

A Consideration of Applying Collective
Impact Framework to Sustainable
Tourism: The Case Studies in California,
United States and Iriomote Island, Japan

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Doctor of Philosophy

A Consideration of Applying Collective Impact Framework to Sustainable Tourism: The Case studies in California, United States and Iriomote Island, Japan

(コレクティブ・インパクトのサステナブル・ツーリズムへの応用の検討)

—アメリカ・カリフォルニアおよび西表島の事例から—

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Abstract

Tourism is an important industry that accounts for 10.4% of global GDP and supports the jobs of 3.13 million people (CREST, 2017). The global tourism industry has grown rapidly in the last 10-15 years, and various adverse effects of tourism on certain destinations have been reported. An increase in the number of visitors generated problems with littering, congestion, and affecting the daily lives of local citizens in urban areas. In areas where the natural environment is the centerpiece of tourism, it is directly linked to environmental degradation. These adverse effects are the result of over-tourism, which is defined as “tourism that has moved beyond the limits of acceptable change in a destination due to the quantity of visitors, resulting in degradation of the environment and infrastructure, diminished travel experiences, wear and tear on building heritage, and / or negative impacts on residents” (CREST, 2017). In contrast to this over-tourism, the concept of sustainable tourism (ST) is described as “tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities” (UNEP and UNWTO, 2005). ST is a type of tourism that meets the needs of the entire local community, including visitors to the destination, in harmony with all three aspects of economy, environment, and society. It is now recognized as an important tool to enable sustainable economic development in areas where tourism is a key industry. Many of the previous case studies on ST have shown the significance of formulating plans in line with using various ST indicators or three-party ST certification standards, and the significance of interpretation to visitors. Although the importance of stakeholder collaboration is discussed, there are still few proposals for a concrete framework.

On Iriomote Island in Okinawa, where the author has been involved for many years, the society and the natural environment have changed rapidly in recent years due to the increase in numbers of tourists. The author conducted research on land use changes on Iriomote Island from the 1960s to the present by analyzing historical topographical maps and aerial photos, as well as interviewing local residents. The result showed that the traditional lifestyle on the island was harmonious with nature, the seasons, and the characteristics of the land, until a wave of development reached local society. Over-tourism has been pointed out in some areas on Iriomote Island from around the 2010s, and it is thought that the introduction of ST is urgently needed for Iriomote Island to continue to be a place where beautiful nature and rich culture remain.

In order to introduce ST to Iriomote Island, it is necessary to clarify the structure of the relationship among stakeholders in successful ST cases. As a case study, a total of 10 months of fieldwork with interviews was done in Lake Tahoe and Monterey Bay, California, USA. Although both destinations are quite

popular and visited by many people worldwide, Lake Tahoe still maintains excellent water quality with transparency of more than 25 meters, and Monterey Bay maintains an ecosystem including wild marine mammals such as whales. Therefore, these two cases can be considered as examples of successful ST.

A literature survey was done to analyze the historical background of the process of developing ST and revealed that both destinations have experienced significant environmental destruction mainly due to development. In both destinations, concerned scientists and local residents started environmental conservation from the bottom up, and eventually those activities gained support from core organizations, which in the case of Lake Tahoe is the TRPA, a bi-state agency, and the non-profit Monterey Bay Aquarium in Monterey Bay. It was also revealed that the natural environment, which is a tourism resource, has been preserved up to the present by those organizations taking leadership in environmental conservation.

In order to clarify the structure surrounding the core organization in two destinations where ST is successfully implemented, interviews were conducted. As a result, TRPA in Lake Tahoe, an organization with state level authority, works closely with local environmental organizations, universities, and tourism industries to preserve the natural environment around Lake Tahoe, especially restoring the transparency of the lake as the common goal to achieve ST in the region. Likewise, many local residents are active as volunteers at the Monterey Bay Aquarium, which proves that the aquarium has strong ties to the community.

In addition, the aquarium provides a place where the local community and stakeholders can gather to collaborate under the theme of ocean conservation. It also facilitates involved stakeholders to have a larger outcome.

The two destinations mentioned above have two features in common: they both have a shared ST vision as a destination, and there is one organization that supports and facilitates all of the ST practices happening for the destination. These features can be found in the Collective Impact Framework (CIF) proposed by Kania & Kramer in 2012. The CIF, which has structured the form of stakeholder collaboration, has been introduced in many countries around the world as an advanced method that enables major social changes. For its establishment, a common agenda, a shared measurement system, mutually reinforcing activities, constant communication among stakeholders, and a backbone organization that supports the framework are necessary.

Based on the CIF, both case studies in California have a common agenda developed, activities of all the stakeholders involved were carried out under the common agenda, and there was an organization that supported the entire system of ST. In other words, these cases proved to be successful cases with the five elements of CIF.

On the other hand, analyzing the situation on Iriomote Island, there is no common agenda, no shared measurement system, activities that are supposed to reinforce each other are fragmented, communication is limited, and most importantly, the organization that should be the backbone of the entire activity is not present. Therefore, it was concluded that the CIF is still not present on Iriomote Island.

In the light of the successful cases in California, the author concluded that the establishment of a core (backbone) organization based on CIF on Iriomote Island should be done to design and share a new form of ST to the island. In addition, learning from successful cases in California, an NPO can be a powerful organization for implementing the CIF to Iriomote Island in order to acquire sustainable funds, and to develop a common agenda with the help of academia to gain expertise on environmental conservation.

Chapter 1

Introduction: The Significance of Sustainable Tourism

Tourism is an important industry that accounts for 10.4% of global GDP and supports the jobs of 3.13 million people (CREST, 2017). The global tourism industry has grown rapidly in the last 10-15 years, and some negative consequences of tourism have been reported in certain areas. In Barcelona, Spain, negative consequences became so significant that, not only is there an increased irritation and dissatisfaction with residents due to too many tourists, but also problems associated with the local livelihood such as rising apartment rental costs have been pointed out. The city of Barcelona has banned building private accommodation and new hotels in certain regions of the city (The Guardian, 2018). Even in Japan, tourists with inappropriate manners have caused an increase in garbage and other obstacles to the daily lives of citizens. These are beginning to be recognized as major problems in famous tourist destinations such as Kyoto and Kamakura (Japan Times, 2018).

In areas where the natural environment is the centerpiece of tourism, an increase in tourists is directly linked to the destruction of the environment. For example, in Maya Bay on Phi Phi Island, Thailand, coral reefs were destroyed by the anchors of tourist boats. Consequently, the ecosystem collapsed, and the coastal area had to implement a no trespassing notice until the ecosystem can fully recover (BBC News, 2018). Similarly, tourists were banned from entering Boracay Island in the Philippines due to the ecosystem degradation induced by over-tourism. It is now opened to the public again; however, the government introduced strict regulations, which limits the number of people who can enter the island at the same time (CNN Travel, 2018). Even in Machu Picchu, Peru, a World Heritage Site, many tourists entering the area increased safety issues and caused damage to the historic ruins. A few policies, such as dividing the times that tourists can visit into morning and afternoon, as well as setting a limit on the maximum duration of stay for tourists, were introduced accordingly (BBC News, 2018).

These problem cases of various tourist destinations show that an increase in the number of visitors generated problems with littering, congestion, and affecting the daily lives of local citizens in urban areas.

Especially in areas where the natural environment is the centerpiece of tourism, it is directly linked to environmental degradation. These adverse effects are the result of over-tourism, which is defined as “tourism that has moved beyond the limits of acceptable change in a destination due to the quantity of visitors, resulting in degradation of the environment and infrastructure, diminished travel experiences, wear and tear on building heritage, and / or negative impacts on residents” (CREST, 2017). According to CREST,

the types of places impacted by over-tourism range from highly sensitive natural environments, such as marine protected areas and wilderness area, to widely accessible and popular places for recreation such as World Heritage Sites, historic cities, beaches, and regional destinations. They also pointed out that almost half (46%) of the 229 of the UNESCO natural heritage sites have no tourism management plan (CREST, 2017).

Considering many National Parks in the United States have a tourist management plan, such as mandatory shuttle service within the park, increased entrance fees during the peak season, or a mandatory parking reservation system, this implies that UNESCO World Natural Heritage sites tend to struggle with properly managing the site after they are registered. In other words, the registration does not help destinations install proper management systems to control the visitors that are attracted by its fame as a UNESCO World Natural Heritage sites. The cases of Boracay Island and Maya Bay mentioned earlier also lacked effective management systems. When environmental damage is already done, the solution would usually be installing strict visitation rules, raising the price of entry fees in order to prevent further environmental degradation, and giving the environment time to restore itself without any human disturbance.

However, installing strict rules or indefinite closure of the destination is not ideal nor sustainable because no income will be generated during the time of restoration, and that directly affects the livelihoods of local people.

In contrast to over-tourism, the concept of sustainable tourism (ST) is described as “tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities” (UNEP and UNWTO, 2005). ST is a type of tourism that meets the needs of the entire local community, including visitors to the destination, in harmony with all three aspects of economy, environment, and society (shown in Figure 1).

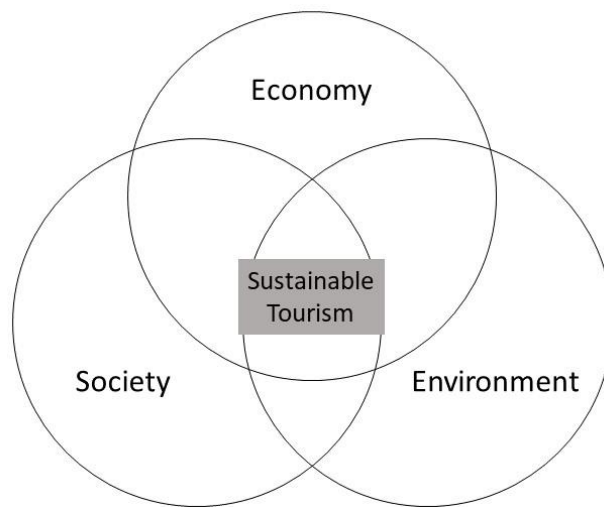


Figure 1. The Concept of Sustainable Tourism (source: author's own)

ST is now recognized as an important tool to enable sustainable economic development in areas where tourism is a key industry, because tourism is a dynamic and complex system that involves all the stakeholders in a destination. The term ST itself is not something completely new. According to Qian et al. (2017), the term first emerged when Ceballos Lascurain of the International Union for Conservation of Nature proposed the concept of ST in 1983. In a global context, UNWTO (United Nations World Tourism Organization) states that within the United Nation's 17 Sustainable Development Goals (SDGs) numbers 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), 12 (Ensure sustainable consumption and production patterns), and 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) are deeply related to the tourism industry and can also be achieved with the support of tourism, along with 13 other goals (UNWTO).

Previous studies on ST showed the significance of visitor interpretation (Oshima 2016, Jacobs and Harms 2013, Powell and Ham 2008), environmental education to visitors (Yoshitomi 1999, Wyles et al. 2013), and stakeholder collaboration (Toko 2014, Salerno et al. 2013, Miočić et al. 2016, Chiodo et al. 2019, Fukami 2011). However, Toko pointed out that many of the studies on ST usually only focus on one out of three aspects that sustainable tourism should secure at the same time, and the economic aspect is usually most emphasized because tourism itself is an economic activity (Toko, 2018). It requires a lot of effort to secure the environmental and sociocultural aspects of tourism, because these two aspects can be easily ignored when trying to improve the economic situation of a destination. Some empirical research on ST uses various ST indicators or third-party ST certification standards, such as the Sustainable Tourism Criteria developed by Global Sustainable Tourism Council (GSTC), which states what should not be done in the

context of sustainable tourism. Green Globes Certification for instance, is a certification based on the standards provided by GSTC. It has 44 core criteria and more than 380 compliance indicators for screening, and the destinations are reviewed twice a year which makes the certification reliable. Toko explains the benefits of gaining third-party certification; 1) a destination with certification can differentiate themselves from other competitors, 2) visitors to the destination can easily recognize the authenticity of the tours provided by the destination, 3) the government can also support the destination with ST certification to make it standard, and 4) the recognition on authentic ST certification can promote the overall level of standards of ST certification (Toko, 2018). In contrast, on Kangaroo Island in Australia, multiple stakeholders worked together and developed their own criteria for monitoring sustainable tourism activities through workshops with local citizens, the tourism industry, and wildlife researchers to discuss and formalize the criteria.

Nonetheless, adopting these certification standards and criteria has proved to be effective for managing ST on a destination level. Other indicators, for example Tourism Carrying Capacity (TCC), have been discussed in the context of tourism over the years. The concept of TCC has two dimensions, Environmental Carrying Capacity (ECC) that is a parameter of environmental quality, and Social Carrying Capacity (SCC) that measures visitor experience (Salano et al. 2013). The concept first emerged in the 1950s (CREST, 2017) and is often pointed out as an important indicator to monitor tourism activities by finding the favorable balance between ECC and SCC. It emphasizes that the use of natural resources should not be overwhelmed by human activities, and when the amount of human activity exceeds the limits of acceptable change of a natural environment, it will be considered overuse. Overuse is very similar to the concept of over-tourism, but rather refers to the actual status of the natural environment which can be calculated by assessing the health of the ecosystem. There is also Physical Carrying Capacity that can be calculated in numbers such as the maximum capacity of accommodation, the total number of rental cars, and in case of a remote island, the maximum capacity of the ferries. Accordingly, carrying capacity that cannot be easily calculated are LAC (Limits of Acceptable Change) that is based on an unpleasant feeling of visitors when visiting overcrowded destinations and the amount of human activity that does not disturb the natural environment. LAC is mostly used by the US Forest Service to evaluate recreational use of national forests. Likewise, VERP (Visitor Experience and Resource Protection) is employed by US National Parks to identify appropriate resources and social conditions-indicators and standards of quality to be achieved and maintained (Manning, 2001). Although these frameworks have been successfully implemented in many of the National Parks and protected areas, researchers pointed out that some weaknesses occur, such as being non-quantitative, reactive, and lacking analytical strictness (Salano et al. 2013). Therefore, employing these indicators to manage ST still needs further research to carefully assess the process and outcome.

Chapter 2

The Concept of Collective Impact Framework

2.1 Definition of the Term and Its Background

The term Collective Impact was first introduced by John Kania and Mark Kramer in the Stanford Social Innovation Review in the Winter 2011 issue. The term is defined simply as “the commitment of a group of important actors from different sectors to a common agenda for solving a specific social problem” (Kania and Kramer 2011). Although this definition alone may look no different from various types of collaborations, partnerships, and networks we all know about that have been employed to solve complex social issues over the course of history, Kania and Kramer claim that collective impact is distinctly different from other forms of collaborations because it involves “a centralized infrastructure, a dedicated staff, and a structured process that leads to a common agenda, shared measurement, continuous communication, and mutually reinforcing activities among all participants”(Kania and Kramer 2011). For instance, when developing a vaccine, public-private partnerships (shown in Figure 2) are often deployed because it requires support from a government to develop laws, and research by private pharmaceutical companies. However, these are mostly project-based and exclude other stakeholders that do not have direct association with the issue. Similarly, social sector networks (shown in Figure 3) are a type of collaboration among different sectors to acquire projects with short-term targets or mid-term objectives. This type of collaboration is usually dissolved once the project is completed, so that the level of achievement is limited. These examples show that collaborations only happen when in need. Despite the fact collaboration can produce an outcome, it lacks continuity to make an outcome that has an impact on society. In this context, an outcome refers to a target to be achieved, and an impact is a collective of achievements that brings social innovation, which cannot be achieved by a single organization. In the sense of a Collective Impact Framework (CIF), the impact can be described as a common agenda, and various stakeholders work independently to make good use of their expertise, while overall activity maintains the motivation to achieve the common agenda. CIF is a multi-dimensional approach that promotes existing activities at the individual and group level to solve various social issues in a community which cannot be solved by the collaboration of one or two organizations.

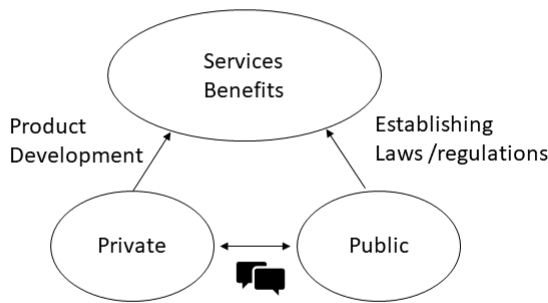


Figure 2. Public-private partnerships
(source: author's own)

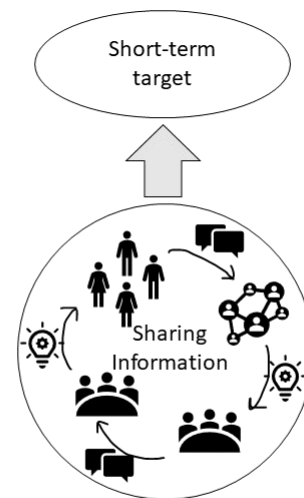


Figure 3. Social sector networks
(source: author's own)

This framework was developed from one successful case of collective impact that happened in Cincinnati, Ohio when Strive, a nonprofit organization tackled the student achievement crisis in the region.

Strive achieved in making more than 300 local leaders from various sectors to participate and abandon their individual agendas and goals in favor of a larger outcome as a community, which improved student achievements (Kania and Kramer 2011). Other successful cases which applied the Collective Impact Framework (CIF) have been reported to solve social issues such as education, homelessness, job creation, and substance abuse; each case shows a tremendous improvement which proves the effectiveness of collective impact in solving social issues.

2.2 Structure of Collective Impact Framework

Five aspects should be achieved in CIF. 1) a common agenda, 2) shared measurement, 3) mutually reinforcing activities, 4) continuous communication, and 5) a backbone support organization (Kania and Kramer 2011). Figure 4 illustrates the structure of CIF. As the illustration suggests, everything functions under the presence of a common agenda, and a backbone organization supports the whole system. When individuals get together, they make groups (partners) to discuss the issue, then several partners with the same objective (one aspect of the common agenda) form working groups to plan actions to take. A Steering Committee consists of representatives from working groups and is facilitated by the backbone organization.

The fundamental role of a steering committee is to guide the vision and strategy while supporting aligned activities. It is also important to note that the information flows both from the top down and from the bottom up, taking the public will into consideration.

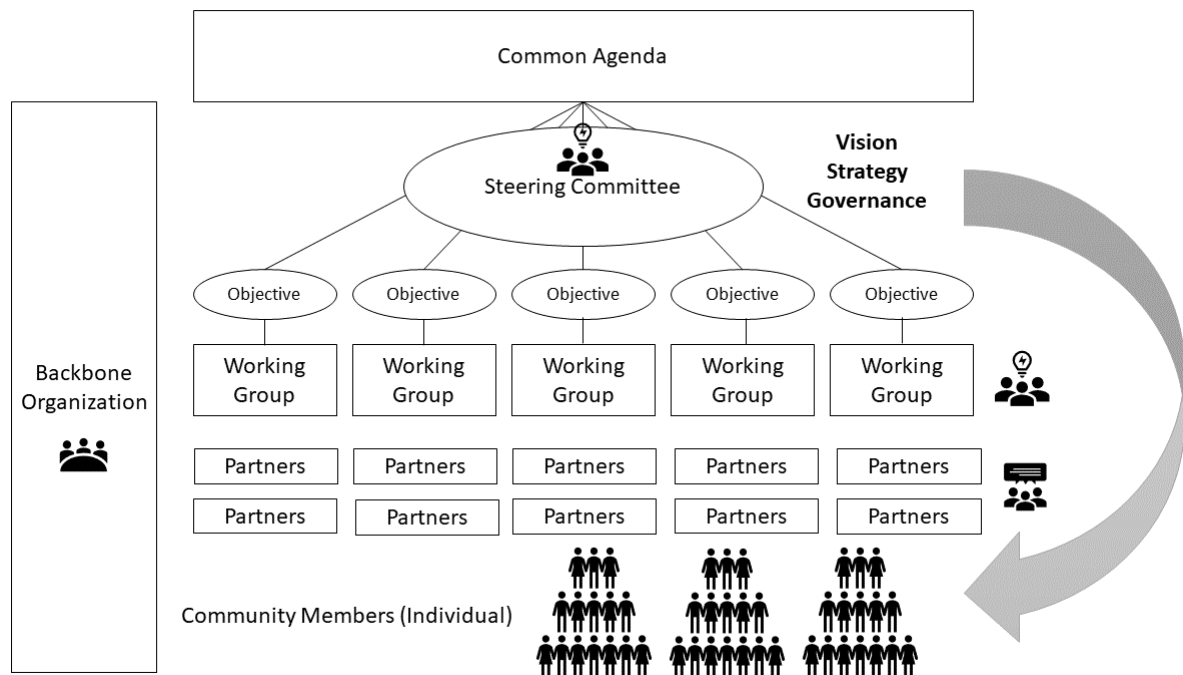


Figure 4. Structure of Collective Impact Framework
(source: based on Kania and Kramer 2011 with author's own)

Other types of collaboration, such public-private partnerships and social sector networks mentioned earlier, only represent a part of CIF. In public-private partnerships, both the government and the company are considered a partner in CIF (shown in Figure 5) therefore the level of activity is limited to partner to partner in CIF. Similarly, social sector networks can be considered equivalent to one of the working groups in CIF (shown in Figure 6). However, one working group can only solve one of many problems in society. In CIF, multiple working groups with different objectives but united under the common agenda can generate a larger outcome.

