

Ship & Ocean Newsletter

Selected Papers

No. **12**
January 2010

Ocean Policy Research Foundation

Director's Message

As mankind moves into the 21st century, integrated policies of ocean governance are necessary for the sustainable development and use of our oceans and their resources and the protection of the marine environment.

Towards this end, the Ocean Policy Research Foundation (formerly: Ship & Ocean Foundation) has started an "Ocean Policy Research", with the mission statement "Living in Harmony with the Oceans".

The Ocean Policy Research Foundation aims to conduct cross-sectoral research in ocean related issues in order to initiate debate on marine topics and formulate both domestic and international policy proposals.

We publish a Japanese-language newsletter called the "Ship & Ocean Newsletter" twice a month. The "Ship & Ocean Newsletter" seeks to provide people of diverse viewpoints and backgrounds with a forum for discussion and to contribute to the formulation of maritime policies to achieve coexistence between mankind and the ocean.

Our Foundation believes that the Newsletter can expand effective communication on these issues through its function as editor, publishing timely research and welcoming responses from readers, which might then be published in turn.

"Ship & Ocean Newsletter Selected Papers No.12" contains English-language versions of papers from the Japanese Newsletter edition, published from No.191(2008.7.20) to No.210(2009.5.5).

It is our sincere hope that these Selected Papers will provide useful insights on policy debate in Japan and help to foster global policy dialogue on various issues.

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Executive Director

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The Future of the Short-Tailed Albatross, the Largest Seabird in the Northern Pacific

— A Road to Coexistence Through Revival Operations —

[KEYWORDS] Seabird / Migratory bird survey / Protection activity

Fumio Sato

Researcher, Yamashina Institute for Ornithology

(Ship & Ocean Newsletter No.195 September 20, 2008)

Though once declared extinct, the short-tailed albatross survived in a colony on Torishima Island and is now making a comeback. Decoys and audio recordings have been used to lure albatrosses to new breeding grounds, and an operation is ongoing whereby chicks from Torishima are transported to Ogasawara and hand-reared until becoming independent. The creation of stable breeding grounds on non-volcanic islands is creating a bright future for the short-tailed albatross. It has also lately been discovered that the waters off Choshi are important feeding areas for chick-rearing adults.

Discovery and extinction

The short-tailed albatross has a wingspan of just over 2.4m in flight. When flying over the sea, it does not flap its wings but makes great soaring movements up and down and from side to side, presenting a beautifully dynamic sight. This beautiful large seabird once had extensive breeding grounds along the Kuroshio Current that flows alongside the Japanese archipelago, from the Ogasawara Islands, Izu Torishima and islands near Okinawa to the Penghu Islands of Taiwan. In those days, the numbers are estimated to have been in the millions. As soon as their presence was discovered in around the 1890's, however, people started hunting them for their feathers, which were exported to the west. As a result, the majority of short-tailed albatrosses living on Torishima were culled in less than 10 years. Most albatrosses also disappeared from other breeding grounds by the mid-1920s.

In other words, no sooner had the short-tailed albatross made its appearance in modern history than it was virtually wiped out by human activity. The last remaining colony on Torishima had fallen to a few hundred individuals by the mid-1920s, and in a field survey conducted by an ornithologist in 1949, they were declared to be extinct. With this, it was assumed that the short-tailed albatross had disappeared from the face of the earth.

Hopes for a revival

In 1951, the Meteorological Agency had staff permanently stationed on Torishima Island, as a frontline base for observing typhoons before they hit the mainland. While engaged in their work, the staff discovered a colony of 10 or more short-tailed albatrosses breeding in a field of eulalia on the steep slopes of Tsubamezaki, at the southern end of Torishima. The news was flashed around the world. Subsequently, thanks to protection efforts by the Meteorological Agency, the short-tailed albatross very gradually increased in numbers. The number recorded in January 1955 was 16 adults, 3 chicks, and 4 eggs. In April 1965, 11 chicks were recorded. The albatross population was slowly growing. In November of the same year, however, Torishima suffered a



The short-tailed albatross is a Special Natural Monument of Japan, designated as a Grade II endangered species ("Vulnerable") in the Ministry of the Environment's Red Data Book. Short-tailed albatrosses have a life expectancy of 20 years or more. These are monogamous creatures that lay a single egg in around October and migrate towards the oceans in around May. Chicks live at sea for about three years, returning to their birthplace to breed.

series of violent volcanic earthquakes, causing the closure of the Meteorological Station. With this, the island became uninhabited and information on the short-tailed albatross ceased.

In March 1977, Dr. Hiroshi Hasegawa of Toho University landed unaccompanied on Torishima to investigate the state of the short-tailed albatross, finding 71 adults and 15 chicks. In 1981, the Ministry of the Environment and Tokyo Metropolitan Government started a breeding ground improvement project. Eulalia was planted at Tsubamezaki, and conservation activity aimed at stabilizing the soil was carried out. The Tsubamezaki breeding ground was thickly sedimented with pumice and scoria from the volcanic eruptions, and eulalia grew thickly on top. However, in the 20 years since the rediscovery, heavy rains had caused sediments to run off, most of the vegetation had been lost, and the breeding grounds had become terribly unstable. To increase the albatross population, raising the breeding rate

was an issue of utmost urgency. From this arose the need to stabilize the Tsubamezaki breeding ground.

On the other hand, the biggest threat to the project was that Torishima's volcano would erupt once again. In a 1902 eruption, all 126 islanders lost their lives, while another large eruption in 1939 caused the island to be evacuated. The problem now was how to increase the albatross population to a stable number that would not require constant protection.

Success with decoy operation

In 1991, we started an operation that had been mulled for some time - using decoys (imitation short-tailed albatrosses) to create a new breeding ground on land with stable topography on Torishima Island. Our expectation was that the population would grow dramatically if we could maintain a stable breeding rate every year. After a preparatory period, in March 1993 we installed 50 decoys and equipment for playing audio recordings to lure short-tailed albatrosses to Hatsunezaki in the north of Torishima. At the time, there were 66 chicks at Tsubamezaki. The result was that one pair produced its first egg in 1995, and 10 years later in 2004 there were 4 breeding pairs. This increased to 16 eggs in 2005, 24 eggs in 2006, and 35 eggs in 2007, whereupon the new breeding ground was complete.

As feared, a volcanic eruption occurred in 2002. Fortunately, though, the eruption was small in scale and the albatrosses were unharmed. Our ultimate objective is now to move the birds to an uninhabited, non-volcanic island. If we can achieve this, we are sure that the short-tailed albatross, which has hardly any predators, will gradually increase in number until eventually it will once again be a seabird that is commonly encountered across the Pacific Ocean. Albatross bones have been found in large quantities at Jomon prehistoric sites all over Japan; the Ainu people are said to have used the short-tailed albatross as a guide for locating

swordfish, and its skull as an object for shamanistic rituals. These suggest very strongly that the short-tailed albatross was once a far more familiar sight in Japan than we think possible today.

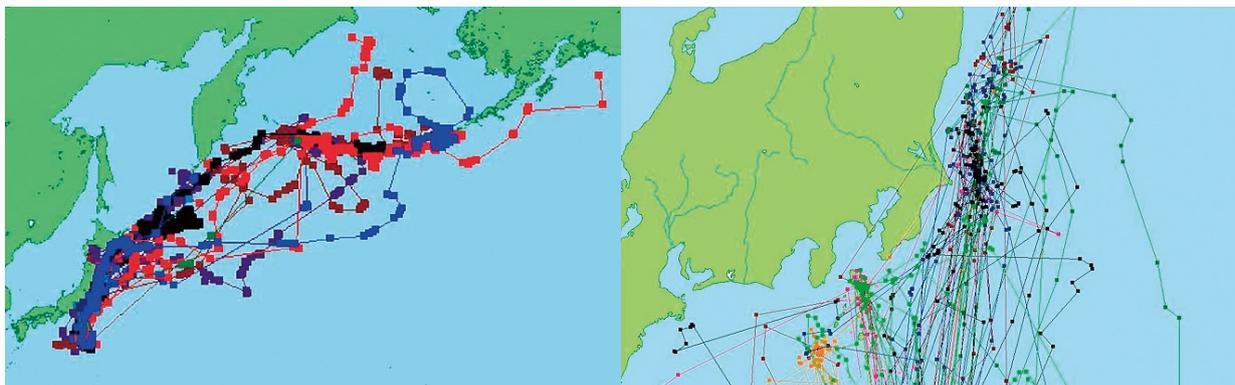
Chicks transferred to Ogasawara Mukojima Island

In 2008, we decided to transfer some of the albatross chicks to a non-volcanic island. There had already been more than 100 fledgling chicks on Torishima every year from 1998 onwards, and it was judged that transporting a small number of chicks to a different island would not significantly impact the overall population. If chicks could be hand-reared and fledged on a different island, the fledged chicks might later return to that island, thereby forming another new breeding ground. In February, 10 chicks were transported from Torishima to Mukojima Island by helicopter. In May, all 10 chicks fledged safely. It was a great success. But will they return to Mukojima in three years' time? Our plan for this operation is to hand-rear a total of at least 50 chicks and allow them to fledge from Mukojima for another four years. We will not know the results until at least five years from now. Considering the possibility that none of them might return, this operation entails a worrying degree of uncertainty.

The mystery of marine habitats and the future of the short-tailed albatross

Short-tailed albatrosses come to Torishima to breed between October and May. So where do they go in summer? And where do the juveniles live for three years before returning to Torishima? The marine habitat of the short-tailed albatross has long been an unsolved mystery.

The recovery of a few albatrosses fitted with bird ring suggests that they spend their summers in seas ranging from the Aleutians to the west coast of America. For ten



Feeding grounds of the short-tailed albatross (areas where the plot lines converge are waters in repeated use)

years from 1996, we fitted artificial satellite transmitters to 31 young albatrosses that had not yet started breeding, and tracked their movements. The results were amazing. After leaving Torishima in May, the birds flew northwards over the continental shelf to the east of Honshu Island, then displayed feeding behavior over the continental shelf to the east of Hokkaido and the Kuriles before arriving in an area between the west and the center of the Aleutians. In August they were found in the Bering Sea and waters east of the Aleutians. The key point would appear to be the continental shelf.

Next, we attached the satellite transmitters to 22 chick-rearing albatrosses in February, i.e., during the breeding season, to investigate where they go to find food for their chicks. Again, the results were astonishing. The feeding grounds visited by the adult birds were within a range of 10km-50km off the coast of Chiba and Ibaraki Prefectures, in the northern Izu Islands to the north of the Kuroshio Current as it proceeds eastwards along the southern coast of Kanto. The short-tailed albatross feeds on squid, small fish, fish eggs, etc., but these seas coincide exactly with a source of fish for people living in the Kanto region.

