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International Day for Biological Diversity Symposium

Thriving with Nature on Islands: Leveraging Their Multifaceted and Interconnected Characteristics

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Elizabeth Rose Hall, UNU Headquarters

Report

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The symposium ‘Thriving with Nature on Islands: Leveraging Their Multifaceted and Interconnected Characteristics’ was held on 22 May 2014 in Elizabeth Rose Hall at UNU Headquarters in Tokyo, marking International Day for Biological Diversity. Over 100 participants attended the symposium, which aimed to increase public awareness and the understanding of biodiversity issues through discussions on how we can leverage islands’ multifaceted and interconnected characteristics for their sustainability. Before the opening of the symposium, a DVD titled ‘Satoumi-Shiraho Village in Ishigaki Island, Okinawa’ was shown. It portrayed how human activities and nature coexisted on the island, indicating coral reef preservation and traditional fishing there.

Opening remarks

Junichi Shiraishi: Vice-Minister for Global Environmental Affairs, Ministry of the Environment of Japan (MOEJ)

Mr. Shiraishi first thanked the audience on behalf of the organizers. International Day for Biological Diversity (IBD) is proclaimed by the United Nations to increase the awareness and understanding of biodiversity issues in the face of the loss of many species worldwide. Ecological services provided by biodiversity have significant roles, for example, to support rich social lives and to reinforce societies’ resilience. The organizers and supporters of this symposium have made efforts in biodiversity conservation, as well as dissemination and outreach on this issue.

This year’s international theme for IBD is ‘Island Biodiversity’. While island biodiversity provides valuable natural resources and supports local people’s lives and diverse

cultures, it is highly vulnerable because of limited resources and frequently occurring natural disasters. Therefore, biodiversity conservation is particularly important in island countries, many of which are currently developing. Japan consists of many islands. For using and taking care of biodiversity, the Japanese people have developed a culture that values islands' multifaceted and interconnected characteristics. For example, in the Kerama Islands, designated as Japan's 31st national park in March 2014, the islanders' lifestyle in harmony with nature has allowed the islands to preserve a rich biodiversity and diverse landscapes. Mr. Shiraishi observed that Japan's experiences, developed amid nature's bounty and threats, could contribute to the development of other island countries.

Mr. Shiraishi explained that this symposium is intended to present specific cases of how islanders in Japan have leveraged islands' multifaceted and interconnected characteristics and explore what Japan's island biodiversity and local communities should be in the future. Finally, he thanked the organizers and supporters: UNU-IAS, the Global Environmental Outreach Centre, the Japan Committee for United Nations Decade on Biodiversity and the Commemorative Foundation for the International Garden and Greenery Exposition.

Video Message

Braulio Ferreira de Souza Dias: Executive Secretary, Convention on Biological Diversity (CBD)

In his video message, Mr. Dias stated that International Day for Biological Diversity provides an opportunity to recognize the central role of biodiversity and healthy ecosystems to life on Earth and to human beings. This year's focus is on island diversity, marking the International Year of small island developing states (SIDS).

Islands constitute less than 5% of the Earth's landmass, yet provide habitat for 20% of all bird, reptile and plant species. Islands harbour more than 50% of the world's known marine biodiversity, 7 of the world's 10 coral reef hotspots and 10 of its 34 conservation hotspots. The conservation and sustainable use of islands' natural resources are critical to achieving the Strategic Plan for Biodiversity 2011–2020 and its Aichi Biodiversity Targets.

The biodiversity of islands, however, is at risk. Because of the vulnerability of their endemic biota and their intense human use, islands have higher extinction rates than

continents. Residents of islands understand the linkages among healthy ecosystems, biodiversity and human well-being. Biodiversity-based industries, such as tourism and fisheries, account for over half the GDP of the economies of SIDS. From the preservation of marine and coastal resources to climate change mitigation and adaption, and from the production of renewable energy to the development of sustainable tourism, islands offer many lessons in resilience and sustainability. The experience and knowledge of islands can contribute significantly to the conservation and sustainable use of the biodiversity and natural resources of our planet.