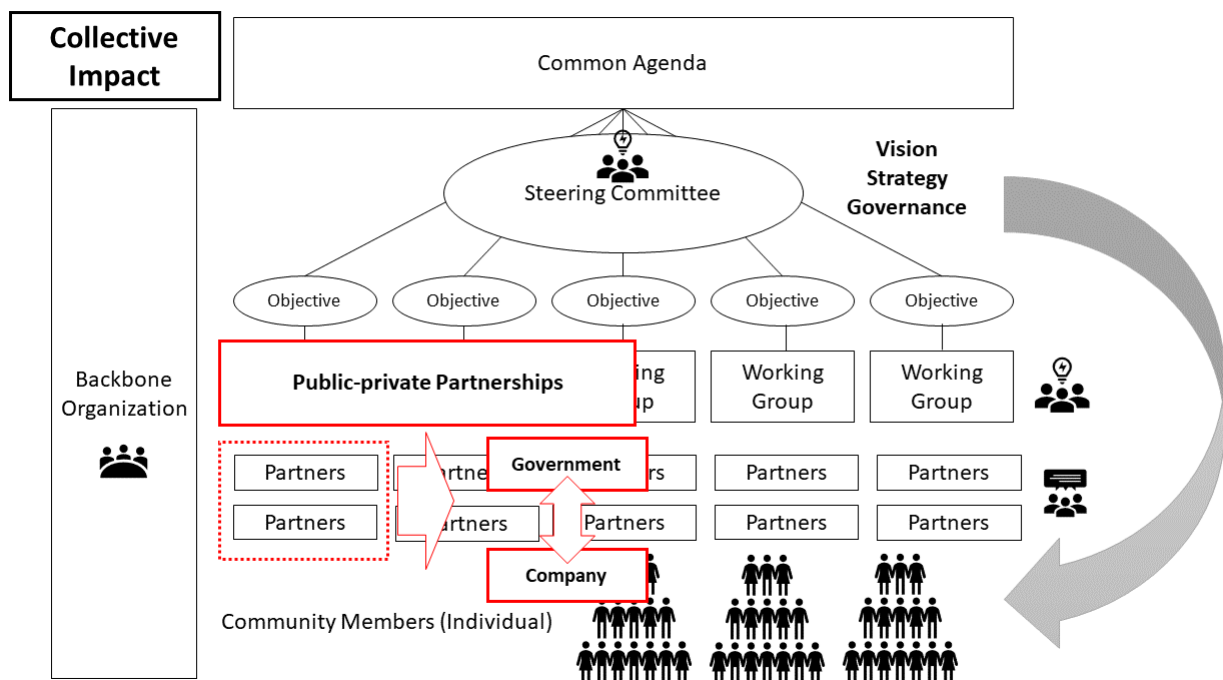


Figure 5. Public-private partnership in CIF
(based on Kania and Kramer 2011 with author's own)

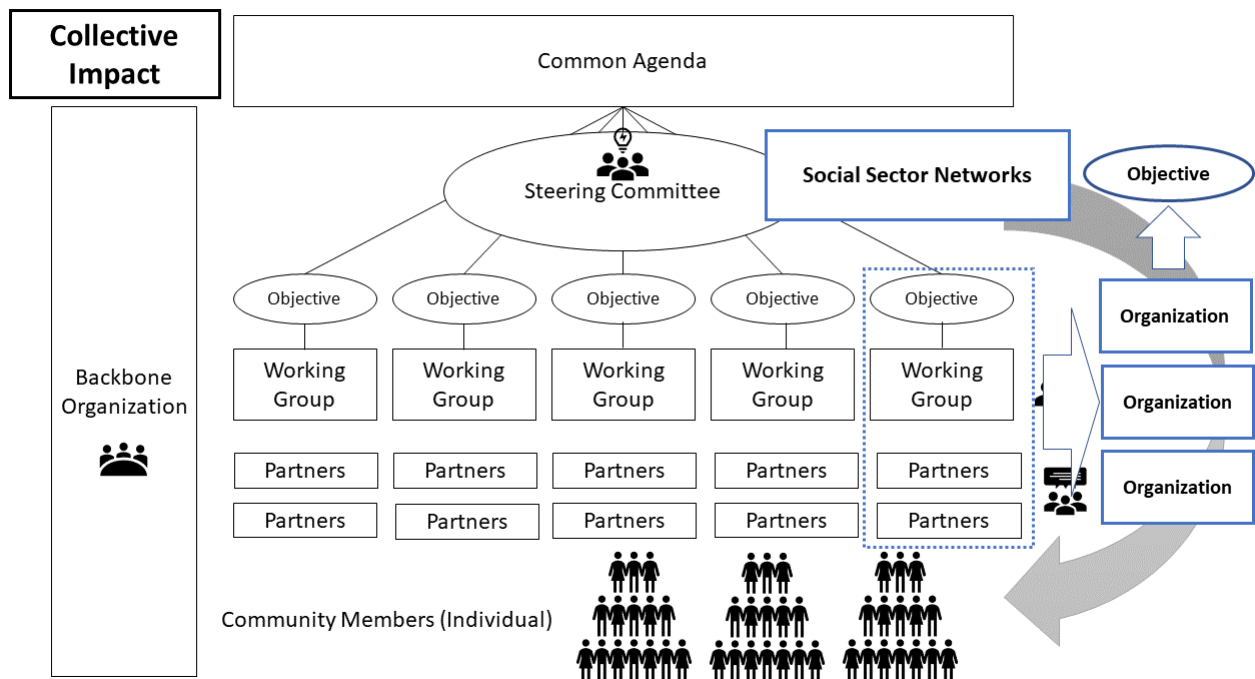


Figure 6. Social sector networks in CIF
(based on Kania and Kramer 2011 with author's own)

The first step to setting a common agenda is to confirm that participants have a common understanding of the issue. This includes determining what is considered an issue, finding out the kind of issue, and discussing why it is an issue. Without a common understanding of the issue, it is challenging to propose a solution that will have a huge impact on society. When it comes to identifying the common agenda, Kania and Kramer suggest that all participants do not need to agree on every single opinion and aspect discussed in the process, but they must agree “on the primary goals for the collective impact initiatives as a whole” (Kania and Kramer 2011). Based on the common agenda, participants then must develop a shared measurement system. This is especially important in collective impact because it plays a role as an indicator that should always recur to all stakeholders. A shared measurement system is used to evaluate the progress of each project as well as to keep the overall common agenda on track. Within CIF, participants are encouraged to play a role of what they think they can do best with their expertise.

Setting a common agenda and shared measurement does not mean all participants should do the same work. Rather, actions that each participant takes should be mutually reinforced to generate better and larger outcomes. Continuous communication among all stakeholders is without a doubt crucial to

maintaining collective impact. Among the five essential aspects of CIF, a backbone organization is what Kania and Kramer calls “centralized infrastructure” to support the whole system (Kania and Kramer 2011). The backbone organization can be played by a single organization or multiple organizations, but they must have the ability to facilitate, coordinate, and communicate among various stakeholders. Kramer and Pfitzer explain the idea behind collective impact as “social problems arise from and persist because of a complex combination of actions and omissions by players in all sectors – and therefore can be solved only by the coordinated efforts of those players, from businesses to government agencies, charitable organizations, and members of affected populations” (Kramer and Pfitzer 2016). CIF is a multi-dimensional approach that promotes existing activities at the individual and group level to solve various social issues in a community, which cannot be solved by a collaboration of one or two organizations.

2.3 Collective Impact Framework and Sustainable Tourism

Despite the proven effectiveness of CIF in solving various social issues, practical examples of applying CIF in the field of tourism are extremely limited in numbers. Issues associated with tourism are also socially complex, especially when the society of a destination highly relies on tourism for its income. Chiodo et al. (2019) investigated collaborative processes of CBT (Community Based Tourism) development in rural areas in Argentina and Italy based on CIF. The result shows that most of the successful cases applied a collaborative approach and social innovation with shareable principles within CIF (Chiodo et al. 2019). This study not only suggests the importance of a collaborative process and having a common agenda in CBT, but also shows the potential of applying CIF to tourism management.

Unlike other indicators that were previously deployed to manage tourism destinations, CIF shows flexibility and applicability to various types of tourist destinations. Agreeing on a common agenda may take time, but it allows various stakeholders to have vision that they can always refer to, while working on their own activities. Because tourism is an industry rooted in the local community, the direction of tourism development should reflect the intentions of local residents at a tourist destination. However, in many cases, a tourism development plan prepared by a country or local government that does not reflect the intentions of local residents, and is adopted as it is, resulting in problems such as poor management or exceeding the capacity of a destination. CIF requires the destination to set a common agenda, which requires close discussions with related stakeholders on how to develop tourist destinations, so it will reflect local intentions and adjust interests among stakeholders. It implies that installing CIF can play a role to prevent various problems associated with tourism from occurring. In addition, the backbone organization works as a coordinator of the whole system, not in pursuit of its own interests, but in connection with the interests of the

entire tourist destination, so that it is always possible to create a plan for tourist destinations along the common agenda.

Chapter 3

Iriomote Island and Sustainable Tourism

3.1 Introduction: Tourism and Islands of Japan

Japan consists of four large islands and 6,852 other small islands. The islands separated from the continent have inherited technology and wisdom to effectively and sustainably use limited natural environments, land, and resources. However, these traditional and sustainable approaches are gradually declining with the change of times, as well as with the increase of contact with the outside world.

While depopulation is a serious issue on many small islands in Japan, some islands such as Yakushima in Kagoshima, or Ogasawara islands that are registered as UNESCO World Natural Heritage sites, and on islands in Okinawa, the impact of tourism has already been reported (Shibasaki et al. 2007, Ichikawa 2008, Ichiki and Shumiya 2007). For instance, in 2018, the number of tourists tripled compared to that of 2011 on Miyako Island in Okinawa (Ritou Keizai Shinbun 2019). The increasing number of tourists set off high demand for constructing new accommodations, and that affected local lives by contributing to a steep rise in house rent. Taketomi Island in Okinawa is a small island with the population of only 365. It is only accessible by ferry from nearby Ishigaki Island, and it is visited by 500,000 people annually (Taketomicho 2019). The popularity of Taketomi Island as a tourist destination brought interest from non-local enterprises, notably resort hotels. Tourism development is now taking place at a popular beach on Taketomi Island, but local residents decided to take it a step further in preventing the degradation of the environment and its historic scenery. They used the governmental framework, *Chiiki Shigen Isan Hou* 地域資源遺産法 (Regional Resource Heritage Act), which was introduced in 2015, that allows local governments to collect entrance fees to a destination where natural and cultural heritage should be managed and protected, in order to establish a fund that manages the sustainability of the destination.

Taketomi Island now asks visitors to voluntarily donate 300 Japanese Yen either when they purchase the ferry ticket or arrive on the island. The collected entry fees will be utilized to protect the environment and to give the land back to the hands of the local people. This action is considered a bottom-up solution to managing a tourism destination, but it still leaves a question of whether it can be applied to cases in different locations, because the scale of Taketomi Island is relatively small, which may not be favorable for other regions.

3.2 Research Overview: The History of Land Use and Its Sociocultural Background on Iriomote Island

Iriomote Island in Okinawa, where the author has been involved for many years, is no exception to over-tourism, because the society and the natural environment have changed rapidly in recent years due to the increase in numbers of tourists. Iriomote Island is now also receiving media attention for expanding its national park area to cover almost the entire island, which happened in 2017. In addition, in 2018, an investigation by IUCN was conducted on Iriomote Island to become the next promising candidate for a World Natural Heritage Site.

The purpose of this chapter is to investigate the history of land use on Iriomote from the 1960s and analyze its transition as well as its sociocultural backgrounds to extract any factors that may affect land use.

Land use analysis and field research were conducted, the former was conducted by analyzing topographical maps with a scale of 1/50,000 as well as aerial photographs, and the latter was conducted by obtaining actual land use data. Interviews were also used to reveal historical backgrounds. The results show that the changes in land use have been mainly affected by demographic changes, this is closely related to the changes in lifestyle and culture. Significant differences found in land use between the western and the eastern parts of the island were attributed to the history of the villages.

3.3 History of the Relationship Between Land Use and Local Lifestyles

The case studies on land and resource use changes and other factors have been conducted on other islands, such as a research conducted by Iida (2014) in Palau, an island nation in Micronesia, which investigated agroforestry the “mechanism for sustainable use of resources.” Many factors show a fluctuating link between traditional island lifestyles and the use of local resources, which includes both external factors such as deforestation and post-independence infrastructure, residential land, and resort development in the colonial era, as well as the eating habits and labor patterns associated with modernization. There are also clear internal factors such as the changes discussed in the research by Takeda and Iwami (2004), which clarified the use of various mangroves on Fiji's Viti Levu Island. It revealed a diverse usage due to internal factors such as knowledge loss, and external factors, such as the appearance of substitutes of mangroves in the modern society.

They also pointed out that the relationship between the local community and mangroves is becoming sparse and showed the importance of not only the ecological aspects but also the preservation of culture and traditional knowledge, the preservation of mangroves from an inheritance aspect, and the

incorporation of cultural perspectives into future conservation plans. In terms of the relationship between human life and the natural environment, Matsumura (2008) conducted research in Tsushima, where Tsushima-wild-cats live as an endemic species and found out that the islanders abandoned traditional farming methods (slash-and-burn) during a period of economic high growth. The reforestation policy replaced hardwood forests with artificial forests, and further public works such as road construction disturbed the forest and foraging environments that are the protected habitats on Tsushima. Based on these previous studies, the use of land and resources on the island region has changed due to a variety of factors, such as changes in lifestyles, culture, and traditions of the island, and being closely related to the natural environment and the habitat of living organisms.

Studies on Iriomote Island include ecological studies mainly based on the conservation of animals and plants (Ueda and Kamiuraki 2008), folklore studies on culture and history (Ankei 1978, Nakama 2012) and on ecotourism and tourism (Okuda 2007, Kaizu and Maita 2001, Yanagida 2012). Among these, research on ecosystems and ecotourism has shown an impact on the environment, due to an increase in the number of tourists. Such academic knowledge has led to the preservation of valuable flora and fauna on Iriomote Island by the Ministry of the Environment in 2016. Academic research and their outcomes have also led to the expansion of the national park area, which aims for protection on a higher level, including most of the entire area of Iriomote Island. Academic interest in Iriomote Island has promoted environmental protection.

On the other hand, Chiba (1960) clarified the characteristics of each village and their social background in 1960, based on the location of various rice paddy fields on Iriomote Island. According to this, it was found that farmers on Iriomote Island at that time were familiar with the location and condition of various rice paddy fields through many years of experience and distributed the fields accordingly. Chiba (1960) states that future development and population migration plans should reflect agricultural locations, socio-economic backgrounds, and public opinion. In addition, Nakama (2012) stated that the use and maintenance of mangrove forests on Iriomote Island is based on the hypothesis that “mangrove forests can be ecologically balanced within the range of traditional use by local residents.” In addition to clarifying cultural meanings, he said that not only conducting strict protection for the island but also knowing how to promote the use of natural resources by local residents in a traditional way should be considered a hint for sustainable land-use.

However, in addition to this literature, there is almost no discussion on the specific changes in land and resource use on Iriomote Island, along with its history, culture, and society. This is due to the fact that Iriomote Island is a remote island area where transportation is extremely poor, and that it was occupied by

the United States from WW2 until 1972. As a result, there is a lack of data about the island. There should be further research done to make up for this lack of basic information, focusing on the relationship between changes in land use and historical changes in people's lives and culture on Iriomote Island.

Therefore, the author conducted a study which focuses on land use on Iriomote Island, from the 1960s to the present, based on changes in life and land use experienced by the current residents since the Showa period.

The purpose of this study was to clarify the spatial distribution of land use using topographic maps, and to consider the background of the transition from a socio-cultural perspective. The 1960s was a period when the lifestyle and industrial structure of residents began to change significantly on Iriomote Island. By carefully reading the changes in land use since then, plans to take advantage of the future use of traditional land and resources are expected.

3.4 Research Design

3.4.1 General Information of the Target Site: Iriomote Island

Iriomote Island (shown in Figure 7) is located approximately 2,100 km from Tokyo and approximately 460 km from Okinawa Island. The area of the island is 289.3 km², and most of it is covered with subtropical forests, with nearly 90% designated as national forest. According to the Kyushu Forest Management Bureau, which manages the national forests of Iriomote Island, the forests of the island belong to a broad-leaved forest zone of the Japanese archipelago, and the species that compose the entire plant community are closely related to those of a primary forest, which is scientifically very important (Kyushu Shinrin Kanrikyoku, 2007). The island is broadly divided into the east and west, and 14 large and small villages are concentrated in the northwest and southeast.

Iriomote Island belongs to Taketomi Town in Yaeyama District, Okinawa Prefecture. Taketomi Town is composed of 16 islands, 9 inhabited and 7 uninhabited. As of the end of November 2019, the population of Iriomote Island is 2,474, of which 961 people live in the eastern area (5 villages) and 1,513 people live in the western area (9 villages), respectively. The main road on the island is generally called the “north coast road,” and is prefectural road No. 215 (which connects Shirahama to Haemida) that runs about halfway around the island along the coastline. “Urauchi Bridge” is considered the east-west border. The main industry that supports the island's economy is tourism, but other primary industries such as sugarcane and pineapple production, livestock production, and rice cultivation are also regarded as important industries.



Figure 7. Location of Iriomote Island (Source: Google map)

3.4.2 Research Method

In order to grasp the transition of land use on Iriomote Island from the 1960s to the present day, a field survey was conducted and a land use transition map was made, as well as a literature survey, field survey, and interviews to clarify the details behind the change in land use. The villages surveyed in this study consisted of 9 villages, 4 in the southeast (Komi, Otomi, Ohara, Toyohara) and 5 in the northwest (Uehara, Sumiyoshi, Hoshidate, Sonai, Shirahama). In addition to clarifying the historical background, land use transition was broadly grasped. The Ooaza (village section) of Iriomote Island (shown in Figure 8) are: Aza Komi (Komi), Aza Haeminaka (Otomi), Aza Haemi (Ohara, Toyohara), Aza Uehara (Uehara, Sumiyoshi), and Aza Iriomote (Hoshidate, Sonai, Shirahama).



Figure 8. Village section of Iriomote Island

(Source: author's own)

In preparing land use transition maps, a 1 / 50,000 topographical map published by the Geospatial Information Authority of Japan in 1966 and 1983 (Showa 58) and the map published by the Geographical Survey Institute of Japan in 2005 were used. First, the surrounding areas including the villages to be surveyed were extracted from the southeast and the northwest, respectively (as shown in Figure 9).

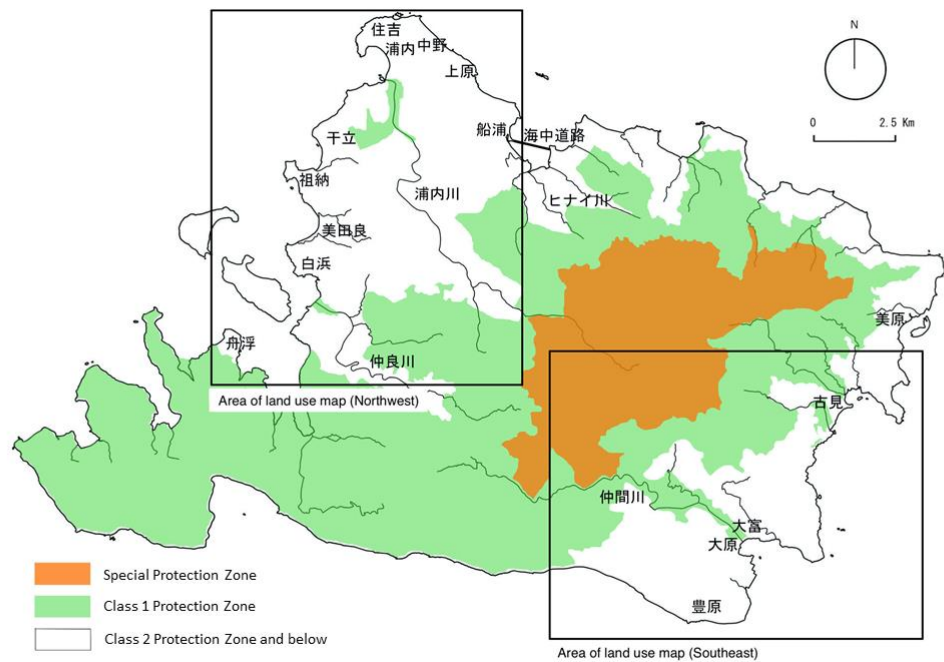


Figure 9. The area of National Park and the area of land use map created

(Source: author's own)

For land use that was difficult to interpret from the topographic maps, an aerial photograph of the same period was used as a supplement. Land use maps for the 1960s, 1980s, and 2000s were created based on the topographic maps from 1966, 1983, and 2005, respectively. In addition, aerial photographs were traced with AutoCAD to calculate the area for each land use category. Vegetation was ascertained using topographic maps and existing vegetation maps published by the Ministry of the Environment in 1980. The first field survey was June 20 to July 2, 2016, the second July 12 to 26, 2016, and the third March 30 to August 5, 2016. The field survey and face to face interviews to gain more detailed information on land use and the factors behind the changes were conducted. The field survey revealed detailed land use information that could not be recognized from image data, such as the types of field crops and the current state of abandoned farmland. The survey subjects were, in principle, men and women who were part-time or full-

time farmers 55 years of age or older living in the target village, but some of them were long-time local residents who were familiar with land use since the 1980s but were not farmers. In that case, local residents under 55 years of age were also interviewed. Table 1 shows the attributes of each survey subject, survey time, and the range of land use clarified through interviews. There are a total of 850 men and women aged 55 and over in the statistical information of the 9 villages targeted, but among them, the residents who mainly know about land use are engaged in agriculture. Therefore, 24 people in total, 13 in the northwest and 11 in the southeast were interviewed. The interview survey was conducted while presenting materials to the subject such as the land use transition map and the aerial photographs created, as well as the aerial photographs and old photographs of the farmland provided by the Taketomi Town Agricultural Committee.

The semi-structured interviews were done to reveal the following fundamental questions in order; 1) whether interviewees recognized or did not recognize the changes in land use, 2) clarifying the details of the change (whether land was abandoned or diverted), and 3) assembling questions in the order of why the change occurred, and the factors were clarified.

Table.1 Attributes of interviewees and survey details

Village	No.	Sex* · Age (Duration of Residence)	Attributes (If a person is a farmer, what they cultivate is shown)	Areas of land use investigated through interview	Duration (Hours)
Shirahama	1	M64 (64)	Farmer (Rice)	Farmland in Shirahama - Urauchi	1.5
	2	M65 (65)	Fisherman	Shirahama and Sonai Villages	1.5
	3	F65 (65)	Minshuku (privately-run lodging)	Shirahama Village and surrounding forest	2.0
Sonai	4	M66 (36)	Public Services	Sonai - Hoshitate and surrounding forest	2.0
	5	F64 (64)	Housewife	Sonai and Hoshitate	1.0
	6	M88 (88)	Farmer (Rice)	Farmland in Mitayoshi - Urauchi	2.0
	7	M80 (80)	Farmer (Rice)	Farmland in Mitayoshi - Urauchi	1.0
	8	M82 (82)	Farmer (Rice)	Farmland in Mitayoshi - Urauchi	1.0
Hoshidate	9	M38 (30)	Service industry / farmer (Rice)	Hoshitate Village and surrounding farmland	2.0
Sumiyoshi	10	F89 (69)	Minshuku (privately-run lodging)/ housewife	Sumiyoshi Village	1.0
	11	F89 (69)	Stock raising / housewife	Sumiyoshi Village and Uehara Village	1.5
	12	M60 (60)	Farmer (Pineapple)	Sumiyoshi Village	2.0
Uehara	13	F79 (69)	Stock raising / housewife	Uehara Village	2.0
Komi	14	M50 (20)	Minshuku (privately-run lodging)/ farmer (Vegetables)	Farmland in Komi Village	1.5
	15	M79 (79)	Farmer (Sugarcane)	Farmland in Komi - Toyohara	1.5
	16	F64 (64)	Housewife	Komi Village	1.5
Otomi	17	M62 (25)	Farmer (Sugarcane)	Komi - Toyohara	1.0
	18	M69 (60)	Farmer (Fruits)	Farmland in Otomi - Ohara	1.5
	19	M67 (16)	Farmer (Fruits)	Komi - Toyohara	2.5
	20	F67 (27)	Housewife	Otomi Village	1.0
Ohara	21	M68 (68)	Civil servant / farmer (Rice and sugarcane)	Farmland in Otomi - Ohara	2.5
Toyohara	22	M63 (28)	Civil servant	Toyohara Village	1.0
	23	M70 (70)	Farmer (Sugarcane)	Village in Komi - Toyohara	1.0
	24	M50 (20)	Service industry / farmer (Sugarcane)	Farmland in Toyohara Village	1.0

* M : Male F : Female

3.5 Result

3.5.1 History of Each Target Village

The year each village was established is indicated on Table 2. Of the target villages, five villages excluding “Shirahama,” “Sonai,” and “Hoshidate” in the northwest, and “Komi” in the southeast, were established by immigration during the 10 years from 1948 to 1957 after the war. “Toyohara” and “Otomi” in the southeastern part existed in the 17th and 18th centuries as “Haimi Village” but they were abandoned by the end of the 19th century. “Uehara” in the northwest was established as “Uehara Village” in the latter half of the 18th century, but the population declined due to an outbreak of malaria, and it was post-war immigrants that formed the foundation of the current village as “Uehara.” Looking at the formation of villages in the northwest, “Shirahama” began as a place of residence for workers when coal mining became popular in the early 1900s, and “Sumiyoshi” was centered on reclaimed migrants from Miyakojima after the war. “Otomi” in the southeast was founded by post-war government-planned immigrants, “Ohara” was founded by migrants from the neighboring Aragusuku-jima, and “Toyohara” was created by post-war government-planned immigrants.

Table 2. Year of establishment of villages and their origin

Region	Village name (Year of Establishment)	Brief history of villages and their origin
NW	Shirahama (1916) Aza Iriomote	Developed as a residence for miners
	Sonai (14C) Aza Iriomote	Established in 14 th century
	Hoshitate (1750) Aza Iriomote	Established before 1750
	Sumiyoshi (1948) Aza Uehara	Immigrants from Miyako Island
	Uehara (Latter half of 18C) Aza Uehara	Immigrants from Hatoma Island
SE	Komi (14C?) Aza Komi	Establishment year is unknown (about 14 th century) Planned immigration was delivered by government after the World War 2 from Okinawa Island, Taketomi Island, and Kohama Island.
	Otomi (1952) Aza Haeminaka	Planned immigration was delivered by government after the World War 2 from Okinawa Island, Hateruma Island, Taketomi Island, and so on.
	Ohara (1941) Aza Haemi	Moved from Aragusuku Island as a prefectural project to create farmers to cultivate Haemi Village
	Toyohara (1953) Aza Haemi	Planned immigration was delivered by government after the World War 2 from Ogimi Villagi in Okinawa Island, Taketomi Island and so on.

3.5.2 Population Trends and Major Events Since the 1960s

Table 3 shows the main events and population transition on Iriomote Island since 1960, which were clarified by the literature (Kinjo 1998, Otomi Kouminkan 2004, Sumiyoshi Kouminkan 2009) and the interview surveys.

