

T B T I   G L O B A L   B O O K   S E R I E S



# IN THE ERA OF BIG CHANGE

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ESSAYS ABOUT  
JAPANESE SMALL-SCALE  
FISHERIES

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EDITED BY  
YINJI LI  
TAMANO NAMIKAWA

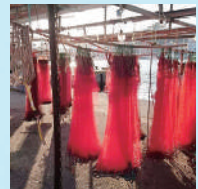


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TBTI Global Book Series



Too Big To Ignore (TBTI; [toobigtoignore.net](http://toobigtoignore.net)) is a global research network and knowledge mobilization partnership supported by over 600 members from around the world. The network aims at elevating the profile of small-scale fisheries, arguing against their marginalization in national and international policies, and developing research and governance capacity to address global fisheries challenges.

TBTI Global Book Series is a new publication series that aims to highlight why we need to pay close attention to small-scale fisheries. The series will be of use to anyone interested in learning more about small-scale fisheries, especially about their important contribution to livelihoods, well-being, poverty alleviation and food security, as well as to those who are keen to help raise profile of small-scale fisheries in the policy realm.

Cover illustration:

Front: *Kinme fishing boats*, Inatori, Shizuoka Pref., Y. Li, 2018;

Back: *Abalone fishing operation*, Tanohata Village, Iwate Pref., Tanohata Village Office, 2020. |

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# Foreword

To say that a book is timely does not generate the sense of novelty or curiosity as it once did - the claim is being made too frequently, with numerous books and articles published each day. Yet, there is something noteworthy about this book, not only because of the splendid content it offers, but also because it highlights the possibility of doing something together in challenging times. Similar to what the title of the book suggests about Japanese small-scale fisheries, the world is in the 'era of big change,' with rising concerns related to global warming, globalization and environmental sustainability. But as the book shows, many of the changes have origins and deep historical roots that need to be traced and examined in order to fully understand why things are what they are today, and to figure out what to do next. Unavoidably, the next steps need to take into consideration the uncertainty and the anxiety around the Covid-19 pandemic, which affects fisheries and marginalized and vulnerable fishing communities in all corners of the world. While the book does not address the impacts of Covid-19 on Japanese small-scale fisheries, its timeliness is in how it reminds us that even in the era of big change, there are many small changes that happen along the way.

This book is a real treat for everyone, whether you're familiar or not with Japanese fisheries. Although the book is about small-scale fisheries, it is obvious, at least in the context of Japan, that they cannot be discussed as if they exist on their own, disconnected from industrial fisheries and other economic sectors in the society. This is clearly the vision of Li and Namikawa, the book editors, as they invited 48 contributors to cover all aspects of small-scale fisheries without losing sights of the broader picture, and with an intention to situate Japanese small-scale fisheries in the global context. Such an effort makes the book a very interest read, in addition to being informative and

thought provoking.

The book begins with two introductory chapters that provide an overview of small-scale fisheries, followed by several chapters addressing various aspects of small-scale fisheries governance (Part 2). Here we learn about major changes facing small-scale fisheries from resource degradation, income reduction to the ‘successor shortage’ problem, mostly due to aging population or de-population with fishers’ children receiving higher education and more job options as they migrate to cities and urban areas. Changes in governance are also prominent, challenging the role and importance of the traditional system that recognizes the rights of fishing people. There is no mistaken, however, about the continued presence and significance of the fisheries cooperative associations (FCA) in determining the level of activities and the wellbeing of fishing communities along the coast. The modernization of the governance system is seen, first and foremost, in the new Fisheries Act (2018), which, similar to other reforms elsewhere, raises issues and questions about its impact on certain sectors. How the Japanese small-scale fisheries will affect by the new legislation, and with it other initiatives, like the Sixth Industrialization leading fisheries into a growth industry (“Seichosangyoka”) or the modern version of Satoumi (the multi-stakeholder council), remains to be seen.

The rich and lively portraits about small-scale fisheries and the fishing villages are presented in Part 3 of the book. These chapters give a vivid picture of small fishing towns dotted around the coast of Japan, with men and women, and in some cases young people, involving in various aspects of the fisheries throughout the value chain. Changes in the demographics, management, marketing, and consumer preference are common threads in these chapters. The dynamics in the fisheries and the fishing communities are further illustrated in Part 4, with chapters discussing new initiatives such as local branding strategies, “Nagisahaku” activities that bring tourists to fishing villages to supplement fishing income, and the ‘Hama-katsu plan’ to revitalize small-scale fisheries, among others. The interplay between tradition and modernity is acknowledged throughout.

Part 5 of the book offers something very unique. After looking into the

Japanese small-scale fisheries, it is now looking outward, making comparison with 13 countries in the region and across the oceans. The comparison with Thailand, Malaysia, Cambodia, Philippines and Vietnam brings insights and lessons in governance, whether community-based, ecosystem-based or market-based. Considering the close connection and exchanges with China, Korea and Taiwan, some similarities are expected although small-scale fisheries in Japan seem to be better recognized and are slightly better off than the neighbouring countries. The inclusion of Marshall Islands and Malawi offers an interesting comparison that again speaks more to similarities than differences. The island setting and the food culture in Marshall Islands, for instance, resonate well with the fisheries tradition in Japan, but both places are going through similar changes and challenges. On the other hand, the comparison with Denmark, USA and Canada shows more differences than similarities. Japan is more protective and appreciative of their small-scale fisheries than these other countries, despite all arguing for heritage and cultural value.

Returning to the point that small-scale fisheries are not isolated from other sectors or other forces outside of their communities, Part 6 of the book looks at small-scale fisheries in the broader context, such as ocean warming and other ocean development like renewable energy. Education and conservation are common themes in the global discourse, which also includes the discussion about international instruments like the Voluntary Guidelines for Securing Small-Scale Fisheries Guidelines and the global agenda like the Sustainable Development Goals. While several chapters suggest the potential for Japan to be a role model for balancing growth and development with sustainable small-scale fisheries, as well as in local capacity development, concerns about social justice and other forms of injustices in policymaking and management are still prevalent and may affect the viability and wellbeing of small-scale fisheries. As argued by the final chapter in the book, it is for these reasons the “TBTI Japan Research Network,” which brings together scientists, practitioners, community groups and organizations interested in small-scale fisheries, is formed.

The TBTI Japan Research Network begins with the book but it certainly

does not end there. Already within the book, it captures the voices of fishers and fishers' organizations, as well as of those working in different government agencies and research institutions, about the issues and concerns in small-scale fisheries and vision and priorities for such a network (Part 7). Li, Namikawa, the 48 chapter authors and the 17 short communication contributors have already embarked on this very important mission – to enhance the visibility of small-scale fisheries, to elevate their values and to promote an appropriate governance system for their sustainability. Now it is up to the reader of the book to join them.

Ratana Chuenpagdee  
TBTI Global Director  
St. John's, Canada  
July 2020

# Acknowledgements

We would first and foremost like to extend our heartfelt thanks to TBTI Director and Global Book Series Editor, Professor Ratana Chuenpagdee of Memorial University, for inviting us to work on this project. We are so honoured to have received this special opportunity, as well as Professor Chuenpagdee's constructive guidance throughout the writing and editing process. We are also deeply appreciative of Vesna Kerezi, TBTI coordinator, and Andrew Tsai, TBTI research assistant, who developed the e-book's format and also provided assistance with English editing.

To the 48 authors who took the time out of their busy lives to contribute chapters to this book: thank you. Without your help, this project would not have been able to come together. We also thank the 17 short communication contributors who, despite the pandemic, took time out of their busy schedules to share their valuable insights with us. We would also like to take this opportunity to express our appreciation for Professor Takeshi Hidaka of Kindai University for his kind guidance and support, and for his willingness to respond to various requests relating to this publication. Furthermore, we are deeply grateful for the fruitful cooperation of Shingo Takayoshi, director of the Japanese Institute of Fisheries Infrastructure and Communities, for mobilizing many of his colleagues to contribute to this publication in addition to authoring a chapter. We would also like to extend our thanks to the following individuals for providing their expertise and advice to this book: our graduate school supervisor, Professor Xiaobo Lou of Tokyo University of Marine Science and Technology; Professor Mitsutaku Makino of Tokyo University; Tomomasa Kageyama, Visiting Professor at Tokyo University of Marine Science and Technology and Adviser to the National Association of Fisheries Infrastructure; Dr. Tsutom Miyata of the Japan Fisheries Research and Education Agency; and

Professor Izumi Seki of the School of Marine Science and Technology at Tokai University.

The launching event of the TBTI Japan Research Network, which included a policy forum and training workshop, was scheduled to take place in Shizuoka from May 20th to 23rd, 2020, but was postponed due to COVID-19. Although the event did not take place as planned, we still wish to thank the School of Marine Science and Technology of Tokai University for their support and for offering a venue to present the occasion. Moreover, we are grateful to the Yui FCA for offering to host the proposed field trip. These acknowledgements would not be complete without recognizing the many organizations which have assisted us with the photographs published in this e-book: the Izu FCA, the Inatori Branch of the Izu FCA, the Shizuoka Set-Net Fishing Association, the Higashihazu FCA, the Mochimune Branch of the Shimizu FCA, Tanohata Village, and Shirayanagi Fisheries. Furthermore, we sincerely thank everyone from various small-scale fisheries in Japan for inspiring us, the authors of this book, to conduct our research and collaborate with these very special fishing communities.

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Yinji Li and Tamano Namikawa (editors)  
Shizuoka and Fujisawa  
July 2020

# List of Acronyms

AIS	Automatic Identification System
ASC	Aquaculture Stewardship Council
BCP	Business Continuity Plan
BVC	Beach Village Committees
CBD	Convention on Biological Diversity
CBFM	Community Based Fishery Management
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP21	21st Session of the Conference of the Parties
CPUE	Catch Per Unit Effort
DEC	Department of Environmental Conservation
DFO	Fisheries and Oceans Canada
DMCR	Department of Marine and Coastal Resources
DMO	Destination Management Organizations
DNA	Deoxyribonucleic Acid
DOF	Department of Fisheries
EAFM	Ecosystem Approach to Fisheries Management
EC	European Commission
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
FCA	Fisheries Cooperative Association
FFAW-Unifor	Fish, Food and Allied Workers Union of Newfoundland and Labrador
FRA	Japan Fisheries Research Agency
FRP	Fiber Reinforced Plastics
FY	Fiscal Year
GARFO	Greater Atlantic Regional Fisheries Office
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNP	Great Northern Peninsula, Newfoundland and Labrador, Canada
GPS	Global Positioning System
GT/GRT	Gross (Registered) Tonnage

GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)
HACCP	Hazard Analysis and Critical Control Point
HLP-SOE	High Level Panel for a Sustainable Ocean Economy
ICLARM	International Center for Living Aquatic Resources Management
ICT	Information and Communication Technology
IISD	International Institute for Sustainable Development
ILEK	Integrated Local Environmental Knowledge
ILO	International Labour Organization
IMO	International Maritime Organization
IntNRMS	Integrated Natural Resource Management Systems
IQ	Individual (catch) Quota
ITQ	Individual Transferable Quota
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported and Unregulated
JF Zengyoren	National Federation of Fisheries Cooperative Associations
JFA	Japan Fisheries Agency
JICA	Japan International Cooperation Agency
JSFE	Japanese Society of Fisheries Economics
JSSF	Japanese Small-Scale Fisheries
JST	Japan Science and Technology Agency
JTED	Juvenile and Trash Excluder Device
LKIM	Lembaga Kemajuan Ikan Malaysia (Fisheries Development Authority of Malaysia)
LPLC	Local Production for Local Consumption
MAED	Malaysian Acetes Efficiency Device
MAFF	Ministry of Agriculture, Forestry and Fisheries of Japan
Maine DMR	Maine Department of Marine Resources
MEL-J	Marine Eco-Label Japan
MFRDMD	Marine Fishery Resources Development and Management Department
MHLW	Ministry of Health, Labor and Welfare
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
MPA	Marine Protected Areas
MPAs	Marine Park Areas
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
MTUs	Mobile Transceiver Units
NAFO	Northwest Atlantic Fisheries Organization
NGO	Non-Governmental Organization
NJFES	North Japan Fisheries Economics Society
NOAA	National Oceanic and Atmospheric Administration
OECM	Other Effective Area-based Conservation Measures
OFCF	Overseas Fishery Cooperation Foundation of Japan



OPRI	Ocean Policy Research Institute
OTEC	Ocean Thermal Energy Conversion
OVA	Outstanding Universal Value
PAN	Protected Area Network
PICRC	Palau International Coral Reef Center
PLS	Pooling system
PNMS	Palau National Marine Sanctuary
POP	Point of Purchase
RISTEX	Research Institute of Science and Technology for Society
RMI	Republic of Marshall Islands
SATREPS	Science and Technology Research Partnership for Sustainable Development
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SDG	Sustainable Development Goals
SEAFDEC	Southeast Asian Fisheries Development Center
SNS	Social Networking Service
SPF	Sasakawa Peace Foundation
SPREP	Secretariat of the Pacific Regional Environment Programme
SSF Guidelines/SSFG	Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries
SSF	Small-Scale Fisheries
STCW	Small Type Coastal Whaling
TAC	Total Allowable Catch
TBTI	Too Big To Ignore
TD-VULS	Transdisciplinary Study of Natural Resource Management under Poverty Conditions Collaborating with Vulnerable Sectors
TEDs	Turtle Excluder Devices
TURF	Territorial Use Rights Fisheries
UNFCCC	United Nations Framework Convention on Climate Change
UNU-IAS	United Nations University Institute for Advanced Study of Sustainability
UPA	Underwater Protected Areas
VMS	Vessel Monitoring System
WSFC	World Small-Scale Fisheries Congress
WWF	World Wide Fund for Nature
WWII	World War II



I

## Introduction



# 1. The Meaning of Small

## **Definition, Governance, Roles and Challenges of Japanese Small-Scale Fisheries**

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Japanese Institute of Fisheries Infrastructure and Communities



*Yui fishing port (Inner port), Shimizu-Ku, Shizuoka Prefecture, Japan. Y. Li, 2020*

*The rapid spread of COVID-19 took place while planning this book on the status of Japanese small-scale fisheries (JSSF). More than ever, they are at risk of folding under the pressures of an increasingly changing world. Despite this, various initiatives from coast to coast are being organized by fishers to help JSSF survive these circumstances. Given the uncertainty of the current climate, this book provides timely insights into JSSF and their significant roles. The opening section begins by providing necessary commentary on how JSSF are defined in this book. Next, significant challenges currently facing JSSF are explained, coined as the “triple pains” and “triple changes.” The governance system of Japan’s fisheries is then analyzed, shedding light on the far-reaching and little-known influence of JSSF. Finally, in addition to outlining the book’s structure, the chapter closes by detailing the book’s objectives and messages.*

## Coastal fisheries vs. small-scale fisheries

In the process of sending chapter invitations for this book, the first issue we encountered was how to answer the question, “What is considered a small-scale fishery (SSF)?” Its definition is not rigidly fixed in the vast body of research of the fishing industry. This is due to the fact that the definition of SSF can vary around the world, depending on different factors such as the natural, social, and cultural environments of the fishery in question. However, this book solely focuses on Japanese small-scale fishery (JSSF). In Japan, fisheries are classified into three categories: pelagic fisheries, offshore fisheries, and coastal fisheries, based on vessel size and fishing location. In terms of identifying SSF within those categories, the coastal fisheries, which are generally small in scale, first come to mind. This group refers to many types of fisheries, including ones that use non-powered boats or powerboats less than ten metric tons, set-net fisheries, and aquaculture. Operated by more than 90% of Japan’s self-employed fishers (MAFF, 2019a), coastal fisheries

## 1. THE MEANING OF SMALL

include fishery enterprises of various sizes, ranging from those that sell large volumes of fish to those that engage fisheries independently and have a much smaller scale of sales. This is the primary source of confusion in finding a consensus on the definition of SSF in Japan.

Having established the above, we consider Japanese coastal fisheries to be SSF. The first reason for this is due to the fact that coastal fisheries include all types of fisheries operating along Japan's coasts. With coastal fisheries already largely considered to be SSF, they offer a logical starting point to explore what constitutes prototypical JSSF. Another reason for this position is to emphasize the importance of coastal fisheries in Japan, during a time in which the fishing industry as a whole has been dramatically impacted by changes in social and natural environments (Tada et al., 2014). Adding to this current wave of change, Japan's government has also recently enacted a new fisheries policy with the aim of "making the fishery industry a growth industry (MAFF, 2018c)." This policy may affect the crucial role that coastal fisheries play, making it essential to identify which of their functions may change versus those which should remain intact.

### The challenge of small: triple pains and triple changes

Now that Japan's coastal fisheries have been identified and defined as JSSF, we will briefly consider the various challenges that they are facing.

#### The triple pains

The environment surrounding Japanese fisheries is becoming increasingly difficult to manage every year. Here, we will borrow the words "triple pains" (Masubuchi, 1987) to refer to three significant challenges currently facing JSSF: the deterioration of fishery resources, a decrease in fishing income, and finally, successor shortage. Regarding marine resources around Japan, resource evaluations have been conducted for 84 stocks of 50 fish species. The government assessment conducted in 2018 (MAFF, 2019a) determined there were 14 stocks with high resource levels (17% of the total stocks), 29 stocks

with moderate levels (34%), and 41 stocks with low levels (49%). Of the 37 stocks that were analyzed of the 15 major fish species in Japan's fisheries and biomes, just 60%–70% were at moderate or high levels. These numbers have been declining for decades, as Japan's fisheries and aquaculture production peaked in 1984 at 12.82 million tons, before rapidly decreasing until 1995 when the decline slowed to a more gradual pace. Coastal fisheries had successfully maintained steady production at a rate of approximately 2 million metric tons per year. However, their production rates have been falling since 1995, with an output of 890,000 metrics tons recorded in 2017 (MAFF, 2018a).

With regard to income, fishers' salaries are much smaller than those of workers in most other industries (MAFF, 2018b): individual fishery enterprises that engage in aquaculture generate approximately 8 million yen, while individuals who engage in coastal fishing generate an average of around 2 million yen. This is partly due to the presence of many aging fishers who continue to fish by reducing the scale of their operations, decreasing the number of operating days, and specializing in fisheries that require less physical effort. Although the income of the middle-aged generation is not considered small and while the unit price of marine products has slightly increased in recent years (disregarding the impacts of COVID-19), salaries fluctuate as they are subject to fish prices which vary due to weather, fuel costs, and catch volumes.

Highlighted against this backdrop is one final major threat to JSSF: a severe lack of successors in the fishing industry. The majority of coastal enterprises in Japan are operated by individual fishers who mainly engage in fishing by themselves. The only potential successors to these fishers are their children, who do not always opt to continue their parent's work due to changes in societal values related to life and work. Although projects in various places exist to recruit and train motivated fishers as leaders (such as those who work in the city), the overall number of fishers in Japan has decreased from 238,000 in 2003 to 153,000 in 2017, while the proportion of fishers aged 65 or older has risen from 30% to 40% (MAFF, 2019b).



### The triple changes

Japanese fisheries are also exposed to what we will refer to as the “triple changes,” which include (a) structural changes in the nation’s social environment; (b) global changes in marine systems; and (c) policy changes in Japan’s fishing industry. Structural changes in the social environment include a decrease in rural populations as urban areas grow, changes in the fishing industry’s product distribution structure due to the increasing power and influence of retailers over SSF, and changes in the lifestyles of urban residents who increasingly use coastal areas for leisure. The growing presence and the impact of ocean development, including renewable energy projects in coastal areas (Kawabe et al., 2016), also represent major structural changes to SSF. As the Blue Justice concept advocates, it is essential that big development recognizes and respects the existence of SSF and the fishing communities which sustain them (Jentoft, 2019).

With regard to changes in the environment of marine ecosystems, Japan’s fisheries have not been spared by their effects. These global changes, induced by various natural and anthropogenic stressors, have impacted the ability of fisheries to function and deliver goods (Bundy et al., 2016). Often manifested in large-scale “natural” disasters such as hurricanes, typhoons, and tsunamis in recent times, coastal fishing communities, in particular, are most vulnerable because they are situated so close to the very sea they depend upon. While all citizens suffer in some way, shape, or form due to damages caused by the changing sea environment, JSSF and their host villages must now face the reality of living along coastal front-lines.

Finally, the last of the “triple changes” refers to those brought on by the fisheries policy reform of 2018. Specifically, in the past, set-net and demarcated fishery rights were governed under a system in which local fishers’ rights were prioritized, as uniformly determined by law. This system has since been modified to give priority to fishers who are deemed to be operating the “most effective and appropriate” fisheries (MAFF, 2018c), easing the entry of private capital into the fishing industry. As a result, there is a growing chorus of concern that local fishers are being deprived of their usual fishing grounds

(Asahi News, 2018; Chosyu News, 2019), and that the effects of these new policy changes may negatively impact JSSF.

## The meaning of small: too big to ignore

Despite these many challenges, this section will explain why we believe that the role of JSSF will continue to be significant for years to come.

### The governance system

The most crucial law in Japan's fisheries institutions is the Fishery Act. Under this law, Japanese fisheries are roughly divided into four major categories: licensed fisheries, fishery rights-based fisheries, free fisheries, and other fisheries (FLSG, 2005). The first category comprises a licensing system that aims to limit Japan's number of fishing vessels. It mainly targets fisheries operating offshore and in distant water fishing grounds and is further sub-divided into minister-licensed fisheries and governor-licensed fisheries. In contrast, fishery rights-based fisheries are primarily composed of coastal fisheries and are sub-divided into set-net fishery rights, demarcated fishery rights, and common (shared) fishery rights (Makino, 2011). Another fundamental law in Japan's fisheries institutions is the "Fisheries Cooperative Act." Based on this act, the constitution of each cooperative provides detailed eligibility requirements for membership, such as disclosure of the annual number of days engaged in fishery, a declared street address in the concerned area, approved consent by the general assembly of the cooperative, etc. (Lou and Ono, 2001).

Coastal fisheries involve both fishery rights-based fisheries and governor-licensed fisheries. The underlying framework of the fishery rights system was succeeded by the Meiji Fishery Act, which formalized customary practices established during the Edo Period regarding the use of fishing waters (Hamamoto, 1989). Well-recognized by fisheries researchers, "Iso-Wa-Ji-Tsuki, Oki-Wa-Iri-Ai" is an old Japanese phrase that aptly describes the customary use of coastal waters in those days. Roughly translated, it states,

“the local fishing community manages the foreshore area, while the offshore area is open to everyone” (Tanaka, 2003). Thus, while the framework of the Meiji Fishery Act has a history of more than 100 years, it is still the fundamental regime governing the use of Japan’s coastal areas as fishing grounds (Kaneda, 2001). Under a governance system so based on fishery rights, fishers gather together around fisheries cooperative associations and self-govern, contributing significantly to the co-management of Japanese fisheries (Makino and Matsuda, 2005).

Meanwhile, a new fisheries policy was enacted in 2018 for the first time in 70 years, revising the fishery rights system in the process. The stated primary purpose of the policy reform is “Sei-Cho-San-Gyo-Ka,” or “growth industrialization,” but there are growing concerns about its impacts on SSFs (The Suisan Keizai Daily News, June 5th, 2018). Cynical about the situation, some critics have been quoting “Sei-Cho-San-Gyo-Ka” but with different intonations, using wordplay to ask, “Is it really growth industrialization?” In this climate of change, it is demanded to fully recognize that the real growth industrialization can only occur by taking the great significance and roles of SSF into full consideration (Cohen PJ et al., 2019).

### Life Above Water and “Life Below Water”

*Life Above Water* (Jentoft, 2019) compellingly emphasizes the need to secure sustainable fishing communities in order to realize the United Nations’ Sustainable Development Goal 14, “Life Below Water,” which aims to “sustainably manage and protect marine and coastal ecosystems.” In alignment with this, Japan’s fishery governance system centered on fishery rights protects life above water by maintaining the regularity of the fishing industry, thus acting to stabilize the communities which depend on it (Hamamoto, 1989). Fishery rights also represent the rights of the fishers’ life. That is, the rights ensure the fundamental viability of fishers’ livelihoods by granting them the exclusive right to fish. Furthermore, it ensures a form of social justice by providing fishers with eligibility and priority to obtain fishery rights (Tabira, 1998). In particular, the common fishery rights are characterized by the fact that

everyone in the community can use them together (Hamamoto, 1999).

The fishery rights system also plays a vital role in protecting life below water and contributing significantly to the sustainable production of Japanese coastal fisheries. Trends in data have shown that the coastal fishery's production levels have remained relatively stable, while those of the offshore and distant water fisheries have shrunk (Lou, 2014). This contrast can be explained by the effectiveness of the fishery rights system in restricting the entry of external capital and individuals into coastal fisheries, where authorized users are easily defined and identified. Furthermore, the rights-based system facilitates the voluntary governance of fishers and fisher's organizations by granting them exclusive rights to manage themselves (Lou, 2009). In this, we can observe that the Japanese fishery rights structure demonstrates some of Ostrom's eight principles for common-pool resource management (Ostrom, 1990). For instance, clear boundaries have been defined, and the rule-making rights of community members are respected by outside authorities.

However, the previously mentioned policy reform will allow companies easier access to the aquaculture and set-net fisheries, with possible aid from the government, which is to evaluate "whether fishing waters are being used appropriately and effectively (MAFF, 2018c)." Although guidelines regarding criteria for such evaluations have yet to be announced, it is believed that the amendment of the Fishery Act will necessitate changes to the practice of self-governance within coastal fisheries. If they are indeed to occur, it is crucial that the governance system does not lose its fundamental role of protecting life above and below water.

## JSSF from a global lens

Published by the Food and Agriculture Organization (FAO), The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication is the first internationally ratified policy document to address challenges facing SSF around the world (FAO, 2015). While they are believed to support regional economies and help highlight

the social and cultural value of people living in coastal areas, communities adjacent to SSF are often vulnerable and subject to poor living and working conditions. In addition to highlighting these harsh circumstances, the SSF Guidelines have been provocative in supporting the long-term viability of SSF and their prioritization of access to resources. In doing so, the SSF Guidelines include mention of land, fishery, and forest rights issues as they relate to SSF, in light of the key roles SSF play in marine resource conservation.

For JSSF, despite lingering uncertainties regarding the revised Fishery Act, many of the provisions in the SSF Guidelines have already been cleared by the Japanese fisheries governance system, such as those which ensure fundamental rights and access to fisheries. That being said, what goes on to take place in Japan's fisheries will still be crucial to observe, as it has been in the past. The Japanese fishing industry, along with its foregoing governance system, has played a significant role in the improvement of fishery management in numerous countries across Asia. These include Vietnam, Thailand, the Philippines, South Korea, and China, among others (OFCF, 2020). In today's era of big change, JSSF are sure to play a significant role in realizing sustainable fisheries on a global basis.

### About this book

The motivation behind this book was born from an idea that occurred as a result of attending various international conferences; that is, Japan is a nation that is proud of its renowned fisheries and oceans. However, its coasts are also home to many small-scale, often family-run fisheries, which do not come anywhere close to being acknowledged in a manner similar to their large scale, industrial counterparts. Therefore, the primary goal of this book is to raise the profile of JSSF and to emphasize their importance in establishing sustainable SSF around the world. With this book, we also wish to inform readers about new initiatives and concepts modeled by JSSF through which communities are rallying to support their local fisheries in as many ways possible.

With the above perspectives in mind, this book has been organized into six parts: (1) Governance Institutions of JSSF, (2) Present Conditions of JSSF,

(3) New Initiatives and Concepts of JSSF, (4) JSSF from a Comparative Lens, (5) JSSF from a Global Lens, (6) Comments and Messages to JSSF. A wide range of topics is covered in each part, in order to provide the reader with a basic understanding of JSSF without having to resort to further materials. While many academic societies exist to conduct studies within the domain of fisheries economics and social sciences in Japan, comprehensive research focused specifically on SSF is less common. Also, compared to existing literature in the field of fisheries natural sciences, there is a clear lack of English materials and books on fisheries social sciences. We believe that this book will provide a much-needed contribution to this gap in research. Furthermore, this book is notable in that it has collected the valuable insights of leaders in the fishery: first-hand experts with experiential knowledge of the “big change” happening daily in the “Era of Big Change.” Input from researchers, civil service workers, and members of the mass media was also received to verify the perspectives of various stakeholders of JSSF.

*“... What the Norwegian example does explain, however, is that if there is a will to foster an organization that makes a difference to small-scale fishers, to the industry, and to the entire fisheries governance system, there is a way.” (Jentoft, 2019, p. 40)*

This quote refers to an example of fishery governance in Norway, prompted by the nation’s Raw Fish Act and the promotion of fishers’ organizations. Jentoft indicates that although it is unclear to what extent the Norwegian model is linked to the governance system of other countries, one thing can be said for certain, using the Norwegian case as an example: if there is a will to change something in a positive manner, then there is a way. We hope that this message is also communicated through this book.

SSF have protected coastal resources, fishers’ livelihoods, and the traditions and cultures of communities throughout the ages. And, despite today’s era of big change, they continue to persevere. JSSF are no exception. Whilst organizing the publication of this book, COVID-19 spread across the globe faster than we had ever anticipated. With the restaurant industry suspended

## 1. THE MEANING OF SMALL

and people staying at home, demand for fish products and prices have sharply declined, leaving JSSF in circumstances more precarious than ever before. With proposed government aid unable to make up for the industry's losses, various initiatives from coast to coast have been spearheaded in an effort to improve the outlook of JSSF, demonstrating their resilience and desire to remain active as meaningful contributors to society. The authors of this chapter contend that where and when there is a will, there is a way, as JSSF look to survive and thrive in this era of change.

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## 2. A Bird's Eye View

### **Diverse Forms of Coastal Fisheries and the Future of Fishing Villages**

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*Fish sorting at Ushitaki fishing port, Aomori Prefecture, K. Suzuki, 2015*



*As the production of Japanese distant water fisheries and offshore fisheries declines, the importance of coastal fisheries, including aquaculture, is increasing. However, coastal fisheries face a number of problems, such as the declining number of fishers and an aging population. While blessed with abundant marine environments, the coastal areas of Japan are subject to harsh conditions such as deteriorating aquatic resources and global-scale climate change. To preserve beautiful fishing villages and abundant fish-eating cultures seen all across Japan for posterity, sustainable business schemes for fishing villages need to be established, such as converting traditional fisheries into a growth industry and utilizing local aquatic resources.*

### History of the Japanese fisheries industry

Being a country surrounded by oceans with rich fishing grounds, Japan has been reliant on aquatic resources since antiquity. From shell middens dated back to the Jomon period (circa 14,000–300 BCE), traces of fish and shellfish eaten by people back then have been discovered. By the Muromachi period (1336–1573), early port towns and fishing villages started forming, thus leading to the flourishing of domestic maritime traffic/international trade. In the Edo period (1603–1868), more people started settling in coastal areas to work as professional fishers, hence forming the foundation of fishing villages as we know today. As the consumption of aquatic products increased, businesses for distributing those items developed. The need to assess the freshness of aquatic products gave birth to the new profession of brokers, thus further clarifying the division between producers and distributors (Ministry of Agriculture, Forestry and Fisheries, 2017).

From the late 19th century to the early 20th century, the Japanese fisheries industry has made unprecedented progress thanks to many technological innovations, such as the establishment of fisheries experimental stations, motorization of fishing vessels, advances in fishing equipment (e.g., fishing

nets), and manufacturing of processed seafood. Amid the post-World War II rapid economic growth in Japan, the fisheries industry also modernized by leaps and bounds, mostly replacing non-motorized boats (which used to comprise the majority of fishing fleets) with motorized vessels. Moreover, advances in fish catching technology have made it possible to operate fishing vessels in more distant waters. These factors contributed to drastic increases in the overall marine fisheries production in Japan (Annual Report on Fisheries, 2017). However, by the early 1970s, the socio-economic situation in Japan had changed dramatically, forcing the fisheries industry to face an increasingly harsh environment. The first oil crisis in 1973 put a halt to the period of rapid economic growth in Japan, and the second oil crisis in 1979 dampened the increasing fish prices. Due to the decrease in sardine resources and the setting of the exclusive economic zone (EEZ), the Japanese annual fisheries production started declining precipitously after peaking in 1984 (12 million 820 thousand tons), with a gradual declining trend continuing in recent years (Figure 1).

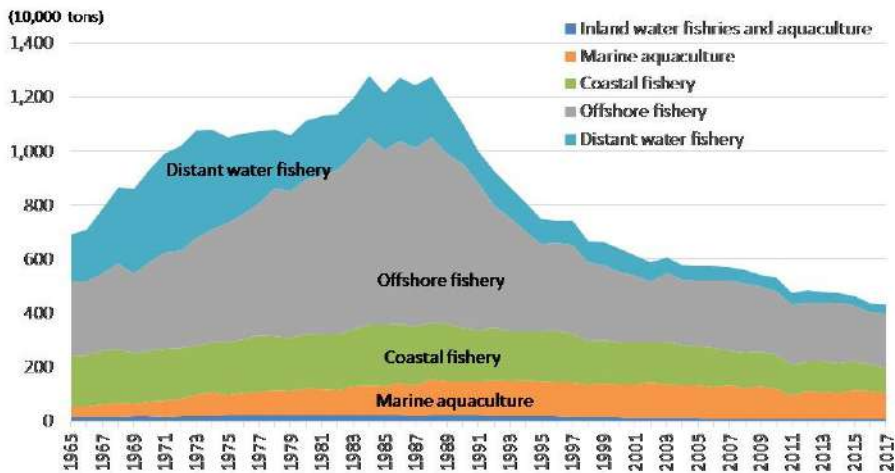


Figure 1: Trends in the production volume of Japan's fisheries and aquaculture.

Source: Fisheries and Aquaculture Production Statistics

## Characteristics and trends of coastal fisheries

In Japan, the majority of coastal fisheries operators run small-scale fisheries businesses, which are the main theme of this manuscript. Accordingly, let us focus on the recent trends in Japan's coastal fisheries. Contrary to the typical image invoked by the phrase "coastal fisheries" (where a couple of fishers embark on a small fishing boat and work on a day-to-day basis), official statistical survey reports define it as follows: "A collective term for any of the fisheries operations that do not use fishing vessels, use non-motorized boats, outboard motorboats, or motorized boats weighing less than 10 tons, or use fixed nets or seawater culture (Fisheries Census)", or "The term for any of the fisheries operations that use trawling nets, other gill nets, large fixed nets, salmon fixed nets, small fixed nets, other fishing nets, other long lines, other trolling lines, other baits, or shell/seaweed gathering nets (Statistic Survey on the Marine Fisheries Production)." In other words, the term "coastal fisheries" refers to any of the fisheries operations that do not use fishing vessels or that use fishing vessels weighing less than 10 tons.

The major characteristics of the Japanese coastal fisheries include the diversity of fishing operations and the pervasiveness of family-run businesses. In waters off both the Pacific coast and the Sea-of-Japan coast of Japan, the confluence of the Oyashio and Kuroshio currents and that of the Tsushima and Liman currents respectively produce a fertile environment rich in plankton, which fish can feed on. Moreover, continental shelves spread in these waters, serving as habitats for many fish species. Thanks to these natural conditions, some of the most abundant fishing grounds in the world are located in the waters adjoining the Japanese archipelago, inhabited by a wide variety of fish species. Additionally, the complexity of the seafloor terrain and natural environment in these waters necessitated fishers to adapt to each specific fish species and fishing ground and devise multitudes of fishing techniques.