As of 2008, the albatross population on Torishima was around 2,000 individuals, a relatively small number that would be difficult to encounter over the vastness of the ocean. The population we envision for the future would be tens of thousands, even hundreds of thousands. Imagine the majestic sight of countless short-tailed albatrosses soaring serenely across the "Kurose River"¹⁾ towards the waters off Choshi, one of the world's foremost fishing grounds, where the Kuroshio and Oyashio currents collide. When that happens, will there be enough fish left for them to eat in these abundant seas? This is our biggest concern at the present time. ■

● Yamashina Institute for Ornithology <http://www.yamashina.or.jp/hp/english/toppage.html>

1) Kurose River = an old name for the Kuroshio Current, so called because it looks like a black river flowing through the ocean.

The Pirates And Indo-Japan Relations

[KEYWORDS] Pirates / International cooperation / Maritime safety

Prabhakaran Paleri

Former Director General, Indian Coast Guard / Visiting Fellow, OPRF
(Ship & Ocean Newsletter No.198 November 5, 2008)

When I was a child I dreamt of being a pirate' is what many adults would say. Children encounter pirates in comic books, memorabilia's, merchandise, animation, videos and movies. No other criminals are eulogized like the pirates. I am not sure whether I thought that way as a child but certainly had a feeling of worsening situation around the world when struggling to lend a hand to my colleagues and seniors in building the Indian Coast Guard in the late 70s.

Piracy existed since vessels could ply on water. The early pirates used the sea for raiding the coasts and villages, some of them forayed even far interior. The form and methods changed when they achieved mobility further into the sea. In course of time they restricted their activities to the sea. Pirates don't raid coastal towns any more. But they use them as hideouts, contact points and forward planning centres. But what is important is that, though piracy had its ups and downs similar to the fluctuations of a stock market, no government has ever been able to eliminate it. Even the young Julius Caesar was kidnapped by the deadly Cilician pirates once for ransom. Though he eliminated them subsequently after release, their successors bounced back and sailed smoothly into the 'golden age' of piracy. In all its probability piracy is here to stay and float into the future. The approach and modalities may undergo change. Could it be terror in its container mode? If that is so the ancient piracy will be resurrected by opening its original modus operandi of attacking at sea, and from the sea over the shore. Nothing prevents a maritime terrorist from negotiating an attack with a missile tipped dirty weapon deep into the land from the sea. Today the sea is a medium for them to glide their supply chain of dreaded cargoes and militant mercenaries. Tomorrow it could be different.

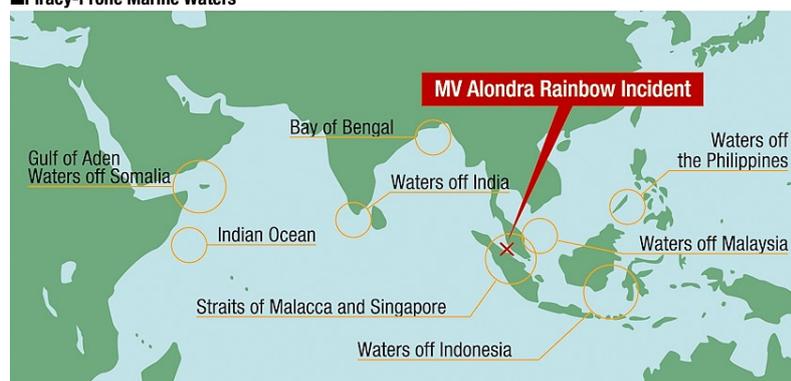
The pirates exist in all forms and shapes in the modern world. There are poverty stricken petty thieves and anchor-

age muggers in almost every navigable port of the countries whose security forces are weak and lax in their duties. There are also pirates of the high seas who are better organised. Some of them operate under powerful and organised syndicates with formal orders. They have the no holds barred attitude for violence against their victims. They can go to the extreme in executing their mission to hijack a ship and its cargo and then run it as a phantom ship. For the victims it will be life long trauma even if survived the assault.

There is no organised piracy in India. But there were incidents of thieving in some of its ports and anchorages by unsuspecting boat people including fishers without a catch on that day. They boarded ships without deck watch at anchorages and stole the wears to earn a living. The Indian Coast Guard stopped it. It was recognised by the International Maritime Bureau in London.

But the Indian Coast Guard never felt it would end up seizing the operatives of an organised syndicate of the South China Sea until the hijacked Japanese ship *Alondra Rainbow* dared to traverse Indian waters on its way to Persian Gulf to negotiate resale as a phantom ship. It also opened a new chapter in Indo-Japanese relations with the prime ministers of both the countries taking interests in collaboration and further coordination to eliminate the bane of piracy jointly. It worked, and today there is a revitalized

■ Piracy-Prone Marine Waters



The pirates of MV Alondra Rainbow

approach in Indo-Japan relations and people to people coordination. I have been a participant and observer in all these developments including the subsequent ReCAAP¹⁾. It is for both the countries to derive more mileage out of this initiatives for which the main cause was the pirates of the South China Sea.

In the meantime piracy is extending its tentacles in many parts of the world as an organised criminal business in its localised form. African continent is witnessing new types of piracies. While Somalia with its clannish militia finds piracy as a major source of finance, the pirates of the oil rich Niger Delta has reinvented themselves as stake holders of big game money according to media reports²⁾. There were incidents of kidnapping for ransom as well as attacks on Nigerian Navy. They also found easier means of income in the weaker section of the population of the Delta—the fishers. The fishers sleeping after streaming their nets down expecting a good catch by morning are woken up in the dead of the night by machine gun fire from the pirates who board them. Often they get shot and die. The pirates take away everything. Pirate attacks on offshore oil installations and kidnappings continue. The European Command of the United States, it is understood, has plans for activating the Gulf of Guinea Guard to patrol the area³⁾. The Central and Western African States are also planning a joint continental coast guard⁴⁾. But the greatest burden of lawlessness percolates to those in the lower rung, in this caste the fishers of Niger Delta. There were 107 cases in 2007 according to the Nigerian trawler owner's association. The raids are increasing.

Under such circumstances it will be of interest to examine the probable spots of piracy that may come up later in the sea lanes and shipping routes. It will depend on the social, political and economic system prevailing in the area. The northern sea route that is being examined currently could also be vulnerable for unlawful activities⁵⁾. It has to be studied in detail from this perspective to contain them by cooperative mechanisms designed to ensure safety of navigation. ■

1) The Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) is the first government-to-government agreement to enhance the security of regional waters. ReCAAP was entered into force on September 4, 2006. It comprises 14 member countries which includes Japan, Singapore, Laos, Thailand, Philippines, Myanmar, South Korea, Cambodia, Vietnam, India, Sri Lanka, Brunei, China and Bangladesh (as of May, 2007). Please refer to the OPRF MARINT Monthly Report June 2006.

2) Will Connors, Delta Pirates are Now Targeting Nigeria's Smaller Fish, International Herald and Tribune, Tokyo, 13 Jun 08, p.2.

3) www.globalsecurity.org, September 1, 2008

4) West and Central African States to Co-operate in Sub-regional Coastguard Network, www.imo.org, September 2, 2008

5) Based on a study by the author on the Maritime Dimension of Unlawful Activities for the Institute for Defense Studies and Analyses, New Delhi as an external researcher. It was not an area specific study.

Towards a Vigorous Debate on Coordinated Promotion of Ocean Policy

[KEYWORDS] Coordinated promotion of ocean policy / Basic Ocean Law / Basic Plan on Ocean Policy

Hiroshi Terashima

Executive Director, Ocean Policy Research Foundation
(Ship & Ocean Newsletter No.200 December 5, 2008)

Since the launch of this Newsletter in 2000, Japan's ocean policy has taken significant steps forward. The Basic Act on Ocean Policy has been enacted, and in March of 2008 Japan's first Basic Plan on Ocean Policy was decided by the Cabinet. But while our country has begun its evolution into "a new ocean state", our ocean policy is still being held back by vertical divisions among administrative agencies. If we are to implement an ocean policy in a comprehensive and systematic fashion based on the widest perspective, vigorous debate needs to continue.

On the 200th issue of the Ship & Ocean Newsletter

Launched in August 2000, the Ship & Ocean Newsletter now celebrates its 200th issue. In the preview issue of July 20th, 2000, Nippon Foundation Chairman Yohei Sasakawa (then President), who was instrumental in promoting the launch, stated the purpose of the Newsletter as follows:

"We must become fully aware that the ocean paradigm has already changed and must quickly build our nation's ocean policies for the 21st century. The wisdom of many people must be incorporated into our ocean governance in consideration of the wide range of areas encompassed by the relationship between mankind and the ocean.

To contribute to the formulation of Japan's ocean governance, we have established an Ocean Policy Think Tank with the cooperation of The Nippon Foundation, the Ship & Ocean Foundation¹⁾, and researchers at home and abroad, in order to conduct research on various issues related to ocean governance and to propose policies in Japan and abroad, from a standpoint not constrained by individual administrative divisions or areas of specialization. This newsletter is issued as a hot line to inform everyone interested in ocean issues about the activities of this marine think tank as well as a forum for discussing diverse maritime topics."

Looking back, the United Nations Convention on the Law of the Sea (UNCLOS) had come into effect in 1994, while the principle of "sustainable development" and the "Agenda 21" action plan had been adopted at the Earth Summit in Rio. These developments combined to spark initiatives for "ocean governance" based on a shared legal foundation and policy framework for tackling the development, exploitation, conservation and other aspects of the oceans. Various countries had begun earnest efforts to formulate their respective ocean policies, improve administrative and research organizations, and draw up procedures to incorporate the views of a wide range of users. But Japan, though possessing the world's 6th largest Exclusive Economic Zone and world class expertise in many fields including ocean navigation, shipbuilding, fisheries, science, and technology, did not fully appreciate the importance of

"ocean governance". Although this was now a global trend, Japan lagged behind other countries in coordinated efforts to tackle the problems of the oceans. There was not even a platform for coordinated discussion on ocean-related problems in Japan, as each relevant ministry or agency was dealing with ocean-related affairs in isolation.