Table 3 Major events and population trends in Iriomote Island since 1960

Year	Major events of Iriomote Island	Population*
1960	Iriomote Sugar Company is established in Ohara Village	3,496
1961	DDT spraying by U.S. military eradicated malaria	
1965	Yaeyama Development Company (Jujo Paper-manufacturing Company) started logging and reforestation of pulp trees “Discovery” of Iriomote cat	3,287 (▼209)
1966	IUCN recommended setting up protected areas	3,130 (▼157)
1969	Completion of Urauchi Bridge (between Urauchi and Hoshitate)	2,801 (▼329)
1970	Inaba Village (located in Urauchi River basin) abandoned	2,620 (▼181)
1971	Catastrophic damage from heavy drought and typhoon Yubu Village (located in the southeast) moved to Mihara Amitori Village (located in the northwest) abandoned	2,147 (▼473)
1972	Okinawa Reversion to Japan and national park designation Yaeyama Development Company withdrew Iriomote cat was designated as natural monument	1,748 (▼399)
1970	First resort opened in Sumiyoshi Village (northwest)	
1977	North coast road (prefectural road 215) between Shirahama - Haemi opened Underwater road (Funaura Bridge) connecting the western and eastern areas opened Huge damage by large typhoon (20 houses damaged in Sonai Village)	1,461 (▼209)
1983	Pineapple factory in the Nakano Village (in the northwest) closed	1,604 (△143)
1991	Forestry Agency designated forest ecosystem protection area	1,761 (△157)
1992	Prefectural road widening / straightening started (~Ended in 2015)	1,775 (△14)
1996	Iriomote Island Eco-Tourism Association was established	1,895 (△120)
1999	Iriomote Canoe Association was established	1,980 (△85)
2004	Large resort facility opened in Tsukigahama in Urauchi Village (northwest)	2,242 (△262)
2007	Name changed to Iriomote Ishigaki National Park (Transferred into the national park in Ishigaki Island area)	2,325 (△83)
2013	New airport opened in Ishigaki Island Iriomote cat hit by traffic accident 6 times (highest ever)	2,362 (△37)
2014	Highest number of Eco-Tour business (9 companies)	2,304 (▼58)
2016	The whole area of Iriomote Island was into the national park area	2,442 (△138)

*The numbers in parentheses indicate an increase or decrease from the previous generation, △ indicates an increase, and ▼ indicates a decrease.

The population of Iriomote Island, which was 3,539 in 1960, has been declining every year. The lowest population in the 52 years to date is 1,446 in 1976, a decrease of about 59% compared to that of 1960.

Since 1960, the population as a whole has been on a downward trend. In particular, there was a remarkable decline in the population of nearly 900 people from 1970 to 1972. The population has begun to increase again since the 1980s.

According to the “Survey Report on Resources and Economic Potential of Iriomote Island” compiled by Stanford Research Institute in the United States in 1960, Iriomote Island can accommodate a population of about 11,600 when current-cultivated land and potentially-cultivated land is combined. If the potential population employed in the timber industry, transport industry, and service industries are added, the total population could be estimated at 23,100 (Stanford Research Institute 1960). In reality, however, in the 1960s, the eradication of malaria and the beginning of logging and afforestation projects in the pulp industry in the northwestern forest should have brought an increase in the population at least temporarily, but it did not occur.

The remarkable population decline between 1970 and 1972 was caused by a series of events that had a great impact on the society of Iriomote Island, such as villages being abandoned, damage caused by droughts and typhoons, and the return of Okinawa to Japan. The construction of a resort in the mid-1970s and the improvement of transportation convenience by opening the prefectural road 215, which is the main road on the island, as well as Urauchi Bridge in 1977, formed Iriomote Island as a tourist destination. In the 2000s, new large resorts were built, and the number of eco-tour operators increased in association with the popularity of ecotourism. In 2013, the opening of a new airport on Ishigaki Island enabled bigger aircrafts to land on Ishigaki.

3.5.3. Changes in Land Use from the 1960s

Figures 10 and 11 (An enlarged version of each image is also shown in Appendix) show the change in land use in the 1960s, 1980s and 2000s in the Northwest area and the Southeast area of Iriomote Island, respectively. Table 4 and 5 shows the change in areas of land cover in Northwest area and Southeast area.

Agricultural land was categorized as rice paddy fields, crop fields, and orchards. Forests were categorized as broad-leaved forests, coniferous forests, and palm trees. Other land classifications were divided into wastelands (previously cultivated land) and residential areas. On the topographic map, the vegetation in the forest is broadly divided into broad-leaved forest and coniferous forest. At the same time, the classification based on the existing vegetation map published by the Ministry of the Environment in 1980, the forest on Iriomote Island is classified into the *Okinawa Urajirogashi* (*Quercus miyagii*)

community, *Kenagaesakaki* (*Adinandra yaeyamensis* Ohwi) and *Sudajii* (*Castanopsis sieboldii*) community, *Gajumaru* (*Ficus microcarpa*) and *Kuroyona* (*Pongamia pinnata*) community, mangrove (*Kandelia obovate*, *Bruguiera gymnorhiza*, *Rhizophora mucronate*, *Avicennia marina*) community, *Nippayashi* (*Nypa fruticans* wurb) community, *Sakishima Suounoki* (*Heritiera littoralis*) community, and *Adan* (*Pandanus odoratissimus*) as natural vegetation. As reciprocal habitat, *Bochouji* (*Psychotria asiatica*) and *Ijyu* (*Schima liukiuensis* Nakai) community, *Kenagaesakaki* (*Adinandra yaeyamensis* Ohwi) and *Sudajii* (*Castanopsis sieboldii*) secondary forest, *Ryukyu-matsu* (*Pinus luchuensis*) plantation, *Ryukyu-chiku* (*Pleioblastus linearis* Nakai) community, *Chigaya* (*Imperata cylindrica*) and *Susuki* (*Miscanthus sinensis*) community, and *Mokumaou* (*Casuarina equisetifolia*) community can be seen.

Compared with the 1983 topographic map, most of the forests indicated as broad-leaved forests are mixed with the *Kenagaesakaki* (*Adinandra yaeyamensis* Ohwi) and *Sudajii* (*Castanopsis sieboldii*) community in the southeast, and in the northwest, the secondary forest of *Kenagaesakaki* (*Adinandra yaeyamensis* Ohwi) and *Sudajii* (*Castanopsis sieboldii*) community. The broad-leaved forests along the rivers and estuaries were mangrove communities. The coniferous forest that spreads around the village and the forest around Shirahama in the northwest was a *Ryukyu-matsu* (*Pinus luchuensis*) plantation. One of the remarkable changes that can be seen from the land use map in the northwest is the expansion of coniferous forests in the northwestern forest. The broad-leaved forests that were only distributed around the “Shirahama” village in the 1960s, can be seen in the forest area around Shirahama in the 1980s, and expanded in the 2000s to approximately twice the size of that of the 1960s. On the other hand, the coniferous forests that were distributed around “Hoshidate” and “Uehara” in the 1960s became broad-leaved forests by the 2000s, showing a transition to coniferous forests in the northwest that happened in the forests around “Shirahama.”

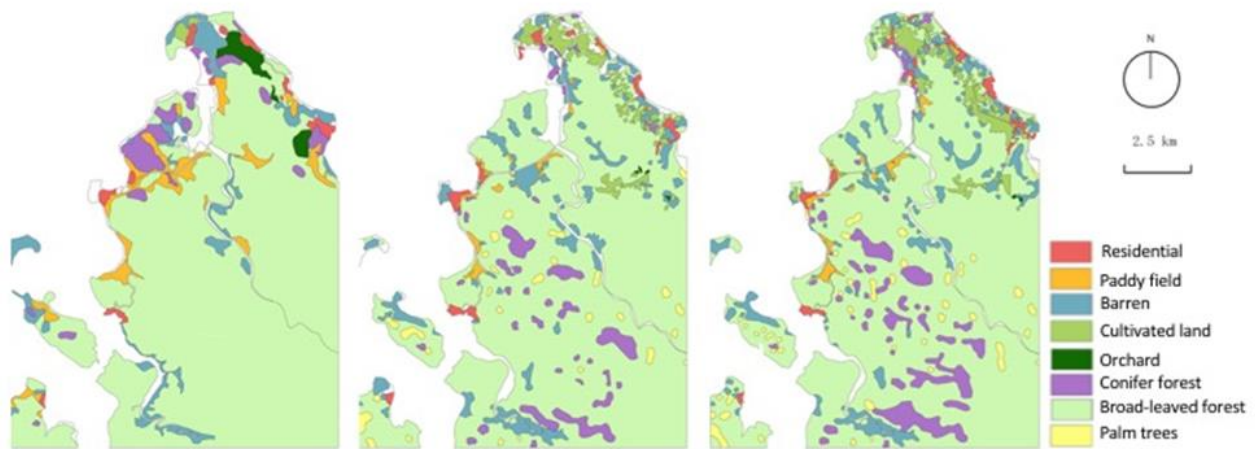


Figure 10. Land use changes by year (1966,1983,2005, left to right) in NW Iriomote



Figure 11. Land use changes by year (1966,1983,2005, left to right) in SE Iriomote

In contrast, a major feature of changes in the forests in the southeastern part is that there is no change to coniferous forests, unlike in the northwestern part of the island. Coniferous forests are only distributed around residential areas, and the area decreased by 39% in the 40 years from the 1960s to the 2000s. Palm trees can be confirmed from the 1980s in both the southeast and northwest, but this is because the legend of the map has changed to include palm trees in broad-leaved forest. Although it does not represent a change in land cover, palm trees in the southeastern forest expanded approximately twice the size in the 20 years from the 1980s to the 2000s.

From the 1960s to the 1980s, the most obvious change found both in the northwest and the southeast was the reduction of paddy fields. In the 1960s, rice paddy fields were distributed in the northwestern part of the island between “Hoshidate” and “Midara,” but in the 1980s, paddy fields along the Urauchi River disappeared completely, and the area was abandoned. The paddy fields distributed along the

prefectural road around “Hoshidate” and “Sonai” villages disappeared or drastically shrunk, leaving the areas abandoned.

In the southeast, the paddy field area was only about 1/5 that of the northwest as of the 1960s, but the three paddy fields between “Komi” and “Otomi” completely disappeared. Overall, from the 1960s to the 2000s, the paddy field areas were reduced by 75.9% in the northwest and 54.7% in the southeast.

In the northwest, wasteland (abandoned fields) spread along the Nakara and Urauchi rivers in the 1960s. In addition to former paddy fields, the abandoned field around “Sumiyoshi” changed to cultivated lands, and the wasteland around Uehara also changed to some cultivated lands. In the southeast, wasteland was distributed around “Toyohara” and “Otomi” in the 1960s. However, the wasteland of “Toyohara” was partly cultivated in the 1980s, while the wasteland of “Otomi” became cultivated in the 2000s.

Orchards existed in the vicinity of “Sumiyoshi,” “Nakano,” “Uehara,” and “Funaura” in the northwest. In the 1980s, they became cultivated fields, and the orchards were only scattered in “Funaura.”

From the 1980s to the 2000s, orchards further decreased by 42% in the entire northwestern region. In the southeast, the orchards can be seen in “Otomi,” “Ohara,” and “Toyohara” in the 1960s, but in the 2000s it was only seen in the part of the field around “Otomi.”

Table 4. Land use/cover area by year of the Northwestern (NW) Iriomote

Land use class	1000 m ² (composition ratio %)					
	1960s		1980s		2000s	
Palm trees	0	(0.0)	1,403	(2.0)	1,659	(2.3)
Abandoned Field	4,140	(5.8)	5,634	(8.0)	5,524	(7.7)
Conifer forest	2,622	(3.7)	3,467	(4.9)	5,028	(7.0)
Broad-leaves forest	58,664	(82.8)	55,877	(79.5)	55,227	(77.0)
Paddy field	3,018	(4.3)	613	(0.9)	726	(1.0)
Orchard	1,150	(1.6)	45	(0.1)	26	(0.0)
Cultivated land	223	(0.3)	2,193	(3.1)	2,551	(3.6)
Residential	997	(1.4)	1,015	(1.4)	1,010	(1.4)

Table 5. Land use/cover area by year of the Southeastern (SE) Iriomote

Class	1000 m ² (Composition ratio %)					
	1960s		1980s		2000s	
Palm trees	0	(0.0)	1,671	(2.4)	3,574	(5.2)
Abandoned Field	1,678	(2.4)	3,382	(4.9)	2,644	(3.8)
Conifer forest	1,934	(2.8)	1,737	(2.5)	1,165	(1.7)
Broad-leaved forest	59,078	(86.1)	56,217	(82.0)	54,829	(79.7)
Paddy field	662	(1.0)	201	(0.3)	300	(0.4)
Orchard	588	(0.9)	0	(0.0)	46	(0.1)
Cultivated land	3,945	(5.7)	4,826	(7.0)	5,532	(8.0)
Residential	764	(1.1)	531	(0.8)	732	(1.1)

The author conducted research on land use changes on Iriomote Island from the 1960s to the 2000s by analyzing historical topographical maps and aerial photos, as well as interviewing local residents to identify the backgrounds of land-use changes. The result showed that the traditional lifestyle on the island was harmonious with nature, the seasons, and the characteristics of the land, until a wave of development reached local society (Fujimura et al. 2017). In addition, over-tourism has been pointed out in some areas on Iriomote Island from around the 2010s. Thus, it is thought that the introduction of ST is urgently needed for Iriomote Island to continue to be a place where beautiful nature and rich culture remain.

However, throughout the conducted survey it has also become clear that some difficult points must be considered when applying ST to Iriomote Island. (1) The island's natural magnificence is not inferior to other tourist areas with successful examples of ST. Moreover, if the conventional lifestyle is maintained, it is possible for tourism to coexist with the island's nature. In reality, it has become difficult to continue a sustainable lifestyle for coexistence with unique natural resources due to the wave of development in the 1980s, changes in lifestyle, and changes in the population composition of the island, which was prevailed as the consequence of significant changes in land use. (2) Generations who want to bring new value to the island are mainly from areas outside of the island, and the future of the island has not always been discussed together with its inhabitants (3) As a result, it became clear that the residents of the island and the organizations that promote tourism did not achieve the sharing of a common goal to deal with issues, such as the issue of over-tourism.

In addition, (4) the fact that there has not been a large-scale environmental destruction on the island has limited a sense of crisis, especially for local residents.

Therefore, in order to grasp the current state of Iriomote Island and draw a picture of the island's future to cope with ST, we should learn concretely from successful examples not only from the island's history but also from that of other regions, and compare each element in detail in order to extract essential strategic points. Throughout the survey conducted in this chapter, it becomes necessary to evaluate objectively in order to link the problems identified by this research one by one with specific countermeasures.

In the next chapter, we will examine in detail successful cases in California and lead to the author's hypothesis that these successful cases may have been brought about by the implicit application of CIF into ST.

Chapter 4

Successful Sustainable Tourism Case Studies in California

4.1 Introduction

In order to introduce ST to Iriomote Island, it is necessary to clarify the structure of the relationship among stakeholders in successful ST cases. As a case study, a total of 10 months of fieldwork with interviews was done in Lake Tahoe and Monterey Bay, California, USA. Although both destinations are quite popular and visited by many people worldwide, Lake Tahoe still maintains an excellent water quality with transparency of more than 25 meters, and Monterey Bay maintains an ecosystem including wild marine mammals such as whales. Therefore, these two cases can be considered as examples of successful ST.

A literature survey was done to analyze the historical background of the process of developing ST and revealed that both destinations have experienced significant environmental destruction mainly due to development prior to efforts placed on environmental conservation.

In both destinations, concerned scientists and local residents started environmental conservation from the bottom up, and eventually those activities gained support from core organizations, which in the case of Lake Tahoe is the TRPA, a bi-state agency, and the non-profit Monterey Bay Aquarium in Monterey Bay. It was also revealed that the natural environment, which is a tourism resource, has been preserved up to the present by those organizations taking leadership in environmental conservation.

4.2 A Case Study on Sustainable Tourism: Lake Tahoe

4.2.1 General Information of Lake Tahoe

Lake Tahoe (shown in Figure 12) is straddled between the state of California and Nevada, and recorded a transparency of 31.2m in 1968, making it one of the most transparent lakes in the world. It has a very small (841 km², (Lake Biwa 3,174 km²)) catchment area, compared with its large surface area (499 km², (Lake Biwa 674 km²)) and depth (with its maximum (505 m) and mean (303 m) depth) and therefore has a large (156 km³, (Lake Biwa 29 km³)) water volume, which creates an exceptionally long residence time (700 years (Lake Biwa 5.5 years)).

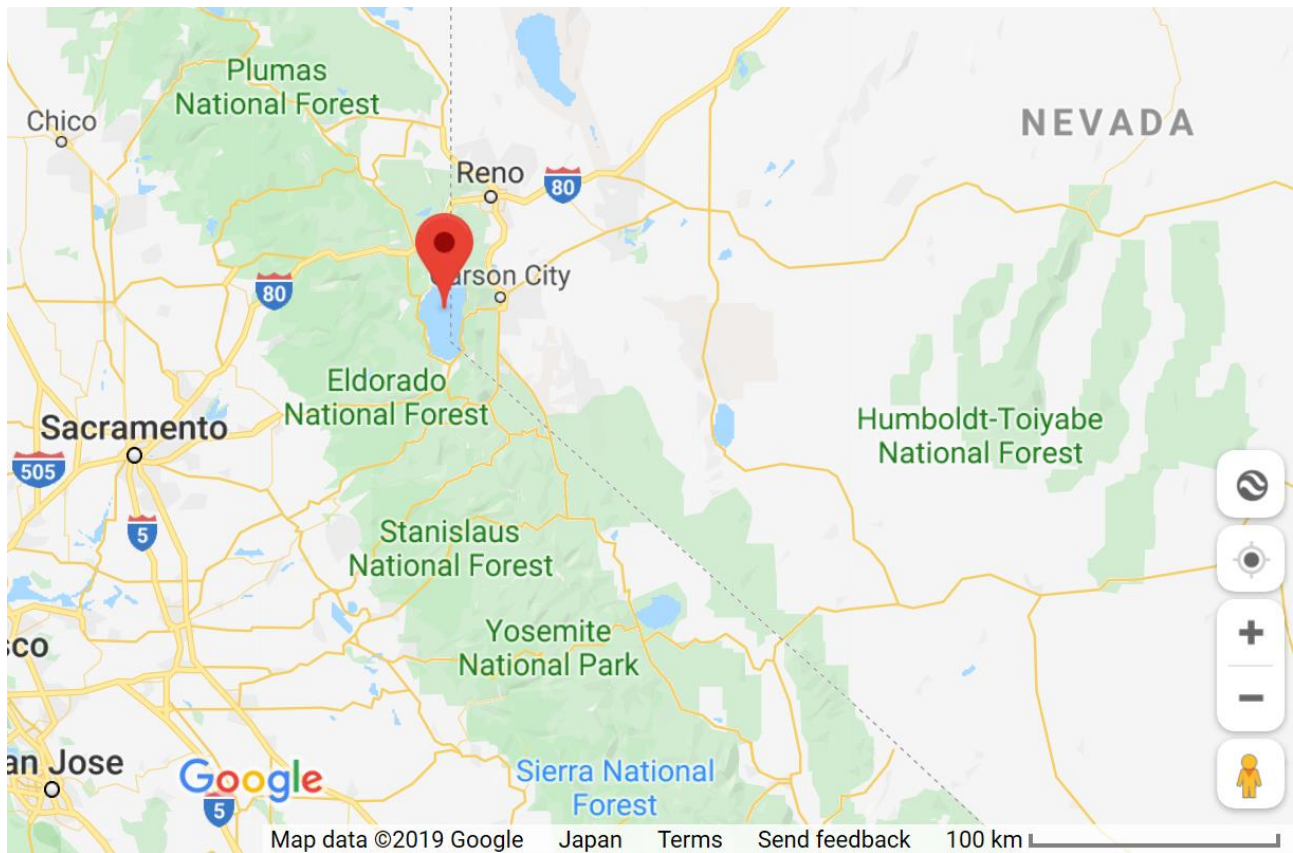


Figure 12. Location of Lake Tahoe (Source: Google map)

Because of these characteristics, once degradation of water quality and associated lake ecosystem destruction starts, it is almost impossible to recover within a certain number of generations.

Lake Tahoe is an oligotrophic lake located in the mountainous area, and the population of the catchment is small, accordingly, no water quality and catchment regulations were established until the 1960s.

However, due to the increase in the population accompanying tourism around the lake and with the development of tourist destinations centering the South Basin, especially on Tahoe Key, the amount of nutrients discharged into the lake increased rapidly, and the water quality tended to deteriorate. On this occasion, Professor Charles R. Goldman of University of California, Davis, scientifically showed that the eutrophication of the lake would progress significantly due to the discharge of wastewater and suspended sediment into the lake, associated by the land use changes. At that time a catchment-scale sewage treatment system was proposed to collect all the sewage from residential and commercial areas. However, Charles R. Goldman and his associated colleagues had proven that by discharging the treated water with a secondary wastewater treatment plan (with insufficient removal process of Phosphorus and Nitrogen from the

wastewater) could cause a significant increase of the eutrophication status of the lake, thus they insisted on not discharging treated wastewater into the lake. After serious discussion in the community and in the catchment area, including in academic sectors, it was officially proposed that the treated sewer should bypass outside of the basin. This plan was promoted and executed mainly by the TRPA (Tahoe Regional Planning Agency), a joint investment of California and Nevada, established in 1969, along with an effective system to manage lakes together with strict regulations on land use in lake basins.

4.2.2 History of Development at Lake Tahoe

Historical literature (Strong 1984, Makley 2011, 2014) reveals the history of Lake Tahoe and its environment in detail. Table 6 shows the history of urban and tourism development within the Lake Tahoe area, as well as environmental actions taken, and regulations enacted.

The history of Lake Tahoe can be divided into four phases, the 1800s, before and after WW2, the 1960s, and after the 1980s. The 1800s is characterized as the primary stage of development. Although Lake Tahoe experienced clear-cutting of the forest and rapid development without any regulation with the discovery and prosperity of Comstock Lode in the mid-1800s as a starting point, Tahoe was overflowing with nature that prevented development to cover the entire basin at the same level. Also, it is notable that Sierra Club, an environmental organization which is still active today, was established as early as 1892 to tackle various environmental issues. Hence, Assemblyman Coleman's resolution to keep Tahoe's land in public hands could not be accepted, which showed the majority of people were still pro-development. 1900 to the 1950s can be divided into two parts, before WW2 and after WW2. Rapid growth happened after WW2 including recreational development such as summer luxury resorts, vacation homes, and ski resorts. Visitation and permanent population gradually increased after WW2 which brought contamination of the lake water. Despite the fact that small sewage treatment facilities were built in the early 1950s, they soon exceeded capacity. Concerned residents formed another environmental organization called Tahoe Improvement and Conservation Association during this period, which continues to grow and has now changed its name to the League to Save Lake Tahoe. Contamination of the lake water suddenly drew attention and became a public health matter. This could be regarded as the initial stage where local residents, although not many of them at that time, started to care about the environmental issues associated with their livelihoods.

The 1960s saw an inflow of tourists, where nearly 20,000 people seeking campsites were turned away from state parks. Both California and Nevada put some effort on acquiring the land and turning it into state parks to keep up with increasing visitation and growing demands. In response, the TRPA was

established to control land use and development around Lake Tahoe as a bi-state agency. However, in the early days of its establishment, some argued that the TRPA was ineffective in terms of suppressing development. It was either that the TRPA was not accepted as a powerful authority or that there was an organizational malfunction. Therefore, by the time C. Goldman, a lake scientist, reported that the lake had lost 25% of its clarity in 1960, much of the damage was already done. It was around this time when people started to seriously think about conservation rather than development.

From the 1980s, much effort was put into restoration and conservation of the natural environment.

Re-vegetation of a former casino site by the Forest Service successfully brought some scenic beauty back, and when the revised TRPA master plan finally came into action in 1987, as mentioned by Raumann et al. (2008), the development rate dropped sharply. After 1987, Lake Tahoe gradually shifted from a pro-development (mainly gambling) tourism destination to an environmentally conscious sustainable tourism destination. This trend can be seen from the fact that recreational rock climbing was banned at Cave Rock in 2007. Although environmental protection was not the only reason (Cave Rock has cultural significance for Native Americans) to ban recreational climbing, this shows that people found great value in preserving the scenic beauty of Lake Tahoe and began to shift towards the environmentally-conscious.