Pledges from Island governments, such as the Micronesia Challenge, the Caribbean Challenge Initiative and the upcoming Western Indian Ocean Coastal Challenge, together with cooperation platforms, such as the Global Islands Partnership (GLISPA), are showing the way to successful multi-party commitments in support of the conservation and sustainable use of biodiversity. The convention's programme of work on island biodiversity, adopted in 2006 by the eighth meeting of the Conference of the Parties to the CBD, provides a strategic framework to significantly reduce the rate of island biodiversity loss. The programme contributes to meeting at least 14 of the 20 Aichi Biodiversity Targets. There is a need to identify those that have the potential to be scaled and replicated as solutions to the conservation and sustainable use of biodiversity throughout the world. Mr. Dias concluded his message by stating that 'as we celebrate the 2014 International Day for Biological Diversity, we should celebrate the spirit of islands and work together for a sustainable future—a future of life in harmony with nature, the future we want'.

Keynote Speech

Kazuhiko Takeuchi: Senior Vice-Rector, United Nations University

Prof. Takeuchi presented a keynote speech titled 'Learning from Kerama Islands National Park; How to Leverage the Resilience of the Islands'. While showing many pictures, he explained the background and context of the Kerama Islands, which were designated as Japan's 31st National Park on 5 March 2014, a new park for the first time in 27 years, since Kushiro Marsh's designation in 1987. From 2006 to 2010, MOEJ implemented a national/quasi-national park assessment project that selected ecologically and geologically important sites in Japan. In this

project, 18 potential sites, including the Kerama Islands, were selected for new designation or the large-scale expansion of national/quasi-national parks. One of them was Sanriku Fukko National Park, which was renamed and expanded from Rikunaka Seaside National Park in 2013. This park's theme is the linkage of the forests, villages, rivers and oceans, as well as recovery from the Great East Japan Earthquake (*Fukko* means *recovery* in Japanese). The designation and expansion of national parks align well with the Aichi Biodiversity Targets, adopted in 2010, because goals in the targets include the conservation of islands and marine ecology. The National Biodiversity Strategy of Japan 2012–2020 also proposes biodiversity conservation in national parks.

Before being designated as a national park, the Kerama Islands were a part of the Okinawa Coast Quasi-National Park. While their archipelago and coral reef seascapes have been highly valued, many other aspects of the islands are also being considered, such as the ecological value of the coral reefs that provide habitats for various marine wildlife, tourism resources including the ocean areas for humpback whales' breeding, continental landscapes of beaches and coastal cliffs and diverse landscapes that continue from the land to the ocean. Furthermore, Kerama Islands National Park has a distinctively large ocean area in comparison to other parks, such as Shiretoko National Park and Ogasawara National Park. The park's ocean area was decided based on the local whale-watching association's records of whales' habitats. Satoumi in the Kerama Islands is complex and fragile. Diverse marine species, including a wider variety of coral species than Maldives, live densely in the extremely clear ocean. To preserve such a precious environment, many efforts have been made. For example, the local diving association is trying to exterminate acanthaster and coral-eating gastropods, restrict the number of diving ships and preserve coral reefs through coral transplanting. The whale-watching association also strives for the conservation of humpback whales through scientific monitoring and the formulation of voluntary rules.

Prof. Takeuchi emphasized that these local people's efforts in the preservation of the natural environment are essential for national park management. Along with such efforts, a new framework for park management has been developed. In June 2012, the nation's second Comprehensive Plan for Promoting Ecotourism was certified in Togashiki and Zamami Villages, Okinawa. Furthermore, the adoption of new ordinances is under review; these will set rules for coral reef preservation and restrict the number of tourists.