According to the 2018 Fisheries Census, there were 60,201 coastal fisheries businesses (excluding marine culture businesses). Of these, 58,611 were privately managed entities, showing that the majority of coastal fisheries operators were family-run businesses. In a report of a comparison survey on

the international competitiveness of fisheries production (published in 2017), the Fisheries Agency documented that the production per fisher was 27.6 tons and the production per fishing vessel was 31.2 tons in Japan, as opposed to 214.5 tons/fisher and 637.9 tons/vessel in Norway. This underscores the significantly small production scale of Japanese fisheries businesses (including non-coastal fisheries).

Let us elaborate a little on the types of marine fisheries classified as coastal fisheries in the Fisheries Census. In addition to cultured fish such as yellowtail, amberjack, sea bream, flatfish, striped jack, balloon fish, and bluefin tuna, a wide variety of marine lives are cultivated in Japan (e.g., seashells like abalones, scallops, and oysters, and seaweeds like nori and wakame). In general, Japanese people tend to appreciate natural products more than cultured products. Nevertheless, the demand for cultured aquatic products is high at supermarkets and eating establishments because it is easier to adjust the size, quality, quantity, and procurement time with cultured products; hence, stable production needs to continue. There are 13,950 marine culture businesses in total, of which 12,506 are run by individuals or families (as of 2018). While the ratio of corporations to family/individual-run businesses is slightly higher than the coastal fishing vessel operations, approximately 90% are still run operated by individuals or families.

As above, the majority of coastal fisheries businesses in Japan are characteristically family-run and considerably small-scale. In terms of the production trends, fisheries production in Japan has been steadily declining since the late 1980s, as mentioned above. By fisheries division (as shown in Figure 1), the divisions that have seen the steepest decline are the deep-sea and offshore fisheries. The coastal fisheries production fluctuated around 2 million tons by the mid-1990s and started declining in the late 1990s, falling below 1 million tons in 2016. Meanwhile, marine culture production continued to grow significantly from the 1960s to the mid-1990s. Albeit a slight decline in recent years, production has been fluctuating around 1 million tons. In contrast to the ever-declining deep-sea and offshore fisheries, one can argue that the positions of the coastal and marine culture fisheries have relatively increased.

### Challenges faced by the coastal fisheries industry and roles played by fishing villages

Given the rapid decline in the offshore and deep-sea fisheries, the importance of the coastal and marine culture fisheries has been increasing. However, numerous challenges remain. In the coastal fisheries in Japan, the biggest of such challenges may be the difficulty of recruiting new workers. In 1969, there were nearly 400 thousand self-employed coastal fisheries operators; however, the number had declined to approximately 90 thousand by 2017 (Annual Fisheries Dynamics Report). Although the number of newly employed fishers has been fluctuating stably at around 2 thousand (including those in the offshore/deep-sea fisheries; estimates by the Fisheries Agency), the overall number of newly employed fishers has been consistently dropping. Besides the decreasing number of fishers, their aging has also been a huge issue. The aging of the workforce is a problem concerning not only the fisheries industry but also Japan as a whole. Additionally, many of the fishing villages are geographically at a disadvantage. With young people flowing into urban areas, and fishing incomes remaining at low levels, it is extremely difficult to secure the next generation of fishers.

In order to strengthen the competitiveness of the fishery/marine culture businesses that are in such a plight, various measures are being taken at various levels, including municipalities and other administrative bodies. For instance, as part of an effort to make the fisheries industry a growth sector, state-of-the-art technologies such as ICT, IoT, and AI, as well as drones and robots, have been incorporated into the fishery and marine culture settings in recent years. These personnel- and labor-saving efforts are expected to turn fishery operations profitable again based on the improved profitability data (Annual Fisheries Report, 2018).

As the fisheries industry continues to lose its momentum, the vitality of fishing villages is also being lost. To not only strengthen the fisheries industry itself but also reinvigorate local communities, some endeavors have started to add new values to the local resources inherent in fishing villages, which in turn are used to benefit the general public. These endeavors (colloquially

referred to as “Umigyo” (sea business) in Japan) began to be undertaken in fishing villages across the country, as proposed in a previous study as “a new type of businesses by people in coastal communities that fully utilize local resources including the sea, culture, tradition, and landscapes” (Lou, 2013). In the 1980s, new uses of coastal resources, such as recreational fishing, diving, whale watching, and fishing tourism, started to be explored. As evidenced by today’s ecotourism, blue tourism, hands-on learning, efforts toward local production for local consumption, the people’s needs for the oceans, fisheries industry, and fishing villages began diversifying. To cater to those new needs, and as sources of new incomes for fishers and fisheries cooperatives, more and more businesses started tapping into local resources in fishing villages. For instance, in some areas frequented by visitors who come to do diving, fishers guide these visitors to diving spots by a fishing boat, or fisheries cooperatives construct and maintain changing rooms and resting facilities in an attempt to improve their profits.

Furthermore, the Fisheries Agency is promoting extended stays in fishing villages as a form of tourism called “Nagisahaku” (a stay at a beach town). From tasting local cuisine using freshly caught seafood, to enjoying beautiful, almost primordial, landscapes of fishing villages, visitors can have first-hand experiences of the industry and culture of fishing villages, including fisheries. By promoting communication between cities and fishing communities, these efforts aim to revitalize fishing communities and help urban visitors learn the importance of the roles played by fishing villages and the fisheries industry. As more and more tourists from overseas have been coming to Japan in recent years, restaurants serving fish dishes and fishing tours have become more common to cater to the inbound demand.

Such endeavors to respond to the people’s needs by adding new values to local resources are considered to be one side of the multifaceted functions of fishing villages. In addition to supplying aquatic products, the responsibilities of fishing villages include the preservation of natural environments, monitoring of the national borders, implementation of maritime rescue tasks, and inheritance of traditional culture. To maintain these functions, it goes without saying that the continued and sustainable development of coastal

fisheries and fishing villages is essential.

While blessed with rich marine environments, the coastal areas of Japan are subject to harsh conditions such as deteriorating aquatic resources and global-scale climate change. A worldwide food shortage is predicted in the future due to a population explosion. To preserve beautiful fishing villages and abundant fish-eating cultures seen all across Japan for posterity, sustainable business schemes for fishing villages need to be established, such as converting traditional fisheries into a growth industry and utilizing local aquatic resources (e.g., Umigyo).





## II

### Governance Institutions of JSSF



### 3. A Long Standing Institution

#### **Roles and Issues of the Japanese Fisheries Cooperative Association**

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*Traditional fishing village landscape in Ine, Kyoto, Japan, M. Mochizuki, 2020*

*The Fisheries Cooperative Association (FCA) in Japan was organized to improve the livelihood of fishers. It also plays an important role in the management of coastal fisheries and fishing grounds and in local community activities. The FCA operates various business services, such as sales, purchasing, and credit, to support member fishers. The primary difference between the FCA and other cooperatives, such as agricultural cooperatives, is that the FCA is the governing body of fishery rights. This chapter focuses on fishery rights, joint sales, and the FCA's relationship with local communities. It discusses both the role the FCA fills for Japanese small-scale fisheries and the present-day issues confronting the FCA.*

## Overview of the FCA

The Fisheries Cooperative Association (FCA) is the national organization of Japanese fishers. The FCA was established under the Fishery Cooperative Act in 1949. The association aims to stabilize and manage fishery households, improve the economic and social status of fishers, and manage marine resources through the management of fishery rights and business economics.

FCAs can be divided into two broad types: “Local Area FCAs” and “Industry-specific Cooperatives,” the latter organized by fishers involved with specific types of fisheries, such as tuna fisheries and salmon fisheries, for example. Local area FCAs are classified into “Coastal Area FCAs” and “Inland-water Area FCAs.” According to the Ministry of Agriculture, Forestry and Fisheries’ (2007, 2019a) fisheries cooperative statistics table, on March 31, 1995, there were 2,008 FCAs for coastal areas, 885 for inland water areas, and 213 industry-specific cooperatives, for a grand total of 3,106 FCAs. However, the number of FCAs has decreased in recent years. As of March 31, 2018, the total number of FCAs was 955 for coastal areas, 806 for inland water areas, and 89 for industry-specific cooperatives, for a grand total of 1,850 FCAs. The reason for

the decrease in the number of FCAs is the increasing instances of the merger between neighboring unions, aimed at strengthening the management base. In particular, the coastal area FCAs have been actively merged, and their scale has increased.

An FCA has several major business thrusts. The “sale business” sell union members’ catch; the “purchasing business” supplies union members with necessary items, such as fishing gear and fuel. The “common-use business” allows members to use shared facilities. The “guidance business” provides guidance and advice on adjusting fishing grounds and improving fishery management and skills, while a “mutual-aid program” deals with mutual aid insurance concerns, such as pensions, damages, and welfare. An FCA can also provide credit services, lending necessary funds to members and receiving savings, but in recent years, an increasing number of FCAs have transferred the credit business to the prefectural-level federation of fishery credit cooperatives.

What distinguishes Japanese FCAs the most from other cooperatives, such as agricultural cooperatives, is that the FCA is the governing body of fishery rights. In Japanese coastal fisheries, fishery rights have been set for “Large-Scale Set Net Fishery rights,” “Coastal Aquaculture rights,” and “Common Fishery rights” under the Fishery Act; the FCA is granted fishery rights as a prefectural governor’s license. The FCA not only plays a leading role in the proper use and management of fishery resources through the management of fishery rights and guidance to union members, but it also plays a role in beach-cleaning activities, tree-planting activities in the upper river basin, marine-disaster-prevention activities, and more. Thus, the FCA is a core organization supporting the local economic and social activities of fishing villages.

## Fishery rights and small-scale fisheries

Japan’s marine fisheries are classified administratively as coastal, offshore, and distant water fisheries (Yamamoto, 1995). According to a white paper by the Ministry of Agriculture, Forestry and Fisheries (2019b), the number

of marine fishers in Japan was 153,490 in 2017, of which 91,950 were self-employed in fisheries, and 61,530 were hired by fisheries. Of the self-employed, 88,670 [96.4%] were engaged in coastal fishing, indicating that a majority of marine fishers are engaged in coastal fisheries. As a characteristic of the Japanese coastal fisheries, most of the fishers engaged in coastal fisheries are small-scale fisheries (SSF), and coastal fishing grounds are set fishery rights. In Japan, fishery rights are granted to the FCA and the system does not allow free entry into the fishery. Moreover, Japanese fishery rights, called the common fishery right, are well known worldwide as involving community-based management.

Accordingly, let us focus on the common fishery right and explain the legal definition of common fishery and the management of fishery rights.

The current Japanese Fishery Act defines “common fishery” as a specific area of the sea where fishers operate jointly. Common fisheries include fisheries that capture sedentary resources, such as abalone, top shell, bivalves, sea cucumber, sea urchin, and kelp and fisheries that use Gill nets, beach seines, small set nets, and baskets. Common fisheries are diversified fisheries but are generally small-scale. The common fishery right is owned by the FCA (or by a Federation of Fishery Cooperative Associations). It is stipulated that fishers who are members of the union may join the common fishery and catch fish in accordance with the regulations for fishery right established by the FCA. In other words, to participate in a common fishery, a fisher must be a member of the FCA that manages the common fishery’s fishery rights. To become a member, a fisher must have lived in the area and must fish for at least 90–120 days per year (the number of days depends on each individual area FCA). Therefore, in order to become a union member, a fisher must work at a fishery company or as an apprentice to a senior fisher to accumulate a record of practice activity.

According to Yamamoto (1995, 2000), Japanese fisheries have been regulated by three separate laws: “Ura” Law [1743–1867], Old Fishery Act [1901–1948], and Current Fishery Act [1949 to present]. During the feudal era and based on Ura Law, fishing grounds facing a fishing village were managed and used exclusively by the village as villagers’ common property. Later, the

Old Fishery Act was enacted; the Fishery Society, a predecessor of FCAs, was formed under the Old Fishery Act. The law tried to maintain the order of fishing villages by allowing the Fishery Society to inherit the management of the common fishery grounds of fishing villages, along with the villages' traditional exclusive fishery rights. Based on this historical background, the common fishery rights and fishing grounds that are managed by the FCA are based on fishing village communities. According to Feeny et al. (1990), such communal-property systems for the Japanese coastal fisheries are considered good examples of how traditional fishing-village community-management is maintained with legal approval.

## Joint sales and SSF

An FCA's economic activities are important in supporting the lives of coastal SSF fishers. In particular, the sales business, which is the core business of the FCA, is directly linked to fisheries income. The majority of FCAs that have a sales business hold a joint sale. A joint-sale system means that the FCA collects and sells their union members' fish and earns a portion of the sales from fishers as fees.

The FCA also opens local markets and manages them. Many fishing catches are distributed to consumer markets throughout the country through these local markets. Why was a joint sales system adopted? There are several reasons. Many coastal fishers are small scale and the production of each fisher is small. Hence, it is disadvantageous for a small-scale fisher to trade alone with merchants who have bargaining power. An FCA's sale, in larger volumes, can eliminate the weaknesses of small fishers. It is the role of the FCA to achieve economies of scale by combining the power of each fisher in this way.

Joint sales are also beneficial for distributors participating in the local market. If there is no local market, local distributors have to trade with each fisher, which increases transaction costs. The establishment of a local market makes it easier for local distributors to obtain a certain amount of seafood with uniform specifications as well. Although coastal fisheries are often SSF,

the well-functioning local markets have provided a stable supply of marine products to consumers.

## Relationship with local communities

The Japanese FCA is a community-based organization that has a deep relationship with the local community. According to the Ministry of Agriculture, Forestry and Fisheries' 2018 census (2020), 1,468 fishery districts have held meetings and gatherings related to FCA. Of the 1,468 districts, 611 districts [41.6%] have experience holding meetings and gatherings about agendas for fishery area events (festivals and other events). According to the same source, fishery districts that had implemented FCA-related regional revitalization efforts numbered 1,520 districts nationwide. Looking at the range of activities implemented, garbage clean-up activities were the most common in 1,336 districts [87.9%], followed by a wide variety of events in 564 districts [37.1%], efforts to secure new fishery workers and successors in 453 districts [29.8%], and traditional festivals focused on fisheries, culture, entertainment, and preservation in 416 districts [27.4%]. In these ways, the FCA is deeply involved in the culture and environment of the fishing village and the lives of the people who live there; the FCA is an active participant in activities outside the fishery, a part of the local community contributing to regional revitalization.

## Present-day issues

In recent years, depopulation has been a serious problem facing many fishing villages in Japan. With depopulation, even the traditional events of fishing villages are set to disappear. For example, for hundreds of years, a traditional Kue (the Japanese name for the kelp bass *Epinephelus bruneus*) festival was organized to pray for large catches and safe voyages, in the Ao area of the Wakayama prefecture. However, it has been discontinued for several years now due to a shortage of young people (Kim et al., 2017). The Kue festival was an important tourism resource, not only for the Ao area, but also for the neighboring regions; therefore, the resulting impact on the local economy is



not small.

One of the main reasons for depopulation is the loss of young people from the fishery areas. Fishery households have encountered difficult conditions for many years, including soaring fuel and materials prices and diminishing volumes of catches. Therefore, fisheries have become less attractive, even to sons of fishers. Furthermore, the education level in Japan as a whole is higher than before, and the range of occupational choices available to children in fishing villages has expanded. Young people living in fishing villages have moved to urban areas and neighboring towns in search of more attractive and stable jobs.

Although they are not many, some Japanese young people living in other areas that are not located in fishery areas are interested in rural life and the sea and are attracted to fisheries. However, the above-mentioned problems of fishery rights and the exclusive nature of fishing-village communities make it common for strangers to be denied membership. Therefore, some kind of employment support system is needed to solve the problem. For example, Kyoto Prefecture's "Umi no Tami Gakusya (UTG)" is accepting young people from all over the country who want to work with a fishery in Kyoto. Established in 2015, UTG is somewhat of a job school. Kyoto Prefecture has been cooperating with the Kyoto Prefectural Fisheries Cooperative Association to provide students with the skills and knowledge necessary for fishery work for two years until they graduate. UTG differs from ordinary fishery schools in several ways. UTG graduates receive generous support from prefectural and municipal governments, such as help searching for fishing villages and fishery teachers. A system like the UTG in Kyoto Prefecture is considered to be effective for newcomers from outside the village and without connections, as graduates have settled in fishing villages as fishers.

In recent years, FCAs have undergone many changes. The lack of successors, a decrease in the number of union members, and a decline in the catch quantity have reduced the size of fisheries, making it challenging to maintain village-level FCAs. To cope with this situation, village-level FCAs have merged to reinforce the management foundation of an FCA's organization and business activities. However, as a result of widespread mergers, the traditional fishing-

ground management structure in each fishing village has been changed (Sakita, 2015). A new fishing-ground management structure is needed to manage common fishery rights in each village successfully.

FCAs are economically and socially important for small-scale fishers and fishing villages. However, as described above, the environment surrounding FCAs has changed significantly. Reviving decrepit fishery as an attractive and lucrative industry will be a major challenge for FCAs and will be an important issue in revitalizing fishing villages.

## 4. Women for the Future

### The Role of Women Towards the Future of the Fisheries

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*Entrepreneurial activities of the Women's Group of FCA. (L) Operation of cafeteria, Hachijojima FCA, Tokyo; (R) Fish fillet processing, Oaraimachi FCA, Ibaraki, 2014. I. Seki.*

*This chapter first describes the Women's Group of FCA as the most fundamental of the women's organizations related to fisheries, and it summarizes the background of its establishment, its activities, and the problems it faces. Next, an overview of women starting business activities in fishing communities, which has become increasingly common in recent years, is provided. Finally, it describes women's new network in fishing communities. Currently, attempts are being made to create a network of women in various fields within and outside the region, such as young women in fishing communities, women in the fishing industry, and fishing community women in starting business activities.*

## Women in fisheries and fishing communities

Women in fishing communities have diverse roles in society. Women's main tasks in the fishery are work on lands such as sorting of landed marine products, care of fishing gear, processing and sales. The proportion of land workers by gender is 62% for men and 38% for women (Fisheries Agency, 2017). Also, the ratio of men and women employed in fish processing plants by gender is 38% for men and 62% for women (Fishing Census, 2018). This shows that many women are engaged in work on land and support the fishing and fishing industries. The total number of fishers, or work on the sea, is 151,701, of which 134,186 (88.5%) are men, and 17,515 (11.5%) are women. Women's maritime operations include divers' fishing with their husbands on a fishing boat to support fisheries and women's diving into the sea for shellfish and seaweed. In recent years, there has been an increase in the number of cases in which women themselves become fishing boat owners and engage in fishing.

Additionally, in most areas, women take over the role of household duties such as housework, childcare and nursing care. Many women are responsible for accounting, such as payroll for employees and tax returns. Women in fishing communities are also helping with local events, cleaning beaches

and fishing ports, and supporting the local elderly. Fishers often stay out at sea all night. For this reason, there are many areas where women's fire brigades have been formed. These community activities are conducted by women's organizations. One of the most fundamental organizations of women in fishing communities in Japan is the Women's group of FCA (Fisheries Cooperative Association).

### The birth of the women's group of FCA

The organization of women in each fishing community began around 1950. Eventually, a prefectural Fisheries Cooperative Women's Department Liaison Council was established to oversee these village units. In September 1959, the National Fisheries Cooperative Women's Department Liaison Council was established as a national organization. The initial purpose of creating the Women's group of FCA was to improve their lives. The fishery is an industry that depends on natural resources, and income tends to be unstable. In order to manage a fisher's business systematically, it was necessary to save money when they could not go fishing, that is, when they had no income. Without savings, they cannot borrow money from the Credit Federation of Fisheries Cooperative Associations. Therefore, the women of the fishery household and the cooperative's credit business department collaborated, and a savings promotion campaign was started with the amount of money that they could do themselves, such as the activity of "10 yen per day." This activity spread throughout the countrywide. In addition to savings promotion, life improvement activities include simplified ceremonial occasions and household account bookkeeping activities (Miki, 2010; Taguchi, 2017). In order to improve their quality of life, the women in the fishing community stood up.

## Activities of the women's group of FCA

Japan has entered a period of high economic growth and has become increasingly industrialized. In the 1970s, pollution problems became serious in various parts of the country. Industrial wastewater containing organic substances and domestic sewage using synthetic detergents polluted important fishing grounds. Also, large-scale land reclamation work in the coastal waters lost the fishing grounds themselves. Under these circumstances, women in fishing communities develop a national environmental conservation movement as the Women's group of FCA in order to maintain fisheries and protect their lives. "The Movement to Eliminate Harmful Synthetic Detergents," which was approved by the National Fisheries Cooperative Women's Department Liaison Council in 1975, changed its name in 2002 to the "Promotion of the Use of Natural Soaps" and has continued to this day. In 1996, the "Environmental Conservation Campaign to Connect Forests, Rivers, and the Sea" not only promoted the use of natural soaps but also planted trees in the mountains to protect fishing grounds and cleaned beaches and ports. These activities have been expanded to involve not only the Women's group of FCA but also FCA, local government, and local residents (Nakamichi and others, 2009; Seki, 2010).

In the 1980s, seafood promoting activities became popular. There was increase in the consumption of marine products through activities such as teaching children cutting and cooking fish in cooperation with local schools, providing local marine products for school lunches, participating in local events and promoting marine products. The development of processed fishery products by women's groups in each region has also become active, and the seafood promoting activities have triggered the development of the Women's group of FCA into economic activities (Miki, 2010). In Japan, the word "gender equality" was first used in public in 1991, and the "Basic Law for Gender Equality Society" was promulgated in 1999. In 1992, the Ministry of Agriculture, Forestry and Fisheries presented the Medium to Long Term Vision on Women in a rural area and began to support awareness-raising campaigns and women's starting business activities in order to promote the

participation of women in the rural area. The Women's group of FCA has also started a round-table meeting between the officers of the National Fisheries Cooperative Women's Department Liaison Council and the Fisheries Agency Secretary in 1988 to bring the voices of women in fishing communities to the national government (Miki, 2010). The round-table conference is held once a year.

Japan's population is aging rapidly, but in fishing communities, the population is aging at a rate of 10 percents higher than in Japan. In 2018, the aging rate in Japan was 28.1%, and the aging rate in fishing communities was 38.9%. The Women's group of FCA engaged in activities related to local welfare for the elderly. Main activities include participating in events (such as participating in festivals/events at facilities for the elderly, and handing out commemorative gifts for Respect for the Elderly), training helpers, visiting day-care facilities and greeting to the elderly, serving lunches, delivering fresh fish to nursing homes in the local area, helping the elderly evacuate during disaster drills, helping to sort garbage for the elderly living alone, and so on. It can be seen that women support the local elderly on a daily basis and contribute to their welfare (Seki, 2010).

### Issues for the Women's group of FCA

Women in fishing communities have played a variety of roles in the community, relying on women's organizations such as the Women's group of FCA. However, the decrease in the number of women's groups and members and the aging of the members is a severe problem for the Women's group of FCA. In 1997, there were 1,233 women's groups, and the number of members was 123,087, but in 2010 the number of women's groups was 789, and the number of members was 56,585, as of April 2019 with 618 women's groups and 32,051 members, the organizational power of the Women's group of FCA is declining (Seki, 2018). In addition, the age composition of members of the Women's group of FCA is 4.8% for those under the 30s, 11% for 40s, 23.1% for 50s, 33% for 60s, and 28.1% for those over 70s. It can be seen that 60 years or older is over 60% of the total (JF Zengyoren, National Federation

of Fisheries Cooperative Associations Survey, 2018). The reasons for this situation include the depopulation and aging of the fishing communities and the lack of participation of young women in fishery households due to circumstances such as having a job outside.

## Women's social participation and FCA

There is another issue that the Women's group of FCA has. One of the roles of the Women's group of FCA is that it is a nucleus for a gender equality society. As part of the women's group activities, participation in training sessions on women's social participation has been conducted. However, only 5.7% of women are members of FCA, and women have few opportunities to comment on the operation of FCA (Seki, 2019). The percentage of women among the officers of FCA is 0.5%, which is far lower than the 7.7% of the agricultural cooperative (Statistics Table of Fisheries Cooperatives, 2017). This does not allow men and women to engage in fisheries in an equal position (Taguchi, 2017; Seki, 2019). In order for women's opinions that are deeply involved in fisheries through work on the land, etc., to be reflected in the management of FCA, the promotion of women to officers of FCA and women's organizations such as the Women's group of FCA should be given to increasing the number of opportunities to present opinions on management.

## Entrepreneurial activities and women

The Women's group of FCA has a lot of issues related to the continuity of the organization and activities performed by the organization. On the other hand, some groups are starting new activities. Until now, most of the activities of the Women's group of FCA have been free volunteers. In recent years, however, some women's groups have performed a wide range of economic activities such as the manufacture and sale of processed fishery products, the sale of fresh and live fish, the operation of cafeterias, management of local tourism such as fishing experience, and private inn. JF Zengyoren is surveying the activities of the Women's group of FCA. For the first time in the 2006 survey,



“Economic activity” was included in the activity content. A study conducted at the time showed that 42.1% of the 852 women’s groups engaged in economic activities. A 2017 survey found that each prefecture has women’s groups that have economic activities. Of the 36 prefectures that responded, 52.8% said that there are women’s groups that engage in economic activities.

Looking at economic activities by women in fishing communities, the majority of the activities are by the Women’s group of FCA. However, there are also moves to recruit coworkers and start new organizations to conduct economic activities. The purpose of economic activity is, of course, to make money. Many women seek jobs other than their fishing work to stabilize the fishery household, which income depends on the catch of the day and to make women economically independent. However, many fishing communities are located in remote areas, and there are few places to work nearby, fisheries can be done in the middle of the night or early in the morning so it difficult to work outside while helping fish at home, older women do not have a general job offer. Therefore, some women start their activities with the motivation to create their work with their own hands.

However, the purpose of activities is not limited to economic effects (Seki, 2018). In fisheries such as purse seine and a trawl net, that have large catches at once, some fish are not put on the market and are discarded because they are not uniform in size, and the market value of some fish is low. Women say that they do not want to waste the precious resources of their husbands and sons who have caught their lives and that they want more people to eat fresh and delicious fish.

### The building of the new network

There is a growing movement to network not only the Women’s group of FCA but also women who are engaged in various activities in fishing communities. In 2003, three female researchers (Natsuko Miki of National Research Institute of Fisheries Science, Kumi Soejima of National Fisheries University and Izumi Seki of Tokai University) engaged in research activities on fisheries and fishing communities, have launched “Umi-Hito-Kurashi forum,” or Forum for Sea,

People and Life (Photo 1). The forum continues to be a group that supports the activities by fishing community women, especially starting a business activity (Miki, 2017). The symposium, which has been held once a year for 15 years, has created a loose network of participants. Women who continued to participate in the symposium spontaneously held a meeting saying, “I want to do something more than just meet once a year”, and several groups jointly participated in a department store event in Tokyo to promote their processed fishery products. Also, since 2017, several groups have been exhibiting at the Japan International Seafood Show as the group of “Umi-Hito-Kurashi forum.” The networking of women in fishing communities is also spreading in each prefecture or country (Sato, 2018). The Fisheries Agency launched the “Fisheries girls’ spirit project” in 2018, to support the activities that create new value by connecting women involved in the fisheries industry and to maintain a prosperous fishery industry for 100 years, in 2018.

Also, a network of young women in the fishing community has been created. JF Zengyoren has conducted training for the young member of the Women’s group of FCA as a “training program for Freshmizu”. In the background, there are issues such as a decrease in the number of the Women’s group of FCA and the limitations of women’s group activities due to aging. In addition to this, another “Freshmizu meeting” was launched in January 2017. The purpose of the meeting is to create a place for young women in the fishing community area to interact and to create opportunities for information dissemination and cooperation. This is for young women who are conscious of engaging in community activities and starting a series of business activities in fishing communities, regardless of the female members of the women’s group of FCA (Seki, 2017).

#### 4. WOMEN FOR THE FUTURE



*Photo 1. Group photo of Umi-Hito-Kurashi symposium, Shizuoka, Umi-Hito-Kurashi Forum. 2016*

## Conclusion

Women's activities are indispensable for the maintenance and activation of fisheries and fishing communities and have significance for women's livelihood and income. Although the Women's group of FCA has the problems of drastic decrease in the number of members and of aging members, the value of women's groups in the region is excellent. Some women's groups are engaged in starting a series of business activities that allow young women to participate, while others are reviewing past events to revitalize the organization. On the other hand, a new network centering on young women is emerging. In the future, working together to think about the maintenance and development of fisheries and fishing communities across generations and genders should be conducted. At the same time, further deepening cooperation with the surrounding people, such as FCA, administrative bodies, residents, and women in other regions, would be essential.

## 5. Fisheries Policy Reform

### Increased Efficiency Through Reform and Complementary Communication

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Kindai University



*Nori-seaweed aquaculture, Lake Hamana, Shizuoka Pref. Y. Li, 2018*

*Currently, the fisheries policy reform centering on the revision of Fishery Act in Japan is in progress. The Fishery Act forms the basic framework of the fishery system in Japan and provides the elementary framework of fishery right systems such as common fishery rights, aquaculture fishery rights, and set-net fishery rights for small coastal fisheries. Under the revised Fishery Act, the democratization of fisheries, which has been the objective so far, has been eliminated. The main aim of the law is to improve fishery productivity by enhancing the efficiency of fisheries. However, efficient long-term management of the coastal environment and resources requires concerted effort and collaboration among all stakeholders. To achieve this, this study proposes the concept of Satoumi as a type of coastal management initiatives.*

## Introduction

Japanese fisheries policy is implemented by various systems related to fishery management and fishery resource protection. At the heart of this is the Fishery Act, which establishes the basic framework for fisheries and fishery management. The target fishery categories range from small coastal fisheries to offshore and distant water fisheries. For small fisheries, this law establishes an institutional framework for fishery rights that are institutionalized based on traditional fishing management practices from the feudal era and forms the basis of fishing ground utilization. Therefore, the amendment of the Fishery Act is the centerpiece of the “Reform of Fishery Policy.” In December 2018, amendments to the Fishery Act were passed by the Diet, and the Fishery Policy Reform was to proceed in earnest. This reform includes full-scale changes in fisheries management systems and drastic changes in coastal fisheries management. This study confirms that the main aim of these reforms is to promote fishery management efficiently; however, there still seems to be a problem in terms of communication between relevant stakeholders.

## Main contents of reform of fisheries policy

The purpose of the Fisheries Policy Reform is to adopt appropriate management strategies for fishery resources and facilitate the growth of the fishery industry. It also aims to establish a fishery employment structure that can increase the income of fishers and adopt a balanced age structure. To achieve this, the Fisheries Policy Reform aims to amend the Fishery Act. Criticisms on the Policy have emphasized the need to revise the Fishery Act, especially the resource management system, which is centered on the expansion of Total Allowable Catch, the introduction of the Individual Quota system, and the elimination of the acquisition of priority rights on aquaculture fishery. Particularly, there are many objections to the amendment of the acquisition of priority rights (Kase 2018, Sano 2020). However, the amendment of the purpose set forth in Article 1 of the Fishery Act is considered to be the most important point.

Initially, the purpose of the Fishery Act was to improve fishery productivity and democratize fisheries, as described in Article 1. However, while amending the Fishery Act, the part providing for the democratization of fisheries was deleted from the purpose of the law together with the Fisheries Coordination Agency. As a result, the revised Fishery Act is only focused on improving fishery productivity. This is an important principle that is further echoed in the “Reform of Fisheries Policy,” and it aims to enhance fishery productivity through rationalization and improving efficiency.

### **The former Fishery Act**

Article 1: The purpose of this Act is to establish a basic fisheries production system in which fisheries adjustment organizations, mainly consisting of fishery managers and fishery employees, can be operated for systematic utilization of waters to enhance fisheries productivity and also democratize the fishing industry. Act No. 267 of December 15, 1949

### **The revised Fishery Act**

Article 1: The purpose of this Act is to ensure sustainable use of fishery

resources, promote comprehensive use of water surfaces, and enhance fishery productivity by establishing measures and systems for permitting and licensing fisheries and other basic systems for fishery production, considering the fact that fisheries are the primary source of seafood to people and the orderly production activities of fishers are instrumental in the fulfillment of this mission. Act No. 95 of December 14, 2018

The objectives of the former Fishery Act contradict the intention to improve fishery productivity and facilitate the democratization of fisheries. To achieve the former, it is necessary to curb wasteful fishing and enhance the efficiency of quick response to changing situations. A centralized system, where people with authority and funds make decisions and move them down, is effective for efficient progress. On the other hand, to facilitate the democratization of fisheries, it is necessary for the parties concerned to engage in meaningful discussions and come to a consensus. Considering the fact that it may take time for all the stakeholders to embrace the proposed reforms, it is important to communicate effectively, create awareness, and explain the importance of the reforms. This will resolve the conflict between the principles of efficiency and those of communication, which is a glaring challenge in the reform process.

Notably, in an attempt to resolve this conflict, a concept of resource-management oriented fishery targeting small coastal fisheries was developed and applied to Japanese fisheries in the 1980s. The adoption of this concept aimed at establishing a rational and efficient fishery management system that can adequately convey information on fishery resources to fisheries personnel (Hasegawa, 1989). It is worth noting that resource-management oriented fisheries attempt to solve the contradictions of the current Fishing Law and aim to achieve both efficiency and communication. However, even in resource-oriented fisheries management, balancing efficiency and communication seemed difficult. To effectively respond to recent changes in the natural and social environments, the fishing industry has to pursue efficiency and sustainability.

From the above findings, it is clear that when the Fishery Act was amended, the government did not maintain the two contradictory principles that existed in the past; instead, it only focused on improving efficiency. The stance of

pursuing this improvement in efficiency appears everywhere in the proposed amendments. The purpose of this amendment, which is to improve the efficiency of the fishery system and facilitate fishery productivity, is extremely clear and easy to understand. This is also reflected in the coastal fishing ground management system, which is the focus of this paper.

## Changes in coastal fishing ground management

With regard to changes in the coastal fishing ground management, this paper explores the responsibilities of fishery right holders and the coastal fishing ground management mechanisms adopted. It also identifies their shortcomings.