Table 6. History of development and environmental actions taken at Lake Tahoe

	Development and businesses	Environment-related actions
1844	First American explored Lake Tahoe	
1848-1855	Gold Rush	
1873		First lake clarity was measured by LeConte
1899		Forest reserve was established in the SW of the lake
1901	First luxury hotel was established	
1927		First State Park was established in Tahoe City
1957		League to Save Lake Tahoe was established
1969		TRPA was established
1974		Dr. Goldman reported that the lake has lost its clarity by 25% from 1960
1987		Environmental Carrying Capacity Threshold was introduced

4.2.3 Environmental Conservation and Sustainable Tourism at Lake Tahoe

Historical literature reviews revealed that it was not until the establishment of the TRPA that environmental conservation of Lake Tahoe came to public attention. At first, there were only some concerned scientists and local residents who sensed the impact of rapid development around the lake.

Monitoring of the health of the lake has been done ever since Dr. Goldman began conducting research on Lake Tahoe in 1958 and various data of the lake ecosystem has been accumulated for over 60 years. A satellite buoy of NASA (shown in Figure 13) measures the color of the lake for lake transparency research. UC Davis Tahoe Environmental Research Center (TERC) is dedicated to research on Lake Tahoe and is also considered a point of contact with the public. Environmental education programs are held for children and the general public including tourists to the lake.

Although the year-round population of Lake Tahoe basin is around 53,000, the temporary population at peak times can be over 300,000. Lake Tahoe is now facing over-tourism, and the TRPA takes the initiative to solve problems related to over-tourism. One example is the “Take Care” initiative that is supported by various stakeholders in the region to raise awareness of visitors and local residents about environmental conservation. An illustration created by this program (shown in Figure 14) is shared within the community and can be seen at hotels, restaurants, beaches and trails. The use of unified illustrations to promote environmental conservation not only has a visual impact to visitors, but also can strengthen the link between the illustration and environmental conservation messaging.

In this manner, although the TRPA is an organization with state level authority, they work closely with local environmental organizations, universities, and tourism industries to preserve the natural environment around Lake Tahoe, especially restoring the transparency of the lake as a common goal in achieving ST in the region.

Lake Tahoe has beautiful natural resources, the lake water is highly transparent, and it is surrounded by mountains. It has been widely known as one of the most attractive places for recreation in America. Early accommodation started in the 19th Century but it accelerated with the completion of the Central Pacific Railroad and the surrounding lake shore road construction, enabling easy access both from Nevada and California. Lake Tahoe is currently attracting swimmers, boaters, water skiers, fishermen, and tourists.

However, all necessary natural resources for these tourist industries require serious conservation standards for the region. Therefore, the establishment of a ST framework is essential for all the recreational activity in the Lake Tahoe region. The TRPA Compact recognized that the economy surrounding Lake Tahoe is largely and historically based on tourism and dependent on its recreational resources. Therefore, the

preservation of recreational opportunities has been established as one of the primary objectives of the Regional Plan (TRPA, 1971).

The TRPA has launched several unique regulatory considerations for ST. The first is “TRPA’s recreation threshold,” a non-quantitative threshold which sets numerical standards similar to other environmental thresholds, but its policy statements are endorsed by the TRPA’s governing council. The first outdoor recreation threshold standard is a two-part policy statement (the first part concerns the perceptual experience on the part of the recreationist, the second part encourages providing additional physical access to the shore-zone and other undeveloped land) to preserve and enhance high quality recreation and provide additional access to high quality lands for low-density recreation. The second outdoor recreation threshold standard is intended to ensure that a fair share of the region’s outdoor recreation capacity is available to the general public.

The Second unique TRPA program is the Environmental Improvement Program (EPI), designed to accelerate achievement of the environmental threshold carrying capacities (ETCC) established in the Lake Tahoe Region. The TRPA also sets clear goals and objectives to establish ST based on well managed recreational resources. The TRPA also develops urban recreation including youth and sports-oriented forms of outdoor and indoor recreation in urban areas in the Lake Tahoe Region.

Other than the TRPA there are important Federal Agencies including the U.S. Forest Service – called The U.S. Forest Services-Lake Tahoe Basin Management Unit (LTBMU), encompassing portions of four national forests in the catchment area and offers the largest and wilderness diversity of outdoor recreational opportunities. The U.S. Army Corps of Engineers (Corps) is responsible for planning, constructing, and operating water control, flood protection, navigation, and beach erosion.

There are several State Agencies related to this issue; for California this includes the California Department of Parks and Recreation (CDPR), the California State Lands Commission (CSLC), and the California Tahoe Conservancy (CTC), and for Nevada this includes the Nevada Division of State Lands (State Lands), the Nevada Division of State Parks, and the Nevada Division of Wildlife.

A survey conducted on behalf of the California Department of Parks and Recreation for all of California indicates that beach recreation is the predominant activity in which the recreating public participates. The survey asked respondents to note the number of days per year of participation in 42 major recreational activities. The survey found that 69.4 percent of the respondents participated in beach activities for one or more days, of which 19.5 percent participated in power-boating. Although not all beach users seek a solitary experience, beach activity that includes conversation, reading, and nature watching requires a lower

background noise level, which the Lake Tahoe basin can easily provide, except in the South Lake Tahoe region.

Throughout the overall survey, we may conclude that the Lake Tahoe region can be considered as one of the more attractive tourism and recreation sites for not only surrounding states (California and Nevada) but also throughout the nation, thanks to its extraordinary natural resources, and that the TRPA endorses several important initiatives in order to establish sustainable recreational activities. Including the establishment of tourism thresholds, promotion of surveys, and integration with other organizations.



Figure 13. NASA satellite buoy on Lake Tahoe
(photo taken by author)



Figure 14. “Take Care” sign on the trail
(photo taken by the author)

4.3 A Case Study on Sustainable Tourism: Monterey Bay

4.3.1 General Information of Monterey Bay

Monterey Bay (shown in Figure 15), located on the central California coast, is now a popular tourist destination in the United States. Monterey Bay is a part of the Monterey Bay National Marine Sanctuary (MBNMS) that was designated in 1992 as the 11th National Marine Sanctuary in the United States (shown in Figure 16). It is the largest national marine sanctuary regulated by NOAA (National Oceanic and Atmospheric Administration).

The MBNMS stretches along the central coast of California from San Francisco to Cambria and it is protected and regulated under the National Marine Sanctuary Act, which is a federal law.

In addition to being a National Marine Sanctuary, the state of California has state level marine protected areas and reserves called CA Marine Protected Areas (MPAs). They come in all shapes, sizes, and purposes. These MPAs are controlled under the Marine Life Protection Act that came into effect in 1999, and managed by the California Department of Fish and Wildlife. Figure 17 shows four different types of MPAs by the level of prohibited activities.

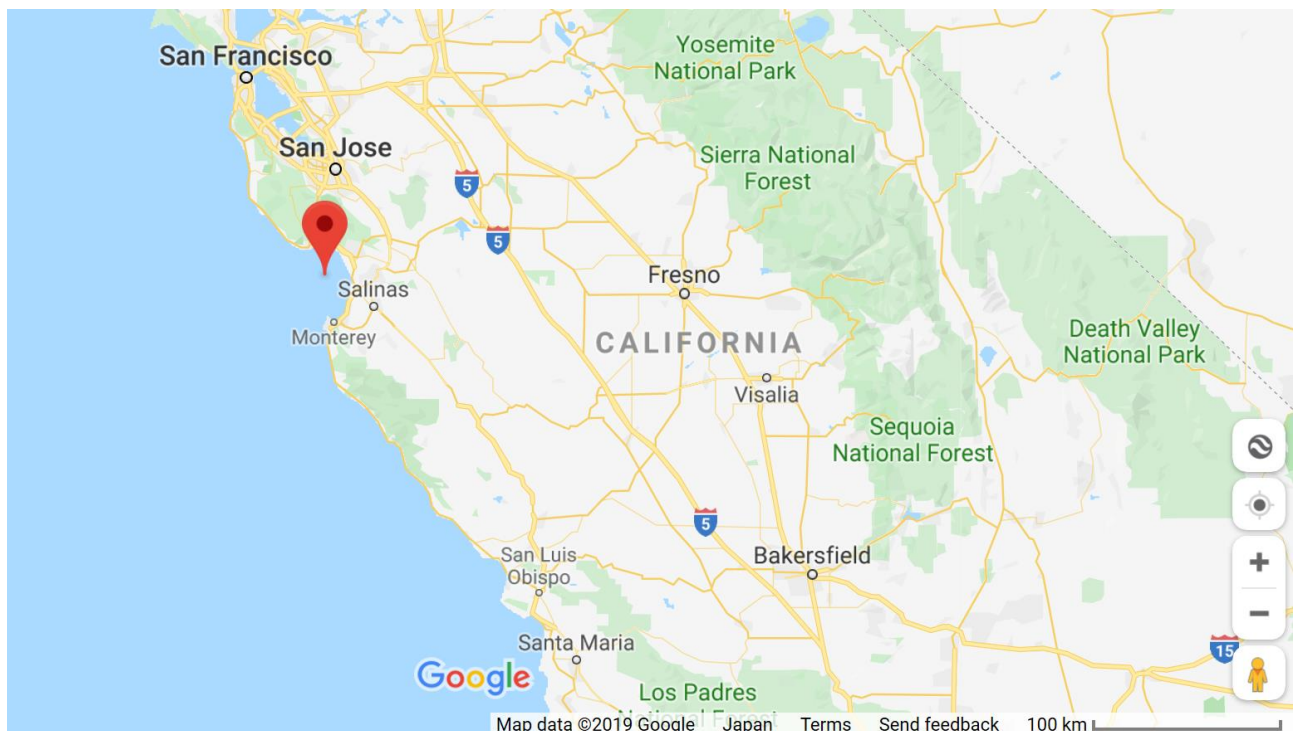


Figure 15. Location of Monterey Bay

(Source: Google map)

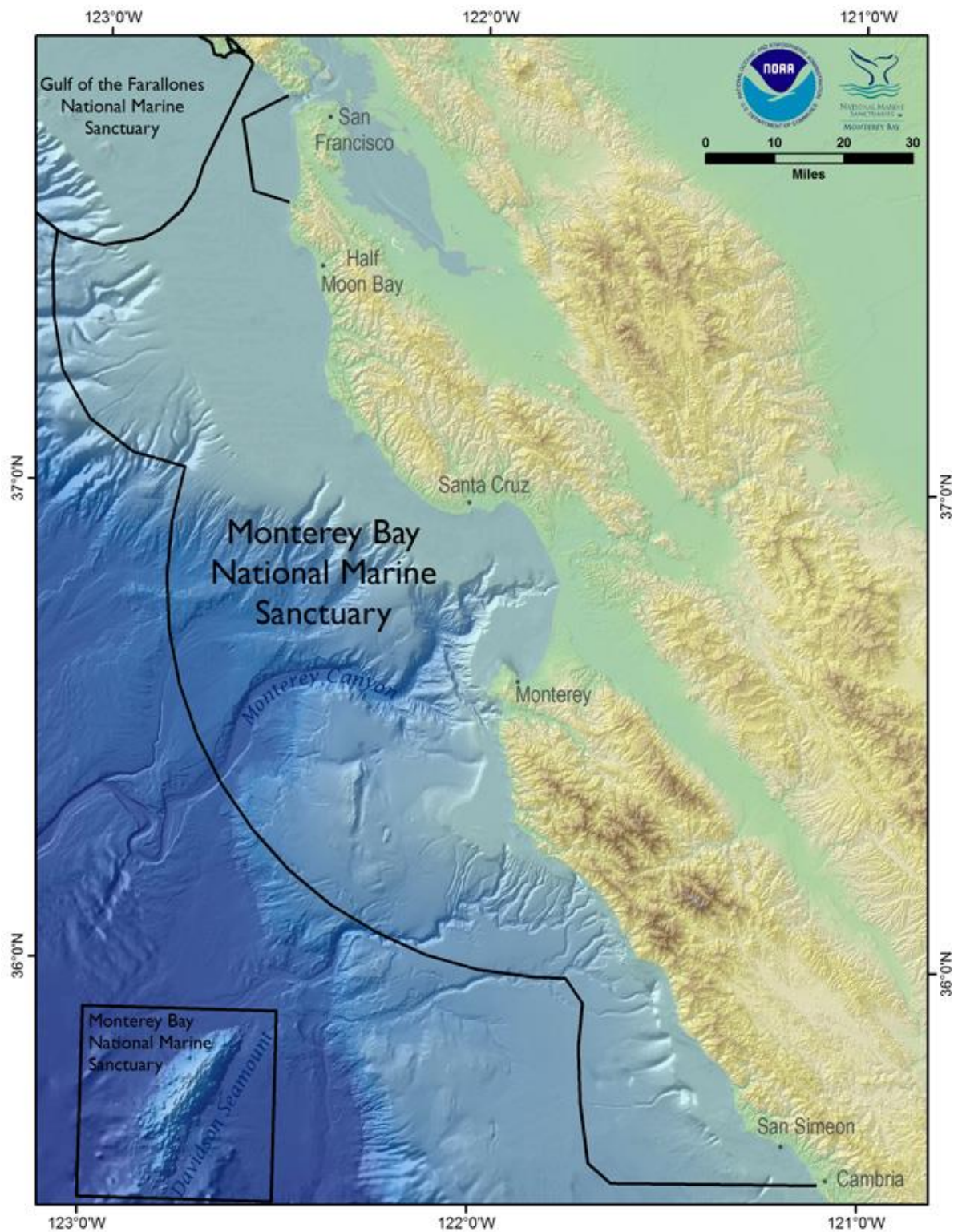


Figure 16. The map of Monterey Bay National Marine Sanctuary (source: NOAA)

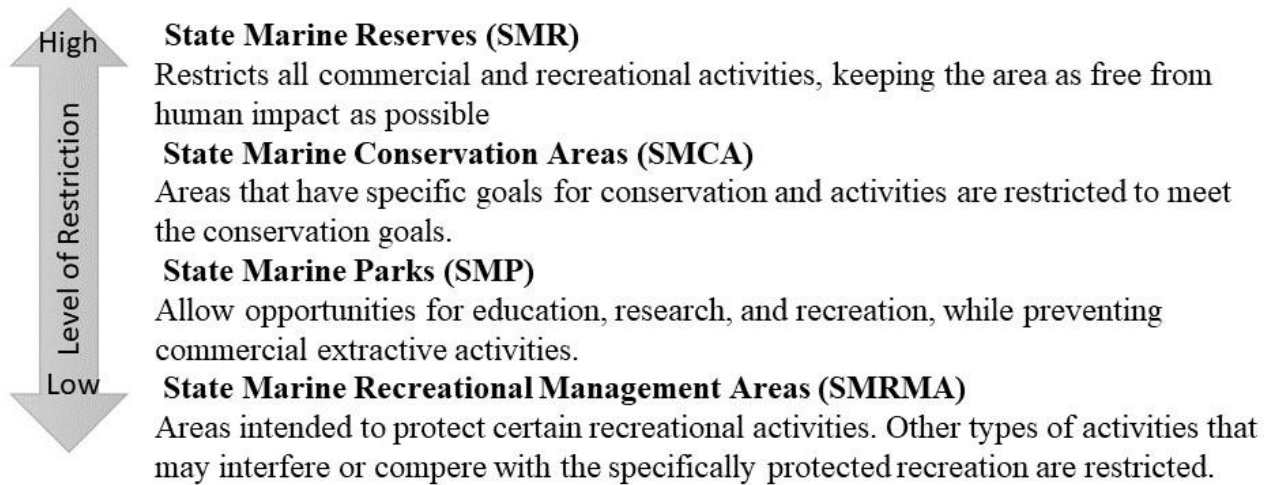


Figure 17. Types of Marine Protected Area
(source: California Department of fish and Wildlife)

4.3.2 History of Development at Monterey Bay

Table 7 describes the history of development in Monterey Bay, revealed from Palumbi and Sotka (2012) and Chiang (2018). The environmental history of Monterey Bay until the 1950s saw a radical change in the environment, notably disturbed coastal ecosystems by various human activities.

The first major change that happened to the natural environment in Monterey Bay dates back to the sea otter fur trade in the late 1700s. At that time, sea otter fur was popular as a luxury item in China, and ships from Mexico and Russia hunted sea otters along the northern coast of California. However, by the 1850s, the otter fur trade had ended due to a drastic decrease in the otter population, which once was abundant before excessive hunting. After sea otters disappeared from the bay, whaling for whale oil became popular in the 1850s. Monterey Bay is located in the migration path of whales, where many whales pass through. In 1855, a second whaling company was established in Monterey, and in 1861, there were a total of five operating whaling companies. 1854 to 1864 was called the golden age of whaling and an average of 490 whales were captured annually. However, whaling declined with the decreased number of whales in Monterey Bay, because whales, including calves, were hunted in the Gulf of Mexico where whales nursed.

Soon after whaling went out of business, abalone hunting by Chinese migrants flourished along the coast of Monterey Bay. However, again, they caught every single abalone, including young shells, which resulted in a serious decline of the abalone population, and the industry did not last long. Then in the 1900s, the sardine canning factory emerged as a new industry. Although sardines were abundant at the time they

started the industry, fishery scientists began to worry about the sustainability of the industry and put out an alert by the 1920s. However, the alerts were widely ignored until the sardines finally disappeared from the bay in 1944. The sardine canning factory not only depleted resources, but they also discarded waste (such as sardine internal organs and heads) that was produced during the canning process in the sea in front of the current MBA and Hopkins Marine Station. It was not until Dr. Julia Platt took action against this situation that Monterey Bay shifted towards environmental conservation. As a scientist and a local citizen, Dr. Platt felt a sense of danger in the environmental destruction of her town and established the Hopkins Marine Refuge in 1931. With the establishment of Hopkins Marine Refuge and the end of the canning industry in 1948, Monterey Bay cleansed itself of the waste and pollution of the 1930s and 1940s by the end of the 1950s. In 1960, sea otters returned to Monterey Bay, and the original coastal ecosystem gradually recovered.

When Rachel Carson published "Silent Spring" in 1962, the effects of DDT on seabirds were pointed out in Monterey, and environmental awareness increased throughout the United States in the 1970s.

After many years of planning, trial and error, and the establishment of regulations with the city, the Monterey Aquarium opened in 1984 as the centerpiece of Monterey tourism. In 1987, MBARI, a research facility, was established, which laid the foundation for marine conservation in Monterey Bay.

As outlined above, various resources in Monterey Bay have been depleted, but since the establishment of Hopkins Marine Station, a marine research facility at Stanford University in 1917, it gradually began to follow the path to marine conservation.

Today, wild marine life in Monterey Bay is protected as an important tourism resource. The protection of marine animals is the priority, as shown in Figure 18, a fence is installed to prevent people from disturbing Harbor Seals in pupping season. However, looking back on the history, some of the marine life was eliminated from Monterey Bay. The reason why this region is a pioneer in marine environment conservation is the thought that we should never repeat the experience of destroying the natural environment to a point where it cannot be recovered.



Figure 18. A temporary fence set along the beaches in Pacific Grove
(photo taken by the author)

Table 7. History of development and environmental actions taken in Monterey Bay

	Development and businesses	Environment-related actions
Late 1700s	Sea otter fur trade	
1817	Otters were becoming scarce	
1850	End of otter fur trade	
1850s-1870s	Whaling	
1917		Hopkins Marine Station was established
1920s - 1930s	Sardine Cannery	
1931		Hopkins Marine Life Refuge was established by Dr. Julia Platt
1948	Sardine industry collapsed	
1961		Rachel Carson's "Silent Spring" was published
1984		Monterey Bay Aquarium was opened
1987		MBARI was established

4.3.3 Environmental Conservation and Sustainable Tourism at Monterey Bay

Initial literature reviews revealed that the environment of Monterey Bay was managed and protected in various ways, including federal or state level laws and regulations, environmental initiatives that locally-active environmental organizations take part in, and community-based environmental actions taken by an environmentally-conscious community within the region. For example, CA MPAs have a network called California's MPA that various stakeholders, ranging from scientific institutions to local, regional, and national environmental organizations are involved. This network is in charge of various things, from planning to monitoring of the MPAs. Although the MPAs are regulated by the state, there are various stakeholders involved in the process so it can be regarded as stakeholder-driven. Therefore, stakeholder involvement in managing MPAs can be seen as one of the key factors for managing marine environments sustainably.

These MPAs, as well as CA State Parks are supported by voluntary docents who are local residents, showing that ST in Monterey Bay is highly supported by community involvement, most importantly, volunteers. In addition, both the cities of Monterey and Pacific Grove have a volunteer program. City volunteers clean up streets, parks and beaches to keep the city clean. Locally active environmental organizations hold beach clean ups throughout Monterey County. Monterey Bay Aquarium (MBA), one of the most popular tourist destinations in Monterey Bay, is also supported by volunteers, which proves that the

aquarium has strong ties to the community. The importance of volunteers in managing ST is inevitable in this sense, and the case in Monterey Bay is unique in a way that its demography consists of retired people in the community that suggests local residents have money, time, and the mindset to volunteer for the environment as a whole.

According to the American Community Survey of 2017, the estimated median age of the city of Pacific Grove is 49 years old, which is 12.9 years older than the median age of the state of California (36.1).

This implies that the community includes a certain amount of retirement age population. In fact, the population of 65 years old and older accounts for 26.2% of the total population in Pacific Grove, that is a 4.6% increase from 2010 US Census data (21.6%) and is similar to that of Japan (27.05%) which is considered an aging society. We can say that this rate is significantly higher when compared to the rate for the city of Monterey (18.2%), Monterey County (12.4%), state of California (13.2%), and also United States as a whole (14.9%). Given the fact that the retired population usually has extra time and money to spare, it is not unusual to have so many volunteer workers in the region. In addition, economic data shows that median household income is much higher in Pacific Grove (\$81,304) than that of the city of Monterey (\$68,511), Monterey County (\$60,889), and the state of California (\$63,783) which suggests the community has extra money, therefore they can donate to the aquarium or organizations that they care about. Pacific Grove clearly shows a potential to be very active in volunteering.

MBA is a non-profit organization that is run by its admission fees, occasional donations, and project-based funding. Unlike most Japanese aquariums, MBA does not have any marine mammals in captivity with the exception of rescued California sea otters in rehab. Therefore, there is no dolphin show to entertain visitors either. Exhibitions at MBA are mostly environmental conscious. Figure 19 shows one of the aquarium tanks with plastic waste placed in it, exhibiting a real situation in the nearby ocean. There are also a lot of enlightening and uplifting artwork using marine debris to encourage plastic ocean pollution awareness (shown in Figure 20). These environmental educational aspects are both for kids and adults. MBA works as both a tourist attraction and an educational center for the city. Tokyo Sea Life Park in Kasai, Tokyo, partnered with MBA in 1990, has similar exhibitions as MBA where they display the environment of Tokyo Bay with a lot of garbage in it (shown in Figure 21). The environmental education aspects of the aquarium were already recognized in the US when the Federal Government established the Environment Education Act in 1970 (Yoshitomi 1999). However, MBA is considered exceptional compared to other US aquariums with environmental education aspects, because MBA leads the whole community and city towards a sustainable future by acting as core organization. MBA not only provides a place where the local community and

stakeholders can gather to collaborate under the theme of ocean conservation, but also facilitates involved stakeholders to have a larger outcome.



Figure 19. The aquarium tank at MBA displaying marine garbage
(photo taken by the author)



Figure 20. The plastic pollution exhibition at MBA
(photo taken by the author)



Figure 21. The aquarium tank at Tokyo Sea Life Park displaying marine garbage to exhibit the environment of Tokyo Bay
(photo taken by the author)

4.4 Result

The two destinations mentioned above have two features in common: they both have a shared ST vision as a destination, and there is one organization that supports and facilitates all of the ST practices for the destination.