The culture and history of the Kerama Islands teach that the ocean, continental areas and humans' lives are all connected. Prof. Takeuchi emphasized that Kerama Islands National Park should be recognized as a sustainable model that shows human activities can coexist

with nature. Besides the Kerama Islands, other neighbouring islands should also be included in national park management. There is a plan to newly designate the Amami Oshima/Tokunoshima area and Yambaru area as a national park and to expand the area of Iriomote-Ishigaki National Park. Pursuing this plan will lead to promoting the designation of the four islands (Amami Ohisma, Tokunoshima, Yambaru and Iriomote Island) as a world natural heritage site. Prof. Takeuchi believes that this momentum will contribute to the advancement of environmental administration in Japan and the world.

Case Report I

Yasunori Sakurai: Professor, Hokkaido University

Dr. Sakurai gave a presentation titled 'The Sea of Shiretoko, Tsushima, and Sanriku – Their Interconnectedness'. The ocean, accounting for 71% of the Earth's surface area, holds a huge amount of water, which serves as a source of life. It supports approximately 20% of the animal protein that humans consume. Japan has a long coastline, equal to approximately 80% of the equator, the sixth largest exclusive economic zone in the world and high fishery production. However, the ocean surrounding Japan is currently facing many challenges and changes. First, trawl fishery has reduced diversity in the ocean bed, simplifying the marine ecological structure and decreasing the number of large fish. Moreover, since 2010, the water temperature of the ocean's surface has been colder in winter and spring and hotter in summer and fall. Furthermore, many other abnormal changes of marine wildlife's behaviours have been observed, including the change of salmon's breeding migration, catch of bonito in the Tsushima Current, leatherback and basking shark's emergence on the Okhotsk Sea Coast, sagittated calamary and yellowtail's delayed migration to the north and south and Alaskan pollack's early arrival to the coast in southern Hokkaido. Japan's coastal areas are also facing many problems, such as losses of natural coasts, seaweed bed and tideland; red tide, eutrophication and oligotrophication; the government's vertical administrative structure. Cooperation with other countries is essential to address these issues. The ocean surrounding Japan is becoming 'a sea of conflicts' with neighbouring states; however, it has to become 'a sea of corporation'. To make coastal fishing more sustainable, many measures have to be taken, including

a solution to the challenges faced by traditional fishery, the implementation of voluntary fishery management in conformity with the existing regulations and preservation and the assessment of coastal ecology.

Dr. Sakurai spoke about the interconnectedness of Japan's ocean, citing three ocean areas: Tsushima, Shiretoko and Sanriku. First, he explained about Tsushima, the islands situated between Kyushu and the Korean Peninsula. The Tsushima Sea has rich fish species that support the local fishing industry. Because the location is surrounded by the Sea of Japan, the East China Sea and the Yellow Sea, the preservation of ocean ecology in Tsushima is essential for the future marine environment and fishery in Asia—not just in Japan. In Tsushima, a new recording system was introduced to ensure traceability from the producers to the consumers. Traceability is expected to add value to marine products. Moreover, the designation of marine protection areas is being planned in Tsushima to preserve the islands' nature and societies and to stabilize coastal fishery.

Next, Dr. Sakurai explained about Multiple-Use Integrated Marine Management Plan in the Shiretoko World Natural Heritage site. This plan was initiated to solve a simple yet difficult problem to maintain balance between marine ecology preservation and stable fishery. The plan became well known internationally because of the success of its well-functioning science committee, consisting of competing multi-stakeholders. Marine preservation measures called 'Shiretoko Style' were implemented in the plan. The Shiretoko Style got rid of the government's vertical administrative structure and promoted fisheries' voluntary efforts, such as the branding of fishery products and the management of the Alaskan pollack fishery. Because the marine environment in Shiretoko is highly complex and unstable, Dr. Sakurai suggested the use of adaptive management that includes the prediction and monitoring of changes in the ocean and review of natural resource management and use.