Regarding the responsibilities of fishers, the revised Fishery Act stipulates that the national government and prefectures have an obligation to prevent and resolve conflicts concerning the proper implementation and conservation of fishery resources and the use of fishing grounds. The law further clarifies that fishery right holders have an obligation to utilize fishing grounds appropriately and effectively, and they are obligated to report on their utilization status. In the worst-case scenario, fishery rights can be revoked if they are not properly utilized by the holders. This is completely different from the framework of the previous law, which allowed fishing communities to manage the coast as a common fishery right institution. Under the revised law, the new framework is based on the idea of hierarchical transfer of authority, i.e., national government -> prefecture government -> fisherman's cooperative association (FCA, fishery right holder). Such a top-down hierarchical organization is efficient in achieving a specific purpose (Taguchi 2019). It is presumed that since FCA, as a fisher's rights holder, is granted exclusive rights to the coastal area, which is a public asset and a common fish resource, it has a social responsibility to manage fishery resources (Hidaka 2002). In addition, the revised Fishery Act stipulates that FCA has management obligations that are transferred from the state and prefectures. Although the standards for proper utilization have not yet been set out by the national government, this will complete the hierarchical management system. The delegation of



authority from the national government to prefectures and from prefectures to fishery cooperatives (fishery right holders) and the accompanying obligations and rules are further clarified in the revised law.

The newly established coastal fishing ground management plan specifies fishing ground management operations that can be adopted. They include red tide monitoring, seagrass bed conservation activities, and monitoring poaching in fishing grounds. Currently, these management operations are voluntarily carried out by fishery cooperatives. However, if these amendments are effected, the prefectures that have the obligation to manage fishing grounds will have the authority to entrust such operations to FCAs, which are the coastal fishing ground management bodies. In addition, other groups can also act as coastal fishing ground management bodies. As a precedent for this, there were national projects supporting fishery multifunctionality before the revision. Each project was carried out by a council of stakeholders, who were mainly fishers, and various regional stakeholders, who acted as the management body and carried out various conservation and management activities. The revised Fishery Act system envisages this form of coastal fishing ground management organization. If a council for projects supporting fishery multifunctionality is approved as a coastal fishing ground management body, the council's management responsibilities will be clearly described in the fishing ground plan and legally legitimized. Its responsibilities may include activities beyond traditional fishery rights management, such as activities that are not covered by the fishery rights; activities that span across multiple fishery rights and fishing grounds; and activities that extend outside specific fishery rights and fishing grounds.

To implement these proposals, concerted effort among all the relevant stakeholders is needed. However, under the revised Fishery Act, if this effort is implemented from the perspective of improving efficiency by delegating authority from the top coming down, it will be difficult to achieve the expected results. Another issue is whether it will be possible to implement these proposals even if budgetary allocations are not sufficient. Initially, various people in the region, including fishers, were free to communicate and voluntarily participate in environmental conservation activities. However,

this provision was deleted from the Reform of Fisheries Policy and the revision of the Fishery Act. Although a path was set up to build a new coastal fishing ground management system based on the projects supporting fishery multifunctionality, this still means that the communication that supports the effectiveness of those activities was lost.

## Conclusion

The Fisheries Policy Reform and the revision of Fishery Act are the first major attempts toward reviewing coastal fishing ground management in 70 years. The most distinctive feature is that they both aim at improving efficiency and fishery productivity. It is inevitable that they will be incompatible with traditional systems such as fishing villages. This implies that the current Japanese fishery is in critical condition. Therefore, despite the fact that they have been cut off, communication between fishers and non-fishers is needed to improve efficiency. From a long-term perspective, it can be more beneficial if stakeholders in communication can agree to implement a new management system in the coastal environment. In addition, coastal residents and users, such as fishers, should be allowed to participate in various activities voluntarily and spontaneously, and sufficient communication between these parties should be facilitated. If these management mechanisms are not included in the Fisheries Policy Reform, then another mechanism of implementing them should be devised. One such mechanism for that could be the concept of Satoumi (Yanagi 2013, Hidaka 2016). The contents will be described in detail in another chapter.

## 6. The Satoumi Concept

### **The Role of Small-Scale Fisheries in Coastal Management**

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*Sea cleaning activities by fishers in Hakata Bay, Fukuoka City, Japan, by Fukuoka City Fisheries Cooperative Association, 2020*

*Satoumi, a concept proposed by Yanagi (1998), is a new coastal management strategy that is gaining popularity in Japan.[1] Traditionally, coastal management in Japan has been governed by the Fishery Rights system that enables fishers to exploit a certain area. However, as a result of a changing social environment, this system is no longer effective. Satoumi has been introduced as an alternative that consists of integrated and comprehensive management of the land and coastal area. Satoumi involves the cooperation of people living in an area where the environmental and social conditions are similar. The fishers and non-fisher stakeholders participate in management based on scientific and objective observation. The small-scale fishers have important roles in Satoumi: they have legitimate access to resources based on fishery rights as well as means to operate at sea, they are knowledgeable regarding aquatic resources, and they provide a contact point for various stakeholders to participate in Satoumi management.*

## Introduction

The concept of Satoumi was first proposed in Japan in 1998 but has recently been adopted around the world, with academic sessions on this theme having been held at international conferences. The term Satoumi was initially used in Japan to refer to a specific area of sea adjacent to a village but is now used with regard to the management of the coastal environment and marine resources since proposed in 1998. In this chapter, I first explain the background, functions, and expectations of this so-called modern Satoumi and then introduce its role in management.

### Traditional coastal management and the fishery rights institution

The archetype of modern Satoumi was the traditional site management system in Japan, whereby a given coastal fishing village managed and decided how to use and preserve the area of sea in front of it. Management systems of this nature likely exist around the world, as exemplified by the mechanism of “Sashi” management in Indonesia (Akimitsu, 1996). In Japan, this management system was legalized during the Edo period, when the country had a feudal social structure and can be summarized by the phrase “the seashore is ruled by the coastal community, and the offshore is used commonly.” This means that, during this time, the coastal sea was used and managed by the coastal fishing village, while the offshore was used by fishers involved in offshore fishing. Consequently, the coastal fishing villages established the rules on how the sea and its resources could be used (i.e., who could catch what and how), created fishing grounds, and set up prohibited areas to protect the environment and resources. Since the fishing villages of small-scale fishers managed the sea and resources as a community, these can be considered a traditional and closed commons whose use was closed to the outside, which is likely to have been a sustainable model.

When Japan shifted from this feudal system to a modern, centralized system in the late nineteenth century, this traditional management system was legalized as a dedicated fishery right by the Meiji Fishery Act, which was established in 1910. The skeleton of this law is as follows. The Fisheries Cooperative Association (FCA), which represents the fishing village, is the fishery right holder, and its members exercise the fishery right. According to the rules set by the FCA, its members can exclusively fish within the area defined as fishery right grounds, and the FCA sets the rules for using these grounds. The FCA also makes various efforts to preserve the fishing ground environment and increase fishery resources, for example, by cleaning the fishing grounds and monitoring the water quality to preserve the fishing ground environment, releasing seeds and seedlings to maintain and increase marine resources, and establishing fish reefs as breeding grounds. These

human activities have allowed the environment and resources within the fishery right ground to be maintained. This basic framework has been inherited by the current Fishery Act, which was established in 1949, and is now a common fishery right. Thus, it can be said that the prototype of Satoumi has been institutionalized.

## Changes in the environment and the fishery rights system

In the era when coastal users were mainly fishers, and most of the coastal fishing villages were comprised of fishers and fisheries-related people, the coastal area could be managed well under this prototype of Satoumi. However, Japan experienced a period of rapid economic growth in the second half of the twentieth century, which saw the non-fishing use of coastal areas increasing and people other than fishers visiting coastal areas, as well as declines in the total number of fishers and the proportion of fishers living in fishing villages. This meant that fisheries made up only part of the use of a given coastal zone and fishers made up only part of the resident community, despite their activities being legally guaranteed by a fishery right. The traditional management system was unable to cope with this situation, as it became apparent in the 1980s, raising the important issue of how the coastal environment could be protected. Thus, Yanagi (1998) proposed Satoumi as a concept for the management of coastal areas.

## The emergence of modern Satoumi

Satoumi, as proposed by Yanagi (1998), is defined as “a coastal area where biological productivity and biodiversity have increased through human interaction” and is said to have been inspired by the fact that forests near villages are maintained through the villagers’ management activities, such as logging and thinning. Countering the long-standing belief that it would be better not to conserve the marine environment, Yanagi (1998) stated that proper human involvement would restore and improve the environment and

explored cases from around the world in an attempt to build a theory that supported this. Examples of these case studies included the thinning of seaweed beds and the construction of stationary fishing gear using stone walls. Theoretically, management should be such that the biota does not become an extreme phase, and the optimum condition of nutrients and fishery resources is achieved by considering the convex relationship between the two and manually maintaining appropriate nutrient levels. These are described in detail in Yanagi (2012).

Yanagi's (1998) concept of Satoumi was adopted by the Japanese Government in the late 2000s since when the Ministry of the Environment has included Satoumi in its 21st Century Environmental Strategy, created a guidebook for Satoumi, and promoted the expansion of Satoumi through auxiliary projects. In addition, it was stated in the Marine Basic Plan, which was prepared based on the Marine Basic Law, that the concept of Satoumi should be incorporated into marine management. Local governments are also expanding their efforts in terms of Satoumi, with examples including the management of Omura Bay by Nagasaki Prefecture, the coastal management plan of Kagawa Prefecture, and comprehensive plans by Shima and Fukui City. Similarly, the number of cases where the private sector is working on Satoumi is also increasing in Japan, with my survey identifying approximately 240 cases in 2015 and a survey by the Ministry of the Environment identifying 291 cases in 2018.

### Overview of modern Satoumi

In addition to Yanagi (1998), many others have been investigating how to manage or create Satoumi, and research in this field is rapidly evolving. Therefore, here, I will summarize the ideal model for modern Satoumi that is currently assumed, according to Hidaka (2016, 2018).

Satoumi management is mainly conducted by a council consisting of various local stakeholders, such as fishers, local residents, various groups and organizations, and other relevant people, which largely centers on the FCA and municipalities. This council acts as the managing body and, as such, not

only determines and implements the contents of Satoumi management but also serves as a conduit through which various stakeholders can participate and communicate with participants.

The target of management is the shallow coastal sea in a local area because the people and physical/biological conditions are relatively similar within such a local area. However, as such, Satoumi cannot cover a wider area across the region, making it necessary to form a Satoumi network in cooperation with the neighboring Satoumi. This network sometimes includes Satoyama, which is a similar concept but concerns mountains and forests. The most important goal is for the network to cover critical points of the material cycle, but it can also consider the distribution and movement of living entities, such as fish stocks.

Management activities, such as preserving and improving the environment, maintaining and increasing marine resources, and creating rules for utilization, are carried out in Satoumi. This differs from traditional fishery rights management in which some activities are not necessarily directly linked to fisheries, and management is carried out based on scientific evidence and objective observations. The introduction of new technologies is also expected. At this time, the presence of scientists who are closely related to the region is important because they will allow science-based management to take place. Participants in the management also include people who live outside the region and who support activities while outside the region. Thus, it is important that the value of the relationship between these people and Satoumi is recognized and a mechanism for realizing this is developed (Uehara et al., 2019).

The biological effects of Satoumi have previously been recognized, and theoretical explanations for these effects have been given by previous studies like Yanagi (2012) and Yanagi ed. (2019). However, unfortunately, not all Satoumi efforts have been successful in drastically restoring the coastal environment and increasing biological productivity. This is because these efforts are localized, and the effects are limited and take time to manifest. One example of this can be seen at Hinase in Bizen City, Okayama Prefecture, where it took approximately 20 years before the effects of eelgrass propagation became apparent; however, these effects have rapidly emerged since



then, alongside improvements in the environment, an increase in fishery production, and the expansion of activities in cooperation with other regions, resulting in this being considered a successful example of Satoumi (Tanaka, 2019).

In recent years, the educational benefit of participating in management activities has also attracted attention as a Satoumi effect (Sakurai et al., 2018), with the observation that students who participate in Satoumi experience a dramatically improved awareness of the region and the environment, which spreads to their parents and the fisher participants who support the activities. The economic effects of Satoumi have also been considered. It can be assumed that the improvement of the environment and the restoration of marine resources will increase fishery production. However, educational travel and marine tourism for participation in the creation of Satoumi are expected to emerge as new economic activities, and a mechanism has also been established for consumers outside the region to purchase marine products produced in Satoumi as environmental products (Higa et al., 2019), which also contributes to realizing the value of the relationships between people and Satoumi, as mentioned previously.

### Roles of small-scale fishers in modern Satoumi

In this section, I would like to highlight three key roles that small-scale fishers play in modern Satoumi areas.

First, small-scale fishers play a role in legitimizing public water activities. Satoumi is formed in a shallow area along the coast and consequently overlaps with the common fishery right ground. The FCA, which is made up of small-scale fishers in the region, is the fishery right holder with responsibility for managing the fishery, making its participation in Satoumi management an important success factor. Thus, the FCA and its union members lead the way in the creation of Satoumi so that the various activities that take place on the surface of public water are justified and can be carried out.

Second, small-scale fishers play a role in the provision of knowledge about the sea and the various means of activity at sea. Small-scale fishers undertake

production activities based on the region or fishing grounds and have good knowledge of the environment of the target coastal area and the fishery resources that are found there. In addition, these fishers have a wealth of experience in fishing boats at sea. Such knowledge of the sea and the means of activity at sea is important in the creation of Satoumi.

Third, small-scale fishers play a role as residents of the coastal region. Although many coastal residents are not fishers and the proportion of fishers is decreasing, most small-scale fishers have lived in coastal regions for a long time, providing a large window of opportunity for coastal residents to participate in the creation of Satoumi. For example, they can act as a bridge when local residents' groups need to be involved, which is particularly important in the creation of a network of Satoumi throughout the region.

Some fishers may feel repelled by the involvement of non-fishers in the coastal area. However, improvement of the coastal environment and restoration of the fishing ground environment and fishery resources will benefit fishers but can no longer be achieved by fishers alone due to the declining social share of fisheries. Furthermore, science is one of the characteristics of modern Satoumi, and this is not limited to natural science; social science knowledge is required to build an organization and structure for Satoumi management. Satoumi is concerned with reviewing the connection between coastal areas and people and proposing a new way of connecting. Thus, the relationship between people who are involved or interested in coastal areas is also important, making it necessary to consider the humanities. Satoumi provides the social opportunities for both fishers and other users to have a social responsibility, and small-scale fishers can take the lead on this, making the significance of their participation clear.

## Acknowledgment

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## Endnotes

[1] <https://www.amazon.co.jp/Integrated-Coastal-Management-Japanese-Satoumi-ebook/dp/B07WHP3DJB>; Hidaka, T. (2016). Satoumi and coastal management–satoumi management. Tokyo: Association of Agriculture and Forestry Statistics. In Japanese.

## 7. Coastal Use Governance

### **The Role of Local Fishers in Coastal Recreational Use Management**

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The Japanese Institute of Fisheries Infrastructure and Communities



*The beautiful coastal area used for fishing and recreation. T. Namikawa, 2015*

*The coastal area is a geographical space that has high environmental and socio-economic value. As the needs for coastal zone use diversify along with economic growth and advancements in science and technology, it has become critical to establish rules for the appropriate use of coastal regions to govern access by prospective users with a so-called “coastal use governance.” This chapter[1], using a remote island near Tokyo as an example, will provide an overview of the development of coastal zone management practices in Japan, as well as demonstrate how local fishers play an important role in coastal recreational use management.*

### Introduction

The coastal area comprises the band of sea and land along the waterfront, such as a sandy beach, seawall, or the banks of a harbor. Coastal zones are geographical spaces that are socioeconomically valuable due to their diverse ecosystem and natural resources, and are protected as spaces that not only safeguard areas of land from seaborne disasters, but can also be used as sites for development (e.g., manufacturing facilities). People use coastal zones not only for fishing and shipping, but also for recreational activities such as beach walks, swimming, shellfish gathering, and fishing. As economic development and progress in science and technology have led to growth in coastal zones, serious environmental problems appear. Meanwhile, people have come to demand “richness” in enjoying the environmental utility of coastal zones, and integrated coastal zone management frameworks, such as the conservation of the coastal zone biome and efficient use of resources, are needed. In coastal zones today, where diversified use needs and integrated coastal zone management frameworks are being promoted, approaches to appropriate rule-making to ensure the optimal use of coastal zones, as well as their dissemination, have become important. On this backdrop, the following sections will discuss what role fishers play or could potentially play in the es-

tablishment of a coastal use management system. This is an important factor to consider in clarifying a method for minimizing environmental degradation due to overuse and congestion as well as appropriately and sustainably using resources in coastal areas in the context of regional promotion efforts.

## Japanese coastal governance

Since the time when fisheries and shipping were the main uses of coastal zones, these areas have taken on various types of importance depending on the diversification of uses, and various uses such as industrial land development by land reclamation, recreational use, and the re-evaluation of environmental functions, such as tidal flats and seagrass beds, have appeared. Meanwhile, the focus and methods of their management have also changed. These can include resource management related to the use of fisheries, the management of space in terms of development and national conservation, the coordination of fisheries and marine recreational activities, and so on. This section will provide an overview of the historical background of these uses and management modes and clarify which actors have played critical roles.

### Management of fisheries

The fishing industry has been operating in various parts of Japan since ancient times, and the roots of the governance framework for this industry are said to trace back to the *Taiho* Code of the Nara Period. The “*Ritsuryo Youryaku*” enacted by the Tokugawa Shogunate states that “shore hunting is to be done in the area designated to each, while the seas are communal,” which means that areas of land are to be managed by villages, while offshore areas are spaces where people can operate freely. The designated village fishery system of fisheries governance was born from the history of fishery disputes, such as power and boundary disputes between the fishing villages. This mode, in which users self-regulate their use, can be referred to as user management. In fact, even in Tokyo Bay, voluntary regulations on fishing equipment and methods were negotiated among fishers in order to conserve resources.

A policy aimed at establishing a modern nation was promoted during the Meiji Era, and in 1875 (Meiji, 8), the government abolished the customary right to use fishing grounds and began leasing the sea surface owned by the government to collect rental fees in an attempt to modernize fishery governance. However, as a result of the disruption of the customary fishing order, fishing sites were confused and many conflicts occurred, and fisheries were also abolished in the following year. After this point, fisheries' resources were managed by convention. Subsequently, in 1910 (Meiji, 43), the "Meiji Fishery Act" was enacted, and the doctrine of "the beach is part of the land" was established as a "fishery right exclusively for land surface water" and codified. The 1949 (Showa, 24) Fishery Act has not changed its basic intent, and some hold the opinion that this policy succeeded regarding the relationship between the fisheries cooperatives and their members under the current "Cooperative Fisheries Rights" of common (shared) fishery rights, specified fishery rights, and access permits.

Although there are different views as to whether common fishery rights have the same nature as those from the Edo Period, the principle of "protection/cultivation of resources by users" is adhered to in their resource management, and there are restrictions originating from the old convention. As resource management is carried out through the control of inputs, such as fishing, licensing, and regulations on fishing, most fisheries resource management measures, such as the adjustment of fishing volumes and protection/cultivation of fisheries resources, are mainly carried out voluntarily by fishers.

### Space management

During the Edo Period, when the commodities economy was robust, the port was the key to the distribution of clan specialty products to countries and the transportation of goods from rural areas to the clan. At that time, estuaries were numerous, and the buildup of sediment was an issue; mountain and flood controls to maintain port functionality were also important management priorities of the era's politicians. In addition, as many new rice fields were

cultivated due to the increasing population, the coastal zones faced great demand not only as a place for acquiring marine resources, but also as a space for developing ports and rice fields. Projects, such as the development of new rice fields, required large-scale civil engineering work, and were the domain of the feudal clans and the wealthy traders who did business with them. Such developments were said to require the permission of the Tokugawa Shogunate, and the political administration was responsible for space management.

During the rapid industrialization of the Meiji and Showa eras, port development was promoted, and during the post-war period of high economic growth, industrial and urban uses, such as land reclamation, also became common. While a governor's permit was required to establish a land reclamation landfill under the Act on Reclamation of Publicly-owned Water Surfaces (enacted in 1926, amended in 1973), pollution became a chronic concern over the course of successive developments of industrial areas in coastal zones. In addition, as a result of many of the coastal zones on the land side being owned by companies, a situation arose in which local residents could not secure access to these coastal zones. As a result, the "Right to Beach Access" movement, which was a "movement to eliminate pollution, protect the natural environment from destruction, and restore nature," gained traction in various places, starting with Hyogo Prefecture. Moreover, several public movements opposing landfills and demanding the improvement of river water quality began to appear in various places due to a sense of crisis regarding the deterioration of the environment in the coastal zones, such as an increase in landfill creation and the decline in inflow water quality from rivers.

In this way, the management of development spaces has essentially been undertaken by the state. However, once the environmental value of coastal zones begins to be widely recognized by society, beneficiaries of this new value, such as local residents, will assert new rights through means such as seeking to revise laws. This can be identified as a mode of management that does not fit within the framework of administrative management. This also applies to the development of coastal facilities that protect the country from destructive weather, such as storm systems and tsunamis. The coastal development projects that emphasized business efficiency resulted in the deterioration



of coastal landscapes due to the division of land areas and coasts and the placement of wave-dissipating blocks. As a result of raising awareness of this issue, consideration of uses with respect to the protection of the environment was incorporated into the legislative intent of the “Coast Act” (enacted in 1956, revised in 1999), and reflected the opinions of residents. As such, in the same way, that the opinions of users from the viewpoint of environmental conservation in the management of development spaces have had an influence on the administration, a new system is being sought in which the management of protected spaces will also include new users as well as those in coastal zones.

### Management of recreation

The problem of conflicts of use has also been apparent since the 1980s, which saw an increase in the number of marine recreational uses. This conflict first started between commercial and game fishing. This is a problem because the target resource is the same, and it can be said that the issue is how to regulate fishers in terms of priority of use with respect to coastal resource management. For example, in 1993 in Iejima, Hyogo Prefecture, a fisher who was dissatisfied with the fishery use agreement between commercial and game fisher, filed a lawsuit to open the entire area to fishing boats. Following the issue of game fishing, conflicts between fishing and diving activities became the subject of attention. This conflict came into notice because of the complexity of the legal basis for diving and the user fees imposed by numerous fisheries cooperatives on diving patrons; conflicts in Osezaki in Shizuoka Prefecture and Miyakojima in Okinawa Prefecture have become famous examples. Traditionally, fishers who have preferential use of coastal zones have collected money from divers under various guises, a practice that divers have begun to question.

This background is greatly influenced by the recent changes in the environment surrounding fisheries. Compared to other users, fishers have a greater presence in terms of rights regarding the use of coastal zones in that they have the right to fish as a property right, but due to the low fish prices and lack of successors, their status as an industry continues to decline. In addition, it has been generally recognized in recent years that fishers often find

themselves on the side of being victims of coastal environmental problems, and can be perpetrators of problems such as overfishing and littering discarded fishing gear causing damage to the coastal environment. Such changes in the awareness of fisheries and a decline in their overall position in regional economies are believed to call into question the appropriateness of preferential use for fisheries.

## The role of small-scale fishers in coastal governance in Japan

As described above, coastal zones managed by fishers, who are users of fisheries resources under certain rules, have developed both spatial and environmental values. Various use and management measures are being sought, and a management framework that reflects the opinions of various users is in flux. As such, one issue affecting coastal zone management is how to manage the greater number of users' individual purposes and what manner of an organization should govern this activity. This issue will be particularly apparent in problematic areas of recreational use management. As I recognized earlier, when the fishing industry was specialized, the coastal zones were essentially such that "residents of area villages = fishers." Such thinking can still be observed in areas where coastal use is specialized for indigenous people. As such, even if not clearly stated, if the scope of users is defined by tacit understanding and a group of defined scope establishes and enforces the rules governing the use of resources, this resource will be managed by the local commons.

Coastal areas have long been local commons. However, as the use of coastal areas is diversified and multi-layered, the range of users is expanding, as people other than fishers, such as marine recreation tourists and urban residents living on seafronts, become included among the coastline users. Stated differently, the coastal zone is transforming from a local commons to an open commons and has the characteristics to create a "tragedy of the commons."

As such, it is important to determine whether it is possible for fishers to

function as managers of modern coastal zones, which have an increasingly diverse body of users and are expanding from local to open commons. Fishers can establish rules for the sustainable management of local commons by utilizing their deep knowledge of the coastal zones as well as the cooperation of research institutions. However, problems such as resource use, over-fishing, and irrational use, which tend to be specialized to one aspect of seafood production, have been pointed out, and the role of fishers as traditional management bodies is in question. It has become difficult to establish a unilateral relationship in which the fishers set rules for using coastal zones that do not hinder the fishery and will be followed by users. This is the aforementioned conflict faced with the diving industry. Thus, are fishers no longer suitable to function as coastal zone managers? This is not always the case, and in some areas, fishers do act as such. The following section will discuss the case of Hatsushima, Atami City, where fishers have established diving rules and are establishing an orderly use management system. This is an example of the management of the coastal zones as local commons while accepting the new use of diving in response to the social demand for diversifying the uses of coastal zones.

### Examples of recreation management by fishers

Hatsushima is located on Sagami Bay and is the closest remote island to the metropolitan area. Hatsushima is a small island with a population of 333 (as of 2015) and a perimeter of approximately 4 km. Its main industries are fishing and tourism, with tourism being the greater of the two. Like many parts of Japan, the coastal zone of Hatsushima has been used for fishing. A production structure of mainly fishing and secondary farming, centered on the family labor of each household, was adopted, but from around 1920, when the rod net was introduced, a joint fishing labor form was adopted, and an equal distribution system for each household was introduced. The Tengusa fishery is also popular, and the profits obtained from the shore sale and the fisheries cooperative's directly managed business are distributed evenly to each household. In this way, in Hatsushima, where arable land is scarce,

marine products obtained from the coastal zones are valuable resources in the region, and profits have been secured through cooperative use and evenly distributed among the islanders.

Meanwhile, Hatsushima had been attracting attention as a tourist destination since even before the war. With the development of infrastructure to support tourism, these coastal zones have become more valuable as a place for marine recreational activities such as fishing and swimming, and the islanders have become more amenable to accepting tourists. The development of the resort hotel “Hatsushima Club,” which was promoted with the participation of the islanders (1994), occupies more than one-third of the island’s land surface, and the island took this opportunity to engage in the tourism enterprise. Since the islanders’ main businesses have become operating guesthouses and restaurants, the Hatsushima area had only part-time fishers, indicating that fishing has become an industry secondary to tourism.

Amid this wave of tourism, the fisheries cooperatives decided to engage in the diving business, with the catch phrase “from catching to watching.” The Hatsushima Diving Center was established in 1998 with a diving shop. It can be said to have been the pioneer of the Izu Peninsula diving business, as a business partner to the fishing cooperative. There were rules in place designed to both protect the environment and secure profits on the island, such as only accepting shop-run tours and offering benefits for guests staying on the island. The fishers managed the use of the recreational coastal zone. The rules fishers set can be roughly divided into the following two:

(1) Rules for restricting use: only shop tours that accept groups led by instructors belonging to the diving shop for the purpose of safety management and environmental conservation: “environmental conservation to avoid conflict with the fishing industry,” “diving area restrictions,” and “application system for dive time,” etc.

(2) Rules for soliciting profits in the area: “No lunch allowed,” which induces the use of restaurants on the island, and no “guest privileges” that allows diving earlier than usual.

Both rules greatly limit the actions of users. This is thought to be because these rules carry legitimacy in that everyone believes that these rules should

be followed and create a structure that provides incentives to those who follow them. For example, the use-restriction rules are easy for everyone to approve as they create a structure to ensure the sustainable use of the limited resources of the island. Moreover, these rules were established by the fishers themselves—the islanders who have devised and used the limited resources—so it seems that their legitimacy as a management entity is reinforced and that the rules are easier to be recognized and approved. In addition, these rules establish incentives for each stakeholder.

For divers who are users, (1) securing a favorable recreation space, (2) ensuring safety, and (3) enjoying appropriate services can be incentives to follow the rules. In addition, for diving shops, there are the (1) economic incentives of profiting from tours, and (2) negative incentives that they cannot be patronized unless the rules are followed. Although the rules restrict the growth of businesses and hinder the increase in profits, at the Hatsushima Diving Center, rather than expanding short-term profits by excessively increasing the number of users, the center's policy is to improve satisfaction and maintain environmental protection by accepting an appropriate number of patrons corresponding to the capacity of the facility. Stated differently, the use-restriction rules create an incentive for users in terms of greater user satisfaction, and also incentives for business operators as well, such as business continuity and lower management costs.

Meanwhile, what about local profit guidance rules? The establishment of such rules is based on the traditional superiority of fishers and landowners, namely the islanders. There is no problem as long as the user understands the legitimacy of the rule and is convinced to follow it, but if the traditional advantage is asserted and local profits are excessively secured, the fishers set the rule and manage the use. There is a possibility that the justification for doing so may fluctuate. Meals and lodging on the island could be more expensive than users are willing to accept and will be deterred if profits are solicited excessively.

## Conclusion: coastal governance and small-scale fisheries

In order to coordinate diverse uses, avoid the overutilization of coastal zones, and use resources sustainably, users must accept some restrictions. Those who manage coastal zones must design their use systems such that users can understand and accept the restrictions. As the value of the coastal zone increases in response to social demands, fishers in Hatsushima have encouraged further utilization of the coastal zone and have restricted users from managing the coastal zone as a local commons. The fishers, who are the management entities, have the legitimacy of historical ownership, and at the same time, maintain the system by securing economic incentives for each entity whose actions are regulated under this framework.

In the case of Hatsushima, these institutional designs are believed to have been possible because they were created by fishers who live in the area, own land, and have fishery rights. In this respect, regional fishers will continue to play an important role in managing coastal use. In contrast, as the use of coastal zones is diversified, fishers holding the rights to coastal zones only because they were the first group there will no longer be the case, and is considered a coastal management entity by sole virtue of being a fisher is no longer compatible with the current social environment. Therefore, in order for fishers to play a leading role in the management and to maintain and operate systems limiting the rights of other users, they must clearly build their own legitimacy, and I believe that it is important to demonstrate this to the increasing groups of users of the coastal zone and encourage their cooperation.

## Endnotes

[1] This chapter was written by Tamano Namikawa in reference to “Suitability of Fisheries for Recreation Management in Coastal Zones”, Minoru Tada, Xiaobo Lou, Masahiko Arij, Takahiro Matsui, Sachiko Harada (Eds.), and “The Changing Japanese Fishery: Seeking Potential and Sustainability”, Hokuto Shobo, 2014.

## 8. From Attention to Action

### A Long Road Towards Gender Equality

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*Behind every boat, there is a woman, a family and a fishing community (Slogan of European network AKTEA, 2002). Gender equality is one of the objectives of Japanese authorities to fulfill the country's commitment to the ratification of international conventions. In addition, gender equality has been integrated into national sectorial policies with the aim of strengthening women's participation in the economy. In particular, women's employment and participation in decision making should be promoted in economic sectors such as agriculture and fisheries. However, the current legal framework is struggling to be implemented, and gender inequalities still dominate Japanese society. In the fisheries sector, the paternalistic attitudes of cooperatives prevent women from being fully employed in fisheries and make it impossible for women to participate in decision making in the sector. This paper examines national rural and fisheries policies related to gender equality and highlights the gap between theoretical objectives and effective implementation.*

## Japanese gender policy in general

Since 2014, gender equality in all sectors, including agriculture and fisheries, became one of the objectives of Japanese authorities. However, Japanese society is still dominated by paternalistic attitudes and behavior, making this objective difficult to achieve. The reason is probably that gender equality policies are only targeting equal opportunities in employment without questioning the masculine values dominating Japanese society that expect women to stay at home and take care of children, husbands and old parents. In this paper, we present the main Japanese national policies that have strived to promote women's participation in economic activities, particularly in fisheries, and highlight women's views regarding these policies.

The 1945 Japanese constitution is the first legal document introducing the principle of equal rights between women and men in education and the family



for the first time in Japanese history. Since then, equality principles between women and men have evolved over time and according to international events. For example, after the international women's year in 1975, celebrated by the United Nations, Japan adopted, in 1977, a national plan for the equality of women and men, and then, in 1985, ratified the UN Convention on the Elimination of all Forms of Discrimination against Women (CEDAW-1975). Subsequently, Japan's "New National Action Plan Toward The Year 2000" promoted gender equality and spoke about a "gender-equal society," a term which has been mentioned since 1994 in Japanese legislation (Cabinet Office, 2001). The "Plan of Gender Equality of the Year 2000" was adopted in 1996, and the Basic Act for Gender-Equal Society was implemented in 1999, followed by the Basic Plan for Gender Equality in 2000. The Japanese government has included women's equal opportunities as one of its important policy areas since 2014, and has put forward policies that address equality in all sectors.

## Gender policy in rural societies

According to the National Association of Fisheries Cooperatives Women's Groups, women represent 60% of the labor force in rural communities. Their major contributions are to support family enterprises, bring up children, take care of the family and take care of the household (1989). However, this contribution is invisible, and society pays little attention to it. To modify this erroneous image and promote the role of rural women in community development, the Ministry of Agriculture Forestry and Fisheries introduced the "Day of Rural Women" celebrated every year on the 10<sup>th</sup> of March, probably in relation to international women's day. On this day, through different events, rural women's role in communities is promoted by showing their abilities and capacities (National Association of Fisheries Cooperatives Women's Groups, 1989).

Another tool used by Japanese authorities to support women's economic participation in rural family enterprises has been "Family Management Agreements." Thus, family members involved in family enterprises (farms or fishing) discuss and make an agreement on how tasks are shared among them

both in the enterprise and household. Agriculture and fisheries in Japan are operated by family-based, small-scale businesses, and like all family-based activities, they have advantages but also disadvantages, since the line between the management of enterprises and private life is not clear, indeed, roles, working hours, earnings of family members are often confusing (Ministry of Agriculture, Forestry and Fisheries of Japan).

Therefore, these agreements are made to make agriculture more appealing to farmers' wives and successors. Nowadays, national authorities also provide economic incentives, through subsidies, for agricultural sector with the aim of increasing the number of households signing up to these agreements. In 2019, 58,182 households involved in agriculture had signed a Family Management Agreement, and 1,665 more have recently signed one (Ministry of Agriculture, Forestry and Fisheries, 2019). The Japanese government has tried to expand Family Management Agreements into fishery households. However, the numbers are not really increasing compared with the agricultural sector because, unlike the agricultural sector, in fisheries, no economic incentives have been forthcoming. In addition, the number of fishers who have signed these agreements at the national level is unknown, as the authorities do not always register them (Rural Women Empowerment and Life Improvement Association, 2006). In the prefecture of Yamaguchi, where the number is available, there are 54 signatory fishery households (2015) out of a total of 2,858 (Yamaguchi prefecture, 2016). According to the Association of Rural Women's Empowerment and Life Improvement, this number of households is higher than in other provinces (Rural Women Empowerment and Life Improvement Association, 2006).

## Gender policy in fisheries

In 1992, the Ministry of Agriculture, Forestry and Fisheries of Japan prepared a medium to a long-term vision about rural women aiming to promote and support their participation in decision-making and entrepreneurship (Miki, 2010). Within this context, the National Association of Fisheries Cooperatives Women's Groups organized meetings with members of women's groups and

the Director-General of the Fisheries Agency to establish a common vision of women's needs to be negotiated with decision-makers (National Association of Fisheries Cooperatives Women's Group, 1994). It appears that this action influenced the Fisheries White Paper that included support for women to achieve gender equality and facilitated the introduction of more gender-sensitive policies (Miki, 2010). As a result, Women's Fisheries Groups have received interest-free subsidies for fish processing equipment and facilities. Women's Groups in Fisheries Cooperatives Associations (FCAs) have also requested the organization of training courses and workshops about gender-equality. Unfortunately, these courses have not produced any tangible effects.