These two successful examples of ST in California are examined thoroughly by the author and efforts are made to extract common points in both cases. The common features that the author considers important in the two cases are as follows. 1) Rapid environmental deterioration in the past (Monterey Bay in the 1930s until the 1960s, Lake Tahoe in the 1960s) caused by rapid development, including tourism, 2) Clarification of common goals through exclusive leadership by two distinguished doctors (In Monterey Bay,

Dr. Julia Platt pushed the community toward ocean conservation, and in Lake Tahoe, Dr. Charles Goldman raised public awareness by constantly monitoring the lake clarity caused by eutrophication), and 3) Establishment and continuation of a common backbone organization (Monterey Bay Aquarium in 1984 for Monterey Bay, TRPA in 1969 for Lake Tahoe). Regarding the establishment of backbone organizations, because these two organizations belong to different sectors (MBA is a private, non-profit organization and TRPA is a bi-state agency with state-level authority), these common features were not discussed in the past study. Accordingly, Figure 22 and 23 shows the structure of stakeholder cooperation as shown in the form of CIF in Lake Tahoe and Monterey Bay, respectively. Different colors indicate different objectives (themes) that each working group aim at. As Figure 22 illustrates, while Lake Tahoe's Take Care Initiative works as a common agenda for the region, multiple stakeholders are joining to various working groups using their expertise. In addition, the role TRPA plays as a backbone organization enables to apply visions and strategy directly to tourism management.

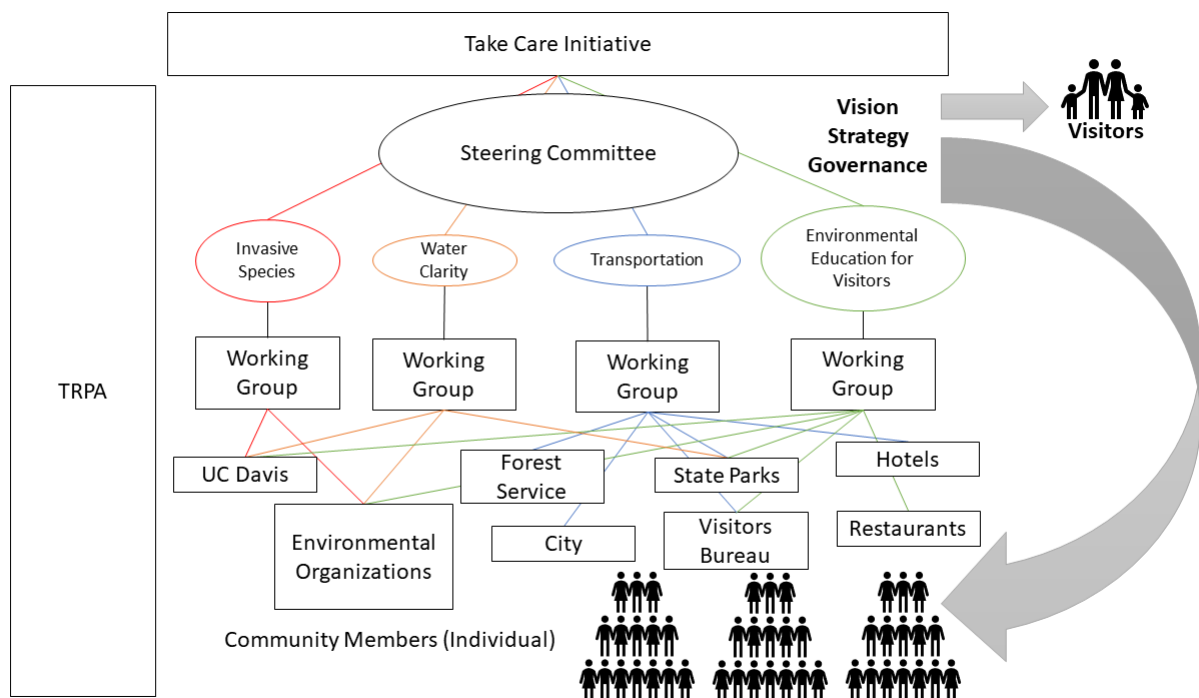


Figure 22. Stakeholder structure in Lake Tahoe as shown in the form of CIF

(Source: Kania and Kramer 2011 with author's own)

Similarly, all the objectives of working groups shown in Figure 23 are connected to the broad theme as a region, which is “ocean conservation” in the case of Monterey Bay. Since MBA, a backbone organization, is one of the biggest tourist attractions in the region, promoting ocean conservation directly connects to ST destination planning, and a common agenda can easily be recognized by visitors.

In both cases of California, the structure of stakeholder cooperation can be incorporated into CIF.

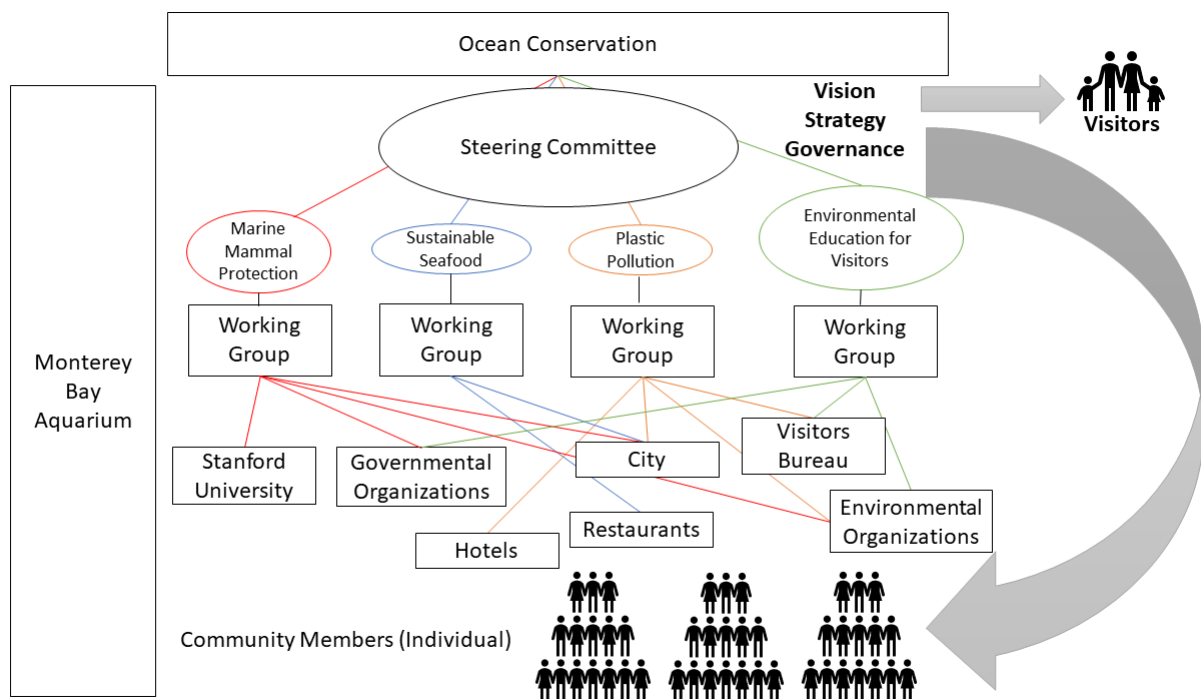


Figure 23. Stakeholder structure in Monterey Bay as shown in the form of CIF

(Source: Kania and Kramer 2011 with author’s own)

In the light of Collective Impact Framework, the author proposed a new binding that these two cases can be classified together to be successful examples of Implicit Application of Collective Impact Framework - CIF. In the following chapter the author will discuss in detail by introducing CIF Index.

Chapter 5

Evaluation of the Status of Collective Impact Framework by Introducing CIF Index

5.1 Introduction

In this chapter, we will verify whether the hypothesis is correct; that the successful ST of the two cases in California can be evaluated through the implicit application of CIF. To that end, the author reconsiders the five elements of CIF precisely. The five elements of CIF can be divided into two parts; systematic (institutional) aspects that can be regarded as necessary items, and operational (practical) aspects that are conditions for CIF to be effective. Thus, three elements, which are, the presence of a common agenda, a backbone organization, and a shared measurement system are all requirements within the system of CIF. On the other hand, continuous communication among stakeholders and reinforcing activities are something that should be operated within CIF.

Based on this classification of five elements (shown in Figure 24), a CIF matrix is generated. The following Table 8 proposes the generated CIF matrix. The author first tried to accomplish this through a literature survey on how well this concept can be satisfied, but since it was a new concept and a rather practical method, previous studies have been conducted on specific cases and therefore it is difficult to develop this into an applicable method. Hence, the author decided to verify each element of this CIF matrix through interviews.

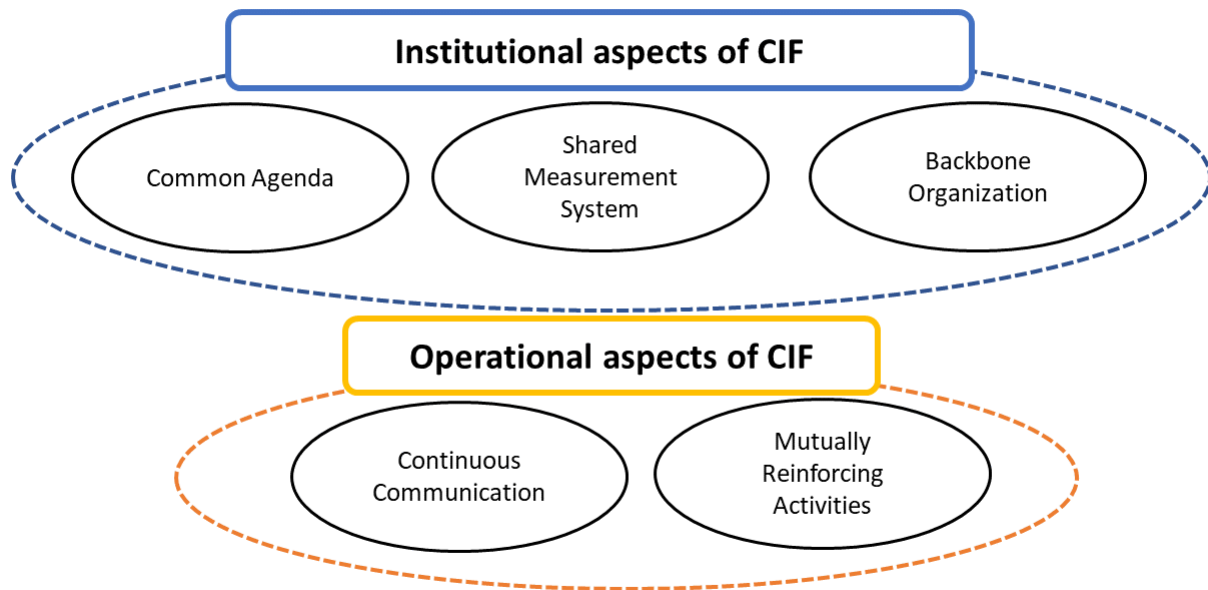


Figure 24. Classification of five elements of CIF

(source: author's own)

5.2 Method

Interview materials were prepared during the period of September to December 2018, and semi-structured interviews were conducted in Pacific Grove and Monterey (from January 2018 to May 2019), and at the Lake Tahoe Basin (from May 2019 to July 2019). Comparative interviews in Iriomote Island were conducted from July to September 2019 accordingly.

Interviewees were selected from the list of stakeholders in each location. Prior to the interview survey, preliminary literature research (mostly on the Internet) and interviews with key persons were conducted to reveal the stakeholder structure of each location in California. The common feature of stakeholder structure found in both locations is that there are four sectors involved in ST; 1) the public sector, that includes the Federal Government, State, County, and City, 2) the research and education sector, including universities, schools, and research institutions, 3) the local community, that includes individual community members as well as local organizations, and 4) the tourism industry, including tour operators and accommodations. From these four sectors, two to three organizations each were interviewed for 1 to 2 hours in the two locations in California and on Iriomote Island.

The criteria for interviewing each element of the matrix are as follows (Table 8).

Table 8. Criteria for evaluating CIF

(source: author's own)

Variables	Calculation Method and Values
Institutional aspects	
a. Common agenda	Presence of a common agenda (0 = absence; 1 = presence)
b. Backbone organization	Presence of a backbone organization (0 = absence; 0.5 = fragmented; 1 = presence)
c. Shared measurement system	Presence of a shared measurement system (0 = absence; 1 = presence)
Operational aspects	
d. Continuous communication	0 = only project-based communication among stakeholders; 0.5 = presence of some sort of council within the same sector (e.g. tourism association within tourism sector); 1 = constant communication among stakeholders
e. Mutually reinforcing activities	0 = projects are one-time only (performed with single subsidy/grant); 0.5 = presence of public-private partnerships or similar collaboration between two stakeholders; 1 = presence of multi-stakeholder collaboration project

First, Item a (common agenda) was evaluated based on the presence of the theme or project that all stakeholders in the region recognize. In the interview, it was revealed by asking interviewees if they are involved in projects or if they use a slogan that can be found in common. Values (0,1) were given as; absence of common agenda = 0, presence of common agenda = 1. In case of Lake Tahoe, there is a project called “Take Care,” that involves various stakeholders from different sections. This project is led mainly by the TRPA, a core organization that coordinates sustainable tourism activities within the Lake Tahoe region. The purpose of this project is to raise awareness of visitors as well as local residents of the environmental conservation.

The message that “Take Care” addresses is simply asking people to “take care,” or always consider the conservation of Lake Tahoe. Because this message is widely shared within the region, and it works as a principle for organizations to operate within the region, it can be considered a “common agenda” of Lake Tahoe. In the Monterey Bay region, although we cannot observe a specific project that unites various stakeholders together, MBA clearly leads the community with one shared principle, that is, “Ocean Conservation.” Local residents of Monterey Bay have been very active in volunteering from the beginning, and they support all kinds of environment-related activities within the region. Together with the shared principle, it seems that local residents have become more and more proud of their conservation activities. For instance, volunteers can easily be found at MBA working as interpreters, on the streets and beaches picking up garbage, and at State Parks as docents.

“Ocean Conservation” has long been a common theme among people in Monterey Bay since around the time that the sardine industry collapsed, and Dr. Platt established a marine refuge in front of Hopkins Marine Station. From these observations, the author considered that both the cases in California, common agenda has long been established and shared in the community. In the case of Iriomote island, no common agenda can be observed since the island’s tourism development. The author observed several “fragmented” principles and catch phrases, such as “*Iriomote Yamaneko* comes first”, a controversial topic that urges local residents to leave the island in order to protect *Iriomote Yamaneko* (Iriomote wild cat), which is listed in IUCN Red List of Threatened Species as CR (Critically Endangered), mainly because of the concern over a decreasing population trend (IUCN, 2019). Moreover, the number of cats killed by traffic accidents are also increasing in recent years (Yaeyama Mainichi Shinbun 2018). The population is estimated at around 100 and the number has not changed drastically since monitoring began in 1982 (Izawa et al 2009). However, this particular phrase has never been accepted and shared among local residents as a “principle for action.”

Item b (backbone organization) was evaluated by the identified core organization (TRPA, MBA and Iriomote Island Ecotourism Association) and by investigating their ability not only to lead the community but also to facilitate the whole community by connecting various stakeholders together towards a common goal. If the core organization takes leadership and also facilitates, they were given the value of 1.

Interview surveys revealed that both representing organizations – the TRPA for Lake Tahoe and the MBA for Monterey Bay - communicate actively with various stakeholders. TRPA not only acts as state-level authority in managing environmental conservation around the Lake Tahoe, but they also communicate with small organizations in the community. MBA, on the other hand, does not possess any kind of authority in managing environmental conservation in the region. However, their activities for ocean conservation directly influence plans and regulations of the governmental authorities. In addition, MBA works closely with the community in Monterey Bay to enhance and support bottom-up actions for ocean conservation. Through the interview, it was revealed that these two core organizations clearly perform a “recognizable” leadership under their common agenda. It was also revealed that their ability in connecting various organizations together also helped to achieve better dissemination and utilization of the determined common agenda. The reason Iriomote Island Ecotourism Association was evaluated as “fragmented (0.5)” on Item b was because communication is limited to one-to-one, which does not demonstrate the ability to coordinate stakeholders despite their role as a core organization to lead the community. It was revealed from the interview survey that, although Iriomote Island Ecotourism Association knows many local organizations active in the island, organizations they communicate with regularly are limited to the public sector, the local

community, and the tourism industry (and also limited to tour operators such as kayaking, snorkeling, and scuba diving). In the academic sector, there are two university research facilities on the island, but communication with them rarely happens. The lack of communication with academic sector can be considered a major difference between the two cases in California and the case on Iriomote Island.

Item c (shared measurement system) is simply evaluated by the existence of collected data that is consistently shared across all stakeholders in such a measurement system. Lake Tahoe was given the value of 1, because there is the Environmental Threshold Carrying Capacities, introduced in 1982 and adopted to Regional Plan in 1987, to monitor the health of environment and society around Lake Tahoe that still plays a role as principal for environmental conservation. TRPA's Environmental Threshold Carrying Capacities has 178 threshold standards to assess the environmental health of the lake and is evaluated by various organizations and scientists with different expertise every four years. Every organization associated with Lake Tahoe is aware of this standard, and activity should be established based on this standard. Monterey Bay on the other hand, does not have a shared measurement system because the coastal environment around Monterey Bay is regulated by different authorities on different assessment criteria and therefore it was given the value of 0. However, this does not imply that the coastal environment in Monterey Bay is not managed in an effective way. Regulations are carefully planned to manage each unique ecosystem, but the assessment criteria are different for each location, thus it was given the value of 0. Iriomote Island was also evaluated and given the value of 0, considering their way of conservation in the local environment is not entirely scientific, and ineffective, conducted and regulated by different governmental authorities. For example, the marine environment of the island is partially protected by the Ministry of the Environment as it is a part of a Japanese National Park, and land areas are protected by both the Forestry Agency and the Ministry of the Environment, covering almost the entire island, excluding village areas. Unlike the case in Monterey Bay however, on Iriomote Island, environmental protection and management has been conducted separately due to the jurisdiction of responsible authorities both on a national and local level, not in an integrated way.

As for the operational aspects, Item d (continuous communication), is evaluated based on whether meetings with various stakeholders are held on a regular basis, and relationship among stakeholders is a form of permanent working groups, rather than project-based relationships. Both Lake Tahoe and Monterey Bay were given the value of 1, because there have active working groups. In Lake Tahoe, the TRPA manages at least 10 different projects: Sustainable Recreation Working Group (SRWG) is one of those, consisting of government agencies, non-profit organizations, and tourism associations in the area. SRWG holds a meeting every month to discuss matters related to sustainable tourism in order to make Lake Tahoe the world's finest sustainable destination, which shows that there is continuous communication among various stakeholders

from different sectors. In Monterey Bay, the MBA is involved in federal and state-level projects and planning as well as bottom-up projects such as reusable bag promotion at farmers markets led by Communities for Sustainable Monterey County. Iriomote Island was given the value of 0.5, because groups that exist on the island are formed within the same sector.

For example, the canoe union and stand up paddle board union are a collective of tour operators that use the same equipment, but they do not include stakeholders from other sectors. Therefore, these unions are rather considered as “partners” in the context of CIF, and not considered as a “working group.”

Finally, Item e (mutually reinforcing activities) were evaluated by investigating if activities of each organization are differentiated while still being coordinated along the course of stakeholder collaboration.

Lake Tahoe and Monterey Bay were given the value of 1, because it was revealed through interviews that the activities each stakeholder takes on fit into their area of expertise. These activities reinforce one another to achieve a larger outcome as a community. For instance, within SRWG, each organization provides data that it has access to. Tourist associations provide information on tourists such as number of hotel stays and duration of stay, State Parks take surveys on satisfaction, and local environmental organizations accumulate more detailed data such as the amount of garbage on the beach, obtained from beach clean-ups. All of this available data from individual activities of different organizations are then integrated and developed into a sustainable recreation strategic plan. This process is a good example of mutually reinforcing activities of different organizations. The reason why Iriomote Island was given the value of 0.5 is first of all, they lack cross-sector collaboration, which was seen in both cases in California. In addition, although some organizations do what they do best, their activities are usually pointed at achieving their own goal as an organization.

The maximum value of each aspect therefore became 3 for the institutional aspects, and 2 for the operational aspects. In this manner, the CIF Matrix generates a maximum score of 5.

The advantage of the CIF Matrix is that we may generate a CIF Index as a single number by simply adding all notes throughout the results obtained from qualitative observations, as performed by Chiodo et al. (2019).

5.3 Result

The result of each criteria evaluated and given value is shown on Table 9.

Table 9. The values of each element of CIF in each location

Variables	Lake Tahoe	Monterey Bay	Iriomote Island
Institutional aspects			
a. Common agenda	1	1	0
b. Backbone organization	1	1	0.5
c. Shared measurement system	1	0	0
Total score of x-axis	3	2	0.5
Operational aspects			
d. Continuous communication	1	1	0.5
e. Mutually reinforcing activities	1	1	0.5
Total score of y-axis	2	2	1

The result of the CIF index is divided into two different axes, institutional aspects, set as the x-axis, and operational aspect, set as the y-axis. As listed in the Table 9, the score in each axis for three locations can be illustrated by summing up those scores.

Since the CIF index is divided into two axes, the resulting value can be illustrated in bidimensional plot figure. Figure 25 shows the assumed scores of 4 hypothetical cases. In Figure 25, “A” represents the score of 5.0, which is the maximum score and considered successful CIF. On the other hand, “B” shows the score of 0, which means that CIF is completely absent. “C” represents the case that all institutional aspects are employed but it is not operated as the way CIF requires. “D” represents the case that does not have any institutional aspects of CIF, but the community is very active therefore shows some potential to be a successful case of CIF.

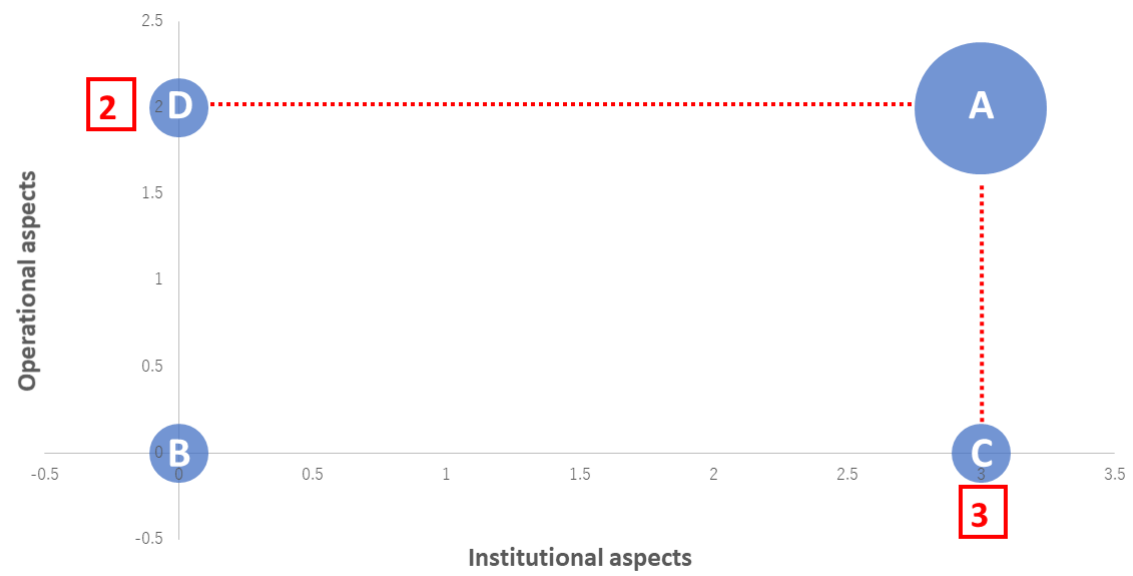


Figure 25. Sample scores of CIF Index
(source: author's own)

The calculated results of the CIF index are shown in Figure 22. As the calculation results are based on the CIF Matrix through interviews, the total CIF Index, the sum of each axis, becomes 5.0 for Lake Tahoe and 4.0 for Monterey Bay. Using the same CIF matrix applied for Iriomote Island, the resulting CIF Index for Iriomote island is 1.5.