Finally, Dr. Sakurai explained about the Sanriku Ocean, where the temperature varies annually, thereby influencing the fishery yields in set-net and small-vessel fisheries. Although the fishery in Sanriku was severely damaged by the Great East Japan Earthquake in March 2011, at present, it is gradually recovering. For example, the figures of fishery yield in Iwate's coastal areas show a gradual increase. To contribute to the recovery from the disaster and teach about the threats of natural disasters, the Green Reconstruction Project has been implemented by MOEJ. The project's main accomplishment thus far is the establishment of Sanriku Recovery National Park. Dr. Sakurai also referred to his own involvement in promoting the local fishery in Sanriku. He has taught the local fishermen how to preserve the quality of fresh squid and created a sustainable fishing method for the giant Pacific octopus.

Dr. Sakurai concluded that we should achieve a good balance between the rich biodiversity of marine ecology and sustainable fishery. We have to ensure sustainable marine production that could solve the world's environmental and food problems, preserve habitats for diverse wildlife and implement the integrated assessment of coastal fishery that takes social, economic and ecological values into consideration.

Case Report II

Masaru Kanda: President, Kuroshio Jikkan Center

Dr. Kanda's presentation titled 'Kashiwa Island in Ashizuri Uwakai National Park - Leveraging the Island's Characteristics for Sustainability of Satoumi', focused on his center's efforts in creating a coexisting model of ocean and islanders. The Kashiwa Island is located in the southwest of Shikoku and its circumference is approximately 3.9 km. It is known as one of the best diving spots in Japan. Its special location, where the highly clear, warm current Kuroshio and Sukumo Bay's fertile ocean water meet, makes the island a reservoir of biodiversity. The island's rich nature remains preserved beside islanders' lives.

Dr. Kanda founded the Kuroshio Jikkan Center on the Kashiwa Island in 1998, aiming to realize his idea that 'The island itself can be a museum', i.e. the entire island can exhibit its natural environment and people's lives. He has managed the center based on his belief that 'in Satoumi, people can not only receive the ocean's bounty but also cultivate the ocean'. The center has engaged in three goals to keep Satoumi sustainable:

1. Provide opportunities to 'experience' nature

   The center performs research on marine wildlife, offers seminars on Satoumi, experiential learning programs and eco-tours and disseminates information on and off the island.

2. 'Leverage' nature for people's lives

   The center helps sell local products, prepares spawning sites for bigfin reef squid and regenerates seabeds for the local fishery.

3. 'Protect' nature and people's lives

   The center works for the preservation of coral reefs and seabeds, sets rules including Kashiwa Island Satoumi Charter and manages disaster risks in

preparation for Nankai Trough earthquake.

In the transition from an island of fishery to one of marine leisure, the ocean around the Kashiwa Island experienced environmental degradation, derived from divers' overcrowding and the undesirable manner of usage. This led to worsening the relationship between people in fisheries and the diving industry. The Kuroshio Jikkan Center has made many efforts to improve the relationship by making rules that promote the coexistence of fishing and diving, developing collaborative work for people engaged in the two industries and enhancing communication between leisure tourists and local fishermen. One collaborative work is a project called 'Creating the Marine Forest', in which multi-stakeholders from diving, fishing and forestry work together to solve rocky-shore denudation on the island. This project includes various activities, such as regenerating the seagrass bed, preserving the coral reefs and setting timber from forest thinning in the ocean to provide spawning sites for bigfin reef squid. To gain experiential environmental education, local children are also involved in the project. Dr. Kanda showed many pictures of the project and explained that the project is currently spreading outside the island. Furthermore, he is now trying to get people from other parts of the country involved in the project through a new 'foster parent' program, in which a foster parent purchases timber for bigfin reef squid's spawning space. The local fishermen on the Kashiwa Island catch the squid born in the timber and send them to the foster parents in return.

Finally, Dr. Kanda mentioned that sustainability in Satoumi requires building a system that provides comfortable environments for both islanders and visitors. Many efforts are required to build the system, including making rules, revitalizing the economy and providing guidance on how to leverage nature.