The road to enactment of the Basic Ocean Law

At the same time as launching the Ship & Ocean Newsletter, the Nippon Foundation set up an expert study group on ocean governance in 2000, thereby starting research on Japan's ocean policy. In March 2002, the study group compiled and published "Oceans and Japan: A Proposal on the Ocean Policy of Japan for the 21st Century". The proposal covered six areas, including the basic principles of ocean governance, establishing an ocean policy by enacting a Basic Ocean Law, and developing an administrative mechanism. As such, this represented the starting point of fully-fledged proposals indicating directions for Japan's initiatives on ocean policy. At the time, however, reactions to the proposal were muted, both from the political establishment and from society in general.

Initiatives for a comprehensive ocean policy in Japan were set in motion by the "Proposal for a 21st Century Ocean Policy" submitted by the Ocean Policy Research Foundation to (then) Chief Cabinet Secretary Abe. OPRF had set up an Ocean Policy Research Institute in April 2002, and, in collaboration with experts, had carried out further research on comprehensive ocean policy based on the proposal by the Nippon Foundation. OPRF then announced the outcome of this research in the form of its own proposal in November 2005.

At the time, Japan was involved in disputes with neighboring countries over EEZ boundaries, resource development, security and other issues in the seas around the archipelago. As a result, the need for comprehensive efforts to tackle ocean-related problems was at last becoming understood among politicians and stakeholders. The ruling Liberal Democratic Party (LDP) therefore accepted the proposal, and then, after lobbying by the LDP, a supra-partisan

Basic Ocean Law Study Group consisting of politicians and experts from various ocean-related fields was formed in April 2006. Its Representative Facilitator was Keizo Takemi, then an Upper House Diet Member, and its Chairman was Shigeru Ishiba, a Lower House Diet Member. The Study Group also included observers from ocean-related ministries and agencies, met ten times until December of that year, and finally drew up a Guideline for Ocean Policy and a draft outline of the Basic Ocean Law.

The Guideline for Ocean Policy, subtitled "Aiming to establish Japan as a new ocean state", stated that necessary measures (including the enactment of a Basic Ocean Law) should be taken to promote comprehensive ocean policy. Three parties (LDP, Komeito, Democratic Party) then tabled a lawmaker-initiated Bill for a Basic Act on Ocean Policy to the Diet in April 2007. The Bill was approved by a majority of the Diet and became law. The Basic Act on Ocean Policy took effect on July 20th, a date that was already familiar to people in Japan as "Ocean Day". With this, a Basic Plan on Ocean Policy was to be formulated based on six basic principles, including "comprehensive management of the oceans", and a legal system established clearly specifying that comprehensive efforts should be made to tackle ocean-related issues. The Act itself also specified twelve basic ocean-related measures to be comprehensively tackled by Japan. Finally, a Headquarters for Comprehensive Ocean Policy, with the Prime Minister as its Head, was set up within the Cabinet as a "control tower" for comprehensive promotion of ocean policy.

Cabinet decision on the Basic Plan on Ocean Policy

Today, Japan is under pressure to act urgently on a number of ocean-related issues, including the demarcation of waters over which it has sovereign rights, the development and conservation of marine resources, guaranteeing maritime safety and security, developing, exploiting and protecting its EEZ, integrated management of coastal areas, the protection, management and promotion of remote islands, and securing maritime transport. After the Basic Act came into effect, therefore, the first priority of the Headquarters for Comprehensive Ocean Policy was to draw up a Basic Plan on Ocean Policy. This culminated in Japan's first Basic Plan on Ocean Policy being decided by the Cabinet in March 2008. In February of this year, during the formu-

lation process, the Basic Plan on Ocean Policy (draft) was presented for public comment, and many individuals and groups submitted their opinions.

The Basic Plan on Ocean Policy plays an important role in coordinating and amalgamating ocean-related measures under the basic principles specified by the Basic Act, and comprehensively and systematically promoting them. While there are some who gave a positive assessment of the Basic Plan on Ocean Policy decided at this time, other less favorable views have also been expressed; chiefly, that many of the measures incorporated in the Plan are unclear in their specific content, particularly the targets to be achieved, the 'road map', etc. The Ocean Policy Research Foundation therefore conducted a questionnaire survey to evaluate the Basic Plan on Ocean Policy, as reference for future initiatives. We have received a large number of responses, and intend to make them available for reference as soon as the results have been analyzed.

Towards a vigorous debate aimed at coordinated promotion of ocean policy

With the Cabinet decision on a Basic Plan on Ocean Policy, Japan's initiatives aimed at "Establishing a new ocean state nation" have entered the next phase of their evolution. However, this ocean policy is still being held back by vertical divisions among administrative agencies. A task for the future is how we should comprehensively and systematically implement ocean policy from the widest perspective. The Ocean Policy Research Foundation will contribute to resolving this task by intensifying its activities as a thinktank.

Since it was first launched, the Ship & Ocean Newsletter has published the outcome of OPRF's activities as a thinktank on ocean policy, as well as movements connected with the Basic Act on Ocean Policy whenever they have occurred²⁾. As well as helping to raise interest in the oceans, I would be happy if these have also contributed in some small way to the enactment of the Basic Act on Ocean Policy and the formulation of the Basic Plan on Ocean Policy. Now and in future, the Newsletter will fulfil its mission as a hotline on ocean policy, and as a platform for coordinated discussion on the oceans, with support from the Nippon Foundation. I hope that everyone with an interest in this field will continue to debate the issue at hand with continued enthusiasm. ■

1) The Ship & Ocean Foundation, previous name of the Ocean Policy Research Foundation

2) No. 41 (April 20th, 2002): Special Edition, Proposals for Japan's Ocean Policy, No. 130 (Jan. 5th, 2006) : Special Edition, Recommendations for an Ocean Policy in the 21st Century, No. 143 (July 20th, 2006) : Special Edition, "Marine Day" – Wishes in Japan's Endeavors as a Maritime Nation, No. 156 (Feb. 5th, 2007) : Information - For the Enactment of a Basic Ocean Law – Aiming to Establish a New Maritime Nation, No. 158 (March 5th, 2007) : On Becoming a New Ocean State, No. 163 (May 20th, 2007) : Special Edition, Thinking about the Basic Ocean Law, No. 167 (July 20th, 2007) and No. 168 (Aug. 5th, 2007) : Special Edition, On the Effectuation of the Basic Ocean Law, No. 186 (May 5th, 2008) Basic Plan on Ocean Policy and Management of the Sea, etc. Besides these, the Newsletter has published numerous views and information about ocean policy across various ocean-related fields.

Thoughts on Climate Problems

[KEYWORDS] Global warming / Climate change / Climate variation

Toshio Yamagata

Vice Dean, Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo
(Ship & Ocean Newsletter No.200 December 5, 2008)

Climate variation, a problem that directly impacts our socio-economics, is gradually becoming predictable to a high degree of precision. This is due to the rapid growth of global ocean observation, enhanced scientific knowledge on climate variation phenomena, and, finally, new techniques for seasonal prediction, developed by assimilating observed data into high-precision models for predicting climate variation. Measures aimed at protecting the global environment ought to be pursued at the same time as promoting and applying this highly specific prediction of climate variation.

The difference between change and variation

A Google search for "global warming" produces about thirty million entries. Not a day goes by without some mention of global warming in the media. Books casting doubt on claims of man's involvement in global warming are piled high in the corners of bookshops. There are misunderstandings at all levels in the information that floods our society, and these appear to be amplifying the issues of contention. One of these misunderstandings, for example, is the tendency to confuse "climate variation" with "climate change". Climate variation refers to a situation in which, due to various internal factors, climate varies significantly from its normal state. Average values over a thirty-year period are often used to define this "normal state". On the other hand, climate change refers to a situation in which this normal state changes over a longer period of time. This often results from some external impact on the atmospheric and oceanic systems that spawn natural variation.

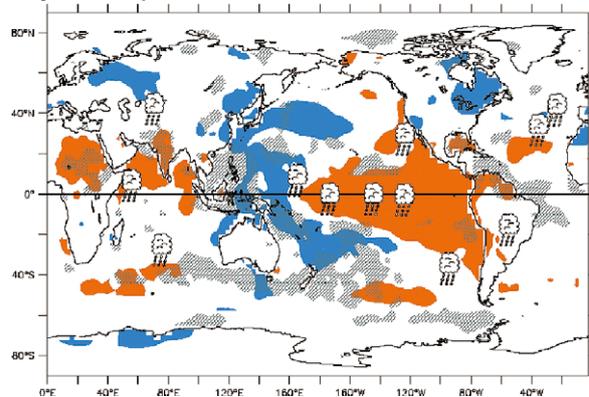
The importance of terminology

The intensely hot summer of 2004 and the heavy snows of the winter of 2005/6 are still fresh in the memory. Since intense heat and heavy snows are included among day-to-day meteorological phenomena, there will be cooler days in the heat of summer, and rays of sunshine amid the heavy snows. If these natural variations differ significantly from normal years (average years) over the season as a whole, they could justifiably be called climate variation. Concentrations of carbon dioxide, one of the "greenhouse gases" responsible for global warming, have been increasing unabated since the industrial revolution; the relationship between this and the rise in earth surface temperatures in recent years has become a major focal point as a problem of global warming. Since this is thought to be caused by human activity outside atmospheric and oceanic systems, it is a problem of climate change. The earth's rotational orbit and the tilt of the earth's axis fluctuate on a timescale of tens of thousands of years or more. These cause ice ages and interglacial periods due to changes in the volume of

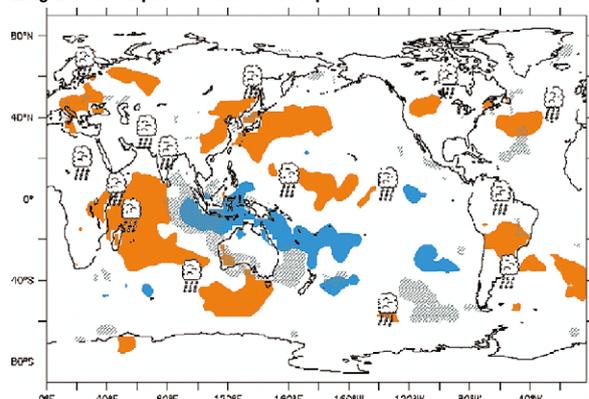
sunlight radiation falling on the earth, and as such, these could also be described as climate change.