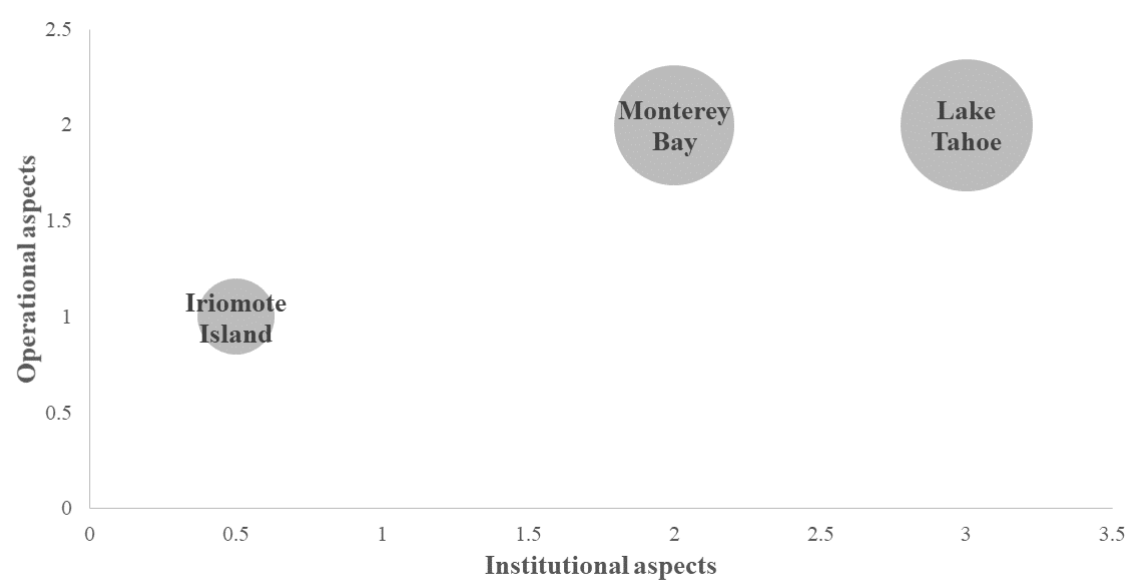


Figure 26. The result of calculated CIF Index
(source: author’s own)

By observing Figure 22 and comparing it to scores of sample cases shown in Figure 25, the position in figure 27 illustrates the status of CIF application in each location: the ideal position was given to Lake Tahoe, having maximum Institutional and Operational scores, meaning that having an appropriate institutional framework which functions as required. In the case of Monterey Bay, the institutional aspects are inferior to the case in Lake Tahoe, due to the lack of a “shared measurement system,” in other words, common environmental evaluation criteria, while the other indicators perform equally as the case in Lake Tahoe. In the case of Iriomote Island, both institutional and operational aspects are inferior to the two California cases, meaning that there are still major issues to be solved to achieve CIF in practice.

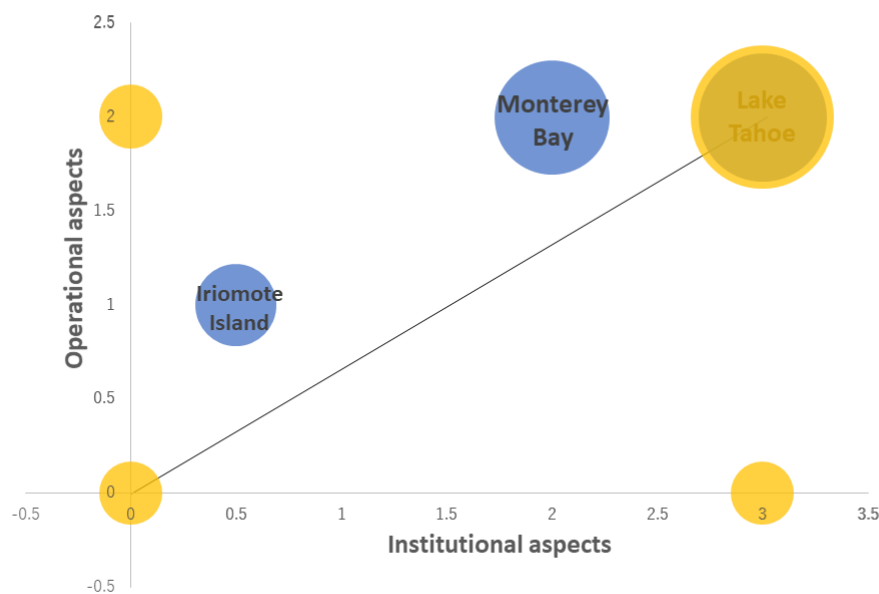


Figure 27. The calculated result of CIF Index and sample scores

(source: author’s own)

According to the calculated CIF Index value, we may evaluate the independent ST example as a basis for fitting into CIF, for all cases whether explicitly or implicitly introduced to the CIF concepts. We have just demonstrated that two successful ST examples in California can be classified as implicit application of CIF, which can potentially be applied to other successful or unsuccessful cases of ST, according to these standards.

Chapter 6

Discussion - Why CIF Index of Iriomote Island Was Significantly Lower than the California Cases

6.1 Summary

In this chapter, we will discuss why the case of Iriomote Island was low in the CIF Index introduced in Chapter 5, in comparison with the two California cases; the two significant low scores were found in “Common Agenda” and “Backbone Organization” in particular. These are the important elements that are common in two of the successful ST stories in California. On the contrary, Iriomote Island Ecotourism Association could have become a backbone organization corresponding to these, but it has not yet been established.

However, when the root cause was investigated, in both cases in California, there was strong leadership to overcome environmental destruction once they experienced how serious it became. On the other hand, on Iriomote Island, environmental destruction was not as serious, and at the same time, the movement against it was not as advanced. The lack of strong leadership in the case of Iriomote Island should also be illustrated.

6.2 CIF Index Evaluation: California

Based on CIF, both case studies in California have a common agenda developed, activities of all the stakeholders involved were carried out under the common agenda, and there was an organization that supported the entire system of ST. The case in Lake Tahoe met all five aspects to achieve CIF. Hence, the only difference found between the two California cases was the presence of a “shared measurement system” that could not be found in the case in Monterey Bay. Environmental Threshold Carrying Capacities developed by the TRPA and scientists can be considered one of the most sophisticated systems in the world, as the regulations are all based on precise and scientific achievements among all environmental sciences, including limnology and hydrology, forestry and land-use management, mapping using satellite remote sensing and GIS, combined with the most strict bi-state regulations determined by the TRPA, as bi-state authority possessing the right to establish new and innovative regulations. They have a common and simple representative environmental index - as lake water transparency is measured using the same technique that LeConte first used to measure the lake clarity in 1873. Since the freshwater environment, especially for

oligotrophic lake like Lake Tahoe, has a simpler ecosystem than a coastal ecosystem, the advantage for Lake Tahoe in establishing a shared measurement system can be explained by the following two aspects: a closed hydrological system and a simple ecosystem.

The former - a closed hydrological system limited to the lake system, is an advantage of Lake Tahoe. At the same time, a closed hydrological system may also be a major disadvantage and risk for such an environment. Unlike Monterey Bay and Iriomote Island, the Lake Tahoe system could never be recovered within a short period of time once it collapsed, since the retention time of the lake system lasts about 700 years.

Monterey Bay, which can be listed as possessing appropriate institutional aspects and very active operational aspects, should be highlighted by its uniqueness and integrity with local culture represented by the sardine cannery. Monterey Bay can be characterized by their self-dependent history led by strong leadership in the academic sector, combined with the local tourism industry after the collapse of the sardine cannery. The MBA, being a private and non-governmental organization, played a major role as a core organization in the region, providing several opportunities for the local community in integrating organizations in completely different sectors to unite under the common agenda, "Ocean Conservation."

Therefore, even without having precise standards and establishing common measurement system for environmental conservation, it was proved to have an effective CIF. As stated in the previous paragraph, since the coastal environment is an open system and ecosystems in coastal environments are much more complex than freshwater systems, the regulations for protection - in other words, the establishment of a "shared measurement system" is not as easy as in the case of Lake Tahoe. However, it means there are a lot of things to do and survey to achieve sustainable environment and sustainable tourism, which can be observed by taking a look at several exhibitions illustrated in the MBA, and represented by several different projects being conducted at Hopkins Marine Station of Stanford University. In short, these cases proved to be successful within the five elements of CIF.

6.3 CIF Index Evaluation: Iriomote Island

On the other hand, analyzing the situation on Iriomote Island, there is no common agenda, no shared measurement system, activities that are supposed to reinforce each other are fragmented, communication is limited, and most importantly, the organization that should be the backbone of the entire activity is not fully present. Therefore, it was concluded that the CIF is not yet present on Iriomote Island.

As a result of evaluating ST on Iriomote Island by CIF, not only the vision is lacking and the role that the core organization plays are fragmented based on the criteria of the backbone organization in CIF, but

it also became clear that the activities of individual organizations are dependent on project-based funds. This means that funding for each organization is extremely volatile and activity funds are limited to grants and project funds. This is why Item d, continuous communication, was evaluated as 0.5, that is, communication between stakeholders is limited to the project-related activities. It suggests that ensuring continued funding is a major challenge for organizations on the island.

In addition, although there is no particular mention of cash flow in CIF, the two cases in California show that projects that involve various stakeholders related to a common agenda are managed and carried out by a backbone organization; the funds were generated from each organization. In other words, projects are carried out using funds from related organizations while individual organizations also get donations and make some sales revenue for their own activities. Taking Lake Tahoe's Take Care Initiative as an example, because the project was established by a collection of many organizations and the funds are centralized, each organization can take a bigger step than the steps that they could take as a single organization. In Monterey Bay, the aquarium serves as backbone organization that connects small organizations together to help them produce a larger outcome. These examples can be considered as evidence that the activities of individual organizations are linked to a common agenda, making it possible to continue to operate. In other words, instead of funds that have been acquired individually by the organization so far, collectives of organizations with the same purpose along a common agenda can solve the problems of insufficient funds and manpower for achieving bigger goals. By adding the function of fund aggregation and appropriate distribution to one of the roles of the backbone organization, Iriomote Island would be able to continue to create tourism sites in accordance with a common agenda.

Chapter 7

The Future of Sustainable Tourism on Iriomote Island

7.1 CIF and Sustainable Tourism

In the light of the successful cases in California, the author concluded that a core (backbone) organization based on CIF on Iriomote Island should be established to design and share a new form of ST on the island. In addition, learning from successful cases in California, an NPO can be a powerful organization for implementing the CIF to Iriomote Island in order to acquire sustainable funds, as well as to develop a common agenda with the help of academia to gain expertise on environmental conservation.

Throughout the accomplishment of this survey, it was concluded that (1) CIF can be considered a major framework in order to evaluate ST achievement; (2) the CIF Index can be used for the evaluation of the status of achievement in different stages of ST. Among the CIF items used for the CIF Index, it was concluded that the establishment of a common agenda throughout the creation of a reliable and tangible backbone organization in the region is essential in order to stabilize long and reliable development for sustainable tourism in the region. For this aspect, the author considers what should be done on Iriomote Island, in order for it to be a successful example of ST.

Considering the background of the two successful cases, based on the fact that the establishment of a “common agenda” is an essential item, the author observed that both cases in California were led by outstanding leaders who possess both scientific backgrounds and consciousness as local residents. There is a question about such aspects, whether a “common agenda” can be provided by an outsider of the island. In the two successful cases, it was proven that a “common agenda” without full consent of local residents cannot be disseminated and shared, and that it cannot become a “primary principle of action” of the background organization. In the case of Iriomote, some “agendas” have been proposed by outsiders, which were not shared or agreed upon by the local residents, and thus have not been successful as a “primary principle of action.” Accordingly, the activities for raising awareness and consciousness of local residents for them to be able to establish their own “common agenda” should be established.

Throughout the discussion made in Chapters 4 and 5, we have demonstrated that two successful California ST cases can be classified as implicit application of CIF concepts. If this consideration is true, we have to investigate how to implement an “Explicit” or “Intentional” application of CIF into the unsuccessful example of ST, such as places like Iriomote.

7.2 IRIOMOTE VISION 2030: Workshop Towards Sustainable Future of the Island

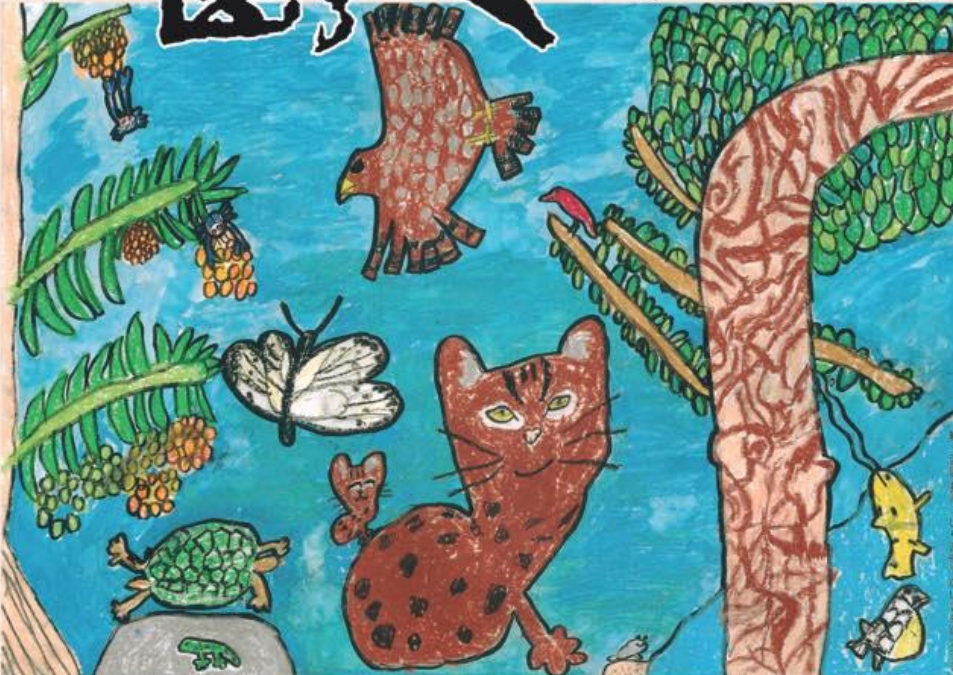
7.2.1 Objectives and Method

For the purpose mentioned above, the author held a workshop to extract public motivations for the future of Iriomote Island and to establish a foundation to build a common agenda. There are two objectives for this workshop, the first is to gain understanding of the concept of sustainable tourism and collective impact, and secondly, to extract public will towards the future of Iriomote Island. The workshop took place at Nakano Waiwai Hall in Nakano Village, Iriomote Island on December 14th, 2019 from 10am to 4pm as one of the exhibitions of “*Shimapitu Bunkasai* 島びと文化祭” sponsored by Iriomote Island Ecotourism Association (shown in Figure 28 and 29). This bi-annual event started in 2000 and is held mainly for local residents to gain familiarity with the traditional culture of the island.

In addition to exhibitions from various organizations that are based on the island, traditional handmade crafts are sold, and traditional songs and dances are performed by students.

伝統 継承 創造 文化力は島の力

第8回 西表島人文化祭



石垣・西表・宮崎のフェリー割引乗船券があります(要予約) 「ミ」を減らすためにマイバッグ・マイ箸をお持ちください

2019年12月14日(土) 西表島・中野わいわいホール

展示の部
10:00~16:00

- 島内作家による手工芸品の展示・販売
- 島の「文化」「自然」「環境」パネル展示
- 島の物産展・おいしいものバザー
- ワークショップ
- 体験コーナー
- 紙芝居公演
- リラクソヨガ
- ほか

舞台の部
19:00~21:00

- 舞踊
- 唄・三線
- 古謡
- 古典太鼓
- エイサー
- ハワイアンフラ
- ほか

入場無料

協賛: 安栄観光 西表島交通(株) イルマーレウナリザギ (資) 浦内川観光 紅露工房
スーパー八重 ダイビングチームうなりざき 八重山観光フェリー (株) 由布島 ほか

後援: 竹富町 竹富町教育委員会 環境省沖縄奄美自然環境事務所 九州森林管理局 竹富町観光協会
竹富町商工会 竹富町物産観光振興公社 株式会社八重山毎日新聞 八重山日報社 沖縄タイムス社

主催: 特定非営利活動法人 西表島エコツーリズム協会

スペシャルツアー
西表島・民謡のふるさと巡り
12月15日(日)開催
有料・定員20名・要予約

お問い合わせ: 西表島エコツーリズム協会 (0980-85-6331)




Figure 28. Official flyer of Shimapitu Bunkasai

(source: photo taken by the author)



Figure 29. The entrance of *Shimapitu Bunkasai*
(source: photo taken by the author)

In order to extract public opinions through this workshop, the author prepared the following two simple questions to ask to local residents as shown in Figure 30.

- 1) In 2030 (in 10 years from now), what would you expect Iriomote Island to still have?
- 2) In 2030 (in 10 years from now), what would you expect Iriomote Island not to have anymore? (What would you want to get rid of?)

Combining answers from these two questions together can generate a basic statement as follows; “In 2030, Iriomote Island should still have X but should not have Y,” that directly reflects the opinions of local residents about the future of Iriomote Island. This can also be considered a vision of the island, as well as a foundation when establishing a common agenda.

Participants were randomly selected as the workshop was held as a part of the event. Participants were handed small piece of colored paper and a pen to write the answers on the B1 sized paper that the author provided. A short oral explanation of the concept of ST, CIF, and the purpose of this workshop was provided using a poster (shown in Figure 31) as visual aid to participants before they were asked to answer the questions. The anonymity of participants was kept by limitation of available space (1 or 2 people at a time) to write answers. Figure 32, 33, and 34 are scenes from the workshop.

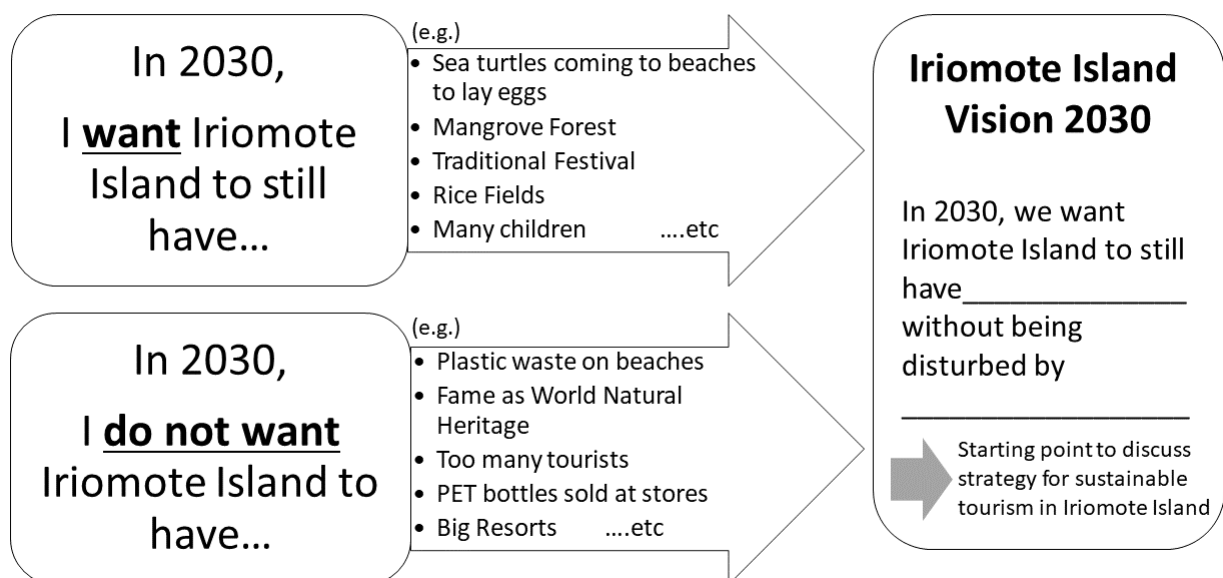


Figure 30. Questions asked in IRIOMOTE VISION 2030

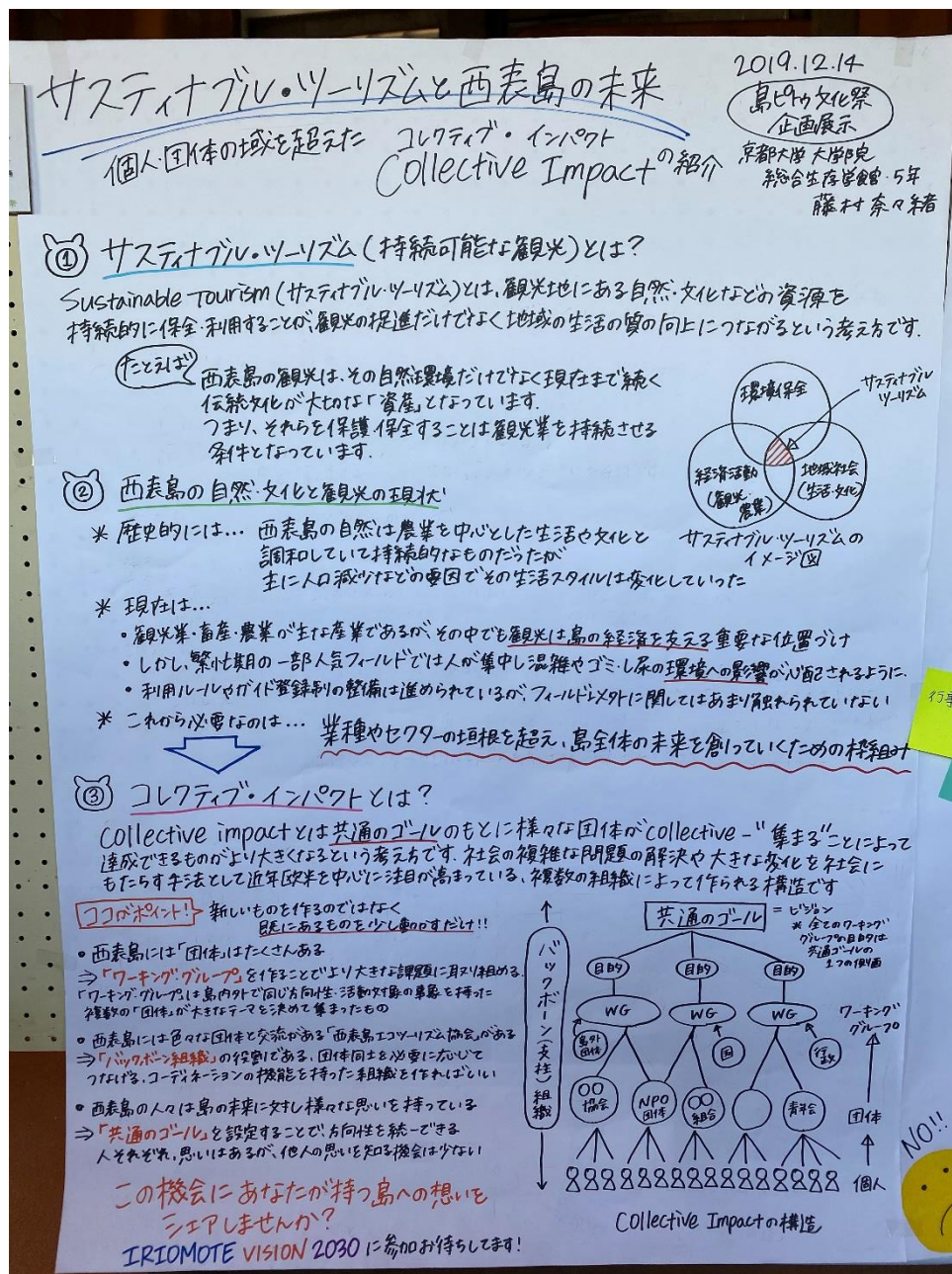


Figure 31. A poster explaining the concept of sustainable tourism and collective impact