Case Report III

Sakijiro Maezato: Division Manager, Amami City

In his presentation, 'Amami: the Island of Yui', Mr. Maezato showed how islanders and rich nature have interacted and coexisted on the Amami Island and explained the Amami City's promotion of ecotourism and efforts towards the islands' designation as a world natural heritage site. *Yui* means a linkage between humans and nature, their culture and each other. People in Amami have traditionally cherished the spirit of *Yui*.

The Amami Islands, consisting of eight inhabited islands, are located in the middle of Okinawa and Kagoshima cities. They have a maritime subtropical rainy climate. Although their area is only 0.3% of Japan's total land area, the Amami Islands are inhabited by 10% of

the national endangered species and many other endemic and protected species. They are called the 'Galapagos of the East' because of their rich diversity and have been selected as a potential world natural heritage site.

Amami has a distinctive culture, but it is historically influenced by the main island, the Ryukyu Islands, and neighbouring countries. Its culture shows how islanders have leveraged and coexisted with nature. On the Amami Islands, there is the knowledge of and tradition based on the many ways islanders benefit from the rich ocean. This includes natural bulkheads of coral reef that slow coastal erosion, forests of thatch screwpine plants that provide sand and wind breaks, forests of garcinia trees that aid in fire prevention, nagaki (a traditional fishing method involving the setting of rocks to catch fish with waning ocean tides), bountiful sea lettuce and seaside recreation. Amami also has traditional events and festivals strongly connected to nature's cycles, such as tides, sunrise and sunset, movements and positions of stars, the strength of wind and rain and bird migration. Some of these events are nationally designated as intangible cultural heritage.

Mr. Maezato also explained about efforts towards the designation of Amami as a world natural heritage site, planned for 2016. One main effort is to promote ecotourism. The Amami Islands Ecotourism Promotion Association is promoting ecotourism that utilizes the local natural environment, history and culture. For example, an NPO group called Yamura Land offers experiential tours that include tourists' interviews with villagers, cleaning activities and traditional cultural experiences. Finally, Mr. Maezato promised that people in Amami would continue passing down their traditional lifestyle that protects and leverages the islands' rich nature and traditional culture.

Panel Discussion

The panel discussion was moderated by Shiro Wakui, Professor at Tokyo City University, and the panellists who participated in it are as follows.

Kazuhiko Takeuchi: Senior Vice-Rector, United Nations University
Masaru Kanda: President, Kuroshio Jikkan Center

Koji Furuse: Director, Center for Environmental Studies

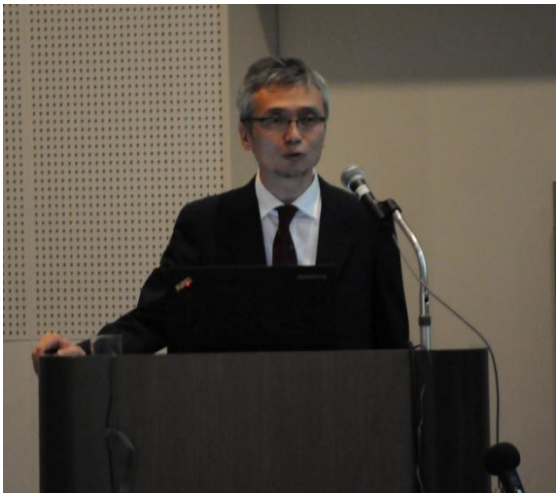
Atsuko Isamoto: President and Managing Editor, *Rito Keizai Shimbun*

Prof. Wakui first summarized the keynote speech, reminding the audience that the length of Japan's coastline is 80% of the equator and that Japanese people have had a social system adapted to rich nature. In the introduction to the panel discussion, Prof. Wakui referred to some serious conditions currently faced by the ocean, such as the rise in the water temperature and CO_2 concentration. He also observed that changes in the ocean, such as a decrease in coral reefs and shifts of ocean currents, are attributable to humans' unlimited desires. He stated that currently the Earth's conditions are analogous to the tragedy of the Easter Island, where the islanders' overuse of the environment destroyed their own civilization.