Given this interpretation, it is somewhat embarrassing that, in Japanese, the IPCC is translated as the "Intergovernmental Panel on Climate Variation" and the UNFCC as the "United Nations Framework Convention on Climate Variation". In fact, of course, they should be translated as "Intergovernmental Panel on Climate Change" and "United Nations Framework Convention on Climate Change", as

■ Fig. 1 Global impact of El Niño in summer



■ Fig. 2 Global impact of Indian Ocean Dipole Mode in summer



Shaded parts = drought
cloud symbol = heavy rains
blue parts = abnormally low temperatures
orange parts = abnormally high temperatures.

they are in English. Again, "global warming projection" is often translated in Japanese as "global warming prediction", but the word "prediction" invites misunderstanding that the initial value problem can be explained in the manner of a weather forecast. Since this is a future projection with a high degree of uncertainty, depending partly on scenarios such as socio-economic policies, it should more correctly be translated as "global warming projection". In fact, IPCC reports make very careful distinctions between the terms "variation" and "change", "prediction" and "projection".

Limitations of models used for the IPCC report

This distinction between the concepts of "variation" and "change" is by no means limited to the realm of semantics. It causes serious discrepancies when considering application measures for local communities. It is climate variation, not climate change, which is directly related to the abnormal weather and extreme phenomena that impact our socio-economic conditions. Climate change is change that creates a platform for climate variation. It is extremely important that we understand this graded structure. Let me give a specific example. A phenomenon called the Pacific-Japan pattern (PJ pattern) brings summer to Japan and East Asia. From around April, the sun reaches a high elevation near Indonesia, stimulating convection activity there. Warm air rises, and then falls near the Philippines. The resultant fine weather over waters near the Philippines causes seawater temperatures to rise significantly there. Then, in around July, the center of convection activity moves to this warmed sea area. The area of falling warm air moves northwards in tandem, until the area near Japan is covered with the Bonin (Ogasawara) high, ushering in the summer. This is called the atmospheric PJ pattern.

"El Niño" is a phenomenon that interrupts this seasonal progression and causes cool summer (Fig. 1). When this phenomenon occurs, the warm seawater near the Philippines moves towards the area ranging from the eastern Pacific to the International Date Line, making strong convection less likely to occur. The Bonin (Ogasawara) high that brings summer to Japan is not reinforced, either. On the other hand, it has become clear that, if the dipole mode phenomenon occurs in the Indian Ocean, convection becomes active over an area ranging from northern India to near the Philippines. In that case, temperatures in Japan are extremely high (Fig. 2).

IPCC reports discuss the global climate tens of years or a hundred years hence, using models of climate change based on greenhouse gas emission scenarios. While scientifically tricky problems such as the treatment of clouds still remain, I think there is no major error in this approach, insofar as it

concerns average imaging for the planet as a whole. However, it would be dangerous to discuss the impact on local communities using the results of the models used for the IPCC report. This is due to serious problems with the reproducibility of climate variation phenomena in those models.

For more appropriate application measures

Of course, the outlook is not all pessimistic. This is because, though somewhat hidden behind more prominent IPCC topics, initiatives aimed at predicting climate variation have been progressing rapidly of late. We are now at the level whereby the occurrence of El Niño can be predicted one or two years in advance. This is all due to rapid growth in wide-area planetary observation using satellites and buoys, the enhancement of scientific knowledge, and advances in techniques for assimilating observed data into models and making seasonal predictions. Predicting the likelihood of droughts, floods, abnormally high or low temperatures, etc., between several months and one year in advance will make a direct contribution to socio-economic activities. Measures aimed at protecting the global environment should be promoted in parallel with this prediction of specific climate variation, and application measures based on it. Systems in developing countries are particularly vulnerable to flooding, drought, and other calamities. If we can cooperate in disaster prevention or mitigation based on predicted data as well as promoting infrastructure development and capacity building, we should be able to encourage an understanding of measures to protect the global environment in those countries as well. This future objective is likely to be spelled out at the 3rd World Climate Conference (WCC-3) to be held in Geneva in 2009. ■

A Look at the Dramas of Oceans and Islands

— Towards an Integration of Ocean Data —

[KEYWORDS] Island ecosystems / Biosphere protection zones / Data integration

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(Ship & Ocean Newsletter No.200 December 5, 2008)

When we consider the future of an island, we tend to see it as a straightforward choice between development and protection. But these need not necessarily be seen as mutually exclusive. Each island is governed by its own environmental and cultural conditions; the circumstances faced by each one are diverse and their histories are different. Before all else, it is important that we investigate an island's eco-history in detail. A significant factor in considering the future of oceans will be the ability to cross-reference information, organize it into useable forms, and promote the integration of data.

Talking about islands...

On October 22nd and 23rd, 2008, the 3rd RIHN International Symposium was held at the Research Institute for Humanity and Nature (RIHN, in Kita Ward, Kyoto), of which I am a member. The overall theme of the Symposium was "The Futurability of Islands - Beyond Endemism and Vulnerability", as discussed by 10 participants from overseas and 13 from Japan (Photo 1).

The islands highlighted during the Symposium included the Galapagos Islands (Ecuador), Komodo (Indonesia), Timor (East Timor), Polynesian Outliers, Kilwa (Tanzania), East Maui, Hawaii (USA), Jeju (South Korea), the whole of Vietnam (Vietnam), and Iriomote and Taketomi (Yaeyama, Japan). The topics for discussion were also broad ranging, including islanders' perspectives, protection zones and conservation, islanders' lives and culture, and island development in the global era. So what was discussed at the Symposium, and what significance did it have?

The dilemma of "development or protection"

The Symposium was attended by Miguel Clüsener-Godt from the UNESCO "Man and Biosphere" (MAB) program. There are 531 UNESCO-recognized biosphere protection zones in 101 countries around the world, and a little known fact is that four of these zones are in Japan. They are the Shiga Highlands, Mount Haku, Mount Odaigahara



■Photo 1 Group photo of the Symposium participants, including island researchers from all over the world.

and Yakushima Island. Expectations at this year's Symposium were high, particularly as Iriomote Island in Okinawa has been proposed as a candidate MAB site.

Islands are, by definition, surrounded by the sea. Although it depends partly on size, there are limits to an island's ecological tolerance, and islands are generally vulnerable to outside influences. Given this characteristic, how do islanders perceive the barriers

between inside and outside? Do they accept or reject external influences? Between prehistoric times and the present day, the status of islands has certainly not been constant. They have been affected by a complex combination of factors, ranging from climate change, tsunamis, earthquakes and other natural factors, to ethnic displacement, epidemics of contagious diseases, the introduction of new crops and exotic species, and other man-made factors.

In any epoch, the development and conservation of islands must have been problems of the greatest magnitude. In reality, however, protection of the environment has rarely been prioritized in this process. On Easter Island in the remote east Pacific, for example, the environment was continuously ravaged by population increase and disputes between groups of islanders. Some of the massive moai stone statues were abandoned in mid-construction, speaking volumes of the chaos that ensued (Photo 2). Mountain goats introduced to Japan's Ogasawara Islands before the war subsequently became wild and continued to increase in number, dramatically changing the islands' vegetation. Jeju Island in South Korea depends on revenue from tourism



■Photo2 A moai statue at Rano Raraku on Easter Island. The statues are characterized by their unusually long ears, and people on the island say there was once a conflict between long-eared and short-eared peoples here.

as the major component of its economy, but there are now fears that development will exhaust groundwater and eradicate the traditional culture based on water-related beliefs.

To improve islanders' lives and revitalize industries, we need to develop forests and unutilized land. But if such acts lead to the destruction of valuable natural resources, it could leave seeds of blight remaining long into the future. The dilemma of "development or protection" remains a major problem, not only for developing countries but for industrialized nations as well. It is a perplexing conundrum.

Island tourism

Could tourism provide a means of breaking through this dilemma? Our discussion focused on this point. Many of the islands highlighted in the Symposium are also famous tourist destinations. Tourists have been visiting these islands in ever increasing numbers in recent years, and various opinions were expressed regarding length of stays and the impact on island economies, how to evaluate the differing impacts on island ecosystems from mass tourism and eco-tourism, ways of regulating the number of visitors to an island in terms of the total headcount, and so on. There were also opinions as to how we should evaluate the future potential of "ordinary islands", which make up the majority, along with the major tourist destinations of Tahiti, Bali, and Phuket. We were once again reminded that islands exist under diverse environmental and cultural conditions.

In UNESCO's biosphere program, "land allotment" is presented as a model for the coexistence between conservation and development of nature. Land is divided into core zones where the emphasis is on nature conservation, buffer zones for use only by local residents, and transition zones that can also be used by outsiders.

In the case of islands, these zones straddle both land and sea. In Hawaii, for example, the entire surrounding sea area is earmarked as a sanctuary for whales, but recreational fishing and whale watching are allowed. On the other hand, the core zone on the Indonesian island of Komodo, famous for its "Komodo dragons", are its coral reef seas. These seas are rich in fish, however, and so continually face the problem of illegal fishing from outside. The circumstances facing each individual island are truly diverse and their histories are different.

Attempts at "eco-history" and integrating ocean data

When considering the future of islands during the Symposium, two ideas struck me as tasks for the future. The first is to attempt a detailed description of various events that have occurred on an island in the past, and the changes

caused by them. In the modern world, the all or nothing choice of "development or protection" tends to be seen as a universal formula. But the problems faced by individual islands should certainly not be approached within the same framework (and, moreover, one that is created under European guidance). We should first look back over the situation of each island in historical terms. I am proposing this as an attempt at "eco-history". Before all else, it is important to investigate an island's eco-history in detail.

The second point concerns the use of this Newsletter. The Newsletter has taken up the problems of islands from a range of different angles, as is clear from the fact that, up to and including this 200th edition, some 600 different opinions have been expressed on the subject. The question, however, is whether individual views and proposals have been integrated and reflected in new approaches and policies.

On the problems of islands, while wide-ranging discussions covering subjects from ecology to security and culture have often been pursued separately, more effort is needed to bring these opinions together into a cohesive whole. For example, the presentation on UNESCO underwater cultural heritage (by Akatsuki Takahashi in No. 197, 2008) could be seen as naturally complementing my own proposal. The theme of protection zones and roseate terns in Australia's Great Barrier Reef (by Kiyooki Ozaki in No. 137, 2006) is also closely related to problems on the size of protection zones in the concept of biospheres. It is time to identify our groups of problems and make clear the extent of our current knowledge. Preparations for promoting the integration of data have only recently come together, but I feel that we may now be able to link the various types of ocean-related data together and make them available as a coherent whole. To achieve this, collaboration between the Newsletter's readers and the editorial staff is indispensable. I look forward to receiving all of your opinions, which will help us take new actions for a better future. ■

The New Cooperative Framework in the Malacca and Singapore Straits and the Role of the Private Sector

[KEYWORDS] Malacca Singapore Straits / safety of navigation / corporate social responsibility (CSR)

Yohei Sasakawa

Chairman, The Nippon Foundation

(Ship & Ocean Newsletter No.202 January 5, 2009)

The Co-operative Mechanism was established in 2007 through the efforts of the Coastal States. It is highly significant that the Aids to Navigation Fund, established within the Mechanism, serves as a means to receive voluntary contributions not only from User States but from various non-State entities as well. In November of 2008 the International Symposium on Safety and Protection of the Marine Environment in the Straits of Malacca and Singapore provided a venue for discussion in which the international shipping industry could address the huge problems facing the Straits as its own problems, an important step forward for the safety of navigation in the Straits, the protection of its environment, and the global economy.