In 2017, the Fisheries Basic Plan tasked FCAs with promoting women's participation in the fisheries sector. This objective was better developed in later plans made by Japanese authorities focusing on promoting women's participation in all fields with special emphasis given to improving women's roles in economic development (Cabinet Office, 2015; Gender Equality Bureau Cabinet Office, 2016). However, our observations show that women are still absent from decision-making processes regarding fishing communities. Moreover, women's rights are not being acknowledged despite the recommendations made by the 4<sup>th</sup> Basic Plan for Gender Equality (2015) regarding women's appointments to FCA boards; neither is women's participation in decision making concerning fisheries management and community development (Soejima and Frangoudes, 2019). Thus, it seems to be difficult to achieve the objectives set by the legislative framework at the local level. For example, Yamaguchi prefecture's medium-to-long-term vision about rural women laid down in 2016 set as an objective to double the number of women on FCA's boards by 2020 (only one woman has been a board member, in 2015). However, as of May 2020, this objective has not been achieved.

The "Hama-katsu Plan (Seashore Revitalization Plans)," the central pillar of Japanese fisheries policy, is a tool targeting the development of local communities and designates FCAs to achieve this target (Fisheries Agency, 2013). According to Hama-katsu Plan policies, women should be part of local economic development. FCAs should be open to and facilitate women's integration into new activities. The main objective of Hama-katsu Plan is

to increase fishing income by at least 10% over a five-year period through voluntary initiatives. This could be possible by introducing measures to add value to fish catches. Processing, creation of new products, or selling to new markets are the main priorities. Women's groups have long experience in processing and creating new products and can come up with new ideas as part of these Hama-katsu Plan, if only the FCAs would open the doors to them. It seems that in practice, women have not participated in the design of these plans for various reasons. Among others, women have not been informed about the plans and their objectives; thus, they were unable to prepare and implement community revitalization plans. One of the reasons they were not informed about the plans was because the FCAs only invited their own women groups whose members were mainly old women. Other fisher women running economic activities in the area were not invited, as they were not members of FCAs. Indeed, there are many examples around the country that show that women who have attempted to take new initiatives to promote their communities have been marginalized by FCAs (Soejima and Frangoudes, 2019).

The absence of young women in community affairs and fisheries is another challenge for fisheries authorities and the National Association of Fisheries Cooperatives Women's Groups. Both have a specific action plan for networking young women in fishing communities. For example, the Fisheries Agency is communicating with younger generations of women through the Social Networking Service (SNS) and organizing lunch meetings with them. In 2017, the National Association of Fisheries Cooperatives Women's Groups launched a network (called Fure-Mizu Bukai) for young women in fishing communities. This new network organizes not only young women directly related to fisheries but also all young women in the fishing communities. The latter group has a high level of awareness about their communities' activities or entrepreneurship etc. These new networks aim to create opportunities for personal exchanges among young women in fishing communities and establish cooperation between them. In Yamaguchi prefecture, this new local network was launched in 2018. However, both networks, national and local, have extremely low budgets, and there is a risk their activities will have to end.

In addition, the visibility of these networks is low. Often fisheries staff in local government have never heard about them.

### Fisher women's opinions about the gender-equal challenge

Gender-equal opportunities in Japan have evolved little by little at all levels. However, men in fisheries' communities are reluctant to change to a more gender-equal society. For example, the leader of a women's group running a fish processing activity and a restaurant, as well as leading the local FCA women's group (from 2005 to 2017) and the women's group of the National Association of FCAs, was rejected when she requested to be a regular member at her local FCA. This negative response can be interpreted as gender discrimination (Soejima and Frangoudes, 2019). This was also the case of a woman diver harvesting abalone. The reason for this negative response is that women, even active ones in fisheries, need to be represented by the head of the household, in other words, their husbands. Men, as regular members of the cooperative, are the only ones allowed to discuss and decide how to regulate the activity and manage fishing stocks (Soejima and Frangoudes, 2019). A woman diver claimed the right to be a regular member of an FCA in front of some board members during an interview conducted by us in June 2016. The men pretended to listen but did not respond to her request.

Another woman working with her husband in squid fisheries also asked to become a regular member of the FCA and participate in decision making during a workshop on SSF voluntary guidelines organized by us with women leaders of Yamaguchi prefecture in June 2016. These open and public requests show that fisher women are motivated to become regular FCA members and be active in decision-making.

As noted above, SRP expects women to be part of the local economic development. Indeed, many women's groups contribute to local economic development (Soejima and Frangoudes, 2019, etc.). Nevertheless, fisheries officers sometimes ask, "Does fishing production increase by paying attention to women?"

## Conclusion

As described above, gender policies in Japan, not only in the fishing sector but in all economic sectors, arise out of economic policies and are not specifically aimed at empowerment and gender equality. The government primarily expects women to contribute to the Japanese economy; thus, it attempts to improve their working environment. Therefore, in Japan, it seems that gender policy needs more time to achieve effective gender-equality. Nevertheless, women have started to earn the right to speak in FCAs or in their communities through their entrepreneurship and women's group activities (Soejima and Frangoudes, 2019). It is worth noting that despite the obstacles women face in Japan, some of the younger generations belonging to the Fure-Mizu Bukai network have produced new ideas to add value to catches and have started to implement their ideas. We should observe what effects on fishing and communities their efforts will be in the near future.

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## 9. Regional Governance

### A Case Study of Government Support in Shizuoka Prefecture

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*Real-time information transmission experiment between remote markets,  
Shizuoka City Central Wholesale Market, Japan, S.Takase, 2020*

*This essay discusses the current situation and issues of the administrative support for small-scale-fisheries (SSF) being carried out in Shizuoka Prefecture, where fishery is thriving. In Shizuoka Prefecture, SSF plays an important role in the region's employment, supporting a wide variety of food cultures, and developing the unique culture of the region. Therefore, to make such SSF sustainable, appropriate management of fish resources, improvement of fish prices, appropriate measures in the distribution and consumption stages of fish are being implemented. Particularly in measures in the distribution and consumption stages of fish that have not much been carried out so far, it is important to cooperate with the tourism industry, to expand local distribution by actively utilizing ICT (Information and Communication Technology) tools, and construct a distribution system within the region. By further expanding these measures, I believe that the possibilities of SSF that are full of regional characteristics can be further enhanced.*

## Introduction

In my opinion, there are two important points in discussing administrative support for small-scale-fisheries (SSF: Fisheries take place in the coastal area using a small fishing boat) in Japan. The first is the division of roles in fishery policy between the state and prefectures. Broadly speaking, Japan's Fishery Act has a system that allows the state to permit the large-scale-fisheries (LSF: Fisheries take place at the pelagic and offshore sea using large fishing boat), while the prefectures permit and license SSF as necessary. For this reason, prefectural governments have provided much direct support (subsidies and financial systems, etc.) to SSF, also supported by the national budget. This is mainly due to the fact that SSF is region-specific, and it is better that prefectural governments that are more knowledgeable about the region take the initiative to deal with various issues related to SSF properly. Therefore,



when considering how governmental support for SSF should be, it is necessary to pay close attention to the role that prefectural governments play. The second is the value that SSF creates. SSF is considered to be much smaller in terms of fish production volume and value than LSF. In fact, in Japan, the output of SSF is only about 40% of the output of LSF (MAFF, 2020b). In Shizuoka Prefecture, the proportion of SSF is even lower, accounting for only 20 to 30% of the production of LSF (MAFF, 2020b). However, it is necessary to carefully consider whether the value produced by SSF can be evaluated solely by the production amount, or whether there is no other value to be evaluated. Based on the above, this essay discusses the current situation and issues of the administrative support for SSF being carried out in Shizuoka Prefecture, which is the epitome of Japan as a whole in the actual situation of SSF compared to LSF.

### The current situation of the fisheries of Shizuoka Prefecture and the importance of SSF promotion

Shizuoka Prefecture is one of Japan's leading areas in fishery thriving. Shizuoka Prefecture ranks fourth in Japan in terms of marine fishery production (in 2018, about 200,000 tons, MAFF, 2020b), fourth in Japan in terms of production value (in 2018, about 53 billion yen, MAFF, 2020c). As mentioned in the introduction, about 3/4 of marine fishery production in Shizuoka Prefecture comes from LSF. But in the LSF, only a few species of fish are landed (mainly bonito, tuna and mackerel). On the other hand, even though SSF in Shizuoka Prefecture accounts for only about one-fourth of the total production, a wide variety of catches is landed. Under such circumstances, the fishery administration of Shizuoka Prefecture recognizes that the administrative support for SSF is essential. In this section, I would like to discuss some of the reasons.

The first reason is the number of fishery enterprises engaged in SSF. The ratio of the number of fishery enterprises engaged in SSF in Shizuoka Prefecture is about 90% of the total (MAFF, 2020a). SSF in Shizuoka Prefecture accounts for only about 1/4 of the total production, but most of Shizuoka's

fishery enterprises engage in SSF, supporting the employment of local residents.

The second reason is the role played by various fish species landed by SSF. As mentioned above, the amount of SSF production in Shizuoka Prefecture is about 1/4 of the total, but among them, many individual fish species record one of the largest catches in the nation such as Shirasu (babu sardine: 3rd place nationwide, 2018, MAFF, 2020b), Sakura shrimp (1st place nationwide, 2018, SPFRI, 2019b), Kinmedai (red bream: 2nd place nationwide, 2018, NRIFS, 2019) or glass eel (1st place in Japan, 2018, Nihon Yosyoku Shinbun, June 15, 2019). Japan is considered to be one of the most developed countries in the world for the culture of eating fish, but it is not just about eating a large amount of fish, but about eating various types of fish. For this reason, SSF in Shizuoka Prefecture is a valuable industry that supports Japanese food culture, even if the total production amount is small.

The third reason is maintenance of cultural diversity in the region. As mentioned above, a wide variety of fish species are landed by SSF in Shizuoka Prefecture, the fish species that are landed differ greatly depending on the region. And that is what makes the region unique. For example, Shirasu is landed in the coastal region of mainly from the west to the central part of the prefecture (Enshu Nada and western and inner parts of Suruga Bay); Sakura shrimp is landed at Yui and Oigawa area (west of Suruga Bay); Kimmedai is landed at Omaezaki area (southwest of Suruga Bay), and the east coast of Izu peninsula; glass eels are landed on Lake Hamana. In this way, region-specific fish species are landed in each region. This kind of situation is linked to cultural events such as local festivals, and creates a culture unique to the region. For example, in the Inatori area (southeast side of Izu Peninsula), the Kimmedai Festival is held, and in the Yui area, the Sakura Shrimp Festival is held. The formation of such diverse cultures in the region created by SSF has enriched human society and also promoted other industries such as the tourism industry, thus producing great economic benefits for the region.

## The current situation and issues of the administrative support for SSF in Shizuoka Prefecture

As mentioned in the second section, SSF in Shizuoka Prefecture plays an important role in the region's employment, supporting a wide variety of food cultures, and developing unique culture of the region. This section describes the current situation and issues of administrative support for SSF in Shizuoka Prefecture to promote such SSF in Shizuoka Prefecture and make it a sustainable industry. What is the most important factor to make SSF sustainable? I think it is to secure workers for SSF. The reason is that, without workers, the industry cannot be established. What, then, is necessary to secure employment for SSF? I think the answer is that, at a minimum, SSF needs to be established as an industry that can earn income and maintain the livelihoods of workers, and for the purpose of attracting more workers, profitable industries will appeal to people seeking jobs. In the primary industry in Japan, including the fishery industry, if any industry is not deemed as established industry, which ensures a certain level of income, those who are currently working in that capacity have no desire to pass on to their children. In addition, new employment seekers are not attracted to an industry that cannot guarantee stable income.

### The directions of the support

Based on this basic idea, the current fishery administration in Shizuoka Prefecture is mainly engaged in support for SSF in the following directions.

(1) The first is the appropriate management of fish resources. Currently, in Shizuoka Prefecture (although there are many similar cases in other areas of Japan), a poor catch is becoming serious in many major fish species. For example, the catch of Kinmedai is less than half compared to 10 years ago (NRIFS, 2019). In addition, the catch of Shirasu in recent two years has been about 60% of the previous (SPFRI, 2019a). Furthermore, concerning Sakura shrimp, which is caught only in Suruga Bay in Japan, there has been very poor catch in recent years (SPFRI, 2019a). In this way, if the catch of the fish

species that SSF mainly aims to catch becomes very poor, SSF itself will not be viable. For this reason, it is extremely important to keep the number of fish resources above a certain level through appropriate resource management. The problem at this time is that for the fish species targeted by many SSF, including SSF in Shizuoka Prefecture, the resource surveys and resource assessments for calculating Maximum Sustainable Yield (MSY) have not been sufficiently implemented. So, I think it is important to set catch targets and implement resource management measures that are as scientific as possible, also considering the economic sustainability of SSF fishers and also important to give them sufficient explanations of how to set targets.

(2) The second is the improvement of fish prices. Increasing income earned by SSF is essential for making SSF attractive. Income is the price multiplied by the catch. Therefore, it is necessary to raise the catch, raise the price, or both in order to increase income. In most fishery administrations up to now, it was considered important how to raise the catch. However, as mentioned above, the amount of fish caught in SSF in many areas of Japan, including Shizuoka Prefecture, has continued to decline. So, I think that it is becoming extremely important to raise fish prices. The next question is how to improve fish prices. The answer to this question has often been to take steps at the production stage, such as increasing the freshness of the catch and branding the catch. Certainly, assuming that demand is constant when fisher lands his or her catch and sell that to the market broker, the price increases when the fish is fresh or has a high brand value. For this reason, even in Shizuoka Prefecture, measures for the production stage are still being implemented as one of the important measures. But in recent years, the development of refrigeration technology and freshness preservation technology has been remarkable, making it difficult to differentiate from the same kind of fish species in other producing areas, and it is becoming difficult to improve the fish price only by such measures. Therefore, I think that measures in the distribution and consumption stages of fish which I discuss next paragraph will become important.

(3) The third is appropriate measures in the distribution and consumption stages of fish. It is necessary to understand the geographical situation of

Shizuoka Prefecture to describe the measures in Shizuoka Prefecture. Shizuoka Prefecture is located in the middle of the Tokyo area and the Nagoya area, where both is a metropolitan area, and many of the fish landed by SSF are also supplied to these areas (Shizuoka Prefectural Government, 2019b). In this case, since the same kind of fish species gather from all over the country in these areas, good freshness and brand value are important in order to raise the price of fish landed in Shizuoka Prefecture. However, as described above, under the recently developed refrigeration technology and freshness preservation technology, it is necessary to satisfy the condition that the brand value becomes extremely high or the freshness is extremely good, which is considerably difficult. For this reason, the measures that Shizuoka Prefectural Government has been implementing since three years ago are to strengthen distribution and increase consumption of fish within the prefecture. In many cases, consumers (especially tourists) have a high interest in “region-specific.” Especially in the case of Shizuoka Prefecture, many tourists are visiting areas such as Izu area (Shizuoka Prefectural Government, 2019a), and it is thought that such tourists are looking for “things that can only be obtained there,” which makes it possible to set a certain high price for such consumers. The problem that must be solved at this time is the distribution route of the local fish landed by SSF. Since Shizuoka Prefecture has a large supply to metropolitan areas, it is thought that the distribution routes to the local area are limited. Perhaps, in the past, there were only local routes, but with the development of efficient distribution to metropolitan areas, the local distribution routes became inefficient and abolished. Therefore, in Shizuoka Prefecture, we are currently working on expanding the local distribution route and the local consumption of local fish to areas around landing sites and areas within the prefecture where relatively great demand can be expected.

### The essential points for implementing the measures

What, then, is necessary when implementing such measures? I think that three additional points that are important.

- (1) The first is cooperation with the tourism industry. As mentioned above,

Shizuoka Prefecture is located in the middle of the Tokyo area and the Nagoya area, and because there are nationwide tourist destinations such as the Izu area and Mt. Fuji, many tourists come from the metropolitan area. Therefore, it is extremely important to connect such tourist demand to the demand for locally landed fish. Three years ago, we were conducting business to promote fish restaurants operated by fishery cooperatives in each region, and the number of tourists visiting these restaurants has been increasing every year. A total of approximately 700,000 customers are recorded annually at the 17 restaurants in fishing ports and other locations (Shizuoka Prefectural Government, 2019c). I think that it is important to further increase the number of customers by further collaborating with tourist spots and experience facilities around the fishing port in the future.

(2) The second is the expansion of local distribution by actively utilizing ICT tools. The basic idea is to efficiently match the real needs of the broker and the actual user with local fish, each of which is a small landing volume and a large variety. Although a certain demand can be expected for locally landed fish species in local distribution, if no measures are taken, it is difficult to carry out local distribution in which the fish price is higher than distribution to metropolitan areas. Due to the fact that many of the local fish are not familiar to the general public, and landing volumes are small, if the broker or the actual user cannot know in advance when it will be landed and how many volumes will be landed, they would not know how to use it. Fortunately, this problem can be solved to some extent by using ICT tools for distribution. Specifically, by utilizing ICT tools such as Line, Twitter, Facebook, etc., the information of fishes on the fishing boat or in the fixed net on the sea before landing can be promptly sent to the broker or the actual user so that the broker and the actual user can place an order according to that information. If this way of distribution is used for local distribution, where local fish is supplied to areas where it is easy to find special value for locally landed fish, fish prices are expected to improve, and the increase in cost due to small-volume distribution can be recovered. Therefore, in Shizuoka Prefecture, from three years ago, we have been conducting a project to carry out such local distribution as a model. For example, by selling squid landed in Nishina, located in the southwestern

part of the Izu Peninsula, to a restaurant in Shizuoka City, which is a major consuming area in Shizuoka Prefecture, there are some cases where they succeed in selling at a higher price than selling to the Tokyo metropolitan area. In this case, since there are fewer intermediate distributors in local distribution, it is also important that the prices purchased by consumers be lowered than in the Tokyo metropolitan area. Regarding future issues, I think it is important to make the contents of information transmission using ICT tools more useful for brokers and actual users (like those with demands for the local fish, such as retail shops and restaurants). And for that purpose, it is necessary to work on the utilization of video, improvement of the timing of information transmission, expansion of information transmission destinations, and so on.

(3) The third is the construction of a distribution system within the region. In Shizuoka Prefecture, many fishing ports, which are bases for SSF, are located in remote areas and have poor transportation. Therefore, it is important to construct distribution routes that enable efficient distribution from such poorly accessible fishing ports to areas in the prefecture where relatively great demand can be expected. From the perspective of reducing distribution cost, it is also important that multiple fishing ports in the region work together to establish a base that collects the fish landed at each fishing port. Actually, in Shizuoka Prefecture, currently, we are working to transport fish using ferries from the west side of the Izu Peninsula to the Shizuoka City side of the Suruga Bay. As a result, distribution time and distribution cost are expected to be reduced. A future issue is how to increase the volume of transportation through this distribution route in order to reduce distribution cost further.

## Conclusion

In this essay, I have written about the significance, current situation, and issues of administrative support for SSF based on the case of Shizuoka Prefecture. I think the most important way of thinking when the government supports SSF is not to save SSF but to believe in the potential of SSF and extend it. Of course, it may be necessary to reduce the scale of SSF in some regions due

to the declining population in the coastal areas, declining the number of fish resources caught in SSF, and the demand of fish. However, as mentioned in the third section, due to the development of ICT technology, it is now possible to meet a variety of individual needs, even with a small amount of a wide range of landings. Moreover, the era has changed from the period of consuming a large number of homogeneous products to the period of recognizing diverse values and seeking products that cannot be normally obtained. Based on this, I believe that the possibilities of SSF that are full of regional characteristics can be further enhanced. I hope this essay will help to strengthen such possibilities.



### III

## Present Conditions of JSSF



## 10. Traditions and Cultures

### **A Look at the Lifestyle of Young Whitebait Fishers**

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*Drawing a net with two boats, Mochimune, Japan, T. Kobayashi, 2016*

*The purpose of this research is to explore some of the reasons why one should pay attention to the lifestyle of youngsters. The reason why this study is focused on their lifestyle is to pay attention to social factors surrounding them other than the amount of income that is generally cited as the main factor. The subjects of this research are five young whitebait fishers. We collected and discussed their stories about their occupation and leisure activities. Each young fisher has a professional pride in fishing. Whitebaiting in Mochimune operates only 130 days a year and can be done in the morning. In the afternoons, they can engage in catching sakura shrimps in Yui during that season, as well as various side jobs. Also, such spare time can be used for leisure activities that are common to various generations. Thus, it has become clear that not only the occupational pride but plenty of leisure time and rich human relations developed there have encouraged young people to join whitebait fishing.*

## Introduction

I met young whitebait fishers through a practical training investigation in which I took my students along with me. Whitebait here refers to the fry of sardines and anchovy. We heard from fishing port officials that there were many young fishers in Mochimune, and they were not so worried about the aging of society and a lack of successors. I took an interest in why young people join whitebait fishery in the Mochimune area, and I made it the purpose of this practical training investigation. In modern times, the aging and declining population of rural villages is a serious problem in a society where the population is decreasing. The human resources of the agricultural, mountain and fishing villages have flowed out in the course of the high economic growth since 1955. It has caused a so-called depopulation problem. It has been so severe that it has made it difficult to secure basic living conditions in rural areas. Even today, the national and local governments have been working on

countermeasures for depopulation, aiming to build a unique and autonomous community through the promotion of local industries and local culture.

Rural fishing villages, where a depopulation problem is occurring, have a high proportion of primary and secondary industries, which are particularly important in the local economy and employment. In order to promote settlement in local communities, so-called sixth sector industrialization, where the primary industry is developed into food processing, distribution, and sales, as well as the expansion of employment and securing of income by adding value to local resources have become another important task to accomplish. In the primary industry, the decline in the number of fishers in the fishery and the aging of fishing boats are severe. Japan boasts the sixth largest exclusive economic zone in the world, which is about 12 times its land area. Also, rich fishing grounds are formed in the waters around Japan due to the joining of nutrients and ocean currents such as Oyashio and Kuroshio. However, according to the Ministry of Fisheries, the aging rate of fishing villages is higher than that of the national average. In this study, we interviewed young fishers from the Mochimune area in Shizuoka Prefecture, which is said to have many new entrants. We tried to identify the factors that make these youngsters settle as fishers and sustain their livelihood in Mochimune, by clarifying their “lifestyle orientations,” focused on their “occupational lives” and “leisure lives.”

## The viewpoint of lifestyle

Nakayama (1998) studied the recognition of young people living in metropolitan areas concerning their desired lives in the future, using the framework of the life structure theory. He says that the important factor that determines the residence orientation for locally-oriented young people is “lifestyle,” that is, what kind of life they want to live. “Underlying this concept is the perception that living activities of a subject, which are supported by some sense of value, are conducted in a consistent style or pattern. People are guided by the desire to ‘live like this’ and select desired actions from a variety of options. By envisioning a desirable life, based on which individual actions

are selected and combined, a coherent pattern of life activities for an individual is created. It can be said that lifestyle is a concept that includes both these patterned behaviors and the element of value consciousness behind it, which resides in a different dimension.” (Nakayama, 1998)

In this research, the stories obtained through the interviews are classified into “occupational life” and “leisure life” from the viewpoint of “lifestyle.” The factors that determine why they settle in Mochimune as fishers and continue fishing are identified, based on their behavior and values from the perspective of the specific motives of individuals, that is, the world that constitutes their experiences and lives from the perspective of their “lifestyle orientation.” In this practical training, a preliminary investigation was conducted on May 13, 2016, the main investigation was conducted on June 4, 2016, and a supplementary investigation was conducted on July 9, 2016. The method of the investigation was participant observation and interviewing. Interviews were conducted with five young fishers. The story told by one of them is introduced in particular at this time. Below, I will describe it based on Ichikawa (2017) and Kobayashi (2017).

## Overview of the Mochimune area

Mochimune is a small town located at the southwestern edge of Shizuoka City (the southern part of the Nagata district in Suruga-Ku), measuring about 4.06 square km. With a population of 4501 as of 2015, it is suffering from population decline and aging like other rural fishing villages. The aging rate is 34.6%. From the fact that Japan’s aging rate is 26.7% of the total population, it can be said that the problem is serious. Mochimune Fishing Port is located on the southwestern tip of Shizuoka City, 2 km southwest of the mouth of the Abe River, which runs through the center of the city from north to south, and 2 km northeast of the Ookuzure Coast. The coastline faces Suruga Bay, and erosion by violent waves is severe. The terrain is somewhat steep near the coast but becomes gentler as it goes offshore. Due to the mild climate unparalleled to other cities, it is temperate in summer and warm in winter. The average temperature is 16 °C, with little snow on the plains. Besides, there

are many sunny days despite a large amount of precipitation, and the hours of sunlight are longer than those of other cities.

The current manager of Mochimune Fishing Port is the Fishing Port Division of the Shizuoka municipal government, and it is operated by the Shimizu Fishery Cooperative Mochimune Branch. According to an interview with one of its regular members, the Shimizu Fishery Cooperative Mochimune Branch was composed of 108 members with 38 regular members and 70 associate members as of May 13, 2016. As for the revenue, 40% of which is earned from fishers as the sales commission. Other revenues are from direct sales of whitebait, farmhouses, and whitebait huts. According to Amano (2014), other than whitebait, the types of fishing currently being operated in Mochimune are gill net fishing, bottom trawling, pole-and-line fishing (also serves as sport fishing on a boat), and skin-diving fishing from May to September for abalones and turban shells. The main seafood at the port is whitebait, which accounts for 95% of the landed fish. Many whitebait fishers are engaged in sakura shrimp fishing in Yui as well.

### A whitebait fisher Mr. A (28, male)

Mr. A (fictitious name) is a 28-year-old whitebait fisher at Mochimune Port. He lived with his family consisting of six people: his father, mother, younger sister, grandparents and himself, and both his father and grandfather were fishers. He started to board a fishing boat soon after graduating from a fisheries high school. Mr. A boards the main boat called trawler. One set of whitebait net called *ikkato* is run by four people on a trawler, two on a skiff (a boat to draw the net), and one on a carrier (a boat to find whitebait and quickly transport whitebait to the port). We asked Mr. A, “What were you interested in when you were a child?” and “How does it specifically contribute to your current job?” Mr. A replied that he had been thinking of taking over whitebaiting from his father when he was still a child. Under the influence of his father, he boarded a fishing boat as a whitebait fisher the next day after he graduated from high school. His father used to say to Mr. A, “Do whatever you want to do if you have anything you want to do.” Mr. A himself said to

his father as well as to his close fisherman friends, “I will do it (I will be a whitebait fisher).” (The explanation in the parentheses is supplemented by the author. The same applies hereafter.) Therefore, the reaction of the people around him was like “Just as expected.” When he first got on the boat, he had seasickness and often stopped the boat to throw up. In a week or so, he got used to sailing on a boat and no longer suffered seasickness. However, Mr. A said that he can still get sick on a stormy day.

We asked Mr. A some questions about present-day whitebait fishers. When I asked about the conditions to be a full-fledged fisher, Mr. A answered as follows. “The qualifications of a full-fledged fisher? Umm...difficult. Well, to be able to catch fish on my own without the help of my parent.” When his father says during whitebaiting for whitebait, “Let’s do the net (lift the net),” he tells other Noriko (crew) the length of rope to the depth of water where there is whitebait, according to the father’s instruction. Then, he helps to flow the net into the sea. It is his father’s job to find the points to catch whitebait. Mr. A assists his father on the trawler, which he boards now. In any case, he must catch whitebait to make a living. Occasionally, his boat hooks the nets of other fishing boats or collides with another boat, and they may be on the verge of fighting. “That’s what happens because we want to catch whitebait. Although we are on good terms with each other like this when (the fishing is) finished, but we are desperate once we go out (to sea).” I asked Mr. A what he is most interested in as he whitebait. “Maybe, how to catch whitebait. I don’t steer the boat yet, so I stay next to my old man to learn to steer the boat. After all, I’m following his instructions on doing this way or that way. Probably, that is my highest interest at this point. I must do it alone when I steer the boat. Like, am I capable of doing it alone? ”

Mr. A does not control the boat. Young fishers who have a fisher parent will eventually take over the boat. However, how to take over depends on the family. Some take it over as soon as he starts fishing on a boat, while others take time like Mr. A, who is on his father’s trawler and is learning how to fish whitebait step by step. He is often scolded by his father for his way of doing his job as he thinks he has a poor memory. However, he sometimes feels his occupation is exciting and challenging. “If a middleman buys the



whitebait that I caught, for a high price, praise the quality of the fish, or if the performance of mine (the boat he boards) is good, I think I want to do more.” According to Mr. A, there was a report from Shizuoka Prefectural Fisheries Research Institute that the haul of sakura shrimps was decreasing. Then he was asked to refrain from catching the shrimps. However, since whitebait fishers, including Mr. A, make a living dependent on sakura shrimp fishing, they cannot stop fishing sakura shrimps. “I mean, we can’t live if sakura shrimps disappear. We can live like other people with these two as a set. It’s OK with sakura shrimps because there is a pool system, but once we go out to sea (pointing to other fishers), it’s competition. If we lose, we’ll get none. We can’t live without sakura shrimps.” Mr. A has no other side jobs other than sakura shrimp fishing. Sometimes, he helps to process whitebait for the products to be sold at the direct sales store at Mochimune Fishing Port. His main job is to wash steaming baskets and pots in which whitebait is boiled while, on the other hand, the staff at the processing factory boils whitebait.

The pool system was introduced for sakura shrimp fishing at an early stage. It has been introduced in Mochimune as well. They say that it is introduced on a limited basis, such as when the number of those who cannot take part in whitebaiting increases because some people lose in a competition for sakura shrimp fishing, when the middlemen do not buy any more whitebait, or when a large amount of whitebait is caught regularly to avoid price drops. Mr. A replies that he is not very happy with this. “Well, it may sound greedy, but we want to ask why we can’t if we are on the side of the boat that can catch a lot. It may be good for the boat that did not perform well (in fishing), but I think the people here are not so happy.” According to Mr. A, veteran fishers are not pleased with the pool system, which reduces their share. For that reason, the pool system is rarely adopted at Mochimune Port. As for the question about whether he wants his son to take over his job as a whitebait fisher, he answers yes. “It’s a respected job. I will support him if he says he wants to do it. I will probably recommend it because I’m proud of doing it.” Mr. A is proud of his occupation as a whitebait fisher. He wishes to pass it down to the next generation. I asked Mr. A about how to spend the fishing suspension season. On a day off, he went to eat ramen noodles in the morning, then to play

with some members of the youth club (the youth association of the fishery cooperative).

Mr. A's hobbies are soaking in a hot spring and driving. He finds time to visit hot springs in the prefecture. Like him, each member of the youth club has hobbies and can spend time alone. Most of Mr. A's friends are members in their twenties and thirties, and they play doing the same things that they were doing as students. Mr. A usually spends his spare time with members of the youth club and the elderly people at the port. The main activities when he plays with young members are karaoke, bowling, fishing at a fishing pond, baseball, etc. If there are a couple of days off, he may go on a trip. Basically, he goes where people gather.

Sometimes, he plays golf with older people working at the port. Mr. A said, "Well, we get together with those faces (friends) in good terms, inviting people who do the same thing. There is one who plays golf, an older man. I also play golf myself, so I will go if he invites me. Well, it doesn't matter whether you are older or younger because there is no pecking order at this port." When I asked him about the vertical relationship, he answered as follows. "No, there is almost none (no vertical relationship). I mean, it is loose, or the horizontal relationship is strong. We have a strong sense of camaraderie. For example, if the net breaks while fishing, these fellows, including the members (on the boat), gather to help without saying a word. What I can say is that a strong sense of camaraderie exists at this port."

He feels that the vertical relationship at Mochimune Port is "loose" compared to other ports. This friendly relationship beyond generations has been pointed out by people from other ports. Mr. A feels that the vertical relationship at ports is generally strict, and this is the only port where it is "loose." When asked about when he feels it is "loose," he answered as follows. "What can I say, they usually teach me everything, gently. So it is easy to go and ask. Just teach me what I don't understand, Invite me for fishing, like 'I will go with you, so come with me.' I sometimes get advice after whitebaiting, like it might be better to do like this." Mr. A said that there is competition while fishing for whitebait. However, people are joking with each other at this port once fishing is over. Thanks to this friendly environment, they can easily

organize employee trips and camps regardless of age. There is no fishing in February and March, and the only whitebaiting is performed during the period from early June to late December. I asked him what he was doing outside of the fishing season. In February and March, he prepares tools with his father, making nets for whitebaiting. From late June, he spends most of his time playing. If he cannot catch whitebait anymore, he may end up fishing earlier and go out to have some fun. He says he has free time but does not travel often. On Sundays, he may be requested to catch whitebait from the direct sales store operated by the Mochimune Fisheries Cooperative.

### Factors behind young fishers entering whitebaiting and continuing to pursue this occupation

One of the factors for young whitebait fishers of Mochimune to continue whitebaiting is to have plenty of free time with about 130 days of whitebaiting and about 40 to 50 days sometimes about 30 days) of sakura shrimp fishing per year. The fact that even a Noriko (a crew member) without a boat can live without any inconvenience with the income from whitebaiting and sakura shrimp fishing could be a huge factor. As for “occupational life,” all five fishers interviewed have taken over the job as a fisher from their father, grandfather, or even from earlier generations. The fact that they all have a fisher father has influenced their “lifestyle” as a fisher and the “lifestyle orientation” behind it. The decision to be a whitebait fisher was triggered by the experience of helping their father with fishing and being acquainted with older fishers at the port where they often visited to play since they were children. On the other hand, there are people like Mr. B (31, male) who chose to change jobs to a whitebait fisher because the sales job at a company was unbearably hard for him. These five fishers oppose the introduction of the pool calculation system to whitebaiting at Mochimune Fishing Port. One of the opposition factors is the fear that the gambling nature of whitebait fishing will be lost. It is this nature that gives them pleasure, motivation, and a sense of purpose for whitebaiting. However, some people, including Mr. B, have the opinion that the system could be introduced regularly for the resource management of

whitebait. Another factor was the pride they have in their boats for catching whitebait more than others.