Islands have a closed system with limited resources. Showing Japan's islands as an example, Prof. Wakui explained that islanders have developed tangible and intangible landscapes, adapting to the various natural environments. Japan is a closed Eden, a garden of endemic species, and we should be aware of these distinctive characteristics. Referring to an allegory written on Palau's traditional storyboard, Prof. Wakui emphasized the importance of maintaining a right balance between humans' activities and nature, without just consuming natural resources.

Prof. Wakui's introduction to the panel discussion was followed by two panellists' presentations.

Koji Furuse: Director, Center for Environmental Studies



Mr. Furuse explained that he has been engaged in environmental education and the interpretation of islands for a long time. In the 1990s, he worked as an interpreter in the nature park on the Hachijo Island, and in the 2000s, he engaged in nature-guide training and program development for coral reef preservation on the Ogasawara Islands. Although interpretation is often translated as *Shizen-kaisetsu* (Explanation of Nature), its content ranges from nature to history, culture and relationships between humans and nature. Interpretation emphasises experiential learning, rather than just the input of facts and figures. Its educational purpose is to enable learners to analyse the meaning and relationships of phenomena around them through experiences and educational materials. It also provides an opportunity for educational communication, where learners can develop emotional and intellectual connections to local resources. For example, interpretation in the Kerama Islands includes learning about the life of a whale, as well as the connection between whales and the local culture. The occupation of the interpreter was first imported to Japan in 1951. An interpreter conveys messages from nature. According to Mr. Furuse, while tour guides only explain the nature of the local site, interpreters provide an opportunity for learners to reflect on biodiversity not only of the site but also of the learners' hometowns.

Atsuko Isamoto: President and Managing Editor, Rito Keizai Shimbunsha

Ms. Isamoto launched a newspaper company, Rito Keizai Shimbunsha (Ritokei), in 2010 to publish the Internet newspaper *Rito Keizai Shimbun* and the tabloid newspaper *Kikan Ritokei.* Both papers provide information regarding small islands in Japan, covering stories of islanders' lifestyles and thoughts. They also introduce products from small islands and people who engage in island-related jobs. Besides utilizing media, Ritokei organizes seminars and workshops to disseminate information on small islands. Ritokei's key phrase is 'Islands in Japan are treasure islands'. The company is trying to show islanders' attractive lifestyle to the Japanese people, most of whom are unaware that they live on islands. Ms. Isamoto spoke about herself, growing up in a mountain village hardly aware that Japan is an island country

until she was attracted to the island culture when she visited her friend who lived on a small island.

Japan consists of 6,852 islands that have over 100-metre outer circumferences, including five main islands (Honshu, Hokkaido, Kyushu, Shikoku and Okinawa Islands) and many other small islands. Among the small islands, 418 are inhabited and home to approximately 700,000 people. Japan's small islands have diverse lifestyles and rich biological diversity. Currently, however, the population on small islands is declining, and island communities are shrinking. People often say that small islands are the epitome of Japan. Observing the coexistence of humans and nature on a small island will help people understand how to coexist with nature in Japan, or even in the world. Ms. Isamoto, therefore, emphasized that discussions on island biodiversity in this symposium are very meaningful.

Before initiating the discussion, Prof. Wakui commented on Mr. Furuse's presentation stating that the interpreters' role is important in that they not only teach about characteristics of the local site but also enable learners to reflect on those of their hometowns. He also stated that both humans and nature should be taken into consideration in leveraging interconnected and multifaceted characteristics of islands, referring to the South Pacific Islands, where customs, cultures and nature are all interconnected.