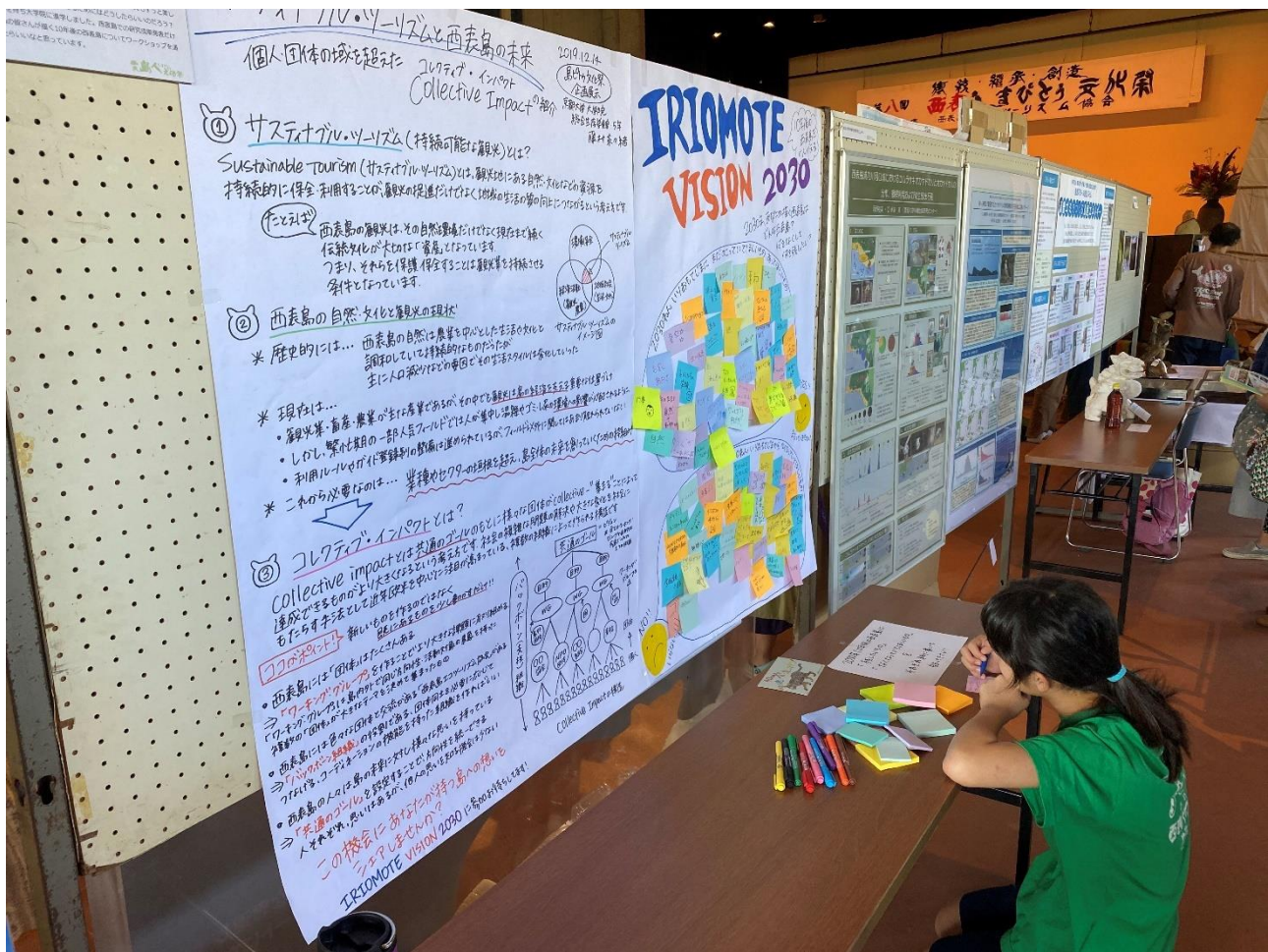


Figure 32. A scene from workshop (1)

(source: photo taken by the author)



Figure 33. A scene from workshop (2)
 (source: photo taken by the author)

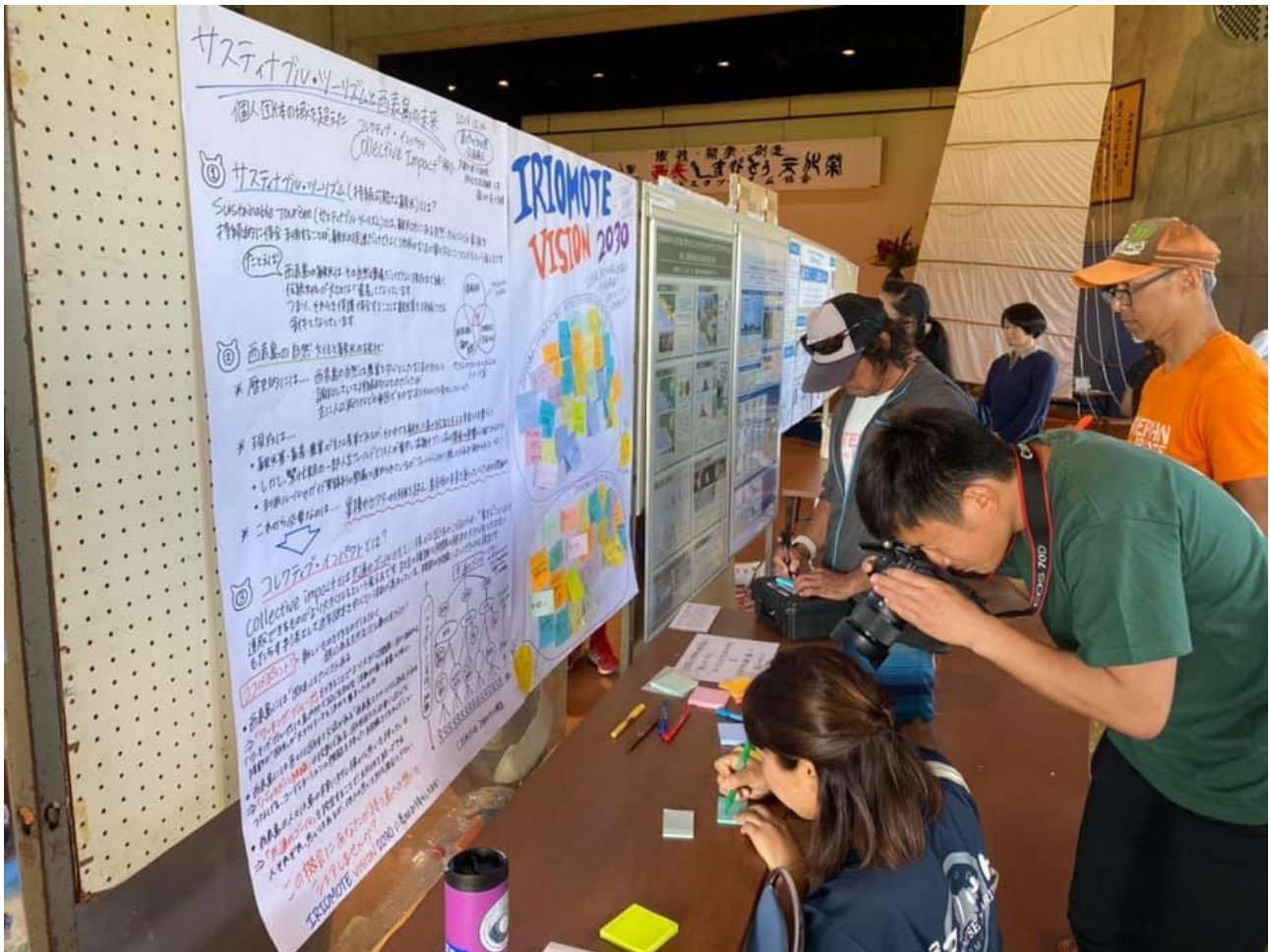


Figure 34. A scene from workshop (3)
 (source: photo taken by the author)

7.2.2 Result

A total of 64 people participated in the workshop. Of these 64 people, 30 were men and 34 were women.

Men in their 30s to 40s, and women in their 20s were the most common age group. Young adults under the age of 19 were consisted mostly as 7 to 14 years old because there is not a high school on the island. Attributions of all the participants are shown in Table 11.

Table 10. Attribution of participants

	Men	Women	Total
Under 19	5	8	13
20s	6	9	15
30s-40s	8	8	16
50s-60s	7	4	11
Over 60s	4	5	9
Total	30	34	64

The answers are classified by extracted keywords and divided into categories. The results show there are 7 categories in Question 1 (Nature, Plants and animals, Marine environment, Local lives and scenery, Culture, Mangrove forest, and Others) and 7 categories in Question 2 (Plastic and marine garbage, Roadkill, Illegal dumping and trash, Tourism development, Someone indifferent to the island, Against World Heritage, and Others).

Figure 35 and 36 show the result of each questions, and the actual answers on the paper are shown in Figure 37 and also in appendix.

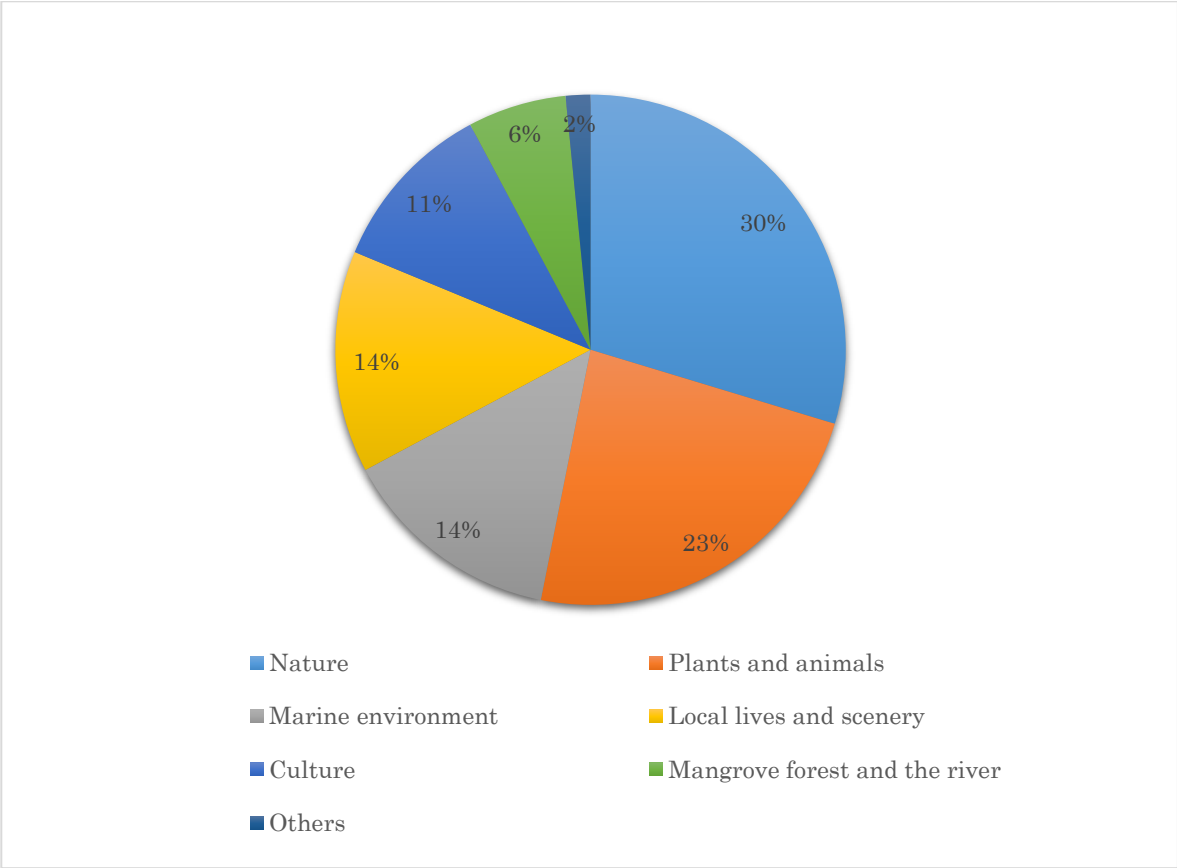


Figure 35. Result of question 1

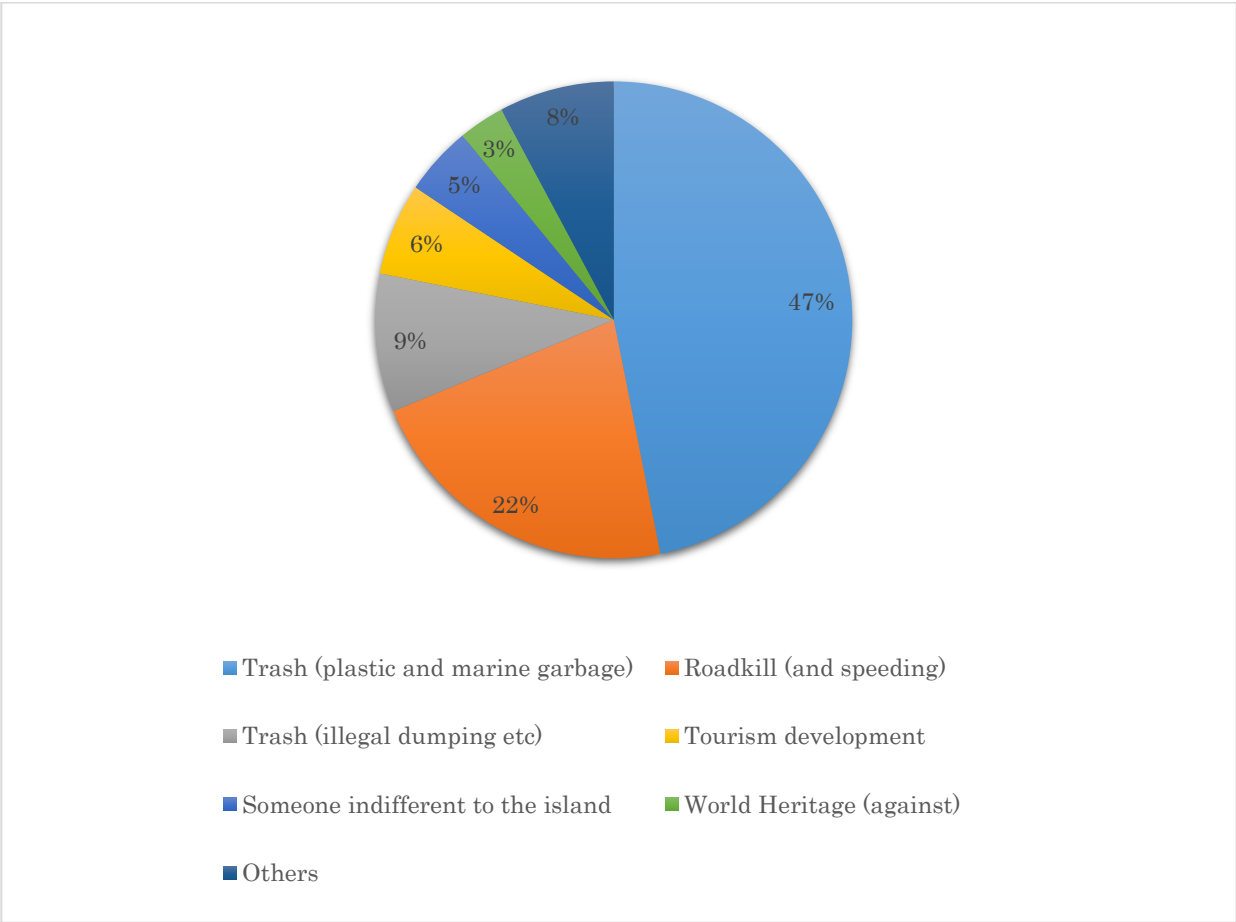


Figure 36. Result of question 2

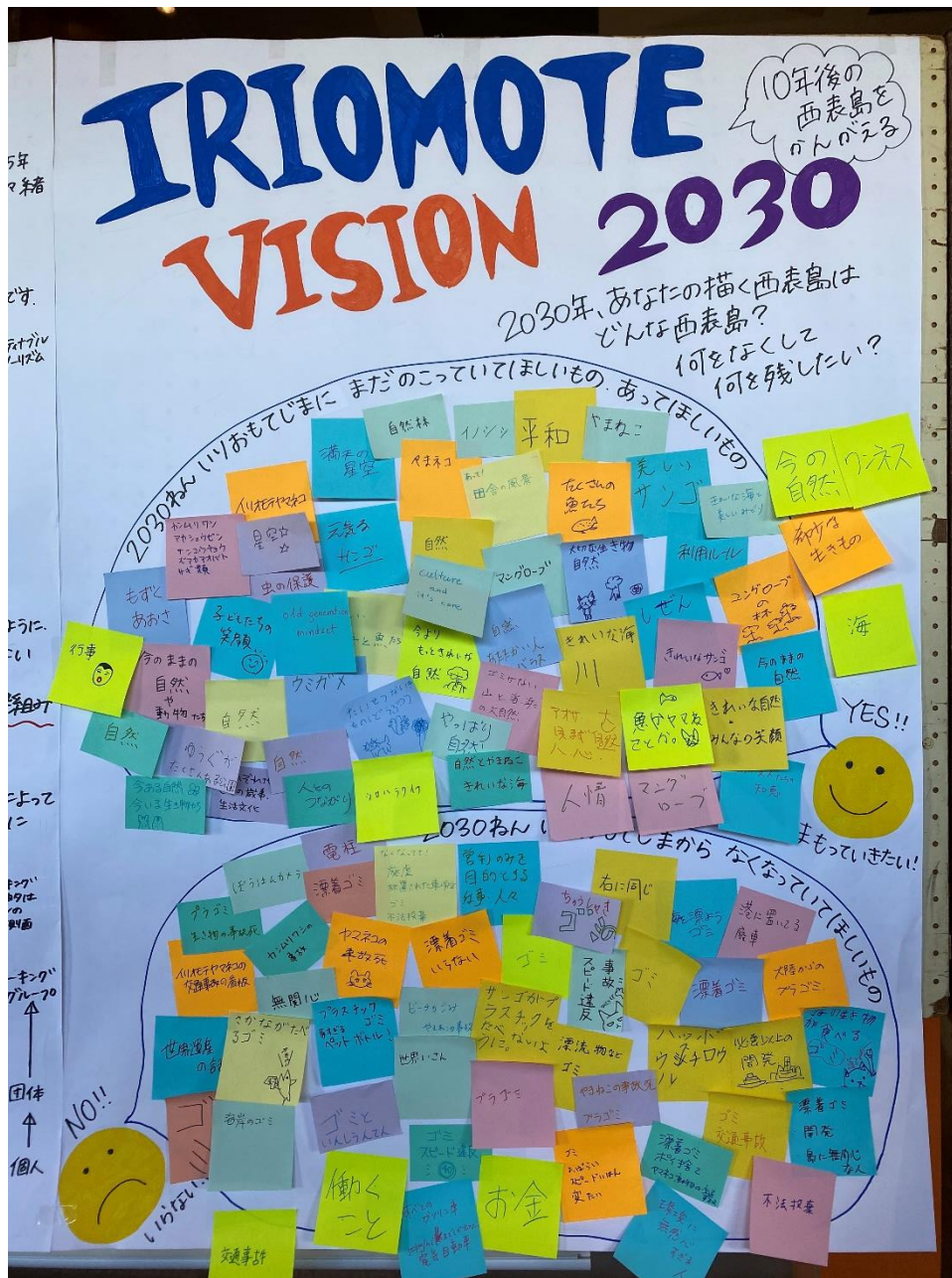


Figure 37. The result of the workshop

In Question 1, out of the 7 categories, “Nature” was the most abundant keyword, and accounted for 30% of the answers. “Nature” includes all kinds of natural environments on the island, which are the ocean, mangrove forests, and rivers. Besides “Nature,” the numbers of answers indicating “Marine environment” and “Mangrove forest” were also considerable. Incorporating these two categories into the “Nature” category accounts for 50% of all answers. In addition, answers indicating specific plants and animals living on the island such as *Iriomote Yamaneko* イリオモテヤマネコ (Iriomote Wild Cat, *Prionailurus bengalensis iriomotensis*), *Ryukyu Inoshishi* リュウキュウイノシシ (Ryukyu wild boar, *Sus scrofa riukiuanus*), and *Shirohara Kuina* シロハラクイナ (White-breasted Waterhen, *Amaurornis phoenicurus*) as well as Mozuku seaweed and Aosa seaweed accounted for 23%. Because these plants and animals cannot exist without the natural environment, this category can also be incorporated into the “Nature” category, and that means the “Nature” category consists of 73% of all answers. This clearly implies that the interests of local people are pointing at preserving the natural environment and living creatures on the island. It is also important to note that the “Local lives and scenery” category includes answers such as “scenery as countryside,” “a park with a lot of playground equipment,” and “human relations” accounted for 14%, indicating that local residents have concerns that further development will change their lifestyle.

In Question 2, out of the 7 categories, “plastic and marine garbage” was the most seen keyword (47%), and these were answered by different age groups including young children, showing the issue is widely shared among local residents. Similarly, “Illegal disposal,” “Abandoned vehicles” and “Abandoned houses” represent 9% of all the answers, and that makes “garbage” together consists 56% of all the answers.

Following the “garbage” category, answers indicating “Roadkill” accounted for 22% of all the answers. On Iriomote Island, animals killed on the road vary from frogs, snakes and crabs that are often seen on the road especially after rain, to protected animals namely *Iriomote Yamaneko* イリオモテヤマネコ (Iriomote Wild Cat, *Prionailurus bengalensis iriomotensis*), *Shirohara Kuina* シロハラクイナ (White-breasted Waterhen, *Amaurornis phoenicurus*), and *Kanmuri Washi* カンムリワシ (Crested Serpent Eagle, *Spilornis cheela*). The number of accidents (roadkill) of Iriomote Wild Cat has been documented since 1978, and 9 kills in 2018 broke the record (Yaeyama Mainichi Shinbun, 2018). Although a nonprofit organization is patrolling regularly to monitor speeding vehicles, the speed limit of 40km/hour is still not perfectly observed by both tourists and local residents.

Moreover, answers indicating “people who are not interested in issues of the island” represents the situation of the island that there are people who really care about the island, but there are also people who have no interest to make a difference.

7.2.3 Findings from IRIOMOTE VISION 2030

Based on the answers collected, a statement that can support creating a “common agenda” for Iriomote Island was presented as the following: “In 2030, the natural environment on the island will still be preserved as the status quo, and roadkill will be eradicated. A framework for proper garbage disposal will be established and the amount of garbage will be sharply reduced.” Therefore, it is a major premise to protect and preserve the natural environment and plants and animals that exist in 2020. In addition, it is suggested that making rules on roadkill prevention and garbage disposal are urgent issues.

The significance of this workshop is demonstrating one possible method of extracting public will to establish a foundation to create a “common agenda.” In the case of Iriomote Island, it was pointed out that people have different opinions about the island, but it was difficult to see the consensus because they are not shared within the community. However, as a result of this workshop, it was thought that by providing a place where people could give their opinions anonymously, they were able to raise their feelings about the island on their own, regardless of age or occupation.

In addition, 13 elementary school students or junior high school students participated in this workshop. The frank opinions of the children may have caught the eyes of adults who did not participate in the workshop but saw the exhibition. It was shown that by taking the form of a workshop rather than a questionnaire or one-on-one interview, it is possible to pick up opinions while communicating with the target audience.

Chapter 8

Conclusion

CIF was proposed by Kania & Kramer as a method to solve various complex social problems such as poverty, education, and crime. Practical examples of CIF application have mainly been seen in the United States, starting with efforts to improve academic performance of teenagers in Ohio by a nonprofit organization; Strive.

On the other hand, there are few examples of applying CIF to solve problems surrounding tourism in tourist destinations, and there is still only one study by Chiodo, Adriani, Navarro and Salvatore, which evaluated CBT from the viewpoint of CIF. Their approach, assessing tourist destinations from the perspective of CIF is an important milestone in clarifying obstacles for tourism planning in tourist destinations. The evaluation demonstrated the possibility that CIF application could be practical for regions that are trying to implement ST.

On Iriomote Island, where the author has been researching for many years, various problems surrounding tourism have recently been pointed out, and solutions have been explored. Because tourism on Iriomote Island is based on its natural environmental resources, it is necessary to balance tourism development and conservation of its natural environmental resources, as well as of wild animals and plants, in order to establish ST exclusively for the island. In addition, traditional local culture and people's lives should also be protected and conserved, not only rich natural environmental resources, but also precious animals and plants, together with tourism development.

In order to implement ST exclusively for Iriomote Island, the author first evaluated the current natural environment of Iriomote Island both spatially and historically. Through the survey via interview in the local community, literature review and GIS analysis, the significant changes in the culture and people's lives from the 1960s to the 2000s, and their root causes were shown. In detail, significant changes to the natural environmental resources of Iriomote Island were mainly due to development through investment from outside of the island, and the traditional sustainable lifestyle was disturbed when people moved away from the island, which happened when Okinawa was returned to Japan. Moreover, tourism development was also led by outside investors, rather than being led by local residents. Iriomote Island continued to be overwhelmed by a wave of development trends from outside the island, resulting in a loss of integrity as an island in tourism development.

