmental Issues & Wildlife (Spring program)

Topic / Question	Quantitative Results	Qualitative Feedback (Reasons & Opinions)
Perception of Human Damage Caused by Wildlife	Think so (Yes): 3 pax Do not think so (No): 1 pax	• Yes: Causes infectious diseases, damages plants and crops, ruins the landscape by digging soil, invades private gardens, and attacks humans. • No: Cannot imagine damage occurring on a severe scale comparable to bear attacks.
Opinions on Unlimited Feeding of Stray Cats (Alien Species)	-	• It is generally not a good practice. • Acceptable only if humans can properly manage them; otherwise, it should not be done. • Cats are living creatures too, making the urge to feed them somewhat inevitable. • It is pitiful for cats to be abandoned or pampered solely for human convenience. • Concerns were raised about cats catching diseases.
Awareness of Marine Plastic Waste & Cleanup Participation	Awareness: All pax Willingness to Participate: All pax	• Want to protect nature; cleaning up even a little helps marine life survive. • Hesitant to participate alone due to dangerous items washed ashore. • Recognizing that microplastics are harmful to human health, participants want to maintain the natural environment for their own well-being.

Table 11. Spring Program Survey Results Analysis

Question	Quantitative Results	Qualitative Responses / Comments (Reasons & Thoughts)
Q1: Did this tour deepen your understanding of biocultural diversity?	1. Deepened: 4 respondents 2. Not deepened: 0 respondents 3. Neither: 0 respondents	- I realized how closely living things and humans live together. - I learned that within the coexistence of humans and nature, human involvement significantly impacts the survival of organisms. - Nature and living things are interconnected with human life and culture. - It was highly engaging because it wasn't just listening to lectures; there were various activities such as going out into the field, experiencing things firsthand, eating, and observing.
Q2: Did you understand that the biocultural diversity of Kabashima and the world is under threat? In what ways?	1. Yes: 4 respondents 2. No: 0 respondents 3. Neither / Do not wish to answer: 0 respondents	- The encroachment of wild boars into human society, the impact of birdwatching on human communities, and the importance of responsibly managing stray cats after spay/neuter surgeries so they can live out their single-generation lives safely. - Wild boars entering the island. The influx of non-native species causes significant issues regarding the habitat and food sources of the native wildlife. - The invasion of wild boars is negatively affecting the local vegetation.
Q3: Did you understand that Kabashima is a valuable transit point for rare migratory birds in Japan?	1. Yes: 3 respondents 2. No: 0 respondents 3. Neither / Do not wish to answer: 1 respondent	- I cannot make a judgment without observing a larger variety of wild birds. - Hearing explanations about the subtropical vegetation and the beautiful birds that visit the island helped me understand. - The guide's commentary was excellent; even when the birds weren't visible, they explained what kind of birds were present based on their songs, which made it very easy to understand.
Q4: This lunch was curry rice utilizing wild boar meat obtained from pest control. Please share your thoughts.	N/A (Open-ended)	- Even though it was a pre-packaged (retort) meal, it was delicious. I felt it is very important to appreciate and utilize the lives of culled animals. - It was delicious. Eating the meat of these animals while reflecting on the pest issue left a strong impression on me, and I will maintain an interest in this topic moving forward. - It was very delicious. Thinking deeply about the issue while eating made it stay with me vividly.
Q5: What are your thoughts after actually cleaning up the drifted garbage on the island?	N/A (Open-ended)	- There was a large amount of marine debris from overseas and waste from commercial fishermen. First and foremost, we must raise awareness about littering. - It was heartbreaking to see problems that would not exist if humans didn't litter. I was reminded of the horror of non-degradable plastics, which ultimately enter our own bodies. Gathering as a group to pick up trash while discussing the waste problem was a great, educational, and enjoyable opportunity. - I was shocked by the sheer volume of garbage, including marine debris from foreign countries. Usually, I just see it and can't do anything about it, so I am very glad I could participate in this active cleanup.