Based on questions from the floor, Prof. Wakui considered three issues for discussion:

1. Preserving island diversity while facing the reality that 700,000 people live on small islands in Japan;
2. Finding a versatile approach to protect biodiversity on islands, which can have different characteristics and features and
3. Passing down islands' cultures and nature to future generations in the face of a declining birth rate and increasingly ageing population.

According to Prof. Takeuchi, in prior environmental policies, only uninhabited natural areas had been valued and regarded as lands that deserve preservation as national parks. However, the Satoyama Initiative and Japan's Strategic Plan for Satochi-Satoyama proposed that maintaining a balance between humans' activities and nature could, in fact, enrich nature.

A definition of ‘national park’ has been currently re-examined. In Sanriku Fukko National Park, the linkage of the forests, villages, rivers and ocean is taken into consideration in preservation efforts.

Prof. Takeuchi stated that in the preservation of inhabited islands, we should consider not only how to preserve uninhabited natural areas but also how to maintain human-influenced natural areas. Building societies in harmony with nature is essential on islands, particularly in the face of industrial decline due to decreasing and ageing population. When human activities and nature coexist and support each other on islands, the local economy can be improved as nature is enriched. For example, on the Sado Island, efforts to preserve Japanese crested ibises contributed to promote local agriculture because creating desirable environments for the ibises required improving the condition of rice fields, where they search for food. Another key element for sustaining island communities is to maintain islanders’ pride in and aspiration to the continuation of island life. On the Sado Island, its designation as a Globally Important Agricultural Heritage Systems (GIAHS) site enabled islanders to appreciate their land and community. Prof. Takeuchi emphasized the importance of discussion on how to achieve desirable human–nature interactions and expressed his hope that islands in Japan will become treasure islands that represent the nation’s sustainable model.

Next, Prof. Wakui considered a question from the floor, ‘How can we maintain coexistence with nature on islands where their ecological value does not deserve designation as national parks?’ He stated that islanders should first take pride in their island. He then asked Ms. Isamoto about how islanders can preserve their lifestyles and cultures that are strongly connected to island biodiversity.

Ms. Isamoto stated that because small islands cannot sustain themselves, they need to stay connected to other islands, particularly economically. Besides education, medical services and transportation systems, maintaining a smooth distribution system of products is one of the most significant challenges currently faced by small islands. Thus, achieving both environmental and economic sustainability is essential on small islands.

Prof. Wakui stated that islanders have confronted the harshness of nature and therefore feared that nature might defeat them if they did not cooperate, as in *Yui*. While this fear builds communities’ strong bonds, it also leads to the exclusion and rejection of

newcomers to islands, eventually resulting in the local economy's decline. Prof. Wakui asked Dr. Kanda about how islanders could avoid such a situation.

According to Dr. Kanda, islands often have an exclusive culture that separates 'outsiders' from 'islanders'. Tourists can comfortably stay on islands; however, this is not necessarily the case with people who come to settle on islands. Even a person who is married to an islander and who has lived on an island for decades is often regarded as an outsider. Although there is no need to destroy islands' identities, we should encourage communication between islanders and outsiders; this could lead to the appreciation of outsiders and creation of a new island culture. Looking at an island from the outsiders' view and increasing outsiders who are interested in islands will help islanders discover their island's value. Dr. Kanda hopes that the next generation will become a driving force for creating a new culture in islands.

Prof. Wakui then considered a question from the floor regarding how to revitalize seagrass beds. Dr. Kanda answered the question, referring to his center's efforts in increasing seagrass beds to provide spawning sites for bigfin reef squid. Because it is difficult to maintain fishermen's interest in revitalization, which takes a long time, the center is performing both short-term and long-term projects. In a short-term project, timber from forest thinning is set for bigfin reef squid's spawning sites. Because this project can show a quick result in the squids' increase, it meets fishermen's expectations quickly and maintains their interest in revitalization. On the other hand, a long-term project aims to improve the healing capacity of the seagrass bed. A changing environment for seagrass beds, such as an increase in the water temperature due to climate change, is causing rocky-shore denudation. Therefore, the long-term project tries to create an environment for algae to grow more easily. For example, it attempts to control the number of marine organisms that eat seaweed, such as echinus. This long-term effort will lead to 'cultivating the ocean', i.e. enabling the ocean to regenerate and heal by itself.