Safety and Protection of the Marine Environment in the Straits of Malacca and Singapore

I am convinced that this symposium is unique in being the first of its kind to be organized by non-State entities, namely The Nippon Foundation and the Round Table, with support from the IMO and the Coastal States. As it provides a venue for discussion in which the international shipping industry can address the huge problems facing the Straits as their own problems, it is an important step forward for the safety of navigation in the Straits and ultimately the stability of the global economy.

Some 400 years ago, the Dutch jurist, Grotius, advocated the principle of "freedom of the seas." He saw the seas as an infinite resource that anyone could exploit freely and the usage of which no one could regulate. Civilization made great strides as international shipping expanded under the freedom of the seas regime, and today's prosperity is based on the distribution of goods and materials around the world. However, from the perspective of maritime transport, a variety of problems have accompanied these advances.

The oceans are where life on earth began and even today our lives on land depend on them. Yet as human activity expands, our insatiable desires threaten to turn them into a garbage dump. We are called on to leave safe and healthy seas for future generations, and so must reduce the burden



Chairman Sasakawa giving the keynote speech. (photo: Natsuko Tominaga)

on the marine environment and stem the degradation of natural eco-systems.

We who utilize and benefit from the oceans must start to think of them as a finite resource, so I believe it is important that we consider how to protect them before they worsen and plan suitable activities in response. In the case of the Malacca and Singapore Straits, our theme today, conservation of the environment and the securing of navigational safety as part of advancing comprehensive management of the ocean is a formidable task, but given the importance and uniqueness of the Straits I believe it is of critical importance for the sustainable development of both the regional and global economies.

As you all know, more than 94,000 vessels transit the Straits annually, far exceeding the number passing through the Suez Canal and the Panama Canal, making the Straits the busiest stretch of water in the world. The number of User States and volume of traffic continues to increase with the growth of the Asian economies and their energy needs. The maritime transport industry has made commendable efforts to comply with the variety of international standards for navigational safety, but with the continuing rise in vessel traffic the risks to safety are also increasing.

The Malacca-Singapore Straits are long and narrow and present many challenges for navigational safety as international straits. There are other possible routes for transporting oil and gas between Asia and Africa and the Middle East, but they require more time, expense, and involve more security risks. As a main artery for international trade, freedom of navigation in the Straits and the maintaining of their efficient operation are in themselves a contribution to the "common benefit of international society." However, prerequisite to this are safe navigation and protection of the marine environment.

User States and Corporate Social Responsibility (CSR)

As the main area of the Straits' falls within the territo-

rial waters of the Coastal States, under the UN Convention on the Law of the Seas they are responsible for ensuring navigational safety by maintaining and improving aids to navigation. However, as the number of ships traversing the Straits increases, the extent of responsibility for navigational safety has expanded and the financial burden to be borne by the Coastal States far exceeds any direct benefits they might expect to receive. It has therefore become more and more difficult to rely solely on the efforts of the Coastal States to ensure the continued absence of dangerous and unsettled conditions in the Straits.

Try to imagine against this background the consequences of a ship running aground in the Straits, creating a large oil spill and resulting in the loss of many valuable seafarers' lives. The ship owner and the cargo owner would suffer not only financial losses and damages to their credibility, but, if pollution resulted, the value of the Straits to the "common benefit of international society" would fall significantly and their functions be disrupted, leading to paralysis and possible destruction. Also, to judge by past accidents, it goes without saying that in the case of an oil spill vast sums of money would be required for the clean-up, and the disruption of oil and gas transport would affect millions of people in energy-importing nations.

Also, Users of the Straits need to be aware of more than just problems that might affect their traversal of the Straits. I once had the opportunity of going through the Straits onboard a buoy tender, and while gazing at the supertankers making their leisurely passage along the equator was amazed to see the huge numbers of fishing boats darting in and out between them and the many other small working vessels directly crossing their paths. In other words, for the inhabitants of the area, the Straits are where they carry out the activities of their day-to-day lives. As our use of the Straits can have a huge impact on coastal fisheries and tourism, and therefore the economy of the whole region, none of us should operate in ways that threaten their places of livelihood or cause undue anxiety to the local inhabitants. Whatever the legal interpretations may be, we must remember that the Straits are in fact someone else's back garden.

Should users of the Straits wish to avoid accidents, enjoy the sustainable use of limited ocean areas, and ensure navigational safety, then coordination and cooperation among the Coastal States, User States, and non-State entities are indispensable. As corporations expand, diversify, and operate more and more across national borders, the effects of their activities on regions around the world and their inhabitants create the need to actively seek solutions to problems with a variety of stakeholders.

If corporate activities result in a burden to Coastal States



Overall view of the conference. (photo: Natsuko Tominaga)

and the communities in coastal areas, it is important to work towards lightening that burden. The adoption of the "precautionary approach" before an accident, rather than post-accident remedies, is necessary not only for the sake of the world economy and local inhabitants, but for the Users own peace of mind, sense of security, and to gain trust and a reputation for reliability.

I have long urged Straits Users to cooperate in assuming a more active international role as an aspect of fulfilling their Corporate Social Responsibility (CSR). Corporations in Europe and North America have now begun to look at CSR not as a cost, but as an investment leading to profits over the long term. Along these lines, should Straits Users take it upon themselves to actively cooperate in securing safety of navigation, the Straits will be safer and used more, thus leading to more favorable assessments of the industry as a whole and eventually larger profits. Corporations are now being called on to orient their activities not only for the pursuit of profit, but to become organizations that, both domestically and internationally, provide safe and secure environments for their operations as well as protect the natural environment.

Given these new developments, when considering Users' social responsibility as the direct recipients of the benefits of the Malacca and Singapore Straits, we have to question if they can truly fulfill their responsibility using the same methods from the past and by simply complying with existing norms and conventions? Can the international shipping industry, as Straits Users, be said to have discharged their social responsibility solely by allocating funds to meet the technical levels called for by international conventions?

The Preventive Approach

The Nippon Foundation has long cooperated with the Coastal States on navigational safety and conservation of the marine environment. If this has helped to make them safer to navigate, then it is a great source of pride and sat-

The New Cooperative Framework in the Malacca and Singapore Straits and the Role of the Private Sector



Retrieval of an Aid to Navigation in the Malacca and Singapore Straits(photo: Hideaki Takahashi)

isfaction for us. However, in looking at the future of the Straits, where the private sector is being called on to play a stronger role, if our contributions should lead to Straits

Users relying overmuch on their right of passage through the Straits and to being content to shift the burden for navigational safety onto others, then the fruits of our previous efforts will have changed from something inspiring praise and hope to increasing sadness and despair.

I believe that the international shipping industry, whose operational base is on the ocean, should not be content with meeting the responsibilities set out by old ideas and laws, but should assume a responsibility to society by contributing to the ocean areas, local communities, and natural environments that its activities affect.

It is too late to act once a serious accident occurs. Timely interventions today can help prevent the worst losses from an accident tomorrow, reduce the effects on the coastal community, and contribute to the inhabitants' peace of mind.

Users of the Straits must acknowledge their responsibility to society by taking a precautionary approach to environmental problems and renewing their efforts to fulfill their responsibilities, rather than leaving the tasks that they should be doing now to future generations.

In determining the area in which concrete cooperation should be made, as ships traversing the Straits make use of and are in most need of aids to navigation, and as these are most likely to suffer damage from collisions, I suggest that the most appropriate form of cooperation would be in the maintenance and management of these aids.

CSR activities by the international shipping industry will contribute to profits in the long run. It might therefore be more appropriate to speak of "benefit sharing," rather than burden sharing, as the discussions have until now been characterized. As the benefits to the international community become apparent, this will further enhance the cooperative framework among the Coastal States, User States, and non-State entities.

The Significance of the New Co-operative Mechanism

The Co-operative Mechanism was established in 2007 through the efforts of the Coastal States. It is highly significant that the Aids to Navigation Fund, established within the Mechanism, will serve as a means to receive voluntary

contributions not only from User States but from various non-State entities as well. I am happy to say that this is a big step towards the establishment of an international cooperative framework for navigational safety in the Straits. In order to make the Co-operative Mechanism and Navigation Fund effective however, the circle of cooperation needs to be expanded among the Coastal States, User States, ourselves, and the non-State Users gathered here today. Since the beginning of recorded history, the Malacca-Singapore Straits have been a unique North-South, East-West crossroads, which accounts for their distinctive history. As we continue on our cooperative journey in the Straits, I am confident that we will all share in the benefits the destination has to offer.

The Co-operative Mechanism and voluntary contributions from the private sector to the Aids to Navigation Fund are products of the unique characteristics of the Malacca and Singapore Straits, and so may not be replicable in other international straits. However, I do believe that our model serves as a useful precedent, showing how the voluntary contributions of stakeholders can be used in solving a variety of international problems. The Nippon Foundation has already announced it will cover one third of the operating costs of the Aids to Navigation Fund for the first five years, demonstrating its commitment to play an active role as a non-State entity. Assuming that all arrangements for the Aids to Navigation Fund will have been completed, and based on the results of the assessment survey conducted by the Coastal States, we are planning to contribute two and a half million US dollars as the first year's installment as early as 2009. I would be most happy if our contribution accelerates the movement towards creating a new future for the Malacca and Singapore Straits. ■



From left: ICS Chairman Polemis, Malaysian Minister of Transport Ong, Nippon Foundation Chairman Sasakawa (photo: Natsuko Tominaga)

● The Roundtable of International Shipping Associations is composed of the Baltic and International Maritime Council (BIMCO), the International Chamber of Shipping (ICS) / International Shipping Federation (ISF), INTERCARGO, and INTERTANKO.
http://www.nippon-foundation.or.jp/org/press/2008/08140_11250.html

Marine Ecolabel Japan

— Promoting Downstream Resource Management

[KEYWORDS] Marine ecolabel / Sustainable fisheries / Resource management

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(Ship & Ocean Newsletter No.208 April 5, 2009)

In December 2007, Japan's first ecolabelling scheme for fishery products was launched. Under the marine ecolabelling scheme, labels are attached to fishery products harvested by sustainable fisheries. When consumers select those products, they are in effect promoting sustainable fisheries. In this paper, I explain why Marine Ecolabel Japan took the step of launching a Japanese scheme, and describe the basic structure and characteristics of the scheme.