While there are those like Mr. A who is learning the fishing know-how at the side of his father to be a full-fledged fisher by taking over his father while enjoying whitebaiting, others like Mr. D (26, male) and Mr. E (28, male) are already steering a boat to search whitebait and giving directions to the crew. Also, there are those whitebait fishers who have become a steerer (boat maneuver) and go fishing while assuming the responsibility for the lives of their employees on the boat. They take pride in whitebaiting and hope to pass the occupation down to the next generation. These factors would contribute to their continuance of whitebaiting until the next generation. As for “leisure life,” apart from making nets for whitebait fishing, they can use their free time working part-time. Other than part-time jobs on land, some, like Mr. C and Mr. D, earn income by taking a boat to sea individually and catching and selling fish. This is an enjoyable side job for those who enjoy fishing as a hobby. Married whitebait fishers can spend their leisure time with their family. As for single whitebait fishers, they can call other members upon engaging in some leisure activities due to the existence of a well-developed youth association for young whitebait fishers (youth club). Having a community of the same generation that can spend leisure time together is an attractive environment for young people. It is clear from the five fishers’ stories that the people involved in whitebaiting at the Mochimune Fishing Port feel that they have a strong sense of comradeship. Understandably, the human relations with loose pecking order at the port are another factor that makes it easier for outsiders to join. From these factors, it has turned out that the five whitebait fishers continue to be a whitebait fisher at Mochimune Fishing Port to maintain the current “lifestyle” and build a better “lifestyle.” Therein, we can find their “lifestyle orientation.”

## Conclusion

The purpose of this study was to clarify the reasons why young people in Mochimune, Shizuoka Prefecture, join whitebaiting and continue fishing from the details of their motives. The stories of the Mochimune whitebait fishers were divided into “professional life” and “leisure life” to clarify the individual “lifestyle orientation.” The annual operation of whitebaiting in Mochimune is as short as 130 days a year. The daily operation may be finished in the morning, and they can engage in seasonal sakura shrimp fishing in Yui or various other side jobs in the afternoon. Not only that, but such spare time can also be used for the leisure activities that are common across generations. From these facts, it has become clear that occupational pride, the gambling nature of fishing, and plenty of leisure time and the rich human relations that have been developed from there are the factors that have made young people go whitebaiting.

## Acknowledgement

I sincerely thank all members of the fieldwork; Ichikawa, Shirai, Nishikawa, Sou, Tsunoda, Akamatsu, Moriyama, Kurita, and those from the Shimizu Fisheries Cooperative Mochimune branch, and whitebait fishers who cooperated with the interview.

# 11. Ama Divers

## Characteristics and Social Status of Women Divers in Fishing Villages

***Mai Yoshimura***

Mie University



*Ama divers, Toba city, Japan, M. Yoshimura, 2018*

*This chapter introduces Ama fishing, a form of Japanese coastal fishing. It is said to have started over 2,000 years ago and has recently been recognized as a cultural heritage and tourism attraction as well as a model for sustainable fishing. Two of the characteristics of Ama fishing are its resource management and communality. These characteristics are related to the geographical and natural conditions of the fishing villages, the nature of their catches, and the dangers associated with diving. In recent years, Ama fishing has been facing the problem of lack of successors, and to solve this problem, there is a fishing village that has started to accept migrants who are interested in Ama fishing. This approach brings new challenges to fishing villages. It is essential to understand the structural issues surrounding fishing villages as well as the relationship between coastal fisheries and fishing villages' history and culture in order to address such a problem.*

## Introduction

In this chapter, I would like to introduce Ama fishing, a form of Japanese coastal fishing. Some of the characteristics of Ama fishing are resource management and communality. It is now recognized as a cultural heritage and tourism attraction, as well as a model for sustainable fisheries. On the other hand, there are also issues related to decrease of resources and difficulties in finding successors. This chapter introduces the characteristics of Ama fishing. It also discusses its issues and prospects based on the case of the Toba-Shima region in Mie Prefecture, where there are the most Ama divers.

## What is Ama fishing?

Ama fishing is a type of fishing where female divers known as “Ama” divers dive to catch shellfish and seaweed without a tank by holding their breath. It is said to have started over 2,000 years ago. While male diving fishing is practiced around the world, it is rare for females and believed to exist only in Japan, South Korea, and Taiwan. In Japan, Ama fishing is now practiced in several areas such as the Mie, Ishikawa, Chiba, and Shizuoka prefectures. According to a survey conducted by the Toba Sea-Folk Museum, in 2010, there were 2,174 Ama divers nationwide. However, this number has been declining (Toba Sea-Folk Museum, 2010). For example, in 1949, there were 6,109 Ama divers in Mie Prefecture, but this number had dropped to 660 by 2017 (Toba Sea-Folk Museum, 2017). In Ama fishing, it is common throughout the country to hold one’s breath and dive with simple equipment, but there are some regional differences in the details. Hence, in the following paragraphs, I describe the case of Mie Prefecture, where I’m conducting my research (Yoshimura, 2019a, 2019b). Ama divers in Mie Prefecture catch abalone with an iron tool called “Iso-Nomi.” They also catch turban shells, oysters, lobsters, sea urchins, and sea cucumbers as well as seaweed. The equipment that Ama divers use has changed. In the old days, they dived without goggles while only wearing a cloth around their waist. Around 1880, goggles were introduced, followed by white cotton outfits called “Isogi” around 1910. Much later, from the 1960s, wetsuits and fins were introduced (Toba Sea-Folk Museum, 2019). In the following section, I describe two characteristics of Ama fishing.

## Resource management of Ama fishing

Most of the divers’ catches, such as abalone, have limited habitat, so if too many are caught, they will eventually disappear. Therefore, Ama divers manage their resources under restrictions. In Mie Prefecture, there are rules dictating when it is not permitted to catch abalone. The abalone spawning season is from October to November, so diving is prohibited from September 15 to December 31. During the diving season, diving hours and days are also



limited. Although the number of hours depends on the community, generally diving hours are from 1 to 3 hours per day, and diving days from 7 to 120 days per year (Toba Sea-Folk Museum, 2019). To avoid catching unspawned abalone, abalone with a shell length of 10.6 cm or shorter is prohibited. Ama divers carry a tool similar to a wooden ruler called “Sunbou,” and constantly check their sizes. In addition to individual divers checking measurements, other divers and fishery cooperative staff also monitor one another and maintain strict size controls. These strict controls mean that Ama fishing is valued as “fishing that does not overfish,” i.e., it is a sustainable practice. The background of these controls is a deep understanding of the marine environment by Ama divers. They are familiar with the seafloor topography, seaweed growth, and the distribution of abalone and other catches in their fishing grounds. If they notice that they have caught too much abalone in one place, they may return several of them back to their original places. One Ama diver told me that when she returned them, she would say, “See you next year.” It was interesting for me to realize that some Ama divers develop that kind of emotional attachment to abalone. Knowledge of the marine environment is not widely shared among people other than Ama divers. To improve resource management and the marine environment, I believe it is important to share the knowledge of Ama divers with government and researchers and to reflect the divers’ voice in policy decisions.

### The communality of Ama fishing

For Ama divers, holding their breath while diving poses a danger to their lives. To reduce this risk, they maintain high communality, so while they essentially fish alone, they go out to the sea in small groups. These small groups are often called “Kamado,” which is another name for Ama huts used by Ama divers before and after diving. The Ama huts are used by the women to warm themselves by setting up a bonfire, changing of clothes, and eating. Women who have just started diving choose a hut with the help of their mothers, mothers-in-law, or friends who have already been diving and have been there for their lifetime. Ama divers often describe their “Kamado” fellows as being

“connected more tightly than our family.” Even when there is no diving, they gather in the huts and enjoy chatting, and when diving, they always monitor one another closely to ensure that they are not in danger. What is interesting is that although they get along well, there is also a rivalry in diving. In addition, there is a mutual monitoring function for resource management, which is already described in the previous section.

Their relationship also has a function outside of diving. For example, if someone is unable to dive due to ill health, other members may visit her house, and they also often share groceries with each other. With such close communication in everyday life, they are able to maintain their social relationships in the community. However, this communality has also led to the secluded nature of Ama diving. In Japan, to enter coastal fisheries, it is necessary to become a local fishery cooperative member. Furthermore, in the case of Ama diving, it is also necessary to gain permission from the local Ama divers and belong to a certain “Kamado.” This rule makes it difficult for potential Ama divers outside the fishing villages to enter the community. However, as I describe later on, in recent years, administrative measures have reduced these barriers of entry, though I must emphasize that this barrier was rationally set up to protect both Ama divers’ lives and the limited resources. When we change their rules, it is important that this point is carefully considered.

## Geographical and natural background of Ama fishing

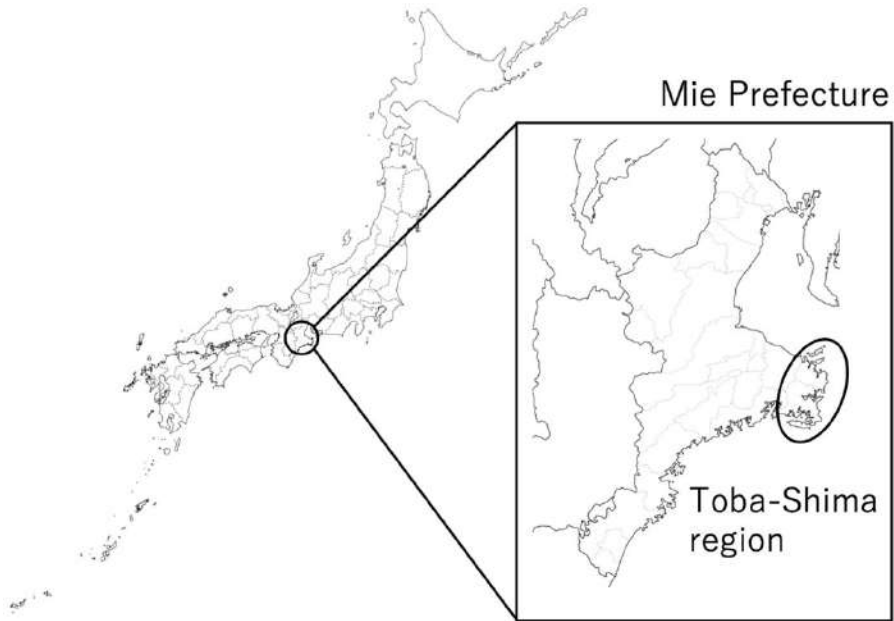


Figure 1. Location of Toba-Shima Region

Why does Ama fishing have such characteristics? It is influenced by the geographical and natural conditions of the fishing villages in the Toba-Shima region. Fishing villages in the Toba-Shima region are on the mainland and four islands (Figure 1). The mainland is along the Rias coast, with mountains behind it. Residential land and farming fields are limited due to the small area of land on both the mainland and the islands. It is far from the urban area, and until the 1970s, roads and sea routes were not well developed, so there was little opportunity to work outside the fishing villages; thus, many residents made a living through fishing. Because those born in the fishing villages lived together on the same land and used limited resources in the same sea, it is probable that this is how resource management and communality developed (Makino, 1994).

## Social status of Ama fishing in fishing villages

Ama fishing is an essential element that consists of the social structure and culture of fishing villages. In terms of livelihood, it has been part of the social division of labor between males and females. In the Toba-Shima region, the exercise of fishery rights is permitted on a household basis. For this reason, in fishing villages, husbands usually work in coastal fisheries while their wives have been Ama divers. As Ama fishing requires only simple equipment and low initial investment, it is easy for women born in fishing villages to start so as to gain high economic benefits. I would like to add that there are only a few Ama divers who specialize in diving because time and days are limited. Ama divers also work on farming fields, help at their husbands' coastal fisheries, and do housework and childcare. In recent years, some young divers have also engaged in freelance work when they are not diving. Ama fishing is an important part of the culture of fishing villages, many of which have ritual festivals that pray for a good harvest and maritime safety. In the case of one fishing village, after praying to God, Ama divers with white "Isogi" gather at the shore and start a race to hunt for one set of male and female abalone. The Ama, who catches the first set, is recognized as the head of Ama divers for a year. Abalone taken by her is offered to shrine, such as "Maneki Awabi (Welcome abalone)." This is one of the biggest festivals in the fishing villages and the reason that many tourists visit there.

## Issues and prospects of Ama fishing

One of the major issues is the lack of successors. I am interested in this issue and exploring the conditions for successors to join. As mentioned previously, the number of Ama divers in the Mie Prefecture has fallen dramatically from 6,109 in 1949, to 660 in 2017, a situation reflected throughout Japan. The background of this decrease is social changes that have come about in fishing villages (Tsukamoto, 2019). When there was poor access to urban areas, those born in fishing villages lived their whole lives there. However, since the 1970s, as access such as roads has improved, people in fishing villages began to move

away to work and live outside. Women increasingly chose to be company employees rather than Ama divers. I heard many elderly Ama divers saying something like, “I do not want my children to have the same hardships. I am glad that they can get a job in an urban area.”

In response to this issue, Toba City has introduced a policy to promote migration from urban areas to fishing villages. The city uses the system of the Ministry of Internal Affairs and Communications called “Local Vitalization Cooperator” to support the migration of urban women who want to become divers. So far, three women have migrated from the Kanto region, one of whom has been working as an Ama diver for more than four years, while another started diving last year. The third has just migrated, so has not yet dived, but is focusing on creating a good relationship with residents. I also observed that issues had been created in the local community that accepted migrants. At first, there were many Ama divers who did not want strangers to participate in this life-threatening diving. There is a gap in perception between the elderly Ama, who had no choice but to dive in order to survive in this area, and the young women who saw diving as a challenge in search of their own way of working and living. This gap is related to resource management and communality, as mentioned above. Elderly divers said they were worried about sharing the limited resources, which they had conserved for a long time, with migrants seen as “outsiders,” and they were reluctant to dive with migrants in whom they did not have enough trust. Therefore, the issue we have to consider is how to rebuild local communality with migrants.

In addition, as mentioned above, Ama fishing has a limit of time and days, so it is assumed that the migrants have other jobs. However, with the declining birthrate and aging of fishing villages as well as a decline in the number of fishers nationwide, there are few jobs left for young people there. In recent years, abalone and seaweed are said to have been in rapid decline, so the future of income from Ama diving is uncertain. Therefore, in order to increase the number of Ama, policymakers and migrants need first to understand the history and customs of fishing villages and Ama divers so as to avoid breaking the social relations in fishing villages. Similarly, it is important for the inhabitants of the fishing village to understand the social background and

characteristics of the migrants. In addition to merely increasing the number of Ama, it is indispensable to promote coastal fisheries and Ama fishing as a whole, increase the production of marine resources, and develop an industrial base that includes non-fishing industries.

## Conclusion

This chapter introduces the characteristics of Ama fishing, a form of Japanese coastal fishing, based on the social structure of fishing villages. Although Ama fishing methods suggest sustainable coastal fisheries, the shortage of successors reflects the structural problems in fishing villages. As the outflow of the population from fishing villages continues, external interventions such as the “Local Vitalization Cooperator” may be inevitable for the promotion of fishing villages. What I want to emphasize is that Ama fishing is deeply related to the local geographic and natural conditions, historical background, and social relationships. To increase the successors of Ama, we first need to understand these relationships and consider appropriate measures to overcome obstacles. To this end, I will continue walking in the fishing villages and listening to the voices of Ama and fishers.

## 12. Small-Scale Whaling

### Current Status and Future Challenges of Small-Scale Whaling

***Shio Segi***

Konan Women's University



*Drive hunting for striped dolphins in Taiji, Wakayama, Shio Segi, 2020*

*While small-scale whaling has long been practiced in many coastal villages in Japan, rapid development was seen in the last 150 years. Since its rise, small-scale whaling has provided food, employment and entertainment intricately linked with people's lives in the whaling areas and beyond. This chapter provides a general overview of the history and current status of small-scale whaling, namely the drive hunt, harpoon hunt, and Small Type Coastal Whaling. In doing so, it describes the origin, development process, and recent conditions of each type of whaling. The chapter concludes with the future challenges and prospects of small-scale whaling.*

## Introduction

Whaling has been one of the most controversial topics in the realm of marine resource use for decades worldwide. Japan has always been at the center of this controversy, and it has sparked tension with its Western allies through the prolonged and formidable debates at the International Whaling Commission. Amid these controversies, the lives of small-scale whale hunters have been upended by pro- and anti-whaling narratives and policies thereof. This chapter gives a brief overview of small-scale whaling in Japan – the history, current status, and future challenges. Small-scale whaling in this chapter refers to whaling activities with less than 40-ton boats in coastal waters. This includes the Japanese legal classification of Small Type Coastal Whaling (STCW), which is administered by the Japan Fisheries Agency (JFA), and “dolphin fisheries,” which include the drive hunt and the harpoon hunt. The latter ones are administrated by each prefecture through licensing individual hunters and organizations. “Dolphin” in this context refers to a range of small-toothed whale species less than 4m in size. In both cases, the quota for different species is determined by whaling types by the JFA.



## Drive hunting

Hunting of small-toothed cetaceans has a long history in Japan. There have been harpoons excavated with dolphin bones from the ancient shell-mounds found in different parts of Japan. In the Mawaki Site (Map 1), for example, bones of a few hundred small-toothed whales were excavated, which indicates that people may have already driven the dolphins to the bay to hunt 5,000 to 6,000 years ago (Hiraguchi, 1993). This technique, now called drive hunting, became prevalent in coastal villages by the 17<sup>th</sup> century. The historical archives show the permitted locations and times of hunting, hunting methods by species, cutting and cleaning of the meat, and sharing systems among the workers, community members, and administrators (Nakamura, 2017). The original method was to hunt dolphins which happened to come into the bay, but this later became more elaborate by hunters actively searching for a pod of dolphins in offshore waters and driving them into the bay (*ibid.*).

In the post-war period, drive hunting became a vital industry to provide animal protein to the local food market, but the demand for the meat kept decreasing due to improving food production systems, and dolphin hunting became an unviable livelihood in many places (Nakamura, 2017). Currently, there are only two prefectures of Shizuoka and Wakayama issuing the license, with quotas for nine species. The drive hunting in Shizuoka was interrupted from 2004 due to protests by environmental activists. It was resumed in the 2019 season for the live trade of dolphins; however, this yielded no catch (Asahi Shimbun, 2020). This means that presently, Wakayama is the only prefecture where active drive hunting continues. Present-day drive hunting involves a group of boats (generally < 10t) which coordinate to surround the dolphins and collaboratively drive them to a cove. This is done by making noise with a metal tube and hammer extended down to the water.

The small town of Taiji in Wakayama is the only place in the country where drive hunting has been actively continued until now. Taiji was the birthplace in the 17<sup>th</sup> century of the sophisticated and highly organized net whaling technique, which involved over 1,000 people in catching large whales (Morita, 1994). Drive hunting was originally practiced as a supplementary livelihood

during the low season of the net whaling and mainly targeted short-finned pilot whales (Hamanaka, 1979). However, after the abrupt end of the net whaling in Taiji in 1878 due to a tragic accident, drive hunting became a more substantial livelihood for those who survived the tragedy. After the post-war whale meat boom, drive hunting also decreased its operation due to the rise of pelagic and coastal whaling elsewhere and the subsequent fall in the price of the lower-quality small-whale meat (Endo, 2011). However, by the 1970s, the drop in catch from large-scale whaling due to overexploitation of greater whales brought the price of small-whale meat up again. Around the same time, drive hunting also regained its popularity among local hunters due to the live trade of dolphins for aquariums (ibid.).

By the late 1980s, the rise in popularity of drive hunting in Taiji led to the creation of a separate association for drive hunters (*Isana Kumiai*) within the Taiji FCA, which autonomously decides the details of hunting (Endo, 2011). As of March 2020, there are twenty-two members of the association and twelve two-man boats are registered. The hunting season is from September until April and hunters travel 10 to 15 miles offshore, but it generally ends before February. During the off-season, many hunters engage in trawling, stick-held dip net fishing, dive fishing, Small Type Coastal Whaling, and other non-fishing related work. Due to the collaborative nature of the method, the catch is equally shared among the boats (Nakamura, 2017: 164).

The economic condition of drive hunting today is not particularly healthy. The size of the catch has been in a downward trend. The most recent publicly available statistics show that the catch has decreased by over half in 18 years, amounting to 894 individuals in 2018, and the overall fulfillment rate of the quota has been around 50% in recent years. This is in part because of the downward trend of the meat price and the increase in operational costs, which have both negatively affected the business (Endo, 2011). The low price of meat has led hunters to limit the number of boats participating in the hunt by not replacing retired boats in an effort to avoid the excessive supply of meat and maintain an acceptable price level (ibid.). The same approach is taken with live dolphin capture.

Furthermore, Taiji, being the epicenter of anti-whaling campaigns, has

been heavily impacted by public outcry around the world. Taiji's drive hunt was featured in the so-called documentary film, *The Cove*, and since its popularization, the small town has attracted environmental activists who protest against and obstruct the hunting, and monitor and at times verbally abuse the hunters. Heightened global criticism of Taiji's drive hunt led the World Aquarium and Zoos Association to demand the Japanese Aquarium and Zoos Association (JAZA) to ensure its constituting zoos and aquariums not to purchase live dolphins from Taiji or risk losing its membership. As the membership is vital for collaboration in research and other partnerships, JAZA conceded and in 2015 passed a decision not to allow its members to purchase live dolphins hunted in Taiji. This has limited the relatively lucrative live dolphin trade there.

These difficulties are somewhat mediated by the building of alliances with other actors. For example, finding a pod of whales can be facilitated through collaborative relations with whale watching operators based in the vicinity of Taiji. Drive hunters and whale watching operators, who often have whale hunting experience, exchange spotting information on whales (Segi, 2003).



*Map 1. Locations of whaling related areas*

## Harpoon hunting

Another method of “dolphin fisheries” is harpoon hunting, which has been practiced in the coastal waters of 7 prefectures in Japan. This hunting method involves a one-man boat with a hunter standing on the bow using a hand-held harpoon, or crossbow in the case of Okinawa, with or without an electrocuting device to hunt the target. It is more commonly practiced in the northern part of the country, where species such as Dall’s porpoise, which usually swim

along with the offshore current, are more abundant (Nakamura, 2017: 58–168). The overall catch from this method is highest in Iwate, where large numbers of Dall's porpoise and True's porpoise have been hunted since the early 20<sup>th</sup> century. The hunting season there is from November until April in offshore waters. Hunters then shift their hunting grounds following the migrating route of the target to the waters off the eastern shore of Hokkaido from May to June, then off its northern shore from September to October (JFA & FRA, 2020).

While the harpoon hunt in Iwate peaked with 40,367 porpoises in 1989, the catch has been experiencing a considerable drop in recent years (JFA & FRA, 2020). Despite the fact that 14,696 porpoises were hunted in Iwate alone in 2000, the catch in the same prefecture dropped to 864 porpoises in 2018. Likewise, harpoon hunting has been progressively downsizing in other areas. In Wakayama, for example, harpoon hunting yielded only 13 dolphins in 2018, which is less than 5% of the amount in 2004, leading many harpoon hunters to stop hunting.

## Small type coastal whaling (STCW)

STCW is a type of whaling employing around 40-ton boats with harpoon guns to target Baird's beaked whale, short-finned pilot whale, false killer whale, and minke whale at the present time. The prototype of STCW emerged in the Boso Peninsula, Chiba Prefecture, at the turn of the 20<sup>th</sup> century with a sailboat equipped with a Norwegian harpoon gun (Ishikawa, 2019: 130). Around the same time, a similar whaling boat was constructed in Taiji after the aforementioned accident of 1878. With the long history of catching short-finned pilot whales in the area, like the case of drive hunting, the remaining hunters started whaling with a small boat with 5 to 7 men on board, which was later equipped with a harpoon gun (Akimichi et al., 1988: 13–14). In the early 1930s, a 6.25-ton whaling boat was constructed in Taiji and was later transferred to another whaling town, Ayukawa, Miyagi Prefecture, where a Norwegian harpoon gun was attached to hunt minke whales (Kalland & Moeran, 1992: 60). With modifications, this set the basis for modern STCW

targeting minke whale and small toothed whales (*ibid.*). In 1943, the number of STCW reached 45 (Akimichi et al., 1988), and it was continued during the war to alleviate worsening food security.

The business of STCW has experienced twists and turns. In the post-war period, like other whaling types, STCW expanded due to higher demand for meat, marking 86 boats registered in 1947 (Kalland & Moeran, 1992: 61). This was followed by a downturn shortly after due to stiff competition with larger-scale whaling, which targeted larger and more commercially valuable species such as fin whale, sei whale, and sperm whale for meat and oil. With the falling profitability of STCW, the government intervened to reduce the over-supply of boats, and by 1967 the number of STCW had dramatically decreased to 10 (Akimichi et al., 1988). However, the profitability picked up again when the supply of meat from large cetaceans decreased due to over-exploitation and tightening IWC regulations over those species. The value of minke whale meat rapidly increased until the moratorium on commercial whaling of large cetaceans, including the said whale in 1988 (Ishikawa, 2019: 141-144). After that time, STCW continued hunting small cetaceans, but the meat price started to fall due to the fact that research whaling provided a large quantity of more commercially valuable meat to the market (*ibid.*: 142-146).

To counter this, the Japanese government decided to include STCW in research whaling operations targeting minke whale in coastal waters from 2002. There are now 5 STCW boats in operation and this number has not changed since 2004. These boats are based in Abashiri, Ayukawa, Wada, and Taiji. Until the end of the 2018 season, all five STCW boats engaged in research whaling in April in the waters off Ayukawa, then to Hachinohe in May, and Abashiri in June. They then moved to individual waters to commercially hunt Baird's beaked whale in July and August, then to Kushiro to resume research whaling. The whaling was paused from November to March. With the government's progressive expansion of the research hunt, the STCW business was largely supplemented by government subsidies for chartering boats. It is believed that STCW was so heavily dependent on research whaling that commercial whaling, which was their primary business, was indeed no longer viable for autonomous and sustainable operation (Ishikawa, 2019: 146-148).

However, STCW boats are now only engaged in commercial whaling. After 68 years of membership in the International Whaling Commission and decades of unsuccessful negotiations to resume commercial whaling of large cetaceans, Japan announced its withdrawal from the ICRW (International Convention for the Regulation of Whaling) in December 2018. Japan resumed commercial whaling from July 2019 only within its territorial waters and the Exclusive Economic Zone (EEZ), unlike previous research whaling, which included waters in the South Pacific and Antarctic Region (JFA, 2019b). In the 2019 season, STCW was allocated a quota of 42 minke whales. Three months after the last research whaling and after a 31-year pause in commercial whaling, STCW boats recommenced commercial whaling for minke whale offshore at Kushiro in July, September, and October, which yielded 33 catches (JFA, 2019a). Like during the research whaling period, STCW engaged in hunting Baird's beaked whale in July and August. For the 2020 season, STCW was given the quota of 100 minke whales for commercial whaling, which appears to be a substantial increase compared to the number for the previous year. However, considering the net quota for both commercial and research whaling of minke whale totaled 121 in 2019 (The Institute of Cetacean Research, n.d.), it is essentially a significant decrease. In fact, the commercial catch of STCW has been in a declining trend (Figure 1). Apart from Baird's beaked whales being constantly caught at a substantial level, there is a significant drop in the catch of short-finned pilot whale. Indeed, there is virtually no catch of short-finned pilot whale (northern form) and false killer whale recorded since 2008.

Non-commercial distribution of the whale meat from STCW within the community has cultural significance in whaling towns (Akimichi et al., 1988; Kalland & Moeran, 1992). The meat is shared during daily interactions and rituals with family members, friends, co-workers, and neighbours. It is not uncommon that the shared meat is redistributed to others, which allows the meat to reach a wide range of people. The sharing practices are reciprocated with other goods or services to smooth and strengthen social relations among members of the communities. However, these practices are also subject to change. In Taiji, according to a whaling manager, after an STCW boat was

purchased by the FCA, crew members refrained from sharing the meat at their discretion as they felt it was unfair to share something which was caught with a communally owned boat.

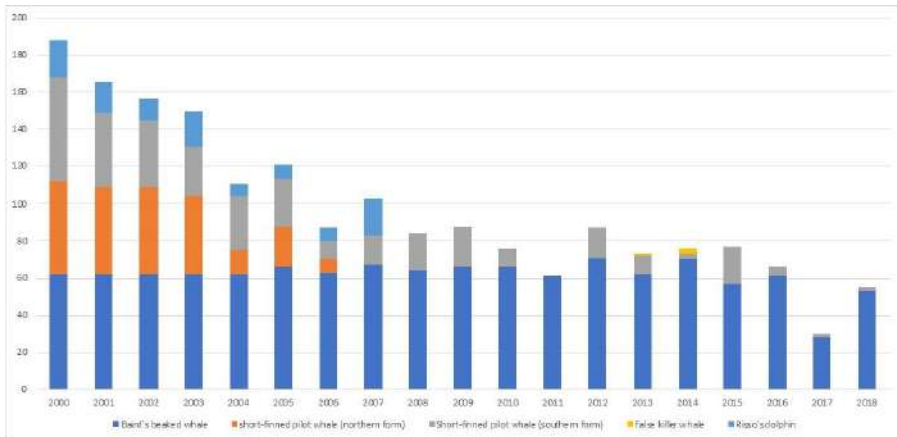


Figure 1. Commercial Catch of the Small Type Coastal Whaling (STCW) in Japan, 2000–2018. (Sources: JFA and FRA, 2016, 2017, 2018, 2019, 2020)

## Future challenges and conclusion

Japanese small-scale whaling is facing several difficult challenges. First and foremost, the continuity of the industry is a serious concern. The recommencement of commercial whaling for large cetaceans opens up new possibilities to improve the business but also a big challenge ahead. The end of research whaling means that the STCW industry is required to be financially viable to sustain its own businesses. While the government continues to provide subsidies to STCW for the transition period, the expectation is that the STCW industry will find a way to secure its economic viability and become autonomous. This is going to become even more challenging as it is becoming harder for hunters to catch their main commercial species of minke whale and Baird's beaked whale over the years, potentially due to decreasing stocks.

There is also a sense of hope: An STCW stakeholder stated his hope to



increase the meat price by swift processing immediately after the catch so that they can provide fresher and tastier meat to the market. Also, without the research whaling constraint of non-selective catch, STCW boats can selectively catch more commercially valuable individuals to improve their profitability. However, an increased quantity of minke whale meat on the market may have a negative effect on drive hunters and harpoon hunters, as was the case in the past.

Secondly, because of low profitability and uncertainty in its future, securing successors to their whaling has been a common problem among small-scale whale hunters. In Taiji, finding a new crew for the drive hunt is not easy and at least some hunters show their hesitation to bring their children into the industry for its seemingly grim prospects. This also poses a grave concern for passing down hunting techniques and local ecological knowledge to the next generations. This concern indeed drove the aged ex-hunters in Futo to revive the hunting practice after 15 years (Asahi Shimbun, 2020).

Thirdly, anti-whaling campaigns continue to make hunting activities more difficult. With the intensification of the campaign after Taiji became the epicenter, the small town has become an ideological battlefield of environmental activists and right-wing activists, and an increased number of police officers monitoring both sides. Amid the controversy, whale hunters have been forced to alter their processes of hunting and processing and invest in facilities to protect their equipment from intruders and vandalism.

All in all, the future of small-scale whaling is not rosy. Yet, be it related to a sense of nationalism or concern for cultural continuity, there is a strong desire among hunters and their community members to maintain their whaling practices, which are embedded within thousands of people's lives. Time can only tell whether the recommencement of commercial whaling for large cetaceans will revive the small-scale whaling industry or not.

## 13. Fishing Safety

### **Fishery Safety Systems for Better Livelihoods**

***Natsuko Miki***

Japan Fisheries Research & Education Agency



*Ama fishery women, Iki Island, Nagasaki, Japan, N. Miki, 2006*

*Research into fishery safety systems in Japan has mostly been carried out as part of the investigation into fishery labor science. The Institute for the Science of Labor and the Institute for the Science of Maritime Labor has been central to this research. Their focus has been deep-sea/offshore fisheries, rather than coastal fisheries; however, Teraoka Gitou, who was involved in the establishment of the Institute for the Science of Labor, addressed mostly coastal fisheries, including the Ama, in his own research, while incorporating a fishery-safety perspective. The fishery safety systems of small-scale fisheries, including the Ama, which had initially attracted the interest of labor-science researchers, are included in the social customs of fishing communities. The mutual-aid approach to shipwrecks and the establishment of practices by fishing associations have been subjects of labor negotiations and group work, as well as information sharing through ship operations at sea.*

## Review of research into fishery safety systems in small-scale fisheries

Research into fishery safety systems (hereafter “safety systems”) in Japan has mainly been carried out by the Institute for the Science of Labor. The core of that research has been done by the Institute for the Science of Maritime Labor (Ohashi et al., 2009) (hereafter “maritime labor institute”), which was founded in 1966; it had started off as the Division of Maritime Labor Research in 1946, and later split from it. It was dissolved at the end of 2006, 40 years after its founding. In its early days, the maritime labor institute’s main topics of research were the shipping industry (international and domestic sea freight) and fisheries. At the time of its founding, the focus within fisheries was not so much on coastal fisheries as on deep-sea/offshore fisheries. Nevertheless, Teraoka Gitou, the long-serving director of the Institute for the Science of Labor who was involved in its founding, had always prioritized coastal fisheries

in his research. His earliest work was in 1927 in Shima, Mie Prefecture, studying the Ama; after the war, he conducted a shipboard study of the working and living conditions of and free time for trawlers in the South China Sea (Teruoka et al., 1950a).

For a comparative study of set net fishing methods, he conducted on-site investigations into performing the activity with a bent posture in Ajiro, Shizuoka Prefecture, and an erect posture in Himi, Toyama Prefecture (Teruoka et al., 1950b), (Teruoka et al., 1950c). Gitto's research extended well beyond fishing to shipboard environments, health management of ships' crews, nutrition while at sea, and even methods for storing provisions, leaving no stone unturned, as reported by Iwasaki Shigeno, who accompanied him for the fieldwork (Iwasaki, 1967). Shigeno also studied the Ama and the women of coastal fishing communities extensively, leaving behind a considerable body of research (Iwasaki, 1968, 1970, 1971, 1972, 1974). This work—the foundation for labor-science research at the two institutes—is what helps us understand small-scale fisheries. In the 1960s and '70s, when Japan's deep-sea fisheries were expanding, labor-science research focused more on them, but in the 1980s and since, with their operations scaled-down, coastal fisheries have assumed a more important position, research-wise. One can cite research into labor incidents in small-scale angling as an example of this, in addition to research by the small-scale fisheries department at the maritime labor institute (Miwa, 1988).

## Fishery safety and daily life in small-scale fisheries

A key feature of communities engaged in small-scale fishing is that their work and everyday life are inextricably linked, in terms of space, labor, and interpersonal relationships. As such, we need to consider the safety systems not only with respect to maritime and fishing ports but also daily life. What made me realize this were my fact-finding surveys of families of children receiving scholarships on account of their parent/s being lost at sea. Hence, I hope that this essay is interpreted expansively as an exploration of the safety systems, particularly with respect to fishing communities' everyday life.

## How fishing communities respond to the risk of shipwrecks: from a survey of families with children of fisherfolk lost at sea receiving scholarships

The scholarship fund for children of fisherfolk lost due to shipwrecks (hereon referred to as Ikueikai, its Japanese nickname), an organization that gives educational loans and grants, was established in October 1970. My survey of families receiving Ikueikai scholarships focused mainly on deep-sea fisheries, but I also visited fishing districts practicing small-scale fishing. Fisheries have always faced a high risk of shipwreck; in the 1960s, when due consideration was not given to safety, shipwrecks in deep-sea fisheries were numerous—in 1961, 1963, and 1965, at least 500 people died or went missing (Japan Fishery Agency, 1972).