Prof. Wakui stated that islanders should appreciate nature's diverse characteristics and find ways to coexist with outsiders, as well as nature. He then asked panellists about how to find a versatile approach to manage ecosystems on islands that have different characteristics and features.

Mr. Furuse stated that each island has different appealing features, and therefore, each community should find its own theme and good points to appeal to tourists, who often have difficulties in finding islands' attractive and interesting characteristics during a short stay. In formal education, teaching contents are standardized, and there is little flexibility in localizing what can be taught and learned. However, interpreters can convey each island's messages more easily because they are allowed to select contents more freely. They can select a theme, depending on the community, and conduct different activities, using local resources.

Prof. Wakui stated that besides appreciating diversity and individuality, building linkage is also essential, referring to an exchange of Rai stones and areca palm in Palau and Yap Islands, thus demonstrating the linkage of the communities, wind and tidal currents. He asked Dr. Sakurai about how we should maintain islands' interconnectedness and diversity in the face of present changes in the ocean, such as simplified fish species in fishery and decline in the number of squid and jelly fish.

Dr. Sakurai stated that Japan's coastal fishing has been currently re-evaluated. While moderate numbers of various kinds of fish are caught in Japan's fishery, large numbers of a small variety are caught in Western fishery. Therefore, Japan's fishing has less impact on ecology and biodiversity. Fishery in Tsushima, Shiretoko and Sanriku should become a successful model of sustainable fishing. Dr. Sakurai recommended that producers should sell products that have additional value, whereas consumers should eat a moderate amount of fish.

Prof. Wakui agreed with Dr. Sakurai, referring to the role of coastal fishery in the recovery from the disaster in Sanriku. Shigeatsu Hatakeyama, an oyster farmer in Sanriku, has engaged in a project called 'Mori wa Uni no Koibito (Forests are the Ocean's Partner)'. This project aims to preserve linkages among forests, rivers and oceans for sustainable oyster farming through the management of Satoyama. In the project, timber from the thinning of trees is used to make raft frames for oyster farming. This project shows that the ocean in Sanriku is closely linked to the forests.

Next, Prof. Wakui considered a question about how to pass down islands' culture and nature to future generations in the face of a declining birth rate and an increasingly aged population. To answer the question, Mr. Maesato mentioned the importance of creating job

opportunities in Amami. While approximately 600 people leave the island every year for such reasons as entering a university, many people come to Amami to find jobs. In the process of designating Amami as a natural world heritage site, tourism is a promising industry that will expand in the near future. Therefore, training guides and interpreters will be essential for supporting tourism and the local community.

Prof. Wakui concluded that humans can play a significant role in preserving island biodiversity because humans and nature are interconnected. He mentioned that people have enriched islands through interaction with those living in other regions, as well as with nature. He referred to the Okinawan Sabani boat that takes a different shape on each island. Its shape is adjusted to the characteristics of each island and the surrounding ocean. Thus, islanders have developed their cultures through interaction with nature. Prof. Wakui reminded participants that we could protect island biodiversity as long as we remember that islands have their own characteristics while remaining interconnected.

Closing Remarks

Tsunao Watanabe: UNU-IAS Senior Programme Coordinator

Mr. Watanabe referred to a forum held in Amami three years ago to discuss its designation as a national park and a world natural heritage site. One high school girl said in the forum that ‘We will leave the island after we graduate, but we hope that you will make the island attractive enough for us to come back’. Mr. Watanabe stated that efforts should be made to respond to her expectation. Many people’s efforts will lead to making islands more attractive and sustainable, and efforts on each island will contribute to shaping a path for the

world we long for. Mr. Watanabe concluded his remarks by thanking the audience for their participation.