Question	Quantitative Results	Qualitative Responses / Comments (Reasons & Thoughts)
Q6: After listening to the lecture about reducing the stray cat population through spay/neuter (TNR) programs, what do you think about humans feeding stray cats?	N/A (Open-ended)	- Irresponsible feeding is unacceptable. It is crucial to continue managing and monitoring them properly even after spay/neuter surgeries. - I learned that we can reduce the population while still valuing the lives of the existing stray cats. I believe feeding them is acceptable as long as people possess the correct knowledge and do it responsibly. - I think feeding stray cats is fine, provided it is done in the correct and responsible manner.
Q7: Do you think management programs like the one mentioned above should expand in the future?	1. Yes: 4 respondents 2. No: 0 respondents 3. Neither: 0 respondents	- While it feels a bit sad to imagine a future where stray cats completely disappear from the outdoors, this is frequently brought up as a serious community issue, so I do want to see these countermeasures spread. - Since these activities are meaningless if executed incorrectly, I think it would be excellent if volunteer organizations with proper training and knowledge expanded their operations nationwide. - Learning that these abandoned cats finish their lives within a single generation made me strongly feel that this correct and humane approach should be expanded across the country.
Q8: Please provide your overall impressions of the program.	N/A (Open-ended)	- It was an intensely detailed, niche, and highly enjoyable tour once again. I am looking forward to future events and would love to participate again. - I was able to spend a deeply fulfilling, fun, and highly educational time. It embodies the true essence of travel—cherishing the local nature and wildlife, interacting with the local residents, and learning about their culture. It was also wonderful to have dedicated time to confront and think deeply about ongoing real-world issues. It was an overall magnificent experience. - Through this program, I was able to re-learn and reflect deeply on the intricate connections between humans, wildlife, nature, and culture. If similar activities are organized in the future, I would definitely love to join again.

V. Conclusion

The objectives of this monitoring tour were as follows. Namely, the Brown Booby is a large seabird located at the top of the ecosystem and frequently migrates to Kabashima during winter, making it difficult to maintain overwintering populations off the coast of Nagasaki Prefecture without abundant marine resources, which are an absolute requirement associated with food resources. Because large numbers of fish are needed to meet the survival requirements of large birds, a rich sea that can support many fish is necessary. This requires nutrient-rich river water formed from groundwater flowing from land areas. It is suggested that the legend of the giant eel well may have originated from the abundance of groundwater. Additionally, river water forms small wetlands just before it flows into the sea and, combined with the presence of riparian forests along the riverbanks, greatly contributes to supporting the diverse bird fauna (Nakamura & Ishida, 2025).

However, the current biodiversity of Kabashima cannot be denied, as experienced in the program, with issues identified including stray cats introduced by humans, wild boars that entered and settled on the island due to insufficient human management of the natural environment, as observed during the instructors' field participation through traces found in forests and farmland, and marine debris washed ashore, as experienced through cleanup activities. Fascinating folk dances like Kabashima Haiyabushi praise the abundant marine resources in their lyrics (Iwasaki, 1987).

The encouragement for participants' understanding was carried out with the above as a backdrop. From the survey results of participants in this project, although the number of participants and the sample size were small, it was suggested that on Kabashima, a small bridge-connected remote island, participants with a certain level of

interest can learn about biocultural diversity and, through a series of stories that run throughout the program's background, reflect on their own actions and potentially change their behavior in their daily lives. It was also found that growing interest in biodiversity, which integrates biological diversity and the underlying cultural diversity, is crucial for the healthy survival of local communities going forward. Furthermore, even on small bridge-connected remote islands without endemic species like Kabashima, if participants are presented with the island's rich biocultural diversity in an accessible way, it seems possible to fully leverage the strength of ecotourism, which allows for rich learning within a relatively small area of activity.

Furthermore, under the unified awareness of learning about Kabashima's rich forests, underground water channels, rivers, wetlands, marine areas, and the culture formed there, the authors continuously implemented themed learning programs in which islanders and stakeholders came together and attempted to establish new "small-scale ecotourism" programs that contribute to fostering environmental awareness and respect for local culture among participants through experience. It was also shown that these programs could be successfully operated.

Conservation models in existing research relied on "isolation." In contrast, the case of Kabashima suggested that even on extremely small bridge-connected remote islands, sustainable ecotourism (environmental education) can exist by centering on the "inseparability of semi-agriculture, semi-fishing, and seabirds" condensed into a tiny space. Therefore, the new bridge-connected remote island symbiosis model proposed in this study may be effective both academically and practically.

This exploratory case study suggests that bridge-connected small islands may serve as suitable sites for short-term biocultural ecotourism when ecological observation, local cultural interpretation, and environmental issues are integrated into a coherent learning narrative.

VI. Ethical Approval

Explanation was provided to the participants, informed consent was obtained, anonymity was ensured, participation was voluntary, and permission was obtained to use photographs. The study respected the island's unique natural timeline.

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