Even before Ikueikai existed, mutual-aid relationships developed among fishing communities following a shipwreck. While these communities have always had mutual-aid societies and relationships, the latter forged in such difficult times have been particularly strong. In many of these communities, after a shipwreck, all fishers in the area would stop fishing and conduct a search. Onshore, women in particular (either as members of the women's auxiliaries of fishing cooperatives or others) would support the fishers part of the search parties by providing them food. In other words, entire regions united in the event of a shipwreck.

In the 1960s, before life insurance programs were fully in place, the bereaved families of men or women lost at sea received trivial compensation amounts, and when women were left as heads of households, they had no choice but to work for low wages. Depending on the region, one way these mutual-aid relationships were revealed was the surviving spouse being given priority for jobs in the region—fishing cooperatives would employ him/her. These relationships also extended outside regions: the fishers' auxiliaries held programs that organizationally supported scholarships for children of those lost at sea, which led to the establishment of Ikueikai. This was spurred on in large part by the Agrihan incident of October 1965—Agrihan Island,

a part of the Northern Mariana Islands, was where seven vessels fishing for bonitos got lost during a typhoon, resulting in 208 deaths. In theory, the danger of shipwreck is the same for all fishing communities, and because the loss of income often left the bereaved family in dire circumstances, the women responded by organizing fundraisers and donations to provide assistance to the children; this snowballed into a national movement. In 1969, a national conference for supporting such children was organized, which is when the movement began making real progress. At the time, the movement was revolutionary, and as a grassroots action to support those children psychologically and economically, it also caught the public's attention. The efforts thus intensified, leading to the establishment of Ikueikai (JF Zengyoren Women's Group Liaison Committee, 1999).

What the results of my studies of families of those lost at sea showed is that, as the life insurance program was set up, the amounts paid for the death of the men increased, gradually reducing the families' economic challenges. However, the fishers engaged in small-scale fishing were not covered under this, and their insurance payouts tended to be low (Miki, 2001). It can, hence, be said that the aforementioned mutual-aid relationships made up for this. Nonetheless, there were several instances of bereaved families moving out of their region to avoid the intrusion that was a side effect of such close relationships. It has been nearly 12 years since I completed my study of Ikueikai families, and I have since had the chance to visit the places I studied. What impressed me deeply on these visits was finding out that the son of a fisher lost in the shipwreck, who had been in primary school at the time of my study, had become a fisher himself upon graduating, instead of avoiding the sea. This was a household that had already lost two men in the same shipwreck. Typically, the young wife of a fisher who has died thus faces a hard life living in the same house with her in-laws, often alienated. In this case, however, the wife and the mother-in-law, both of whom had lost their husbands to the sea, continued to live in harmony. The wife was hired by the local fishing cooperative and supported by the region.

## Fishery safety for the Ama

I have already touched upon the fact that the Ama was studied by both Gitou and Shigeno, who can be regarded as the earliest researchers of the safety systems for small-scale fisheries. An Ama's work is different from fishing while in a boat; it is diving to catch fish, for which they have to hold their breath for long periods. Thus, their lives and livelihoods are uniquely connected—the risk of death is higher for them as they can get stuck underwater sometimes and are unable to free themselves to surface in time. An Ama's work patterns can be classified into three—group operations aboard a boat: several Ama will ride out in a boat as a group to dive; couples operations: a husband and wife will go fishing as a unit, with the former as the boatman and the latter as the diver; and fishing from land, which is practiced in relatively shallow coastal regions. In the first pattern, there may be some rivalry among the women in the group over their catches, but they are still colleagues and organized as a team. While the boatman would, of course, be constantly checking on them, the Ama themselves would also be looking out for each other—they would simultaneously be keeping an eye on who got the biggest catch, and thus earned the bragging rights as is one. Because of the importance of safety in the work of the Ama, they put considerable energy into maintaining their physical health while working, including frequent doctor visits (Miki, 1991). Shigeno's study of the Ama extended beyond their actual work in the water to encompass their lives on land, as well as the lives of women in fishing communities in general.

## Solitary work in small-scale fisheries and fishery safety

At the time when it was relatively common for fishing operations to pass from father to son, it was also common for maritime workers to work together—as a father-son duo or two men. However, as fewer and fewer fishing operations were passed from father to son, and as the technological revolution lightened the burden of maritime work, sometimes fishers went to sea with their spouses (Kase, 1988). In contrast to father-son operations,

where the goal was to increase the value of the catch beyond what each would have netted individually, the husband-wife operations aimed to make shipboard operations more efficient through catch selection, etc., and increase safety. Since the early 1970s, regional labor markets have expanded, and as more women from fishing families have sought work outside the family business, the number of fishers operating solo has increased. The increasing average age of fishers and the growing number of one-person operations have caused some to hypothesize a rise in the number of small-scale fishing incidents. However, as mentioned earlier, research has focused on work-related injuries by anglers.

### Social customs in fishing communities, and fishery safety systems

If we imagine a fixed volume of aquatic resources, the decreasing number of fishers would mean larger pieces of the pie for the ones who are left, which should be viewed positively. In reality, however, regional fishing cooperatives have reached the point in recent years where it is difficult to find the minimum number of members needed to sustain themselves as organizations, thus making the dwindling number of fishers a cause for concern. We can view the following as case studies in what fishing organizations are doing in response. First, they are deciding when fishers can set out and how long they can work for, including whether they can work on a given day. This has been implemented in many fishing areas (Kawashima, 2019). These decisions are made not solely from a resource-management perspective but also from a safety one. The officers are constantly facing the question of how to be fair and equal to each fisher. The second involves the social customs of labor exchange and shared work by fishing organizations. These, too, can be seen in most fishing communities. For example, even after a ship finishes unloading its catch at the port, none of its crew go home until the last vessel has finished doing this. In many fishing communities, they also help each other in the tasks on land, such as fixing nets and processing catches. Perhaps counterintuitively, this mutual assistance can be seen even with big catches. This is not just a matter of technology but also of social custom; it can be seen as a way to



maintain fishery safety in the region. The third is information sharing by fleet organizations when at sea. Ships of a fleet share information about the shoals of fish, ocean conditions, and so on, which makes finding fishing grounds easier and strengthens the safety systems. It is not yet clear how the revised Fisheries Act and other recent policy reforms aimed at increasing efficiency will change the safety systems that are embedded in social customs. It is something that should be monitored as the situation develops.

## Fishery safety systems, today and tomorrow

Since October 2018, wearing life jackets at sea has been mandatory—fishers’ auxiliaries have held frequent classes on how to wear them correctly. As life jackets have gotten lighter and easier to wear, attitudes toward them have changed, and objections reduced, greatly improving the safety of maritime work. The number of incidents, too, has dipped. As I mentioned previously, this trend can be seen among Ikueikai families: as deep-sea fishing decreases and the average age of fishing crews increases, fewer fishers with young children are involved in incidents; improvement of the safety systems has further pushed this number down. That said, coastal fisheries have been assuming a more prominent position in the safety systems.

The following will be issued vis-à-vis the safety systems’ future. First is their relationship with technology and software. Technology for fishery safety is advancing and fishing equipment is getting more sophisticated; this will contribute greatly to overall safety in fisheries. It must, however, be noted that safety in small-scale fisheries is, in many cases, not just a matter of technology but also of social custom. Hence, in fishing communities, it will be important for fishers to share skills related to technology and how to use it better. There are numerous cases where to shorten working hours and preserve freshness, and catches are processed on the ship itself. Furthermore, it will be important to view fishery safety not only vis-à-vis ship-based work but also shore-based work, and as related technologies ensure this, there may be a need to extend the safety systems as part of fishing community culture as well. Moreover, in recent years, there has been a growing trend, not so much

with deep-sea fisheries as with small-scale fisheries, of tech interns coming to Japan to learn. It will be important to communicate with them and include them in the safety systems that are part of social customs.

The relationship between the safety systems and fishing community societies is highly interesting. Fisheries are not merely diverse in terms of their coastal, deep-sea, and aquaculture aspects; the nature of the work changes significantly according to the season: a single fisher may be involved in different kinds of fishing in the course of a year. There are also regional differences, and as is the case with fishing in general, the safety systems for small-scale fisheries boast of a diversity that deserves further attention. Today, among Japan's comprehensive measures to restructure fisheries, to support and promote them and aquaculture, which are being advanced as aquaculture policy, the deployment of refitted boats is intended to increase work productivity, comfort, and safety. What will be important in this is that they respect the diversity of regional small-scale fisheries, share skills, use technology effectively, and reconcile with social customs to build better safety systems.

## 14. Fishing Ports Infrastructure

### **Supporting Seafood Supply and Communities in a Multi-functional Fishing Industry**

***Shingo Takayoshi***

Japanese Institute of Fisheries Infrastructure and Communities



*Aoura fishing port, Matsuura city, Nagasaki Prefecture, Japan. S. Takayoshi, 2019*

*Seas, the Pacific ocean, fisheries, and fishing communities that surround Japan play multiple roles. They supply people with diverse seafood, ensuring the conservation of coastal environments, and protect sea-related culture. Therefore, fisheries policies, including the development of fishing ports, are being promoted in industrial and regional policies. Japanese fishing communities are established near good fishing grounds but are located on narrow flatlands near mountains. For such communities, fishing ports constitute an important means of infrastructure. These ports support safe, reliable, and comfortable fishing activities; they provide space for disaster relief activities and relaxation for fishing communities. Fishers and fishing vessel numbers have declined in recent years; hence, the focus of fishing port development has shifted from a quantitative approach, such as scale-expansion, to a qualitative one, such as multi-purpose use, hygiene, and quality control. Furthermore, measures to prolong the lifespan of aged fishing port facilities have become a major issue.*

## Fishing ports for coastal fisheries

There is a popular song called “Kikoubushi” in Japan, a tune composed by Mr. Ichiro Toba, who became a singer from a fisher. The line “If you see the light of the mother’s port, it greets you for your hard work” in the lyrics expresses that calm waters surrounded by breakwater at fishing ports welcome fishers returning from rough seas. It has now been more than 35 years since I stayed in an isolated island off the Sea of Japan for a month doing fisheries training practice for the Fisheries Agency. The fishing port on that island is classified as Type 4 fishing port (as described later). It is also used for the evacuation of external ships during stormy weather and as a terminal for a ferry connecting the island to the mainland. The main types of fishing included typical coastal fishing techniques such as longline, pole and line, and shellfishing. I stayed in

two fishing households. In the first half of the period of my stay, a father and his son aimed at snappers using the longline method from a fishing boat. In the second half, a married couple, also running an inn, ran a small shellfishing boat, such as the ones used for abalone and turban shells. Although the vicinity of the island was good fishing ground, we sailed out of the fishing port to rough seas once where no obstructions to break waves were present. The boat shook greatly, so I often felt seasick. Once fishing ended, we returned to the fishing port. As soon as the boat entered the harbor behind the breakwater, the waves quickly disappeared, and I remember experiencing a sense of great relief. The fishing port seemed to be a really gentle mother to the small coastal fishing boat.

### Role of fishing ports

A fishing port is not just a fishing boat's mooring facility; it plays distinct roles in the fisheries industry and in the lives of communities. Let me explain these roles: (1) a stable supply of fisheries products, such as the base for fish-farming fisheries, production activities, processing and distribution; (2) core facilities for local communities such as infrastructure for fishing village residents, the foundation of regional economic development, mainly of fisheries-related industries, the base for transportation and flow of information connecting fishing villages and external societies on remote islands, etc., and for fishers training; (3) rich and beautiful leisure space to people, such as space for marine recreation activities, areas for preserving sea culture heritage and learning about the sea experience; (4) ensuring the safety of life and property of fishing community residents, such as preventing the entry of tsunami and storm surges into villages by means of breakwaters, loading and unloading of emergency supplies; and (5) coastal management bases, such as facilities to contribute to the conservation of land and the natural environment, early detection and transmission of information on poaching, smuggling, etc., base for the evacuation of ships in the event of abnormal weather such as typhoons, as well as for relief activities in the event of a disaster. In summary, fishing ports bear multiple conservation functions in coastal areas.

## An overview of fishing ports in Japan

Japan is an island country surrounded by a long coastline with rich marine resources. Fishing has been practiced for a long time; thus, long-established fishing ports and communities have developed. Along 35,000 km of Japanese coastline, 2,806 fishing ports exist at present (as of April 2019). On average, there is a fishing port for every 12 km of coastline. The existence of fishing ports is essential for the effective use of fisheries resources. They are classified into the following types. Type 1 fishing ports have a range of use, such as local fishing (2,069 in total); Type 2 ports have a wider range of use than Type 1 (524 in total); Type 3 is used nationally (114 ports in total); and Type 4 ports are necessary for the development of fishing grounds or evacuation of fishing vessels in remote islands and other remote areas (99 ports in total). The scale of fishing increases from Type 1 to Type 3, the latter accommodating large fishing boats used for offshore fishing and distant water fishing operations in addition to coastal fishing and aquaculture. Type 4 fishing ports have a different character from Type 1 to Type 3; in addition to local fishing boats, they serve as evacuation ports during stormy weather.

Fishing ports have protective structures and facilities such as breakwaters, mooring facilities like quays, anchorage areas such as waterways and basins, and land used for drying fields, fish markets, refrigerators, as well as ice-making facilities. The body managing Type 1 fishing ports is the municipality, whereas from Type 2 to Type 4, it is the prefecture in principle. Construction and improvement activities are mainly carried out by the managing body. Fishing ports are defined by the Development of Fishing Ports and Grounds Act in Japan under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries, while general ports and harbors (993 ports in total as of April 2019) by the Port and Harbor Act under the jurisdiction of the Ministry of Land, Infrastructure, Transport and Tourism.

## Coastal fishing and aquaculture in Japan

The production yield related to coastal fishing and aquaculture in Japan was 1,879,000 tons in 2017, accounting for about 44% of total fisheries production. Coastal fishing can be defined as fishing using a non-powered or motorized fishing boat lighter than 10 tons, stationary net fishing, or using a land net. It is often run by small-scale management bodies with women and elderly workers with families often helping each other. Aquaculture is targeted at fish, shellfish, seaweed, etc., ranging from large-scale company management to small family businesses. It is essential for coastal fishing and aquaculture that fishing ports are established close to fishing grounds, as they involve areas of the sea right in front of the local community that is within reach for small fishing vessels. As such, it is impossible to move fishing vessels from distant fishing ports to fish; therefore, it is essential to maintain fishing ports with minimal functions. In addition, the catch is often landed in the form of live fish and needs to be stored in waters of the fishing port temporarily. Additionally, processing such as seaweed boiling can take place. It has been demonstrated that coastal fisheries supply a wide variety of fisheries products to the public, and possess multiple other functions; thus, we must continue to maintain these fisheries and fishing communities. Therefore, the government is developing both industrial policies to promote the fisheries industry and regional policies to revitalize fishing communities.

## The situation and problems with fishing ports

Plans to develop fishing ports have been systematically constructed and improved by the Fishing Port Improvement Plan based on the Fishing Port Act. Starting from the 1<sup>st</sup> plan, created in 1951, to the 9<sup>th</sup> plan, fishing ports and major facilities have been designated for development by the government, while plans for fishing ports named in the development plan have been formulated by local governments as a form of implementation. This can be called a top-down form of legislation. The Fishing Ports and Grounds Development Act was passed in 2001. Infrastructure development of fisheries

(fishing ports and fishing grounds) was done comprehensively under this law, which had been carried out separately before. The government has formulated a Basic Policy demonstrating the basic idea of development, as well as a Long-term Plan for Fishing Ports and Grounds that define targets and the level of improvement for five years. It has also shifted to a bottom-up form of legislation, where local governments formulate individual development plans independently.

The division of roles between fishing ports was clarified, and efficient improvement was implemented in recent years, such as the consolidation of market functions. In addition, due to changes in the fishing situation, fishing facilities have declined due to the lack of fishing; efforts to use these facilities as non-fishing have begun to revitalize fishing communities. Large-scale development is almost complete. Currently, we are working to improve functions in terms of production, distribution, and working environment, to strengthen disaster prevention and mitigation functions such as earthquakes, tsunamis, as well as implementing measures to improve aging facilities.

**(1) Functionality and comfort:** Due to the substantial aging of fishers, it is important to improve the working environment and promote the employment of women and young fishers. Specifically, floating piers have been constructed in the sea with large tidal differences to facilitate the landing of fish and fishing gear. Roofs and windproof fences have been installed to protect fishers from strong winds and heat. Small fishing boats are vulnerable to waves effectively utilizing natural terrain, such as natural coves. The improvement of slipways, in addition, in combination with breakwaters to secure calm water, enables such vessels to reach land safely. Quays having a depth corresponding to raft depth under the waterline have been improved for aquaculture so that the raft can be towed directly to the fishing port.

**(2) Quality and hygiene management:** The seafood culture in Japan, typified by sashimi, is renowned for its freshness and good quality. In recent years, the maintenance of loading space and hygiene management in corresponding quay areas has advanced in terms of quality. The formulation of and compliance with hygiene management rules, such as those regarding water, ice, maintained cleanliness, and the hygiene of working people, is currently being



implemented.

**(3) Disaster prevention and mitigation:** Typhoons considered to be a result of global warming have become increasingly larger in recent years. Japan has been hit by repeated trench-type earthquakes, such as the Great Earthquake and Tsunami caused by the Great East Japan Earthquake in March 2011, which caused severe damage to almost all fishing ports, mainly along the coast of the northeastern region of Japan. For this reason, disaster prevention/mitigation capabilities and evacuation measures are being expanded to alleviate the effect of waves caused by earthquakes and tsunamis on fishing ports and communities.

**(4) Measures against the aging of facilities:** Fishing port facilities constructed during the period of high economic growth have been aging; however, preventive maintenance efforts are underway to use them for as long as possible by carrying out planned repairs based on an aging diagnosis using breakdown maintenance experience. This will level the budget needed for such projects, prevent a massive rebuilding budget from being concentrated, and allow for a planned response.

## Responding to changes in fishing situations

**(1) Restructuring fishing port functions:** There is a prevalent opinion that fishing ports should be integrated, as there are many of them in Japan. During the debate on how to proceed with fishing port restoration after the Great East Japan Earthquake, there was an opinion that hub fishing ports should be given priority, while other fishing ports should only be restored when the situation allows. In the case of certain aquaculture or coastal fisheries, it takes a long time to go back and forth between fishing ports and fishing grounds using existing small fishing boats. Not only is it inefficient but also dangerous. If certain mooring facilities and worksites cannot be secured, it will not be possible to implement coastal fishing and aquaculture at such ports. On the other hand, as fishing boats and fishers numbers are falling, a surplus of fishing facilities might arise. Therefore, it is important to restructure functions between several fishing ports, including the unification

and abolition of facilities based on future discussions in the relevant region, together with minimizing obstacles to fishing activities. This will never mean abolishing and integrating fishing ports themselves, though.

**(2) The effective utilization of fishing ports:** Fishing ports developed for fishing activities are subject to strict usage regulations, whereas such regulations have started to be eased recently so that fishing port use can promote fishing communities effectively. **a) The promotion of interchanges between urban areas and fishing communities.** Fishers compete for catch and are often not involved in sales to end consumers after landing. It is necessary to reduce the distribution margin and add value to the seafood that fishers caught themselves to boost their income. For example, fishing communities can be revitalized by activities such as tourism by setting up restaurants and direct sales facilities at fishing ports. **b) Exploitation as an aquaculture site.** In response to a decline in fisheries resources, there is a movement to use quiet waters of anchorage areas at fishing ports as sites for aquaculture, including storage to adjust the shipment time by placing fish in cages at the port, and intermediate breeding for hatchling release. For example, fishing ports are used for farming sea cucumbers, and subsequently exporting them by processing them into dried sea cucumbers, or to farm bluefin tuna behind breakwaters. While fishing port waters may be quiet, problems such as high water temperature, and depletion of water quality in summer may persist, which may be resolved by opening a hole for seawater replacement in the breakwater.

## Conclusions

Fishing ports are important infrastructure for fishers and fishing communities, for purposes such as maintaining fishing vessels, making them comfortable to carry out fishing activities, and improving the added value of the catch. Japanese coastal fisheries and fishing communities face various problems; therefore, it is important to continue to promote an efficient and effective developmental plan and utilization of fishing ports in accordance with local community demands in a timely manner.

## 15. Landing Markets

### **A Starting Place for Various Seafood Supply Chains**

***Hiroshi Hayashi***

Japanese Institute of Fisheries, Infrastructure and Communities



*Fish landing (left) and fish display (right) at Choshi Fishing Port, Chiba Prefecture, Japan. H. Hayashi. 2018*

*There are nearly 800 landing markets throughout Japan, and there are approximately 3,000 fishing ports. Approximately one of every four of these fishing ports has a market for selling fresh catch. Markets with a small scale of transactions experience various issues, including weak price formation. In Japan, where various fish species are caught mainly by coastal fisheries, these local markets play an important role in the efficient distribution of fishery products. Many of these landing markets are established adjacent to these coastal fisheries and, as such, are central to the local industry.*

## What is a landing market?

What kind of landscape do you think of when you think of landing markets? It may be an early morning scene of fishing boats unloading their catch, displaying various kinds of fish, and people bidding at auctions. Alternatively, you might think of fresh seafood restaurants. With this in mind, what kind of market serves as a landing market?

In Japan, the Wholesale Market Act governs landing markets. According to this Act, these markets are defined using the term “wholesale market,” which are “markets opened to facilitate the wholesale of fresh foods, etc., and that operate while maintaining the facilities necessary for handling other fresh foods and cargo.” In addition, these wholesale markets can be subdivided into central and regional wholesale markets. Central wholesale markets serve as a core base for the distribution of fresh food products over a wide area, whereas regional wholesale markets function as a collection and delivery base for such products locally. There are also “other markets” among these establishments that are not regulated under this law.

The White Paper on Fisheries published by the Japan Fisheries Agency states that regional wholesale markets are “close to the production regions, where fishers collect, sort, and sell the catches landed,” but these markets do

not include “other markets.” No publications discussing such local landing markets could be found. Under the Wholesale Market Act, the Minister of Agriculture, Forestry, and Fisheries establishes Japan’s basic policy for wholesale market development. The basic policy for the maintenance of wholesale markets (promulgated on January 14, 2016) includes the term “seafood landing market.” While a corresponding maintenance policy is included in the policy, it does not define how such markets should be identified.

According to Demura (2007) in Article 2 of the Wholesale Market Enforcement Ordinance (minimum scale of facilities of local wholesale markets), the area of wholesale markets where goods handled, including seafood, is described as a “wholesale market,” and is established for the use of “those who ship seafood mainly to other wholesale markets, those who perform work in the seafood processing industry, or those who operate seafood processing businesses established at the landing site(s) of fishery products destined mainly for wholesale, that have been shipped from fishers or fishery cooperatives.” “Policies on the Integration and Rationalization of Management of Regional Fish Markets” (The Notification No. 12-4504 by the Director General of the Japan Fisheries Agency) states that such markets are “established for the purpose of wholesale of marine products, are supplied by direct landing or land transportation of marine products by fishing boats, and are located where the initial stage of trade is carried out after receipt of the marine products from the production area.”

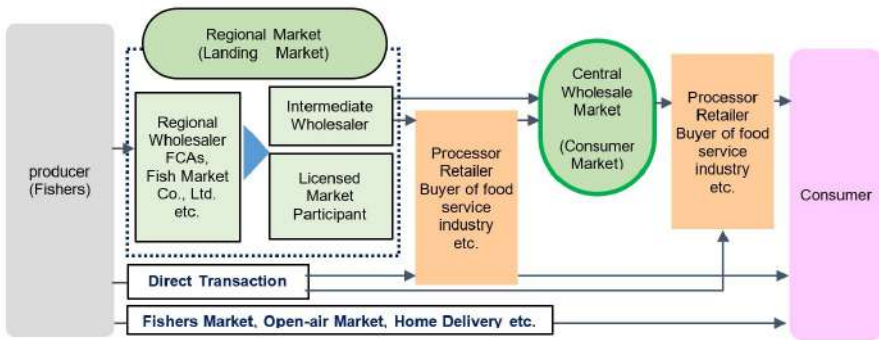
To summarize, for persons involved in fishing port planning, landing markets providing marine products are local wholesale markets established for fish landed directly from fishing wharfs (or ports) and marine products shipped from other fishing ports or other markets.

## The fishery distribution system in Japan

In Japan, the seafood supply chain is as follows. The seafood caught at the fishing grounds is unloaded at the fishing port and sold to the licensed market participant through an auction carried out by wholesalers at the landing market. The licensed market participant ships the purchased seafood to

the consumer market or sells it to intermediate wholesalers and retailers. Seafood shipped to the consumer market is sold to intermediate wholesalers and retailers through an auction carried out by the wholesaler of the consumer market. It finally reaches consumers.

Unlike the supply chain for vegetables, fruits, and meat, *inter alia*, the supply chain for marine products goes through two wholesale markets: the landing market and the consumer market. Owing to the fragility of fish and shellfish and the existence of a food culture where raw fish such as sashimi, sushi, and vinegar are preferred, Japan needs to deliver fresh seafood to consumers. The supply chain that goes through the wholesale market in Japan is a mechanism for providing high-quality, fresh seafood to consumers (Figure 1).



**Figure 1:** The seafood supply chain in Japan. Source: The situation surrounding Japan's wholesale market, Food Industry Affairs Bureau, MAFF, 2019.

In the landing market, seafood is priced at the first level, depending on its freshness and size, and distributed according to its purposes, such as fresh food, food processing, and non-edible processing. In the consumer market, seafood (including perishables, frozen products, and processed products) from almost every landing market is priced at the final level to be sold to retail stores and restaurants.

The landing market and the consumer market are crucial infrastructure for the smooth and stable supply of fresh foods and are indispensable to the daily table of the people. Both markets play essential roles, such as the efficient and

continuous collection and shipment of a wide variety and a large amount of seafood as well as fair and highly transparent price formation.

## Role of the landing market

What kind of function do landing markets play? One is the function of collecting and distributing marine products and sorting them into the necessary items and quantities according to their needs. They also play a role in pricing seafood of a range of qualities through fair evaluation and serve a payment function, where the sales price is quickly and reliably settled. Finally, they serve the function of receiving and transmitting information between downstream needs and upstream production between the “consumer market” and the landing market. According to the White Paper on Fisheries, “various marine products shipped from different markets (such as wholesale markets) are collected, sorted by use, and sold to retailers.”

According to the 2018 Fisheries Census, there are 803 fish markets in Japan. According to the fisheries census, fish markets are defined as “markets where fishery products are directly landed by fishing boats and where such products are brought in from the producing regions by land transport and the initial stage of trading is conducted, even if fishing boats do not land directly.” These are identical to marine landing markets. Table 1(a) shows the number of fish markets by type. The landing market defined above does not include the central wholesale markets. Thus, when excluding central wholesale markets, there is a total of approximately 771 landing markets. Table 1(b) shows the number of fish markets, categorized by the establishing entity. As central wholesale markets are established by local government entities, such as the prefectural or municipal governments of cities with a population of 200,000 or greater, the number of fish markets by the type of entity establishing the market can be obtained by subtracting 32 from the number of local governments (Table 1a). Fishery cooperatives account for 80% of the total number of establishing entities of landing markets. For this reason, weakness in price formation has become a problem in landing markets with small transactions, and the maintenance and strengthening of market

functions are required owing to market consolidation. In Japan, where various fish species are landed in various regions, landing markets play an important role in efficiently distributing marine products.

(a) Number of fish markets by type				
Fish market type	Central wholesale market	Regional wholesale market	Other market	Total
All Markets	32	410	361	803
Except Central Market (≠Fish Market)	---	410	361	771

(b) Number of fish markets by establishing entity type						
Establishing entity type	Local government	Fishery Cooperative Associations (FCAs)	Federation of FCAs	Company	Individual	Total
All Markets	93	603	9	96	2	803
Except Central Market (≠Fish Market)	61	603	9	96	2	771

**Table 1** (a) Number of fish markets by type, and (b) number of fish markets by establishing entity type

## Landing markets and small-scale fisheries

To switch focus, how many fishing ports does Japan have? The data used are based on the fisheries census of April 2018. In total, there are 2,823 fishing ports in Japan. Based on the definition of the regional landing market, and assuming that a regional landing market is located at a fishing port, then we can approximate that there is a landing market at approximately one in every four fishing ports. Of the landing volume of ocean surface fisheries in 2018, offshore fisheries accounted for 47% of the landing volume. Of these offshore fisheries, those that play a central role in production include purse seine fisheries, which catch large amounts of sardines, saury, mackerel, horse



mackerel, squid, and other species. These fisheries have limited fishing ports and landing markets, their landing volume is small, and the fishing ports and landing markets of pelagic fisheries are limited.

In light of this, let us again consider the numbers of landing markets and fishing ports. There are currently 711 landing markets and 2,823 fishing ports in Japan. As offshore and deep-sea fisheries are served by limited fishing ports and landing markets, most of these fish markets consist of landings caught by coastal fisheries. The amount of fish landed is largest at specific Type 3 fishing ports (13 ports), which is used nationwide by fisheries. Revenue earned from landing volumes at Type 2 fishing ports (521 ports) and Type 1 fishing ports (2089 ports) exceeds that of the Type 3 fishing ports (114 ports). Type 1 and Type 2 fishing ports represent mainly coastal fisheries, indicating the central role that coastal fisheries play in the regional industry through the landing market.

## Conclusion

Fisheries are an essential industry that supply people with seafood. However, there are various challenges to the industry, such as a decrease in production because of a reduction in marine resources, a long-term reduction in the number of fishers, and a decline in fish prices. Similarly, in the landing market, the ability to form fish prices has been declining because of a decrease in the amount of fish handled, the sluggish unit price of fish, and the decreasing number of buyers. However, some of the world's best fishing grounds are around Japan, and favorable fishing grounds are spreading along the coast, so the fishing industry's potential seems to be positive. However, the increase in low-priced, imported seafood, the mismatch between demand and production, and the existence of mass retailers seeking a low-cost seafood supply, has influenced fishing, resulting in sluggish fish prices.

Deliberation on the following topics is necessary to address these challenges. One is the implementation of appropriate resource management. For this purpose, it is necessary to record the catch with high accuracy. Providing information such as the fish species and weight of each fish type when selling

marine products in the landing market to a resource management agency will be useful for accurate catch determination and resource management. The other is maintaining the quality of seafood. When the seafood distribution system starts at the landing markets, on the way to the consumer, quality deterioration cannot be recovered. Quality control is essential at the landing market to preclude a decrease in fish pricing.

## 16. Fishing Ground Improvement

### **Indirect Impact of Artificial Reefs on Recreational Fishing**

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*Artificial Reef at Tsushima, Nagasaki Prefecture, Japan. J. Suga, 2003*

*Artificial reefs are systematically being installed as a national measure mainly for the fishing industry; however, they are also being utilized for recreational fishing. Recreational fishing activities are often operated by coastal fishers as a side business, contributing to the income of fishers. However, the use of artificial reefs by recreational fishers is unclear, and there are hardly any studies that measure the specific benefit of the use of artificial reefs by recreational fishers. We conducted a questionnaire survey among recreational fishers and recreational fishing guides in representative areas of recreational fishing and clarified the use of artificial reefs by recreational fishers. By estimating the benefits in each case, we show the indirect impact of artificial reefs on coastal fisheries.*

## What is an artificial reef?

An artificial reef is a structure that is artificially created to promote the aggregation, protection, and culture of aquatic life. When artificial structures are installed in water, fish aggregate in the area and seaweed tends to grow. Prototypes of artificial reefs include the shibazuke fishing that is used across Japan, Ishizuka used in the Chikuma River, and ishigama in Lake Koyama, Tottori Prefecture, where wood, rocks, and other materials are submerged in water to attract and catch fish; the tsuke fishing method (Ogawa, 1968). Reefs have been built across Japan by sinking rocks, sandbags, brushwood, and ships, and by 1932, they were used as breeding sites as part of the measures to promote coastal fisheries. Around this time, Yamaguchi and Miyazaki Prefectures attempted to use concrete, artificial reefs (Goto, 1935). Since the Taisho Era, federal subsidies have been provided for artificial breeding sites and reefs, and after World War II, fisheries' infrastructure systematically became a national policy. In addition to fishing grounds built with stones and concrete blocks, artificial reefs prepared in factories, built on-site, and those made of steel are popular. Artificial reefs are built primarily for the

fishing industry but are also used for recreational fishing, often operated by coastal fishers as a side business. Despite guidelines on methods to measure the benefits of such recreational use of artificial reefs, their actual recreational use is unclear. Studies that measure the specific benefits of recreational use of artificial reefs are scarce. In this chapter, we examine the use of artificial reefs by recreational fishers in specific areas and calculate benefits in each case.

## Use of artificial reefs by recreational fishers

The use of artificial reefs for recreational fishing in the study areas was examined through document collection, interviews with recreational fishing guides, and questionnaires administered to recreational fishing guides and recreational fishers having their own boats. We also performed a trial cost/benefit calculations of the use of artificial reefs by recreational fishers. The study areas surveyed were Oiso Town, Kanagawa Prefecture; Omaezaki Town, Shizuoka Prefecture; Tango Peninsula, Kyoto Prefecture; Inami Town, Wakayama Prefecture; Ajicho in Takamatsu City, Kagawa Prefecture; Fukuoka City in Fukuoka Prefecture; and Nomozaki Town in Nagasaki Prefecture.

## Recreational fishing guide business

The timing and duration of recreational fishing varied depending on fishing grounds and types of fish. However, many fishers left early in the morning and returned to the port between 15:00 to 16:00 after a duration of seven to eight hours. The cost varied by areas, business, and whether it included bait, equipment, and ice. When these items were not included, the cost of bait and equipment was approximately 2,000 to 3,000 yen. Recreational fishing costs that included bait and equipment were 8,000 (Oiso Town) to 16,000 (Tango Peninsula, Kyoto Prefecture) yen, averaging approximately 10,000 yen. Customers of recreational fishing guides were from a wide range of surrounding cities. In areas with good transportation, customers used trains; however, the majority drove to the location. Chartered boats were often rented by groups, where approximately three customers drove together to the site.

The overnight stay was not common, as many customers drove throughout the night to be at the port in time for the early departure. The number of days recreational fishing guides worked each year varies based on the location and condition of the area and personality of the recreational fishing guide. Guides worked more days in Oiso Town, Omaezaki Town, and Inami Town, which have been offering recreational fishing for relatively serious recreational fishers from the Metropolitan areas for a long time, and as part of the Kyoto Fishing Boat Association that focuses on chartered fishing boats (60% of the recreational fishing guides in these three areas worked for 150 days or more a year).

## Use of artificial reefs by recreational fishing guides and fishers using their own boats, and associated problems

In terms of awareness regarding artificial reefs, 48% of the recreational fishing guides “know locations of most artificial reefs,” whereas 50% “only know locations of some artificial reefs.” As many guides are also in the fishing industry, there was hardly anyone who said they “do not know where reefs are.” The awareness level was high in areas where large reefs were installed in relatively uniform areas, with recreational fishing operated as pole and line fishing fisheries (Oiso Town, Omaezaki Town, and Inami Town). In contrast, awareness was relatively low in areas where several reefs were installed between natural reefs and remote islands (Kyoto Prefecture, Aji Town, Takamatsu Setouchi District, and Nomozaki Town). As people learn of artificial reef locations through fishery cooperatives, awareness was low in the Kyoto Fishing Boat Association, where many guides are not fishery industry personnel.