Downstream environmental movements and Japan's unique approach

Demand for fishery products is expanding globally, aided by the relentless increase in world population, rapid economic growth in China and other developing countries, growing health consciousness in the industrialized west, and other factors. As a result, stringent fishing regulations have been imposed for some marine species. Until now, resource management has been carried out "upstream" of resource distribution, mainly by governments, research bodies, and fishery operators. In Europe and America, however, environmental protection movements targeting the "downstream" are starting to appear. The aim of these is to let the consumer choose fishery products that have been caught in eco-friendly fisheries and thus enhance the sustainability of fisheries. Some of these movements unilaterally grade fishery operators and retailers, hampering the businesses of the targeted entity. Others are more oriented towards animal protection. The Monterey Bay Aquarium in America has prepared Pocket Guides that divide edible fish species into "Best Choices", "Good Alternatives", and "Avoid".

The marine ecolabelling scheme has some points in common with these, inasmuch as it is downstream-oriented. But it differs in that fishery operators are only examined and certified by the scheme if they put themselves forward for it. With the Monterey Pocket Guides, the fish routinely caught by a fisherman may suddenly be labeled "Avoid". Moreover, these different systems sometimes produce conflicting opinions about the same fishery operation. This causes inconvenience to both fisherman and consumer. In a way this is inevitable, since these systems evaluate marine resources that, by nature, continue to fluctuate.

Thus, while environmental movements downstream of resource distribution are all the rage, mainly in Europe and America, the rationale that fishermen should not only catch fish but also publicize the importance of resource management and fish-based diets to the "downstream" has existed for some time amongst fishery-related concerns in Japan. In its bid to promote the sustainable use of tuna resources, for example, the Organization for Promotion of Responsible

Certification symbol of
Marine Ecolabel Japan



Tuna Fisheries (OPRT) has developed its own consumer-oriented movement, involving the production of newsletters, pamphlets and other materials, events for dialog with consumers, and so on. Japan's marine ecolabelling scheme was born of a positive interaction between the international environment described above and Japan's unique approach.

The basic structure of Marine Ecolabel Japan (MEL Japan)

Participants from a wide range of sectors, including the fishery industry, scientists, distributors and consumers, are involved in running MEL Japan. The Secretariat is provided by the Japan Fisheries Association (JFA). When creating the scheme, we tried as far as possible to incorporate guidelines for marine ecolabelling specified by the FAO (United Nations Food and Agriculture Organization). While these guidelines provide pointers for the framework and operation of the scheme as well as standards for certification, the guidelines themselves are not mandatory; they merely present a "model" to be followed on a voluntary basis. MEL Japan provides certification at the production as well as the distribution and processing stages. By including both of these, the scheme enables fishery produce caught in sustainable fisheries to reach the consumer without being mixed with any other fishery produce. Only then is a label affixed to the product.

Conditions for certification at the production stage are that (1) fishing is carried out under an established, effective system of fishery management, (2) the targeted resources are maintained at a level of sustainable use, and (3) appropriate measures are taken to protect marine ecosystems. Conditions for certification at the distribution and processing stage are that (1) traceability is assured and (2) there

is a management system that prevents admixture with or contamination by fishery produce other than the targeted produce. Products are examined in line with standards, guidelines, and examination items further subdivided from these conditions. To ensure impartiality and objectivity, examination is undertaken by a body independent of MEL Japan. As of February 2008, the Japan Fisheries Resource Conservation Association has been registered as an examining body.

The right scheme for Japan

Internationally, there is a marine ecolabelling scheme known as MSC (Marine Stewardship Council; see No. 203, Jan. 20, 2009), and this is quickly spreading worldwide. MSC complies with FAO guidelines, and as such, its conditions for certification are basically not unlike those of MEL Japan. So why did we in Japan go to the trouble of launching our own scheme? Behind our decision lay the problem of the special nature of certifying fisheries. Fisheries are bound up with marine resources and ecosystems, and certifying fisheries is not as straightforward as certifying production processes inside a factory. Japan's modern fisheries did not suddenly appear out of nothing; they are an extension of continuous resource management practiced since ancient times. To certify Japan's fisheries requires an adequate understanding of the history of fisheries until the present day, as well as present conditions in the field. Human networks and good access to sites of fisheries and research institutions are indispensable to achieving adequate verification while keeping costs at a minimum. To create this kind of scheme, therefore, those involved in fisheries in Japan realized that they would have to launch it themselves. While the truth of this has become so much more evident after actually starting the scheme, the processes from creating to operating the scheme have been aided by detailed information provided by people with expert knowledge in their own fields.

Proactive efforts by fishermen

In December 2008, exactly a year after MEL Japan was established, "The Sea of Japan Crab Pot Fishery" was the first to be certified by the scheme. What should not be forgotten when considering the MEL Japan scheme are the proactive efforts of the fishermen themselves. After acquiring MEL Japan certification, Masato Nishino, Chairman of the Sea of Japan Crab Pot Fishery Association, had this to say: "Just acquiring certification does not mean we have achieved our task; there is a lot of work yet to do. In



A scene from the examination of "The Sea of Japan Crab Pot Fishery", the first applicant for Marine Ecolabel Japan after the certification scheme was launched in April 2008. The Fisheries became the first to receive certification at the production stage in December that year.

my view, it is the gradual accumulation of small efforts that fishermen make towards future goals, the process of ensuring the sustainability of the red snow crab fishery as a whole, and the attitude of unbending resolve by fishermen to this end that have been recognized as worthy of certification." It is this very attitude of resolve by fishermen that MEL Japan seeks; the true challenge facing certified fisheries, if anything, starts from here.

Currently under examination are the "Stardust Shrimp Two-Boat Seine Fishery" practiced by the Yui Fisherman's Association and the Oigawa Port Fishermen's Association in Shizuoka Prefecture, and the "Lake Jusan Common Freshwater Clam Fishery" of the Jusan Fishermen's Association in Aomori Prefecture. The challenge for MEL Japan lies partly in gradually increasing the number of such thoroughly committed fishermen. ■

The Ship Recycling Convention and Japan's Role

[KEYWORDS] IMO / Ship recycling / International Convention

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(Ship & Ocean Newsletter No.209 April 20, 2009)

When they come to the end of their operational life, superannuated ships are usually sent to be dismantled in developing countries, where labor costs are lower. In some countries, ship breaking is frequently accompanied by fatalities, serious injuries or environmental pollution, creating a problem of worldwide concern. To address this problem, a Ship Recycling Convention is due to be adopted in May this year. As a world leader in ocean navigation and shipbuilding, Japan is expected to show leadership in this respect.

1.Introduction

At one time, large ships were often dismantled in Japan, but the work has increasingly been passed to India, Bangladesh, Pakistan, China and other developing countries in recent years. In some of these countries, however, not enough attention is paid to issues like industrial safety and environmental protection. This frequently results in fatal accidents, injuries or environmental pollution, drawing international criticism. United Nations agencies have produced voluntary guidelines with a view to solving this problem, but they have made little headway in improving the situation. To achieve a quick solution, the International Maritime Organization (IMO) considers it imperative to introduce mandatory regulation. It has therefore started to draw up a "Convention for the Safe and Environmentally Sound Recycling of Ships" (Ship Recycling Convention), which is due to be adopted at a conference held in Hong Kong this May.

2.The Ship Recycling Convention

The purpose of the Ship Recycling Convention is to allocate clear responsibilities amongst all the parties involved, and to enforce a globally uniform discipline without loopholes. As the actual mechanism of regulation, a system of inspection and certificates for ships and recycling will be introduced; ships meeting the standards may only be recycled in facilities that meet the standards. The Convention will cover ships weighing 500 tons or more in merchant shipping tonnage. Warships and government ships used only for non-commercial purposes are excluded, as are ships that are only navigated and recycled inside waters under the sovereignty or control of the registering country for the whole of their operational lives. However, even these exempted ships are expected to comply with the Convention within a range that is both reasonable and feasible. The Convention's requirements will also apply to the ships of non-signatory countries whenever necessary, such cases to be managed by port state control.

The installation or use of asbestos, PCB, and other "highly hazardous substances" will be prohibited or



A superannuated ship waiting to be dismantled

restricted on ships subject to the Convention, while a list ("inventory") specifying the location, type, estimated volume, and other details of these substances as well as lead, mercury, and other "substances deemed potentially harmful" will need to be created and kept. The inventory will ultimately be presented to the ship recycling yard as a tool for information on hazardous substances.

When a construction contract for a new ship is concluded after the Convention has come into effect, the shipyard is to create the inventory. Shipping manufacturers must create a "Material Declaration" specifying the content of hazardous substances in parts used in the ship, and submit this to the shipyard. For existing ships, an inventory must be created no more than five years after the Convention has come into effect, or, if the ship is recycled earlier than that, before recycling is carried out. In reality, however, it will be impossible to gain a correct and comprehensive assessment of hazardous substances to the same degree as in a new ship. Therefore, an expert (or group of experts) authorized as having the necessary knowledge and experience must create the inventory through documentary analysis, sampling, or other means.

Ship recycling yards will not be allowed to accept any ships other than those approved for recycling work. To prevent health hazards to workers and nearby residents, detrimental impacts on the environment are to be prevented,

reduced, or minimized. Systems, procedures and techniques of management are to be established and approved by the government to nullify these impacts within a practicable range.

When a ship is to be recycled, the country of registration must be notified to that effect, and the inventory finalized (including specification of wastes arising during navigation and stored substances). Ship recycling yards are to determine methods of processing hazardous substances based on the inventory, and to create a "Ship Recycling Plan" in line with this. After obtaining the approval of the recycling country, the ship recycling yard will submit this Plan to the ship. The ship must submit the inventory and Ship Recycling Plan to the country of registration and undergo a final inspection. Only when these processes are complete will recycling be permitted. Ship recycling yards must also pass relevant information to the recycling country in advance, and must report to the recycling country and the country of registration when the recycling is complete.