Then the ST-related activities in Lake Tahoe and Monterey Bay in California, USA, where the natural environmental resources are tourism resources, just like Iriomote Island, were investigated as case studies of successful ST. As a result, in both cases, the common agenda was set that plays a role as a shared vision of the region, and there was an organization which can be classified as a backbone organization, with a role to support the activities of each stakeholder in the region. Despite the fact that the types of support (core) organizations were different in each case, in Lake Tahoe, it was TRPA, a bi-state agency and in Monterey Bay, it was MBA, a private nonprofit organization, both organizations are connected to each stakeholder in the region and acted as facilitators of ST initiatives. In other words, ST is successful in these two regions because there was a common agenda established by the community, and a backbone organization was present. However, in both cases, the framework for ST was established without implementing CIF intentionally, which can be titled “Implicit CIF.” It was thus implied that the strategy for establishment of successful ST framework could be based on the presence of CIF, even through Implicit CIF application.

From these successful examples, a hypothesis was proposed that it would be effective to apply Collective Impact as a framework for achieving successful ST.

In order to prove the hypothesis, a CIF index was created, and the framework of ST was evaluated from the viewpoint of CIF in each region. Although the CIF index is a method that is determined by the subjectivity of the practitioner based on interviews, it enables us to visualize the degree of achievement of CIF at different stages by simply quantifying each CIF elements.

As a result of calculating the CIF index, Lake Tahoe and Monterey Bay showed high values.

This indicates that CIF is functioning practically in both cases. Considering that CIF was not deliberately introduced in the cases of California, the author considered that the cases in California are examples of “Implicit CIF” application. On the other hand, Iriomote Island had an extremely low value compared to the case of California. In particular, the lack of a common agenda and the lack of functionality of the backbone organization were pointed out as root causes.

The author then explored the possibility of applying CIF explicitly – titled “Explicit CIF application” to Iriomote Island by supplementing the backbone organization and establishing a common agenda, which was judged to be lacking in the case of Iriomote Island. In CIF, establishing a common agenda should be accomplished through discussion among all local stakeholders. However, in the case of Iriomote Island, it was difficult to obtain integrity among local residents in establishment of a shared vision for the future, which can be therefore integrated into the common agenda of the region. A workshop held by the author succeeded in extracting the shared vision that forms the foundation of common agenda, that directly

reflects opinions of local residents. In this sense, the author introduced one solution that enables ST development reflecting opinions of local residents, in which a person who has expertise in ST and CIF, can provide the opportunity to extract the opinions of the local residents and a system for summarizing those opinions.

However, although the structure of the backbone organization, which is another important element of CIF, was clarified in this paper from successful cases in California, the author could not complete the full evaluation and consideration of a suitable organization structure (whether it can be a nonprofit organization or administrative agency) for Iriomote Island in particular.

The remaining challenge of this paper, establishment of the backbone organization suitable for Iriomote Island, will be performed by the author based on the outcomes of this paper. An organization with the role of facilitation of stakeholders and the aggregation of funds will be introduced.

It is not yet known whether Iriomote Island will be registered as a World Natural Heritage site in the summer of 2020. However, the author swears here to continue to be involved with Iriomote Island as an expert, in order to bring the IRIOMOTE VISION 2030 as close to local residents' hands as possible through "Explicit CIF application."

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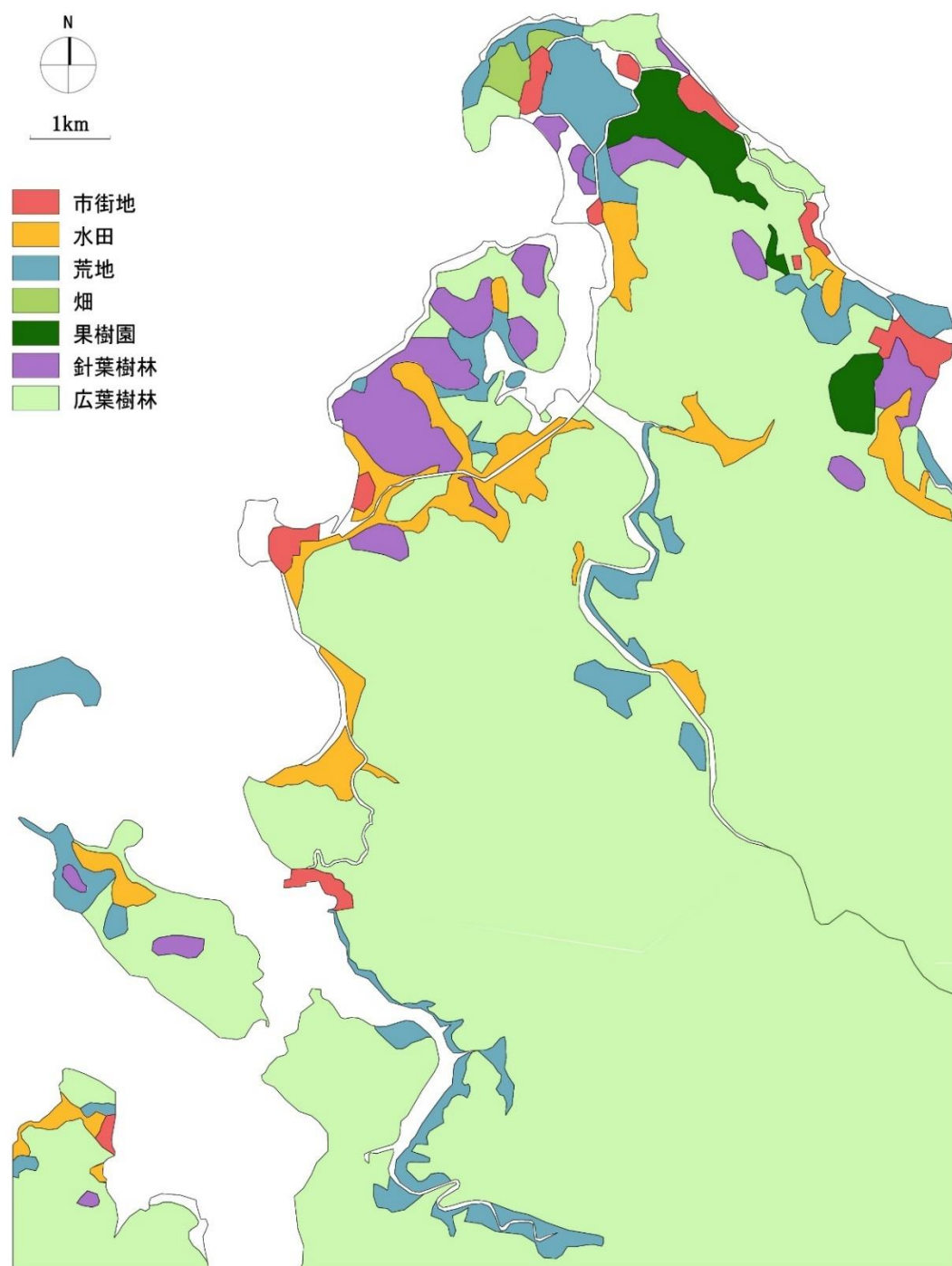
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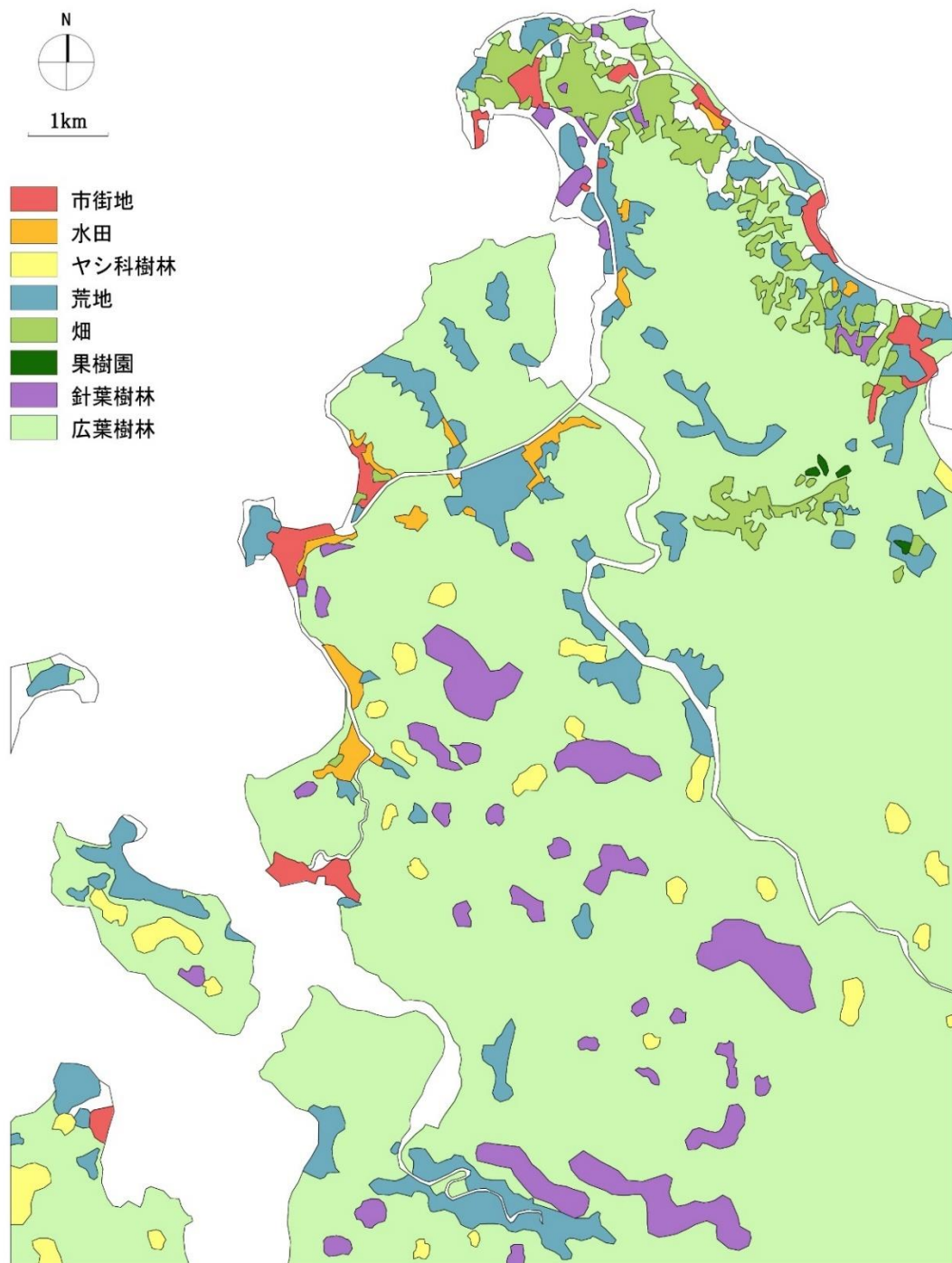
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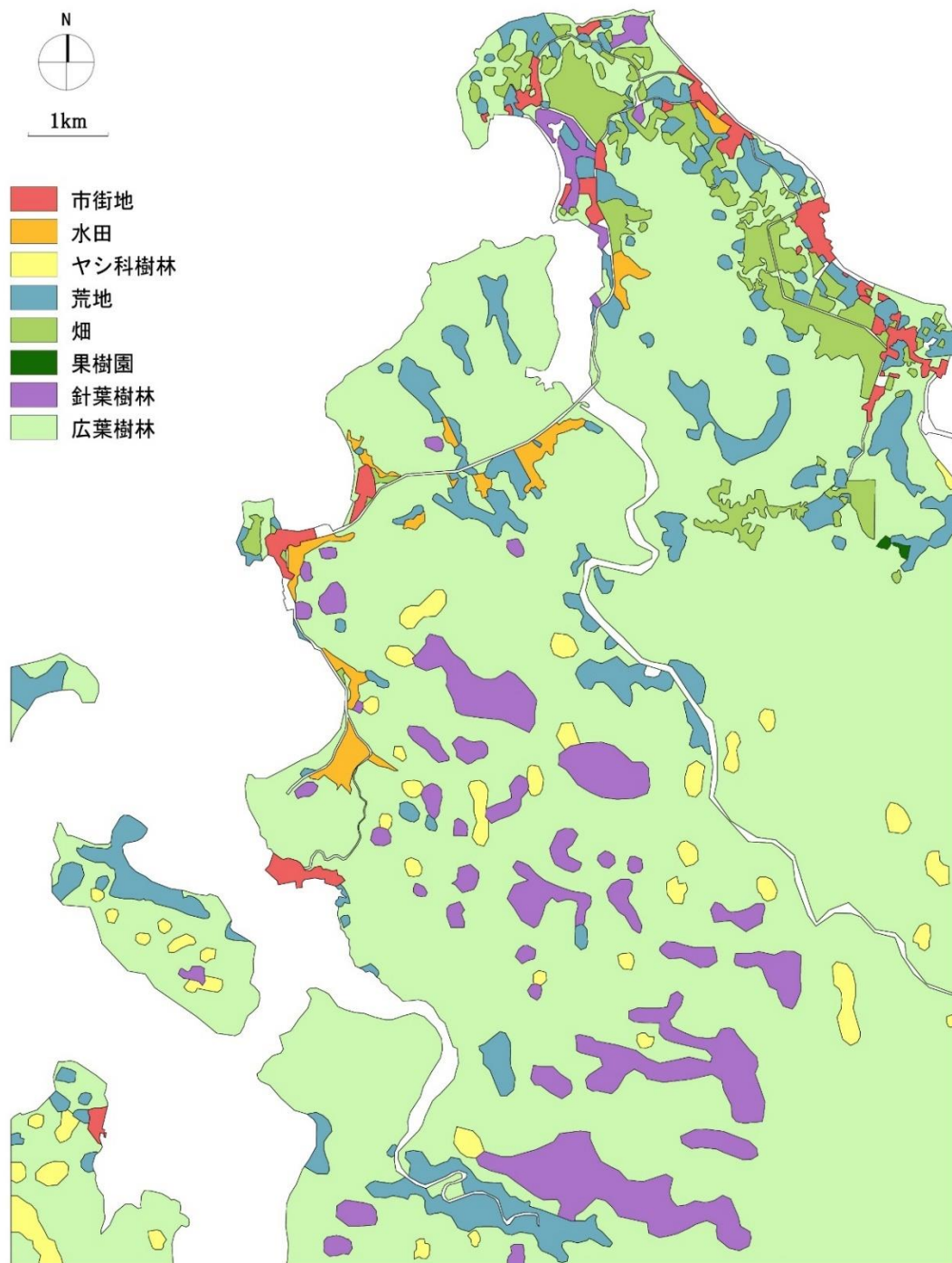
Appendix



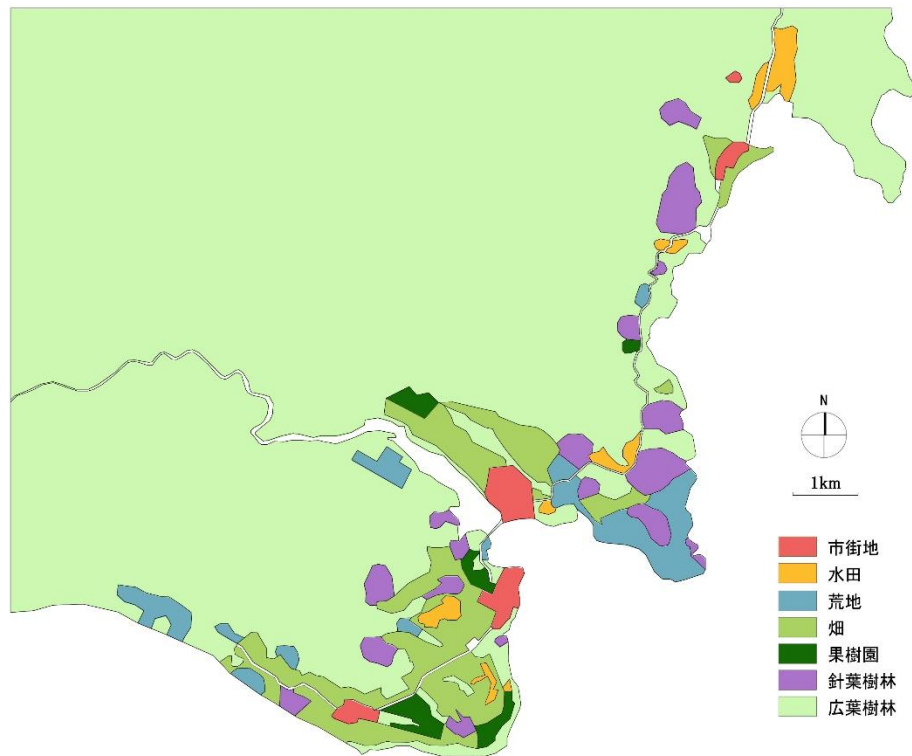
Appendix A. Land use/cover map in 1966 (NW)



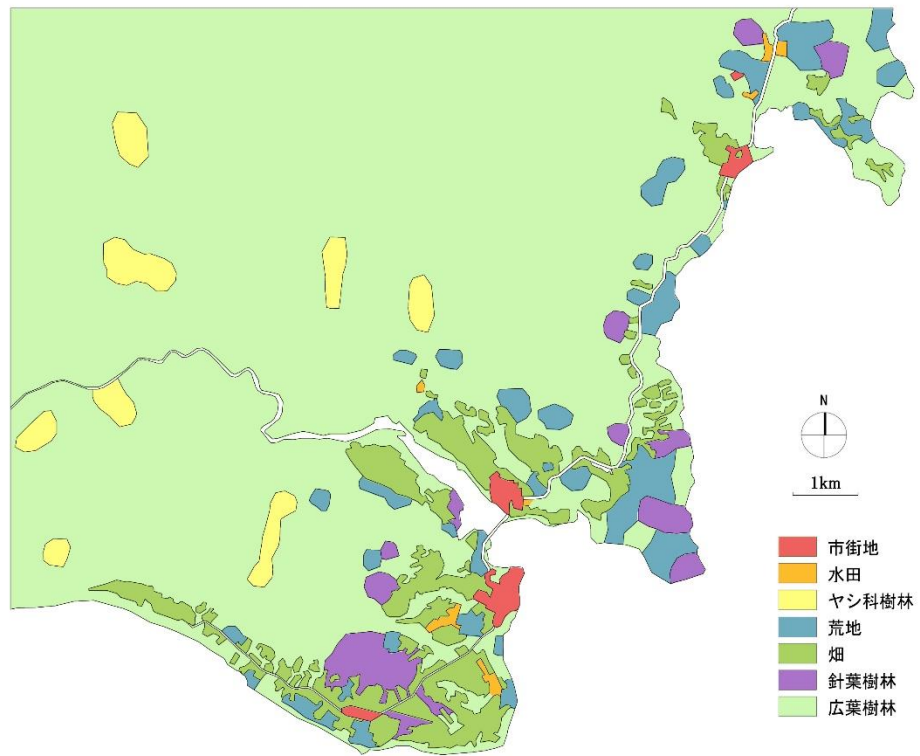
Appendix B. Land use/cover map in 1983 (NW)



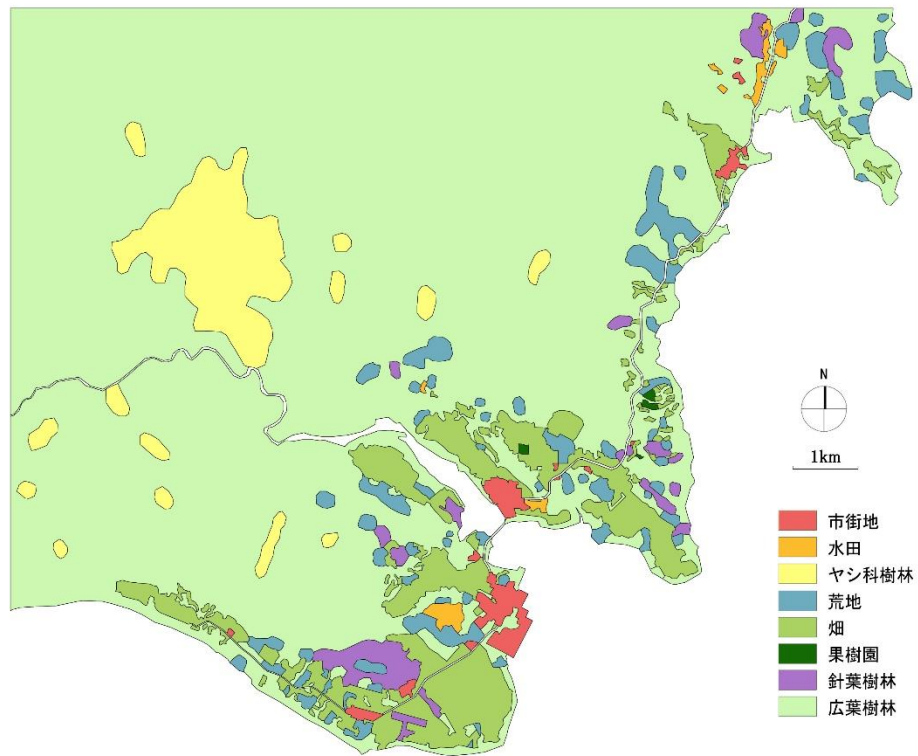
Appendix C. Land use/cover map in 2005 (NW)



Appendix D. Land use/cover map in 1966 (SE)



Appendix E. Land use/cover map in 1983 (SE)



Appendix F. Land use/cover map in 2005 (SE)

Appendix G. List of actual answers in question 1

Question 1	
Category	Answer
Nature	大自然
	自然
	やっぱり自然
	ゴミがない山と海，浜の大自然
	自然とやまねこ
	自然
	今よりもっときれいな自然
	自然
	星空
	自然
	今のままの自然や動物たち
	今ある自然と生き物たち
	自然
	満点の星空
	自然
	しぜん
	きれいな自然
	今のままの自然
	今の自然
Plants and animals	希少な生きもの
	魚やヤマねことか。
	やまねこ
	たくさんの魚たち
	大切な生き物
	アオサ，貝
	イノシシ

	たいせつないきもの（どうぶつ） シロハラクイナ ウミガメ イリオモテヤマネコ 虫の保護 カンムリワシ アカヒョウビン サンコウチョウ ズアカアオ バト サギ類 もずく アオサ やまネコ
Marine environment	海 きれいなサンゴ きれいな海と森 美しいサンゴ きれいな海と川 バラス きれいな海 元気なサンゴ 美しい海と魚たち
Local lives and scenery	利用ルール みんなの笑顔 人，心 人情 田舎の風景 あたたかい人 子どもたちの笑顔 人とのつながり ゆうぐがたくさんある公園
Culture	先人たちの知恵 平和

	歳事 生活文化 culture and it's core 行事 old generation mindset
Mangrove forest	マングローブの森 マングローブ 自然林 マングローブ
Others	ワンネス

Appendix H. List of actual answers in question 2

Question 2	
Category	Answer
Trash (plastic and marine garbage)	プラスチックゴミ
	多すぎるペットボトル
	ゴミ
	さかながたべるゴミ
	海岸のゴミ
	プラゴミ
	ゴミ
	ごみといんしうてん
	漂着ゴミ
	漂着ゴミ
	海の生き物が食べるゴミ
	大陸からのプラゴミ
	海を漂うゴミ
	漂着ゴミ
	ゴミ
	漂着ゴミ
	ハップウスチロウル
	ゴミ
	ゴミ
	ゴミのちゅうしゃき
	漂流物など
	ゴミ
	プラゴミ
	ゴミ
	ゴミ
	サンゴがプラスチックをたべないように

	プラゴミ ゴミ 漂着ゴミいらない ビーチのごみ
Roadkill (and speeding)	交通事故 ヤマネコ，動物の交通事故 スピードいはん 事故 やまねこの事故死 スピード違反 やまねこの事故 カンムリワシの事故 生き物の事故死 イリオモテヤマネコの交通事故の看板 交通事故 スピード違反 すべてのガソリン車→50km/h くらいまでしか出ない電気自動車 ヤマネコの事故死
Trash (illegal dumping etc)	不法投棄 ポイ捨て 港に置いてる廃車 廃墟 放置された車・船 不法投棄
Tourism development	開発 必要以上の開発 営利のみを目的とする仕事・人々 お金

Someone indifferent to the island	島に無関心な人 無関心 環境に無関心すぎる人
World Heritage (against)	世界遺産の話 世界いさん
Others	電柱 働くこと よっぱらい 変たい ぼうはんカメラ