In contrast, 77% of the recreational fishers “do not know locations of artificial reefs at all” or “only know one to five artificial reefs,” presenting relatively low awareness of artificial reefs. The Kyoto Fishing Boat Association and recreational fishers have a strong desire to have the locations of artificial reefs published and obtain information, and this probably influenced some responses.

Dependence on artificial reefs (the ratio of time spent at the artificial reef relative to the total duration of recreational fishing) varied by area and people; however, the total for the study areas was 24% for the guides and 49% for recreational fishers. The mean for the study areas that included “those who do not use artificial reefs” was 21.2% for recreational fishing guides and 12.1% for recreational fishers. The areas with high dependence of recreational fishing guides on artificial reefs were Oiso Town, and Amino Town and the Kyoto Fishing Boat Association in Kyoto Prefecture. In the case of Amino Town, artificial reefs were the major fishing grounds in areas with relatively few natural reefs. In the case of the Fishing Boat Association, based on the recreational fishing agreement with fishery cooperatives, the duration and timing of the use of major natural reefs for recreational fishing are limited. This is likely the reason that the use of artificial reefs located around major natural reefs is high. Similarly, in the case of Oiso Town, artificial reefs are integrated into the large natural reef (Senoumi), making it difficult to differentiate between them, which may have had an impact.

Recreational fishing target species were reef fish such as horse mackerel, sea bream, chicken grunt, amberjack, rockfish, and thread-sail filefish. Natural reefs and artificial reefs were the main fishing grounds, and dependence on artificial reefs was higher in areas where the number of natural reefs was low and in areas where the use of natural reefs was difficult owing to the relationship with the fishing industry.

The reasons for the use of artificial reefs were similar among recreational fishing guides and recreational fishers. The most common reasons were related to catch, such as “easy to catch fish; there may not be many; however, there are always fish to catch, and there are several types of fish like the horse mackerel where one can catch a large number of fish.” Natural reefs were used when targeting large and expensive fish, whereas artificial reefs were used for fish species such as horse mackerel and chicken grunt, where a large number of fish could be caught. Another reason artificial reefs were used was that locations of fishing grounds were close by, making them usable on days with poor weather.

## Problems associated with the use of artificial reefs and improvement

Regarding problems associated with the use of artificial reefs, 30% and 12% of the recreational fishing guides and recreational fishers, respectively, said, “there is no problem.” Excluding the technical problem of “fishing equipment tends to get snagged, making artificial reefs difficult to use,” recreational fishing guides mentioned “users get in the way” and “artificial reefs are difficult to use because there are problems with full-time fishers.” recreational fishers mentioned “locations are difficult to know” in addition to also mentioning “artificial reefs are difficult to use because there are problems with full-time fishers.” These problems were also the reasons for not using artificial reefs, indicating that preventing competition over the use of fishing grounds around reefs is important. Approximately 10% of recreational fishing guides and 10% of recreational fishers said, “artificial reefs are not necessary.” Many recreational fishing guides, many of who were also fishing industry workers, said, “more artificial reefs, similar to the present ones, are needed” (65%). In contrast, many recreational fishers said, “artificial reefs should be separated into those for the fishing industry and those for recreational fishing” (42% vs. 29% who said the present situation is acceptable).

## Trial benefit and cost-effectiveness calculations of use of artificial reefs for recreational fishing

### Improvement in leisure functions

Improvement in leisure functions associated with the use of artificial reefs by recreational fishing guides was measured using the travel cost method; however, when including the cost of transportation and recreational fishing guides in the travel cost, it overlapped with the income effect of recreational fishing guides. Thus, in this summary, we calculated only the improvement in leisure functions based on travel costs that included the cost of recreational fishing guides for comparison. The travel cost method is based on a simple



method described in the “Guidelines for Cost-Benefit Analysis for Coastal Works” by the Ministry of Agriculture, Forestry and Fisheries (for Oiso Town and Inami Town, we performed these calculations using the simple method and the consumer surplus method that is derived from a demand curve, and obtained a similar result).

Annual benefit (1,000 yen/year) = number of guests (number of people/year) × travel cost per guest (1,000 yen/person)

- Number of guests = the number of people who use recreational fishing guides × rate of the duration of the use of assessment target artificial reefs
- Travel cost (yen/person) = transportation cost (yen/person) + transportation time (h) × unit labor cost + recreational fishing cost (guide cost) (yen/h)
- Transportation cost = (return trip distance × cost per trip distance 11.16 yen/vehicle + return trip highway toll) ÷ 3 (people/vehicle)

Table 1 shows the cost/benefits effectiveness calculations of the recreational fishing guide business. The average travel cost per customer of the recreational fishing guide per day in the study areas was 22,500 yen/person with a range of 8,800 to 33,100 yen/person. The benefit per person obtained by multiplying this average value with the artificial reef dependence rate (average of 21%) ranged from 600 to 10,300 yen/person with an average of 4,700 yen/person.

# IN THE ERA OF BIG CHANGE

			Survey area	Karagawa Prefecture	Shizuoka Prefecture	Kyoto Prefecture	Wakayam a Prefecture	Kagawa Prefecture	Kagawa Prefecture	Nagasaki Prefecture		
			average	Oiso Town	Omazaki Town	Tango Amino Kyoto Boat Assoc.	Inami Town	Ajicho	Takamatsu Nishihama	Nomozaki Town		
Number of customers per year		Person /year	A	13,217	24,500	22,500	23,700	12,520	1,700	1,100	8,500	
Average travel cost per person	Transportation cost	1,000yen /person	B	11.4	5	11.2	18.1	15.7	3.7	1.8	7.7	
	Cost including guides	1,000yen /person	C	22.5	15	21.2	33.1	26.7	10.7	8.8	15.7	
Total travel cost	Transportation cost	1,000yen /year	D= A * B	151,183	122,500	252,000	428,970	196,564	6,290	1,980	50,050	
cost	Cost including guides	1,000yen /year	E= A × C	297,236	367,500	477,000	784,470	321,784	18,190	9,680	102,050	
Total artificial reefs	Dependence on artificial reefs		F	0.21	0.407	0.1	0.31	0.057	0.133	0.187	0.038	
Annual benefit	Transportation cost per person	1,000yen /person	G= B * F	2.4	2	1.1	5.8	0.9	0.5	0.3	0.3	
	Cost including guide per person	1,000yen /person	H= C × F	4.7	6.1	2.1	10.3	1.5	1.4	1.6	0.6	
	Total transportation cost	1,000yen /year	I= D * F	31,764	49,858	25,200	132,981	11,204	637	370	1,902	
	Total cost including guides	1,000yen /year	J= E * F	66,701	148,573	47,700	243,188	18,341	2,419	1,810	3,878	
C/B calculation	Target artificial reefs	Types			Artificial reefs	Artificial reefs		Large reefs	Large reefs			
		Business cost	1 million yen			1,097	606		133	72		
	Dependence on artificial reefs		K	0.125		0.1	0.118		0.048	0.057		
	Annual benefit	Transportati on cost	1,000yen /year	L= D * K	18,944		25,200	49,761		302	113	
		Cost including	1,000yen /year	M= E * K	35,031		47,700	90,989		673	552	
	Total cost	1,000 yen	N	498,700		1,183,510	606,797		132,996	72,496		
	Total benefit including cost of guides	1,000 yen	O	691,467		723,188	1,975,948		28,096	38,634		
C/B including cost of guides			P= O/N	1.39		0.61	3.26		0.21	0.53		

**Table 1. Calculation of the benefits of improved leisure functions and cost/benefit (C/B) associated with the use of artificial reefs by recreational fishing guides (surveys conducted in the study areas).**

Source: Questionnaire survey with recreational fishing guides.

\*Number of annual users, total travel cost, and annual benefit are values for the surveyed areas, where benefits from users of the recreational fishing guide who visited from areas other than the surveyed areas, were excluded.

\*Dependence on artificial reefs is the rate for the days of use, and multiple uses on one day are treated as one day of use.

\*Dependence on artificial reefs is high in Oiso Town. This is because artificial reefs are integrated into large natural reefs, making it difficult to differentiate between them.

## Effects of the use of artificial reefs

In Omaezaki Town, Tango Peninsula in Kyoto Prefecture, Ajicho in Kagawa Prefecture, and Takamatsu City in Nishihama District, we selected specific artificial reefs and calculated the cost-benefit ratio (C/B) (measurement period of 30 years and a discount rate of 4.0%, consistent with those recommended in the guideline). In addition, for the number of guests, only the data from the surveyed areas were used, excluding benefits from recreational fishers visiting from outside the surveyed areas to use the survey target reefs. Benefit varied greatly based on the number of guests using recreational fishing guides (and the target areas), artificial reef dependence, and travel cost per person (condition of the locations and type of recreational fishing). Calculated C/B was 0.61 for Omaezaki artificial reefs + large reefs, 3.26 for Nakahama district artificial reefs in Kyoto Prefecture (Tango Peninsula), 0.21 for large reefs around Kabuto Island in Kagawa Prefecture (Ajicho), and 0.53 for large reefs around Ogi Island in Kagawa Prefecture (Takamatsu Setouchi District).

## Benefits from improved leisure effects of recreational fishing

The survey conducted on recreational fishers targeted owners of pleasure boats affiliated with fishing ports and marinas. The benefit of the use of artificial reefs by recreational fishers was calculated by using travel cost as the recreational fishing cost (surveyed areas = surveys conducted in 2003 in Fukuoka City and Nomozaki Town with 90 respondents). Travel cost for each recreational fisher per day (recreational fishing cost = fuel cost + bait cost + meals and drinks on the boat + supplies + transportation cost) varied notably between Fukuoka City and Nomozaki Town: 10,256 yen/person in Fukuoka City (pleasure boat owners in marinas) and 4,117 yen/person in Nomozaki Town (boats moored in fishing ports). The average was 7,050 yen/person. Annual benefit per recreational fisher calculated by multiplying recreational fishing cost with the number of days of recreational fishing per year and artificial reef dependence was about 31,000 yen/person-year in Fukuoka City and 12,000 yen/person-year in Nomozaki Town.

## Conclusions

Artificial reefs are installed mainly for the benefit of the fishing industry. Although there is the problem of competition between fishery workers and recreational fishers, the present survey showed that the use of artificial reefs by recreational fishers is notable. Including the improvements to leisure functions by recreational fishing confirmed an increase in the catch, which is the original objective of reef infrastructure, thereby increasing the benefits of artificial reef infrastructure further.

## 17. Business Continuity Plan

### Disaster Prevention, Mitigation and Management

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*Damage by a tsunami, Shimanokoshi fishing port, Japan, Japanese Institute of Fisheries Infrastructure and Communities (JIFIC), 2013*

*While having developed a fishing industry since ancient times, Japan is also known as a country with many natural disasters. Japanese fishery is always susceptible to such disasters, and it is important to be aware of the risks of disasters and to prepare for them in advance. Based on self-help efforts, it is important to cooperate well with mutual assistance and public help at each stage of the time course of a disaster, that is, at each stage of disaster management, emergency disaster control, disaster recovery and restoration. In Japanese fishery areas, since the Great East Japan Earthquake, a council consisting of persons from the fisheries, the fish processing industry, the government, etc. has been set up to create a Business Continuity Plan (BCP) that determines disaster prevention precautions, mitigation measures, role sharing and cooperation in the event of a natural disaster.*

## Disaster risk and JSSF

Japan's territory is made up of five major islands and is surrounded by more than 6,800 islands. Within those islands, 421 islands are established as human habitat. One of the world's best fishing grounds has been formed within the waters around Japan, and fisheries have been flourishing since ancient times. Hence the fish-eating culture has been nurtured. The coastline of Japan is also complex, with a total length of over 35,000 km, which corresponds to approximately 80% of the circumference of the earth. About 6,300 fishing villages are located along this coastline, which means there are active fishing villages located every 5.6 km of coastline on average today. One of the major landscape features of Japan is that there are so few flatlands that fishing villages are forced to form with densely populated houses on narrow lands with mountains lying behind. Another characteristic is that many fishing villages are in places where land transportation is generally poor, such as capes and remote islands, where good fishing grounds are usually formed.

On the other hand, Japan is a country with many natural disasters. Lying on the Circum-Pacific orogenic belt, volcanic and seismic activities are constantly active. In addition, several typhoons pass through Japan every year, causing collateral damages from storms and storm surges. In recent years, the magnitude of the typhoons and rainfall during the rainy season and autumn are becoming remarkably serious and the damages are expanding, which are thought to be caused by global warming. The fishery is heavily dependent on blessings bestowed by nature. On the contrary, compared to other industries, the fishery industry also comes with a fundamental high-risk issue that depends more on nature in a negative way, being more difficult to manage artificially, and being more susceptible to natural environmental changes or natural disasters compared with the agriculture industry which is an industry that is also similarly nature dependent.

Heavy rainfall can easily cause landslides in fishing villages located on narrow lands, which leads to roads being blocked. Even if it may have no direct damage from rain, the fishing grounds may be damaged by the sediment, driftwood, hay, or debris flowing down from nearby rivers, and the blockage at the fishing port preventing mobilization of the fishing boats. High waves created by typhoons can cause enormous damage to related fishery infrastructures such as fishing port or fishing boats. Storm surges could damage houses and processing plants within the fishing villages, which Japan also has a history of losing many lives due to storm surges. The damage caused by the recent earthquake is still fresh in our memories. One remarkable example of damages caused by the earthquake itself was from the January 1997 Great Hanshin-Awaji Earthquake. The damage was caused by a so-called epicentral earthquake. The house collapsed, many fires broke out, and many lives were lost. The Japanese building architecture is generally excellent in earthquake resistance, but the power of nature still exceeded human knowledge. In the fishing ports, facilities such as breakwaters, quays, processing plants and refrigerators were broken, and liquefaction occurred. Although the damage was devastating, it is also noteworthy that the local fishing village communities near the epicenter contributed a great deal to save many lives, including the elderly.

A tsunami often develops when earthquakes occur on the seabed. The 2011 Great East Japan Earthquake is a notable example, but Japan has experienced numerous tsunamis. In addition to the Great East Japan Earthquake, major tsunamis occurred in 1896, 1923, 1933, 1944, 1946, 1960, 1983, and 1993 since the era of Meiji. A tsunami is one of the natural disasters that is known to cause the most damage to fisheries. It destroys and swipes everything on the beach. Aquaculture products and facilities farmed in the sea, the homes of fishers in fishing villages, and mostly the lives of residents are no exception. Therefore, the fishing villages hit by a tsunami are overwhelmed to the point where it becomes devastating to recover on their own, but it is also the history of Japan that has shown these fishing villages have been revived time and time again. In Japan, tsunamis are bound to come eventually from time to time. It is important to recognize that this is the fate that the Japanese fisheries must embrace.

In Japan, it may also be necessary to pay attention to the damage caused by volcanic activities. In addition to the damage caused by the ash fall due to the eruption, there are several cases where the evacuation of residents on the entire volcanic island is inevitable.

From a different perspective, those involved in the small-scale fishery and living in harmony with nature can conclude to be people that are constantly susceptible to natural disasters. Therefore, it is important always to be aware of the risks of disasters and prepare for them in advance.

## Disaster management and BCP in the fishery area

“Since it is impossible to completely prevent the occurrence of a natural disaster, the concept of disaster mitigation, which means to minimize damage during a disaster and promptly to recover from damages, should be the basic philosophy of disaster prevention. In the event of a natural disaster, we must place the highest priority on saving human lives and combine various measures to prepare for any natural disaster to minimize the economic losses and to keep their impact on socio-economic activities to a minimum.” (Basic Disaster Prevention Plan) “Disaster prevention has three stages over time.:



disaster management, emergency disaster control, and disaster recovery and reconstruction. Taking the best measures at each stage will greatly reduce damage to the minimum.” (Basic Disaster Management Plan)

Disaster prevention studies point out that preparing for a disaster requires three approaches: self-help efforts, mutual assistance, and public help. In other words, self-help means that the individuals are aware and proactively prepare for disaster prevention in order to protect their lives and property. Mutual assistance is to help each other in the immediate local community perimeter. Public help is public support from the administrative organization. It is important for disaster preparedness to be based on these self-help efforts and to complement with mutual assistance and public assistance at each applicable stage. In addition, since the Great East Japan Earthquake, it has been strongly recognized that fisheries do not exist independently by itself, but it is closely tied to related industries like wholesale markets, distribution, processing, etc., and from that point of view, in order to promote organic cooperation among related stakeholders, initiatives have been taken on creation of a council consisting of fishers, distributors, processors, and government officials, etc. to establish a Business Continuity Plan (BCP) in the fishery area that clarifies each responsibility, roles and cooperative relationships in the event of a disaster. Let's take a look at what measures are being considered at each stage.

### (1) Disaster management stage

In disaster management, it is necessary to first anticipate what kind of disaster may occur, and to recognize and sort out the damages that may occur due to the anticipated disaster. Disaster management requires individual scenario consideration for each type of disaster, such as typhoons, earthquakes and tsunamis, matched with each type of fishery category conducted. In Japan, regarding floods and tsunamis, a map called “hazard map” showing the anticipated flooding area is prepared by the local government administrative organization and which are being utilized in the study. However, it is important to pay attention to the possibility that disasters with much larger scales than those anticipated by the hazard map may occur. Next, we should

consider the measures necessary to be taken in advance in order to reduce the damage and to recover rapidly after a disaster.

The first priority is to ensure the safety of human lives. You must confirm the local evacuation sites and evacuation routes in advance. Typhoons and other predictable disasters can be handled with plenty of preparation time, but we are not able to predict when an earthquake or tsunami will arrive. It is not uncommon for those events to occur late at night or early in the morning when most people are asleep. It is important to ensure if earthquake-resistance of buildings is meeting sufficient requirements and to prepare the related infrastructure for safe evacuation. In addition, it is necessary to make sure to avoid dangerous activities like going near the harbor during a storm to check the condition of fishing boats. During the tsunami, there were many cases where people rowed off the coast to save fishing boats and lost their lives.

The second thing to consider is the conservation and minimization of damages of important industrial-goods and facilities such as fishing boats, fishing gear, and other equipment. Evaluating a safe relocation plan to large harbors and coves should be considered. In the case of a tsunami, evacuation of fishing boats offshore is effective if there is enough time, but if the evacuation is delayed, the possibility of distress will increase, so the risks and options must be carefully considered. What should also be considered in advance is storing unused fishing boats and gear on high grounds where tsunamis do not reach. The emergency power supply should also be located in a place where there can be no danger of flooding. For food, water, materials, etc., you must consider storing surplus inventory separately in a safe location. As for the fishing port, the quay near the market, which is indispensable for unloading the fish, should be built earthquake-resistant, and the structure of the breakwater and other facilities should be reconstructed to be resilient. In addition, countermeasures such as securing the fishing gear, materials, etc. to prevent it from flowing out to the basin should be considered. Treatment of abandoned properties is also an important item to note.

The third point to consider is the method to promptly recover after a disaster and mitigate the losses. In Japan, there is a disaster recovery system for fishing ports and other infrastructure, which can be recovered promptly at the expense

of the government. On the other hand, if there is no mechanism to mitigate the losses incurred by fishers in some way and manage their job stably, it will be impossible to continue the industry since the damages caused by the disasters are unavoidable. For these occasions, the insurance system plays a major role. In Japan, with the support of the government, fishing boat insurance is provided for fishing boats, and the fishery mutual-aid system is prepared for fishing products and facilities. From the viewpoint of prompt recovery, it may be effective to hold an agreement with other fishery communities in other areas, which are not likely to be affected by the same disaster, to be able to support and provide materials and personnel when necessary.

The collection of recognizing the result of these studies as a common understanding and sharing the roles among the concerned parties and coming up with a plan is what BCP is about, but in reality simply just creating the plans may have its flaws and may not function well in the event of an actual disaster. What is important is to implement repetitive training. The important aspect of disaster management is to assess what is the appropriate disaster and corresponding mitigation plans and to practice repeatedly according to the plans.

### (2) Emergency disaster control stage

The immediate response after a disaster occurs to first ensure the safety of human lives. It is executing the protocol that was determined in advance to quickly evacuate to the designated place. After the safety of the concerning lives is secured, the focus should be shifted to restart the fisheries by assessing the damage situation and contacting relevant organizations. Investigating the safety of concerned personnel, the status of fishing ports and facilities, the status of fishing boats and fishing gear, materials, the status of products and stored goods, etc., we should be sharing that information as a common understanding among the concerned persons.

Next, we should move on to focusing on emergency measures that require immediate attention, such as debris removal. At that time, information as to when the disaster has happened, the magnitude of the disaster, and all other details should be taken into account in determining the priority order of

recovering. The fisheries that have the shortest period until the main fishing season has the highest priority. Emergency measures should be taken into action including removal of debris at fishing grounds, sea routes, basins, emergency recovery of facilities and equipment such as quays at fishing ports, procurement of equipment such as fishing gear and allocating alternatives to the damaged or lost fishing boats, securing fuel, water and ice, etc.. In the case of a large-scale disaster, self-help efforts and mutual assistance play a large role, as government administrative agencies may take longer time to respond with support. It is effective to flexibly arrange roles in advance among related parties.

### (3) Disaster recovery and restoration stage

After a certain amount of time has passed since the disaster, full-scale recovery and restorations of the region will take place, led by the government administrative agencies. In Japan, local governments are expected to play the central role. Various projects will be implemented promptly in accordance with the recovery and restoration plans established by local governments. Regarding the restoration of fisheries, prompt recovery of affected facilities, payment of insurance money, low-interest loan by the government fund, etc. will be carried out. When recovering and restoring order, there will always be politicians and scholars who will attempt to take advantage of the disaster and claim for what they would call a “revolutionary change.” However, that argument should be regarded as mere opportunism unless there were prior active discussions between the parties concerned building up before the disaster, and it is harmful and of no benefit without those discussions. In recovery and restoration of fishing villages, considerable respect must be paid to the characteristics of coastal fisheries that have been accumulated in the area by the history and culture that has been built on harmony with nature.

Fisheries, especially coastal fisheries, are susceptible to disasters. Therefore, it is worthwhile to consider measures to be taken in the event of a natural disaster or measures to reduce the damages caused by the natural disaster. In this paper, it was introduced that stakeholders have begun to form a council

## 17. BUSINESS CONTINUITY PLAN

in Japan since the Great East Japan Earthquake and to create a BCP in the fishery area. This document is intended to be helpful for future reference when thinking about coastal fisheries in other parts of the world.

## 18. Recruitment and Training

**Enhancing and Matching the Human Resource Development System**

***Naruhito Takenouchi***

Ehime University



*Traditional fishing vessels, Seto Inland Sea, Ehime Prefecture, Takenouchi N. 2016*

*This essay/column describes the present condition and outlook for fishery workers, including managers and employees, in Japan's Small-Scale Fishery (JSSF). The subject of fishery employment is a critical issue to protect Japanese coastal fisheries or small-scale fisheries. Almost 90% of small-scale fisheries are family-run. It is also true that the small-scale fisheries in Japan have played a central role in fishery employment. However, the diversification of employment opportunities and the lack of attractiveness of the fishery itself has led to the problem of lack of successors to the fishery. From the 1960s, when the Japanese fisheries were robust to the real crisis situation in recent years, we will analyze the institutional efforts and status of fishery employment. Finally, we will describe the outlook and measures related to small-scale fisheries and fishery employment of Japan.*

## Current situation of fishery employment in Japan

First, let's look at the overall situation of fishery workers. The Japanese White Paper on Fisheries and the Fisheries Census can verify the statistical data of the current status of small-scale fisheries and fishery workers. As of 2017, the number of fishery workers is 153,490, down 4% from the previous year. The breakdown of fishery workers age 15 to 24 is about 6,000, age 25 to 39 is about 22,000, age 40 to 54 is about 34,000, age 55 to 64 is about 34,000, and age 65 and over is about 59,000. 38% of the total employment is aged 65 and over.

## Trends in new fishery workers

Approximately 2,000 new fishers have been employed each year since 2009, and in 2017, there were 1971 new fishers employed. 70% of these new fishers are young people under the age of 39. However, as shown in the following section, the decline in fishery employment is a significant issue for the supply

of fishery products and the survival of fishing communities. A discussion of this matter is essential to solve these problems. The following describes the structure and characteristics of the small-scale fisheries, its fisheries policy, and the history of the fishery employment issues.

## Structure and features of small-scale fisheries

Article 2 of the Japanese Fisheries Law has the following provisions. In this Act, “a fisher” refers to a person who operates a fishery, and “a fishery employee” refers to a person who is engaged in gathering, catching, or culturing aquatic animals and plants on behalf of a fisher (Ministry of Justice website). Fishery enterprise has been divided into two by the scale. The first division consists of the Coastal Fisheries Establishment, which operates fisheries by using the stationary net on small fishing vessels of less than 10 tons, and Coastal Fisheries Establishment for marine aquaculture. The small-scale fisheries also fall under this division. The second division consists of a middle and large-scale fisheries establishment that uses more than 10 tons of fishing Vessels. Only about 5% of the total number of fishery enterprises are accounted for by the middle and large-scale, but their catch is accounted for more than 50% of the total production. The fisheries business management can be classified by organization, including independent management such as fishery household, joint management by multiple fishers, and company management by establishing a company or corporation. Of these, more than 90% of the coastal fisheries management is independent management, so fishery household = family-run would be fine.

Japan’s fishing village or district has many small, family-run fishery enterprises. Then, what could the structure of this fisheries household = family-run fishery enterprise be?

Fishery household is based on the labor of the family member, so the management is based on the family structure, age, and life cycle. In short, the number of family members and their successors determines the quantity and quality of the fishery household’s workforce and income. The successor to the fishery enterprise is a fishery household member who is engaged in the



fishery and becomes a fisher in the future. In recent years, the percentage of management entities that have secured this fishery successor has become extremely low, and not only the succession of fishers but also the continued existence of coastal fishery enterprises is in jeopardy. It has been pointed out that the problems of fishery successors are: (1) unstable income, (2) poor working environment, and (3) inconvenient lifestyle in fishing villages. For this reason, the number of aging fishers has increased, and they are fishing alone or in couples (Miki, 2008).

## Fisheries policy and employment support activities

In this section, let's discuss Japan's fisheries policy only for employment. In the 1980s, various measures were taken since the decline of the number of fishery workers, but they did not show a sign of recovery. In the 1990s, the situation became more severe. Governments, local governments, and fishery cooperatives made new policies to accept new non-fisher workers in the hope of improving the number of fishery workers. However, these new workers did not have a good retention rate. However, in recent years, the management of fisheries has not improved much even if the number of management bodies has decreased, but rather a drastic decrease in the number of fishery workers has hindered the healthy development of the fishing industry. The text of Article 23 of the Fisheries Basic Act enacted in 2002 states that "(1) The Country shall take necessary measures such as improving technology and management skills of fisheries and promoting the acquisition of technical and management skills of fisheries for those who will be newly engaged in the fishery in order to develop and maintain human resources who will be responsible for efficient and stable fishery management" (Ministry of Justice website). The Fisheries Basic Act has declared that it will encourage newcomers to fishers from outside the fishery. It was a profound innovative way for fishery employment. The 2018 Fisheries White Paper estimates that 150,000 fishery workers will decrease to 70,000 in 2048 from 2017 (Figure 1). There is an urgent need to develop motivated fishers. The Fisheries White Paper points out that measures to develop human resources should be further enhanced, such as training systems in countries

where people can work in the fishery without any experience and fishing schools where practical fishing techniques can be learned.

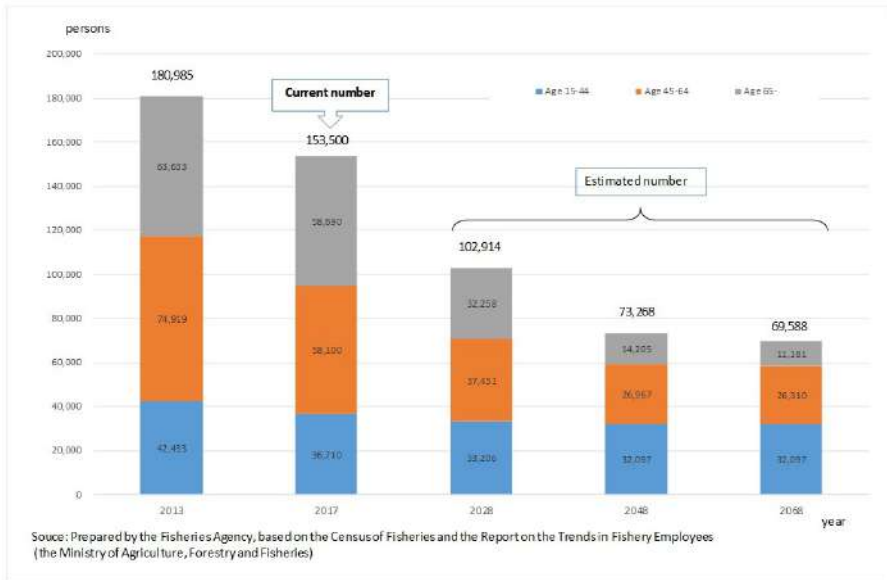


Figure 1. The prospect of the number of fishers[1]

The first revised fishery law in 70 years will be enforced in 2020. This section describes the improvement of fishery employment and fishery management in the revised Fishery Law. Many intellectuals and fishers have expressed a negative opinion on the revised Fisheries Law, but on the other hand, the revised Fisheries Law seeks to increase employment opportunities while increasing fishery income. Also, as companies enter the fishery business, it can become more difficult for fishery workers. For small-scale fisheries to survive while maintaining its social value, it is important to improve fisheries management. It is, by extension, I think and will lead to an increase in the fishery workers. At present, Japan's fisheries policy is working on various missions to improve this situation. In particular, it is actively promoting the development of human resources who can play active roles in the fishing industry.

Now, let's take a look at the latest data from the 2018 Fisheries Census. The number of coastal fisheries management totaled 74,151, including corporate management. Among them, fisheries by fishing Vessels have 54,370 entities, fixed net fishing has 5,831 entities, and marine aquaculture has 13,950 entities. Since the total number of coastal fisheries in 1998 was 142,678, it has been reduced by half. The small-scale fisheries, which do not include corporate management, totaled 71,117 entities. Among them, fisheries by fishing Vessels have 53,822 entities, fixed net fishing has 4,789 entities, and marine aquaculture has 12,506 entities. As of 2018, there are 1280 new employees, 444 fishers, and 836 employees regarding small-scale fisheries. The new 444 fishers consist of 283 vessel fisheries, nine fixed net fisheries, and 152 persons marine aquaculture. In the last section, I would like to discuss the future prospects of fishing employment.

Conclusion: towards the sustainable small-scale fisheries



*Photo 1, A Seminar on Human Resource Development, Uwajima City, Ehime Prefecture, Myoujou. M., June 2018.*

The author has been involved in human resource development seminars for the water industry leaders in Ehime Prefecture. This seminar is not a direct program of fishery employment but has been held since 2013 to promote local fisheries. Participants are mainly fisheries officials, government officials, and private business people. The seminar curriculum consists of “Fisheries Study for the Beginner, Environmental Studies for Fisheries, Coastal Marine Ecology for Fisheries, Aquaculture of Marine Fish, Theory of Fisheries Stock Management, Food Processing Technology, Fish-food distribution” and field works. This seminar has succeeded in providing human resources who can contribute to the revitalization of local fisheries. The picture is the scene I am giving at this seminar (Photo 1).

Various actions to support the revitalization of fisheries employment and fisheries are beginning to be implemented around the country. And such activities must increase along with quality and ensure that they are linked to employment. It is becoming increasingly difficult to find a successor to fisheries from their families. I believe it is important to secure motivation for those who want to work in fisheries in a modern society where employment opportunities are becoming more diverse. One way is to incorporate the fishery management. In short, the fishery management should incorporate a system similar to that of a general company, such as labor and social security, instead of the old-fashioned family labor. It is widely known that work in the agriculture, forestry and fisheries industries has a poor working environment. Therefore, securing new workers in the fishery requires as much welfare, accident prevention, and high income as a business. However, from a different perspective, fishery workers value pride. The pride is facing natural threats regardless of the risk of responding to the needs of the seafood supply for the people. In other words, it is important that the work of fishery is protected as social dignity.

The role of fishery cooperatives will also be important in tackling fishing employment. Fisheries households may not have enough systems to accept fishery workers, so it is important that fishery cooperatives collectively accept them. Fishery cooperatives are not only accepting foreign workers, but also training fisheries, introducing local traditional culture and fishing, and

raising them to be worthy fishers. Fishery cooperatives that have gained such experience will eventually be able to accept fishers from the general public. In order for the small-scale fisheries to survive, it must continue to secure people who want to work in the fishery. Stakeholders in the fishery district need to provide accurate information to those who want to work in the fishery. The information includes the characteristics of the type of fishery for each production area, the requirement of human resources, what kind of labor is required, how much income can be expected, and the status of the social welfare system. And for fishery district stakeholders, it may be more effective to set up a period of internship. Matching the two will increase the retention rate and become a workforce that is rooted in the community in the future. Stakeholders in the fishery district must recognize that they will nurture new workers. This is due to the following reasons.

In the past, human resource development was mainly based on a method that did not rely on artisan language unique to Japan due to a large number of family members. There is a word in Japan that you grow up looking at your parents' back. "Children learn from their parent's example." However, it does not include verbal communication. It's not about verbal communication, but about observing and mastering the gestures and techniques of their boss.

In modern society, a general human resource development system requires verbal communication instead of such traditional methods. Stakeholders in the fishery district need to recognize that communication is a crucial tool for developing new workers. In addition, the people of the regional fisheries area aim to reform the fishing industry to a working environment similar to that of modern enterprises to prepare a system to accept new workers. And above all, it is imperative to raise the workers' passion for revitalizing the regional fishery area. An employee development system is a tool for matching labor dispatch and local fisheries area. Employee development systems are being established in various places. Still, I recognize that it is necessary to discuss once again what kind of talents we want to develop and develop in the community. To make the small-scale fisheries of Japan sustainable, what do you think about the employment issues? Now let's discuss! And now, in anticipation of your insight into the future.

## Endnotes

[1] *FY2018 Trends in Fisheries, FY2019 Fisheries Policy, White Paper on Fisheries: Summary*, p.5. Retrieved from [https://www.jfa.maff.go.jp/j/kikaku/wpaper/pdf/2018\\_jfa\\_wp.pdf](https://www.jfa.maff.go.jp/j/kikaku/wpaper/pdf/2018_jfa_wp.pdf)

## IV

### New Initiatives and Concepts of JSSF





## 19. The Sixth Industrialization

### Development of Flexible Income Opportunities Through Regional Appeal

***Hiroshi Tomita***

Fishery Communities Planning Co., Ltd.