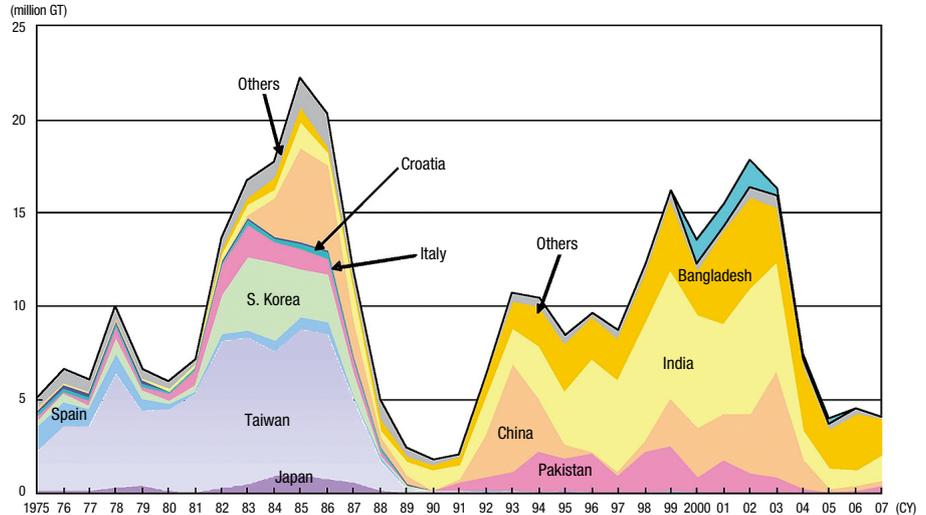
3.Future tasks

Arrangement of legislation: The likelihood is that the requirements for effectuation will be satisfied about two years after the Convention is adopted in May this year, and that the Convention will come into effect about a year after that in around 2012. Japan needs to ratify the Convention and arrange domestic legislation as soon as possible. Some areas of overlap between the Ship Recycling Convention and the Basel Convention have been pointed out, and these need to be demarcated as quickly as possible.

System for creating inventories: In Europe, there are moves to establish internal regulations before the Convention takes effect, and Japan must also waste no time in developing a system for creating inventories. To create the inventory for a new ship, shipping manufacturers will have to submit a "Material Declaration" to the shipyard. For this, PR activity is required not only in Japan but also abroad. Free "Inventory creation support software" is currently being developed, and this is expected to play a part in familiarizing the system.

While inventories for existing ships are to be created by approved experts (or groups of experts), the eligibility requirements need to be clarified and an international

■ World disposals by country of breaking (Lloyd's Register)



system for creation developed with some urgency. Also, to avoid a rush of requests for creation just before the start of application to existing ships, systematic steps will need to be taken to encourage the creation and retention of inventories. To this end, we will also need a system for issuing "appraisals" that can be exchanged for Convention certificates after the Convention has come into effect.

Ensuring recycling capability: It is not yet clear what level of recycling capability will be required of ship recycling yards under the Convention. If actual recycling demand exceeds the capacity of the yards, we could find disused ships being moored or abandoned. Therefore, the capacity of the world's ship recycling yards needs to be evaluated as a matter of urgency. If, as a result, a shortage of capacity is foreseen, ship recycling yards in developing countries should be given ODA and other support with a view to satisfying the Convention requirements. On the other hand, some countries, mainly in Europe, have started to think that a country's ships should be recycled within that country. Japan is also thought to be at a stage where it should consider recycling domestically, rather than simply entrusting the process to developing countries.

While Japan's part in the formulation of this Convention has been highly evaluated, this is largely due to experiments in creating inventories and other concerted efforts made by the Japan Ship Technology Research Association. These activities were in turn facilitated by a fund for ship recycling action established by the Nippon Foundation, a timely gesture indeed. In future, the government will push on to achieve early ratification and develop an appropriate environment. However, it would benefit Japan's role as a leader in navigation and shipbuilding for the private sector to play its part in promoting early compliance with the Convention. ■

The First Japanese to Circle the Globe: Castaways of the Wakamiya-Maru

[KEYWORDS] Wakamiya-Maru / Nadezhda / *Kankai Ibun*

Mikio Oshima

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(Ship & Ocean Newsletter No.209 April 20, 2009)

This is the story of four shipwrecked sailors from the *Wakamiya-Maru* who unwittingly circled the globe during Japan's era of national isolation. Behind their extraordinary tale lay an impasse between Russia, which sought trade with Japan, and the shogun, who wished only to maintain Japan's isolation. This paper will retrace the footsteps of the *Wakamiya-Maru* castaways and introduce the activities of the *Ishinomaki Wakamiya-Maru Castaway Society*, established in 2001 to commemorate their journey.

Around the world in Edo days

When asked to name the first Japanese to circumnavigate the globe, very few will readily know the answer. In fact, it was a group of four sailors called Tsudayu, Sahei, Gihei, and Tajuro, from Ishinomaki in the Sendai Clan territory. They traveled all the way around the world during the Edo period. That's impossible, you might say, as Japan was under a strict policy of national isolation at the time. But it's true; more than 200 years ago, sailors from a ship called the *Wakamiya-Maru* traveled northwards to reach the Bering Sea and southwards almost as far as the Antarctic. Let us now retrace the footsteps of the *Wakamiya-Maru* castaways, the first Japanese to travel around the world.

In November 1793, the *Wakamiya-Maru* set sail for Edo, carrying a cargo of rice and timber from Ishinomaki. On the way, the ship was caught in a ferocious storm. It drifted on open seas with its crew of sixteen, eventually washing ashore on the Aleutian island of Unalaska in the north Pacific. The sailors were rescued by Russians stationed on the island, which was Russian territory at the time. Soon after their arrival, the ship's captain died. The castaways were then transferred to the central Siberian city of Irkutsk. The Russian Tsarina Catherine the Great earnestly sought trade with Japan. It was she who repatriated Daikokuya Kodayu to Japan, as remembered in the novels of Yasushi Inoue and Akira Yoshimura. In fact, rescue and repatriation was part of her policy of rapprochement with Japan. Soon after the sailors' arrival in Irkutsk, however, Catherine died, and they were to remain in the city for seven restless years. During that time, two more of them died of disease.

Soon after Alexander I was enthroned as Tsar, and ten years after their shipwreck, the castaways were summoned to the capital, St. Petersburg. Three fell ill en route and returned to Irkutsk. The remaining ten arrived in St. Petersburg for an audience with the Tsar. Six of them were to remain in Russia, but the four who wanted to go back to Japan would board the *Nadezhda*, Russia's first vessel to circumnavigate the globe. They would be accompanied by Nikolai Rezanov, an envoy given the task of negotiating with the shogun on their arrival in Japan.



Nikolai Rezanov
(from "*Kankai Ibun*")

Setting sail from the port of Kronstadt near St. Petersburg, the *Nadezhda* made calls at Copenhagen, Falmouth (Great Britain), Santa Cruz (Canary Islands, Spain), Santa Catarina Island (Brazil) and Nuku Hiva (Marquesas Islands, South Pacific Ocean) along the way, eventually arriving at Petropavlovsk on the Kamchatka Peninsula about a year later. From there, it turned south towards Nagasaki. It had been a journey fraught with dangers and full of strange experiences; while in the North Sea, the *Nadezhda* had been caught up in the Anglo-French War, mistaken for a French ship and fired upon by the British. It had been buffeted by stormy winds while rounding Cape Horn, a known danger spot at the southernmost tip of South America; it had drifted almost as far as the South Pole and encountered South Pacific islanders with tattoos all over their bodies in the Marquesas Islands.

Repatriation

On September 6th, 1804, the *Nadezhda* finally dropped anchor at Iozaki in the port of Nagasaki. A year and two months since setting sail from St. Petersburg, and a full 11 years after their departure from Ishinomaki, the four castaways were once again to set foot on native soil. But for the Tokugawa shogunate, they were uninvited guests. They were placed under house arrest for three months, during which Tajuro, in despair at the thought of never return-



The jacket brought back from Russia by Tajuro
(Historical Museum of Jomon Village Oku Matsushima)

ing home, tried to kill himself by cutting his tongue with a razor. His life was saved, but he never spoke again.

During his journey around the world, Tajuro is said to have disembarked at every port and taken a look around the port town. A jacket brought back by Tajuro, reportedly a gift from the Tsar, is still preserved in his home town (at the Historical Museum of Jomon Village, Oku Matsushima). Now, more than 200 years later, the jacket looks shabby and threadbare. But when I took it in my hand, I imagined how Tajuro must have wanted to show it to people back home, while telling them all about his life in Russia and his journey around the world. By severing his own tongue, he himself made that impossible.

The long-awaited talks between Rezanov and the shogunate at last materialized in the following March. In the event, the Russians were refused permission not only to trade with Japan, but even to set foot in Japan thereafter; it was a humiliating result for Rezanov. In 1806, Russia suddenly attacked the northern islands of Etorofu (Iturup) and Sakhalin. This unexpected act of hostility from a foreign power came as a big shock to Japan, but one of the underlying causes was the discourteous treatment Rezanov had received at Nagasaki. What ensued was an escalation of tension between Japan and Russia, mainly in a dispute over the Kuril Islands; when Japan imprisoned the Russian explorer Vasily Golovnin, Russia retaliated by capturing the Japanese merchant Takadaya Kahei. And it all started with those talks between Rezanov and the shogun's officials in Nagasaki.

The four castaways were transferred to the Sendai Clan after being examined in Nagasaki, but were then again interrogated at the Sendai Clan residence in Edo. Otsuki

Gentaku, Edo's foremost scholar in western studies ("*Ran-gaku*"), was in charge of the investigation. He later compiled his findings in the form of "*Kankai Ibun*", which he presented to the Sendai Clan. To educated people starved of foreign knowledge in a closed country, the weird and wonderful experiences of the castaways in foreign lands were a precious record, and numerous copies were subsequently made.

Legacy of the castaways

The experiences of the Wakamiya-Maru castaways surpassed even those of the famous Daikokuya Kodayu, yet they were almost unknown in their home region. Wishing to correct this, I contacted all those who were researching the Wakamiya-Maru locally, and together we formed the Ishinomaki Wakamiya-Maru Castaway Society in December 2001. The Society currently has around 80 members and is continuously involved in activities, mainly at the local level. We publish a journal called "*Nadezhda*", which has now reached its 20th issue, and in 2004 we held "The First Japanese to Circumnavigate the Globe Exhibition", including a lecture by author Akira Yoshimura. In 2006, the 200th anniversary of the repatriation, we held a "Repatriation 200th Anniversary Festival" in Higashi Matsushima and Shiogama, birthplaces of the castaways. The result has been that, albeit gradually, people are beginning to know more about the Wakamiya-Maru castaways.

Even beyond this, the Society is in contact with the descendants of Adam von Krusenstern, commander of the *Nadezhda*. They still live in St. Petersburg, a place that has a close connection with the castaways. We have also started full exchanges with the "Nipo-Catarinense Association", an organization in the Brazilian state of Santa Catarina. The state includes Santa Catarina Island, one of the ports visited during the circumnavigation. In this way, we are actively engaged in exchanges, not just locally but also on a global scale. For this, we must thank the Wakamiya-Maru castaways and their journey around the world. ■

Message from a Remote Island — The Challenge of Sustainable Regional Revitalization

[KEYWORDS] Ama-cho / Island revival / Environmental fisheries

Michio Yamauchi

Mayor of Ama-cho, Oki-no-Kuni

(Ship & Ocean Newsletter No.210 May 5, 2009)

Ama-cho in Oki County, Shimane Prefecture, is a remote oceanic island surrounded by the Sea of Japan. At one time, the island was on the verge of financial ruin. Then bold administrative and fiscal reforms were pushed through under the philosophy of "suffer now, enjoy later". A strategy that turned the island into its own "brand" was proposed; strenuous efforts have been made to create new merchandise, industries and employment, drawing on the local resources that exist on the island. In the process, perhaps, we have glimpsed the ideal lifestyle for a sustainable island nation that makes use of the oceans.

Introducing Ama-cho

Ama-cho is an island-town whose administrative area covers the whole of Nakanoshima, one of the Oki islands in the Sea of Japan about 60km off the coast of the Shimane Peninsula. The oceanic climate of Ama-cho, influenced by the Tsushima Current, is warm in winter yet cool in summer. In winter, the Sea of Japan is ravaged by strong seasonal winds, which frequently interrupt ferry services and cut physical links to the island. Ama-cho is blessed with abundant spring water, and contains one of the hundred selected springs designated by the former Ministry of the Environment. The island is devoted half to agriculture and half to fishing, with rice cultivation and natural marine produce ensuring self-sufficiency in food. The Emperor Go-Toba was exiled and died here, and the island possesses many precious items of historical and cultural significance.

Ama-cho had a population of 7,000 in 1950, but that has dwindled to 2,400 today. The elderly make up more than 39% of the population, the annual birth count is less than twenty, and youth account for only 10% of the population. Most young people leave the island upon graduating from high school, islanders in the 20s to 30s age bracket are extremely few, and regional vitality is low. In 2004, Ama-cho stood on the verge of financial collapse, with debts in excess of 10 billion yen as well as a sudden and massive cut in the local allocation tax.

A strategy for survival, based on a two-pronged approach of "defense" and "offense"

To address the situation, I championed the concept of "Building the future of the island ourselves", proposing self-awareness and a two-pronged strategy for survival. Firstly, under the strategy of "defense", I pushed through administrative and fiscal reforms. Based on the belief that reforms would only be supported if they hurt us too, from fiscal 2004 I introduced bold salary cuts aimed at myself, first and foremost, followed by my deputy, the head of education, the local council, and public employees who put themselves forward. The biggest cuts were in the range of 40-50% for the top decision-makers, 15-30% for staff and

40% for councilors. A favorite saying of mine is "suffer now, enjoy later". This philosophy should be the basic attitude of public servants, and I believe it helped us to share a real sense of crisis with the other islanders.

The strategy of "offense", meanwhile, involved industrial promotion measures of a "single-point breakthrough" type. Needless to say, the purpose of this "offense" is to promote industry on the island, increase human resources and employment opportunities, earn revenues, and bring vitality to the island. Simply put, we set the ultimate objective of turning the island's resources into a brand. The first step in this was the development of "sazae curry". For a long time, the islanders had made curry using the *sazae* spiny-top shellfish caught on the island's shores. The council put forward the idea of making this into a product, merchandized it under the slogan "Great island food - *sazae* curry", and it has now become a hit product selling 30,000 units a year. The islanders had taken their diet for granted until then; they didn't even realize that it had commercial value. But when seen from outside, this diet appeared surprisingly fresh and attractive. I think the development of our curry was a good example of this.

The second step was the branding of "*iwagaki*" (rock oysters). With the aim of fully integrated production from nursery to cultivation and sales, local fishermen cooperated with returning islanders and new settlers to set up a stockholding company. Sales were started under the brand name "Haruka Rock Oysters from Ama-cho, Oki". The product was well received at the Tsukiji fish market, and is now shipped to the majority of oyster bars in the metropolitan region. This year we plan to ship around 250,000 units, but in three years' time a system for shipping 500,000 units will be in place, and the value of sales is forecast to reach 150 million yen.

The third step lies in the abundance of fishery resources.



Haruka Rock Oysters from Ama-cho, Oki

Until recently, even if fresh fish and shellfish were caught and unloaded on the island, by the time they had crossed the sea to reach markets on the mainland the freshness had suffered and prices fell as a result. So we decided to introduce equipment called CAS (Cells Alive System), based on new freezing technology using magnetic field energy. CAS is a revolutionary system that allows a supplier to freeze produce while retaining its original taste and freshness. Even after thawing, there are no drips of moisture, and the cells of the food are undamaged. We are using this to overcome the handicap of being on a remote island, and putting our best efforts into the creation of high value-added merchandise. At present, we are attempting to expand sales routes with a focus on restaurant chains. We have recently had some success with the promotion "straight from the fisherman's table", and sales for the gift market are increasingly popular.

Resource management - indispensable for brand sustainability

Nevertheless, the environment surrounding fisheries remains as harsh as ever; even as we discover new channels for growth by creating all these new products, changes have started to occur in the environment of the oceans, our single greatest asset. The phenomenon of global warming accompanying climate and other changes in recent years has led to a deterioration of the marine environment, including beach crusting. Seaweeds have declined considerably, and fish catches have also diminished owing to a loss of fish feeding and spawning grounds. The disappearance of eelgrass colonies, in particular, has already had a pronounced impact

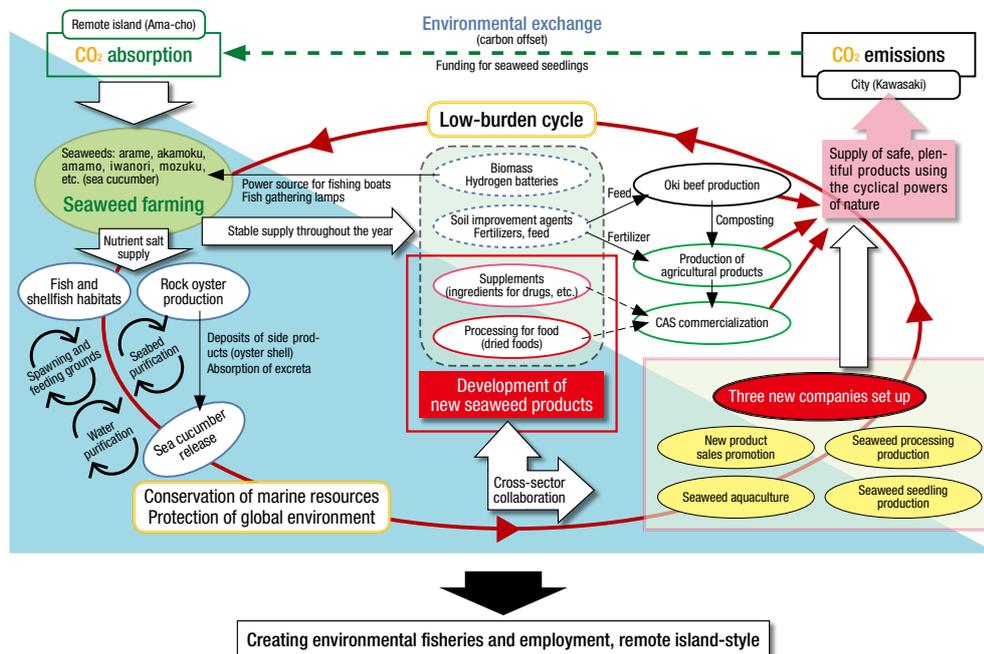
on catches of sea cucumber. There has also been an undeniable impact on shellfish aquaculture. A decline in seaweeds means a loss of purification functions, and in some areas the quality of seabed sediments is growing progressively worse. These and other problems prevent us from expanding production.

The reason behind the deteriorating quality of seabed sediments is an increase in nutrient salts in the sea. By inhibiting the increase of nutrient salts and maintaining equilibrium, we can ensure a good quality of seabed sediments. If we can maintain this balance of nutrient salts via industrially usable aquatic flora and fauna that live on nutrient salts, we will be able to achieve environmental maintenance and create new resources at the same time.

This has led us to focus our attention on a seaweed production project that will also help to prevent beach crusting. The project may look like a very modest one at first sight. But for Ama-cho, which enjoys the fruits of the sea and seeks the revival of marine resources, seaweed production is not only a source of fertile seas but also promises new possibilities. The value of seaweed as a food source is greater than ever, and is the subject of much interest; in recent years, particularly, attention has focused on supplement products using fucoidan and alginic acid, constituent elements of seaweed. In Ama-cho, by making seaweed central to the creation of a recycling-type environmental society, we hope to link it to the creation of new industries that could also provide exchanges with cities.

We broadly envisage two ways of producing and using seaweed, besides those mentioned above. The first is to

■ Message from a Remote Island: The Challenge of Sustainable Regional Revitalization - Ama-cho,



use it as feed and fertilizer for the island's agriculture and livestock industries, and as clean biomass, an energy source for a remote island with an eye on the future. The other is an initiative to absorb CO₂ into seaweed and create emission rights, which can then be sold to urban areas to support their carbon offset. In other words, this could perhaps be described as "environmental fisheries", a style of marine culture under a new framework of "farming the oceans". We have just started work on plans in the hope of building a revolutionary new system that could only be achieved on a remote island.

While seaweed holds the key to the project, building a recycling system based on the use of seaweed will be difficult for Ama-cho to promote single-handedly, since we lack a specialist research center. Therefore, we are currently planning coastal surveys and the development of seeding technology in collaboration with Tokyo University of Marine Science and Technology. When creating beds for the cultivation of seaweed, moreover, we will seek the participation of private companies from off the island. Ama-cho is aiming to develop fisheries by introducing CAS, the latest freezing technology, but by fostering new industries that are in harmony with the environment in future, we wish to make even greater efforts for sustainable regional revival that draws on the forces of nature. ■