*The combined seafood market, restaurant, and processing plant. Iwaizumi Town, Iwate Prefecture, Yokokawa M., 2017*

*The small fishing communities and coastal fisheries operations across Japan provide a safe, stable source of fresh marine products to the country, while also serving other roles, from protecting and managing coastal ecosystems to preserving traditional culture and landscapes. However, the fishing households on which these communities depend are aging and decreasing in number, and their income is far lower than the national average. The sixth industrialization can provide a solution, revitalizing coastal communities by leveraging a wide range of local resources to create community businesses based on distinct regional appeal.*

## The definition of and the need for sixth industrialization

Agricultural economist Naraomi Imamura defined “sixth industrialization” to illustrate the concept of expanding operations in industrial sectors such as agriculture, forestry and fishing, where businesses grow from their respective primary industries to processing (secondary industries) and sales and distribution (tertiary industries) (Imamura, 2017). Initially, the term was intended to express a linear expansion by simply summing “1” for primary, “2” for secondary, and “3” for tertiary industries to reach the “6” tally. Currently, however, the primary industries have declined to the point where they are no longer sustainable on their own, and so Imamura has shifted the definition from straight-forward addition to multiplication ( $1 \times 2 \times 3 = 6$ ), in order to signify the manner in which businesses can plan for organic and comprehensive combinations of the three levels of the industry. In recent years, the term has been embraced across Japan in describing the revitalization of small farming, mountain, and fishing communities, and the diversification of their local industries, efforts which the national government is actively working to support.

There is a need for, and distinct definition of, the sixth industrialization

in small-scale coastal fishing communities and their local fishing industries. Over the five-year span from 2013 to 2017, the average household income in Japan was 5.46 million yen (MHLW, 2019). In contrast, for small-scale, individually-run coastal fishing operations, the average combined fisheries and non-fisheries income was just 2.89 million yen (MAFF, 2019), just over half the income of the average household. As shown in figure 1 below, for fishing households, income from fishing made up 90% of total income, but these activities have unique characteristics such as high expenses and unstable costs and income (due to large year-to-year fluctuations). Non-fishing income made up just 7% of the total and is mainly limited to income from work such as seafood processing and operating leisure fishing boats.

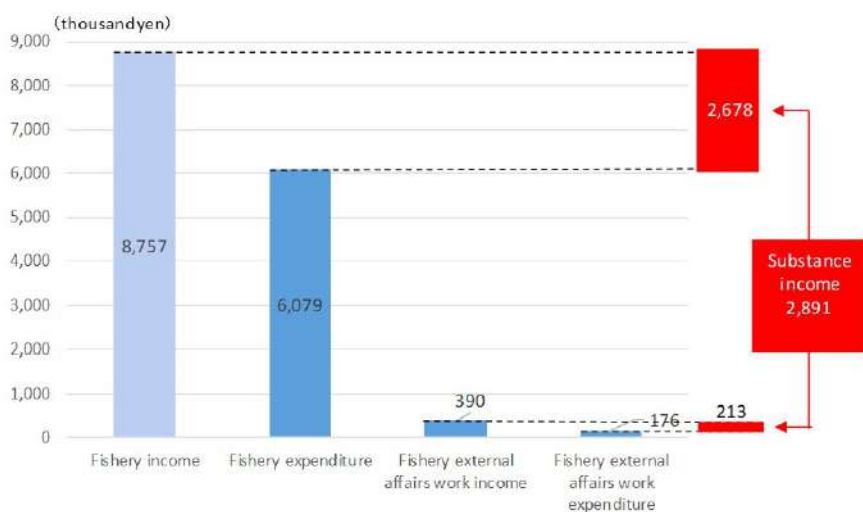


Figure 1. Income of Japanese fishing households (5-year average: 2015–2018).

Source: Fishing management survey by Ministry of Agriculture, Forestry, and Fisheries.

The conditions of coastal fisheries communities and businesses in Japan are diverse. In some regions, it is possible for households to generate sufficient income from fisheries activities alone, while in others, such income is not enough. This is an important point when considering the sixth

industrialization. In areas where fisheries income is sufficient, the sixth industrialization can be implemented with the goal of proactively reviving the fisheries sector, while at the same time creating a ripple effect that revives the broader community, creating new industries in the process. In areas where fisheries income is not sufficient, the sixth industrialization can be implemented with the aim of enabling fishing households to continue operation, through the creation of new opportunities for supplementary income.

## Implementation of sixth industrialization in fishing communities

As the sixth industrialization is intended as a method to solve the broad range of issues and problems facing fishing communities and coastal fishing operations, naturally actual implementations will be diverse and depend on the circumstances. In Japan, aging and depopulation are unabated problems for these communities and businesses, which endanger the continued existence of not only local fisheries but also their rural societies as a whole.

Experience in such situations has taught that a crucial component when implementing the sixth industrialization in a given region, even more important than an understanding of the problems to be solved within the local population, is for the basic goals and overall vision of the implementation to be shared between the various stakeholders. Caution must be taken at the beginning of the implementation. It is acceptable if specific details are not yet well defined, but if there are errors in the fundamental principles and direction, subsequent discussion and efforts will be unfocused and adrift. It is important for individuals such as government officials and workers at local fisheries associations to serve as coordinators for ongoing, constructive workshops that are focused and produce optimal solutions. In this early stage of implementation, it is also effective to invite opinions from outside experts.

In the next stage, stakeholders such as local fishers and residents should work to both identify local resources and evaluate their potential for commercialization. This can be thought of as a search for buried treasure. Local

resources can be divided into four categories: natural resources (including the ocean, coast, scenery, waves, wind and tide, and local wildlife); production resources (including fish and seafood products, fishing methods and technology, fishing boats, and various marine facilities); infrastructural landscape (including fishing ports, noteworthy buildings and homes, paths and roads, and unique local scenery and spaces); and cultural resources (including local individuals, knowledge and wisdom, traditional festivals and practices, customs and etiquette, and food culture) (Fisheries Agency website). Each resource category should be examined to determine how it can be utilized. At this stage, care must be taken not to overlook potential commercial offerings, because local stakeholders live among these various resources and may be too accustomed to them to identify their appeal and commercial value. For this reason, canvassing opinions from potential consumers to be targeted by the sixth industrialization can often lead to new discoveries.

While uncovering such resources and identifying the needs of consumers, the value and commercialization potential of the resources should be considered. One common approach that leads to failure is to take a rigid stance, where “these are our products and so these are what we will sell.” A more successful approach is to first ask questions such as “who will we be selling to?”, “where will we be selling?”, and “how much do we want to sell for?”, the answers to which will lead to “what we should sell.” Keeping these factors in mind, consider the potential of each of the available resources, evaluating 1) how easy they are to manufacture and offer; 2) whether they fit with the overall vision for the region; 3) whether they meet the needs of consumers; 4) whether their use is compatible with the local fishing industry; 5) whether they are compatible with local laws and regulations; 6) how convenient their use is; 7) how safe it is; and 8) whether there are sufficient human resources and know-how to utilize them.

The third stage of implementation considers the ways in which the selected resources will be combined into an offering that supports the sixth industrialization. Based on the results of the survey of potential resources, the question of “who will be involved” should be considered in detail, leading to the development of a “specific list of potential product offerings.” The

details of the offerings are determined by envisaging items such as the main customers, the service providers, how the product will be offered, as well as the time of the year, service hours, location, and fees, which taken together become a plan for the local region to follow. The local stakeholders may decide to offer a single product or combine several products.

The final stage implements the management structure and conditions for the operation to support the sixth industrialization. To ensure that, the project produces ongoing results and is not a one-time offering. Crucial components include the establishment of a management structure with high levels of trust, the right levels of leadership and education on the ground, and methods for obtaining the participation and cooperation of local residents. Needless to say, there are numerous other areas that need to be considered, including tie-ups with businesses and hotels, both local and from other regions; restaurants and sales facilities; the creation of new or renovation of existing facilities for “hands-on” experiences and other offerings; marketing and strategies to create repeat customers; and procedures for handling emergency situations and customer claims.

While the initial details of the project are determined during the preparatory stages of the sixth industrialization, it is important to remember that economic conditions in society, including customer demands, are a living, changing creature. For this reason, it is dangerous to stubbornly stick with the initial project plan. Flexibility is crucial, with constant feedback as the project proceeds. In order to implement the sixth industrialization for coastal fishing operations and fishing communities in a manner that produces effective, sustainable income and employment opportunities, making adjustments and reforms based on a PDCA system, or “Plan-Do-Check-Action,” is indispensable.

## Government support

There are currently various support systems from the Japanese government in place for the sixth industrialization in coastal fishing communities and local businesses. To take one example, the Fisheries Agency, which has jurisdiction

over efforts to revive coastal regions, offers schemes to help plan and finance enterprises that provide “hands-on” experiences in fishing communities or revitalize harbor facilities. The agency provides numerous avenues of support for projects and pilot programs for both soft enterprises and hard infrastructure projects in areas from reestablishing guest accommodations and tourism activities to support sales of local products, restaurants, and seafood production. An example of an effective project for the sixth industrialization is the “Hama no Ouendan,” or “Beach Support Team” website, which introduces specialists in various fields to stakeholders in fishing communities.

Another productive approach comes from regional governments, non-profit organizations, and private organizations that work to draw foreign tourists to farming, mountain, and fishing communities with Japanese Destination Management Organizations (DMOs). DMOs are companies that establish strategies to create tourism regions based on clear concepts and have the functionality to effectively implement those strategies through cooperation with various stakeholders by managing tourism development that draws out local job opportunities while also creating local pride and attachment (DMO website). Effective DMOs allow those involved with the sixth industrialization to broaden their information networks and put them to use as part of the implementation.

## Future topics

Japan’s small fishing communities have collectively demonstrated a versatile and crucial functionality, providing a rich assortment of safe, fresh marine products to the nation. Located all over the country, these communities are dependent on their coastal fishing operations, which in turn depend on individual fishers, whose output is small in scale and unstable. For this reason, it is not just these individually operated fisheries that are in danger of disappearing, but the local communities themselves. To alleviate this situation, the sixth industrialization will play an even more important role in the future, but there remain many problems that must be addressed. The sixth industrialization can be described as the establishment of methods to

foster systems which lead to supplementary income opportunities for fishing households, in the form of sustainable community businesses, which in turn leads to the revival of impoverished fishing communities.

(1) Independence and continuity

In order for the sixth industrialization to contribute to the revitalization of small fishing communities and provide supplementary income to fishing families, regional projects must take root locally, through independent management and sustainability. For this reason, it is essential to foster and install individuals who will take responsibility for the sixth industrialization, as well as create organizations and bodies that will oversee planning and operation. There are many examples where organizations fail because they begin operations without sufficient personnel or management strategies. It is important to find and foster personnel with sufficient motivation and skills and facilitate organizations with strong management ability. The search for contributors must include all parts of local communities, which needless to say includes often overlooked segments such as elderly fishers and local women. In some cases, cooperation with business from outside the region or DMOs can lead to beneficial partnerships.

(2) Regional brands, not products

The core component of the sixth industrialization is to make regional resources appealing, transform them into products, and create new industries. But it must be remembered that a key component of the implementation is strengthening the appeal of the region behind the products, which will increase their value. The implementation of the sixth industrialization allows this regional appeal to be rediscovered, bringing added value to its offerings, strengthening local branding, and providing opportunities for consumers to enjoy the region's local products and services. Further, this implementation deepens the love for and connection to the region, leading to interactions and connections with ever greater numbers of people, so that the base of the sixth industrialization continually broadens. Everyone involved with the effort must keep in mind that in the end, implementing the sixth industrialization



is synonymous with local development based on strengthening the appeal of the region.

(3) Emphasizing community businesses

The sixth industrialization is not just a single regional promotion event. It is important to take the view that implementation involves community-oriented business operations, with fishers and local residents taking a major role in tackling problems using established business methods. The desired result is not to simply invite external businesses to take the lead, but to foster the enthusiasm needed to develop local businesses. In situations where purely local development is not possible, local fishing communities should work together with outside individuals and organizations that share their enthusiasm, to create synergies and new models of joint development.

## 20. Fish Branding Strategies

### A Case study of Regional Brand, Seki Saba and Aji

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*Seki Saba fisher and fishing boat, Saganoseki, Oita Prefecture, Japan. M. Hazumi,*

2020

*Given the severe situation marine products find themselves in, there is a sense of worry in the reduction of resources. Coastal fishing is a fishing method with low pressure on resources. In particular, the fishing method of Seki Saba and Aji is pole-and-line or single line fishing, which is suitable for today's fisheries aiming for sustainable production. However, the problem is that such environmental-oriented fishing methods are not always evaluated economically. If consumers can find value and increase it, the management of coastal fisheries will improve. Under these circumstances, the marine product brand needs to change. This chapter examines the necessity of quality control and a new business model to establish a brand, taking Seki Saba and Aji as a typical example of a celebrity brand, which enjoys the highest brand position. In addition, it is necessary that marine products caught in moderation out of consideration of maintaining fishery resources be recognized as valuable.*

## Seki Saba and Aji, the first established marine product brand

The branding of marine products was activated in 1996 when Seki saba and Aji acquired the first trademark registration as marine products. Until then, the brand of marine products performed based only on external features such as appearance and size. However, the standardization of quality became possible, so the brand of aquatic products was established. In fact, Seki Saba and Aji will gain the status of a top brand and develop it nationwide by creating a system to control quality from the production stage (from catching and landing) to the distribution process. Seki Saba and Aji has gained a reputation nationwide and has established a solid position as a synonym for branded marine products, but the current situation is not always satisfactory. As a celebrity brand, the fishery cooperative has developed a business model that cultivates sales channels

commensurate with its value and supplies it to Tokyo markets and restaurants where prices are high. However, the business model has ceased to work due to the decline in market demand after the collapse of Lehman Brothers. Furthermore, the depletion of resources has become a serious problem. Along with environmental issues and changes in the circumstances surrounding organizations, new developments are required for Seki Saba and Aji.

## Fishery situation-landing amount and landing value

At the Saganoseki branch in 2012, the resources of Seki Saba and Aji, which are the main catch targets, have been remarkably reduced. The peak of both Seki Saba and Aji is around 2000. Until the end of fiscal 1998, Seki Aji peaked a value of around 500 million yen and a quantity of around 250 tons in 1998. Seki Saba peaked at 530 million yen and 156 tons in 1997. However, both have continued to decline, Seki Aji is about 200 million yen, and the volume was 47 tons in 2018. On the other hand, the value of Seki Saba dropped sharply to about 50 million yen and 25 tons in 2018. In particular, the problem is that the quantity of Seki Saba has fallen sharply. According to the Fisheries Agency's assessment of fisheries resources in the waters around Japan, the stock assessment of Masaba in 2018 shows that the Pacific group is moderate, and the trend is increasing, while the Tsushima warm current group is low and the trend is rising. Similarly, sesame mackerel tends to decline moderately in the Pacific and moderate in the East China Sea. Mackerel resources are generally sluggish. Catch of mackerels are carried out in the most purse seine, Oita Prefecture (Saganoseki branch is located in Oita prefecture) currently has a small amount of quota under TAC management and is not explicitly managed. New resource management will be implemented under the revised Fisheries Law (enacted in 2018). The goal of resource management is to maintain or restore the stock level (MSY level) that can achieve the maximum catch that can be caught continuously. However, regarding the mackerel in Oita prefecture, a study meeting between the government and the prefecture has just begun. It is unknown when and what new initiatives will take place. In terms of resource management, there is no immediate action to take on resource depletion.

## How Seki Saba and Aji worked on branding

Seki Saba and Aji have been known all over the country since the late 1980s and have been setting high prices. Under such circumstances, a business was started in which the fishery cooperative became a middleman to buy Seki Saba and Aji and sell lots in bulk in order to enjoy the benefits of the brand. After that, Seki Saba and Aji acquired trademark registration in 1996 and introduced a special agent system in 1997 to manage channels. There, a seal was attached to the tail of the fish. However, such channel management by the dealer system has stopped functioning due to the emergence of fake brands. In 2006, the regional collective trademark system was enacted, and “Seki Aji Seki Saba” was also approved. Taking advantage of this, brand management was started by using this regional collective trademark to manage the channel, renew the seal, and promote it. At present, one seal is attached to each fish, and in a restaurant or the like, one fish may be divided into small portions and used for cooking, so the method of attaching 4 to 5 small-sized seals are used.

Looking at sales destinations, shipments to Tokyo account for 70%, Oita 15%, Fukuoka 4%, and others. The proportion of the Tokyo market is high, where it has been positioned as a major market trading at relatively high prices. However, after the Lehman Shock, the percentage of Auction trading in the wholesale market increased, where prices fell from 5,000 yen to 3,000 yen. On the other hand, the direct transaction with a restaurant in Tokyo is about 4,500 yen, and it is thought that this part will be increased. The restaurant business began in 2012 in partnership with Japan Airlines (JAL). In this system, Seki Saba and Aji are drained blood and nerves in the middle of the night, sent by JAL flight the next morning, and delivered to restaurants in the evening of that day. In the future, it is thought to increase the local Oita. There is an advantage that transportation costs and labor costs are not required. To that end, the Saganoseki branch will focus on shipping to the Oita market and developing sales channels for restaurants. From brand formation to brand expansion through quality control, Seki Saba and Aji is a blessed production area that grows in fast-moving waters and has little change in water temperature throughout the year. The “blessed production

area,” “production and processing technology,” and “quality control at the distribution stage” created the “Celebrity Brand” of the highest brand position.

Furthermore, in 2012, the construction of hardware such as floating mooring berths with Ikesu (a fish cage), cargo handling facilities, and facilities for introducing clean seawater was completed with the support of the national and prefectural governments, and a system capable of advanced hygienic quality control. (Figure 1) Seki Saba and Aji have formed brands with high quality. In addition, efforts are being made to improve hygiene and the freshness of fish to be delivered by improving hardware and improving the distribution system. In particular, since Seki Saba resources are declining, technology development and introduction to ensure stock and stable supply are under consideration.

## 20. FISH BRANDING STRATEGIES

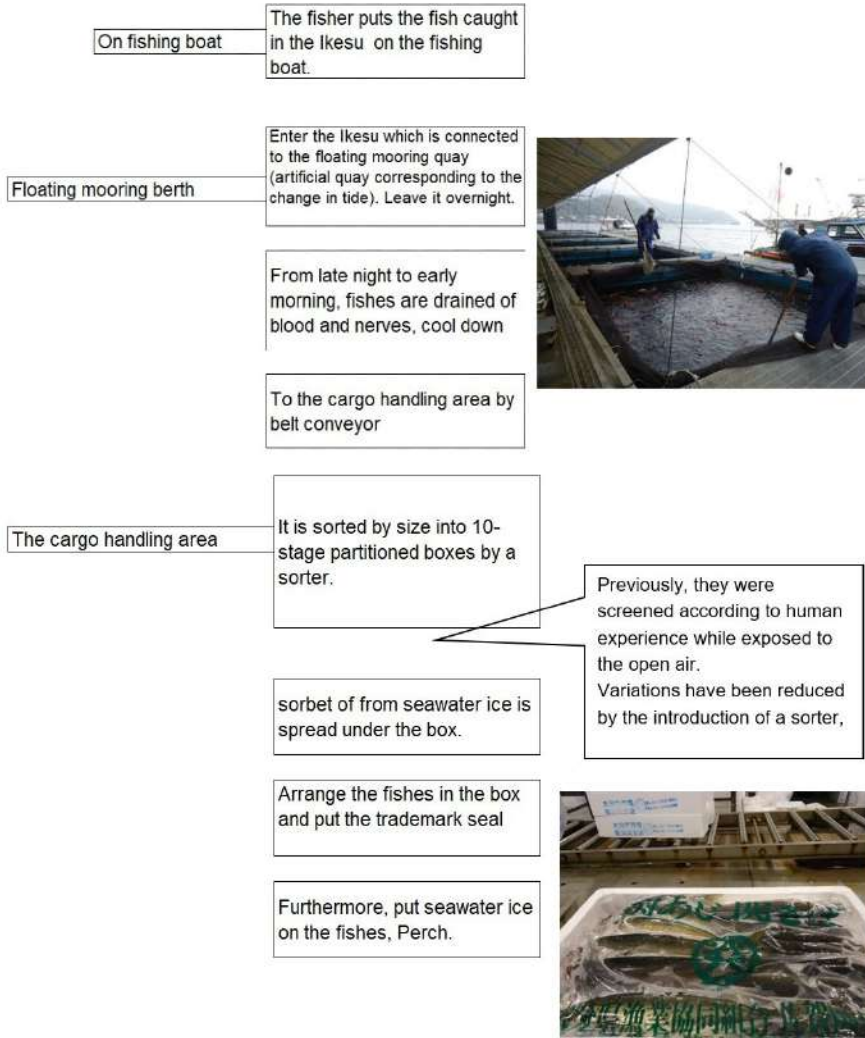


Figure 1, Quality control from landing to shipping

The national reputation of Seki Saba and Aji is a great asset to the Saganoseki branch. Taking advantage of this, the development of single-line fishing “Tai,” “Isaki,” and “Buri” that can be taken at Seki as a family brand has started. As we have seen, as the resources of Seki Saba and Aji are decreasing, establishing a family brand is an effective strategy to cover this. Seki family

brand has not acquired trademark registration, but if a seal is attached, the price will increase about five times. It is necessary for the Seki family brand to actively appeal to consumers that it is the same fishing ground and fishing method as Seki Saba and Aji. This will inform consumers that the Seki family brand is an environmental-oriented fishing method. It is important to create value by doing so.

## Regional branding of Seki Saba and Aji

There is a trend toward regional branding as a new development of Seki Saba and Aji. Until around 2010, the main target has been Tokyo, but new businesses are being developed that link to the region. Saganoseki branches as the business are doing himself, fishery direct management restaurant “Seki of fishing grounds” (since 2000), local fishery processing companies seafood processing products business through cooperation with (since 2004), “The morning market of Seki Saba and Aji Street (since 2005), which is held on the third Saturday of every week along the shopping street following the Saganoseki branch named by citizens.

The Saganoseki branch is mainly engaged in businesses such as the fishery cooperative restaurant “Seki no Fishing Ground” (since 2000), the marine products processing business in cooperation with local fishery processors (since 2004), and “Seki Saba” The morning market (since 2005) which is held on the third Saturday of every week on the shopping street following the Saganoseki branch, named by citizens as “Seki Saba and Aji-dori.” Initiatives linked to tourism include holding the Seki Saba and Aji Festival using Seki Saba and Aji (from 2001) and establishing the “Seki Aji Seki Sabakan” (since 2007) by Saganoseki Tourism Co., Ltd. Furthermore, in 2006, the Chamber of Commerce and Industry, the Saganoseki Branch, and the Neighborhood Association formed a non-profit organization, the “Saganoseki Town Development Council.” The purpose of the formation is to revitalize the region as a town of Seki Saba and Aji. Activities include the support of the Seki Saba and Aji festivals and Seki Saba and Aji restaurant maps.

However, many tourists cannot be expected because Saganoseki has no



tourist facilities such as accommodation facilities and hot springs. Therefore, it is thought to focus on consumption in the prefecture, and work on direct sales of Seki Saba and Aji (since 2013) in cooperation with inns and hotels in Beppu and Yufuin, which are sightseeing spots. In this way, the Saganoseki Branch is shifting from a business model that emphasizes Tokyo to increasing consumption in the prefecture. To that end, tens of millions of systems have been developed that allow online ordering. This convenient system is intended to increase transactions with restaurants in the prefecture.

## Conclusion

The ultimate goal of the brand is to become a power brand (a brand with strong loyalty). There are two possible directions: (1) national brands and (2) Regional brands. (1) National brands need to be high in quality and expensive and scarce and valuable. (2) Regional brands will help develop the region as a business area. In the former case, it is difficult to establish a brand unless the conditions are excellent. Seki Saba and Aji is truly a national brand. The Tokyo market, which was a (1) national brand sales channel, has been high until around 2010. However, after the collapse of Lehman Brothers, the price began to fall, and it became a burden that the costs associated with market development and transportation were high. As a result, development as a (2) regional brand is aimed at. If a regional brand is established, a synergistic effect can be obtained in which the consumer's loyalty to the individual brand, as well as the loyalty to the region, overlap. It is also expected that cooperation with various business entities will lead to regional revitalization.

Consumers' needs for food are based on the premise that they feel the food is safe, reliable and rich in nutrition. A marine brand has a variety of indices, such as the region, culture, relationships with producers, and the environment, and can be said to offer new values that realize richness. At the same time, there is an environmental problem as a major issue at present. Just as the enforcement of the revised Fisheries Law aims at sustainable production, the seafood products produced from the natural environment, such as seafood, are incompatible with the logic of industrial products that they are cheap

and efficient in large quantities. So it needs to show this to consumers. The Seki Saba and Aji are single-line fishing, and this fishing method has low environmental pressure and is suitable for sustainable production. The problem is that such an environmentally friendly fishing method has not been established as an added value. Until now, high quality was valued as a brand, but it is necessary to consider a mechanism of information transmission so as to find environmental value.

As the revised Fisheries Law aims for sustainable production, the food produced from the natural environment of marine products has a background that is incompatible with the logic of industrial products that is cheap and efficient in large quantities. It needs to be shown to consumers. The Seki Saba and Aji, which has been viewed as a case are single-line fishing that fishing method is pressure on the environment is small; it is suitable for sustainable production. The problem is that such an environmental-oriented fishing method has not been established as an added value. Until now, brands have been valued for their high quality. In addition, it is necessary to consider information transmission mechanisms so that value can be added to environmental aspects.

## 21. Urban-Village Exchange

### **The Importance of Urban-Village Exchange in Small-Scale Fishing Communities**

***Tamano Namikawa***

The Japanese Institute of Fisheries Infrastructure and Communities



*New Year's Prayer for the good catch at Kamakura. T.Namikawa, 2019*

*The “Exchange between cities and fishing villages” initiative, which refers to residents of cities visiting regions that are home to fishing villages to enjoy nature and marine products while also stimulating the economy in these regions, serves as one of many initiatives to revitalize fishing village regions. This chapter discusses how increasing the population exchange (providing the value of fishing villages to urban residents), and regional revitalization (securing additional income for fishers) are making important contributions to coastal fishing regions while providing examples of exchanges between cities and fishing villages and characterizing the course of development of such exchanges.*

## Introduction

Fishing villages function to provide a stable supply of fresh seafood, marine recreation activities, and the passage of regional food culture and traditional events to provide a comfortable and mirthful life to the people live in the city. Fishing villages also serve as major contributors to regional revitalization efforts by attracting people to the region and stimulating activity. Many of the exchange activities between cities and fishing villages include fishing excursions that take advantage of the rich natural environment and fresh seafood, morning markets, etc. Activities such as morning markets have been organized for many years, particularly in fishing villages near cities. I would like to review the efforts to facilitate exchanges between cities and fishing villages and confirm their role with respect to small-scale fisheries.

## Regional development and exchanges between cities and fishing villages

Recreational activities in which people stay in rural areas and enjoy the experience of farming, fishing, and interacting with local people are referred to as “green tourism.” According to the Ministry of Agriculture, Forestry and Fisheries’ (MAFF) definition, these are “overnight stay leisure activities in which people enjoy the interaction with nature, culture, and people in rural areas.” In Europe, there is public policy calling for the utilization of travel styles known as agri-tourism and rural tourism as approaches to regional promotion and support. In addition, the “Act on Promotion of Development of Infrastructures for Leisure Stay in Rural Areas” was enacted in Japan in 1994, and various regulatory reforms were subsequently promoted. This version of green tourism relating to fishing villages is referred to as blue tourism (overnight stay leisure activities at fishing villages), and was proposed jointly by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT, formerly the National Land Agency) and the Japan Fisheries Agency in 1998, followed by the creation of an exchange program and the rise in popularity of fishing trips in Hokkaido and Shikoku.

Fishing villages at this time were promoting fisheries resource management, while the demand for fisheries saw growth. “Regional Fisheries Research,” Vol. 37, No. 1 (1996) published by the Japan Regional Fisheries Society of Japan, mainly included papers on resource-management fisheries and direct-sales businesses, which also suggests that these activities were garnering attention during this time. Later, perhaps due to the influence of blue tourism measures, research and reports on fishing experiences became more common in the 2000s, and fishing experience trips were used as educational field activities by different organizations. Specific examples of exchange activities between cities and fishing villages include direct sales markets, fish restaurants, and fishery experience trips. It is in these activities that I have identified value as opportunities for exchange centered around the heritage of marine products, and I focus my attention here.

## Direct sales

Morning markets and direct sales have been ongoing in fishing villages near cities for many years. Such events are suitable for selling catches that did not fall under the existing distribution system through wholesale markets for producer and consumer regions (e.g., the fish are too small or irregularly shaped). This was also used to improve fisher's income by eliminating the cost of intermediate distributors. Four papers (Isobe, 1996, Ito 1996, Inui 1996, Tasaka, 1996) have previously mentioned direct sales (published in "Regional Fisheries Studies"; Japan Regional Fisheries Society of Japan [1996]); they analyzed the background of the promotion of direct sales operations while introducing aspects such as the severe economic reality of fisheries and fishing village management due to low marine product prices and the existence of products that are difficult to adapt to the existing distribution system, the effective use of such products and their contribution to fishery cooperatives, and the purpose of direct sales operations to facilitate understanding through interaction with the general public.

Direct sales businesses in suburban areas of cities are popular, and the "Munakata Road Station" in Munakata, Fukuoka City, is a tourist product center that mainly sells agricultural and marine products. It is a popular establishment visited by approximately 1.6–1.7 million people annually (FY2018 data), and it is said that the annual sales attributable to goods sold (including agricultural products) is 1.8 billion yen (FY2016 data). At present, the number of direct sales fisheries outlets in Japan is increasing, and the amount of annual sales is also increasing (Table 1a). In terms of size, 20% of companies have annual sales of 1–5 million yen, 34% have 10–50 million yen, and 12% have sales of 100 million yen or more. A small proportion of small businesses also exist (Table 1b), and are believed to serve as sources of additional income for fishers.

## 21. URBAN-VILLAGE EXCHANGE

(a)		H23	H24	H25	H26	H27	H28
Nationwide	Revenue (million yen)	27,609	31,112	31,275	33,204	36,486	37,315
	Business entities	580	610	610	640	660	680
	Revenue per business entity (millions of yen)	48	51	51	52	55	55
(b)		H23	H24	H25	H26	H27	H28
Nationwide	Total	100	100	100	100	100	100
	<1 M yen	8.6	6.7	4.7	5.3	5	10.5
	1–5 M yen	32.7	27.1	26.4	30.3	24.3	19.8
	5–10 M yen	9.1	15.4	15.9	11.3	16.5	14.9
	10–50 M yen	29.1	27.8	30.4	27.8	32.3	34.1
	50–100 M yen	10.5	12.6	11.3	13.4	9.8	8.3
	100–300 M yen	6.9	7.5	8.8	9	8.6	8.8
	>300 M yen	3.1	2.9	2.5	2.8	3.5	3.7

*Table 1 (a) Annual direct sales from seafood products and the number of business entities; (b) Proportion of business entities by the scale of annual sales revenue (unit: %). Source: 6th Survey on Industrialization*

In recent years, there have been cases where fisheries cooperatives utilize direct sales to promote an understanding of the fishery rather than to empower fishers to generate additional income. For example, the Kamakura fisheries cooperative in Kanagawa Prefecture uses direct sales to promote Kamakura's fisheries and build connections with local residents. Kamakura, which is located about 50 km away from Tokyo, has come under the spotlight as a tourist destination because of its warm climate, historical heritage, and verdant scenery, and is still a common tourist destination for the Tokyo metropolitan area. Kamakura's fisheries have been operating for centuries, and Kamakura's skipjacks are described in books dating back to the first half of the 14th century. There are currently two fisheries cooperatives in Kamakura serving the Koshigoe and Kamakura areas, but because the fishing port facilities in the Kamakura area remain undeveloped, the fishing boats—mainly smaller boats weighing less than 1 t—have no choice but to moor on the sandy

beaches of the Kamakura coast.

Despite this, the annual aggregate landing volume is approximately 150 t; this is about the same as that caught in the Koshigoe area, which has a developed fishing port. This is because of the combination of various species landed, including sardine whitebait, wakame seaweed, Izu crayfish, turban shell, flounder, filefish, and octopus. There are also many young fishers, and this area is enthusiastic about developing new markets. The distribution channels for fish caught in Kamakura can be roughly described as: (1) shipping to the Yokohama City Central Wholesale Market; (2) seafood brokers; (3) seafood processing and sales out of private homes; and (4) seafood products sold at inns, restaurants, and fresh fish suppliers operated by individual fishers. Channels (1) and (2) offer local residents less opportunity to purchase “made-in-Kamakura” marine products. As the types of fish suitable for the channel (3) are narrow and the volume of marine products distributed via channel (4) is comparatively small, the amount of products available to local residents is limited. Many residents actually feel that the fishery industry presence in the Kamakura area is weak due to the lack of fishing ports and few opportunities to buy “made-in-Kamakura” seafood.

The Kamakura Fisheries Cooperative decided to hold a monthly morning market to address this issue. The first was held on November 7<sup>th</sup>, 2004, and the event has continued to this day (as of 2018). Produce normally sells out after just 30 min after the market opens its doors at 10:00 h, and the event has been hailed as a great success; the event sees about 100 visitors each time, who come from not only local areas (Kamakura residents) but also from outside Kamakura. The event is an opportunity to select from a wide variety of seafood products that cannot be found at large retailers. Sales figures depend on the volume of each catch and the weather, and during favorable weather, the market can bring in approximately 300,000–400,000 yen, which is not a large amount. Fishery cooperatives carry out time-consuming direct sales events by focusing on boosting the presence of the fisheries in Kamakura and delivering marine products caught in Kamakura to residents to maintain the fisheries in Kamakura rather than the economic aspect.



## Experiential fisheries

The “comprehensive learning time” schema incorporating interactive instruction was introduced to elementary and junior high schools in 2002 and high schools in 2003. In addition, in fishing villages, many experiential learning programs have been conducted because of the availability of environments suitable for experiential learning, such as the unique lifestyles, customs, nature, and industrial activities. According to several papers (Isobe 2000, Imai 1999, Torii and Yamao, 2001) discussing the background, actual state, and impact of interactive learning programs, there are many cases of experiential learning programs aimed at promoting economic benefits and developing an understanding of the realities faced by fishing villages and fisheries. The resources used are diverse and include natural resources, fishing villages and traditional fishing methods, social and cultural resources, industrial resources, and human resources. Meanwhile, as mentioned previously, interactive tourism businesses have become active, as evidenced by the shift from green tourism to blue tourism. Interactive tourism allows participants to experience fishing activities such as net fishing, stationary netting, bottom netting, barbecue events, and cooking and crafting classes.

Although experiential learning and experiential tourism are composed of similar programs, they differ depending on whether they are more focused on education or recreation. As an example of the exchange between cities and fishing villages achieved through experiential fisheries, let us consider a case from southern Tokushima Prefecture in which residents from throughout the region cooperated to establish such a program. The Minami-Awa Yokubari Experience Promotion Council is an organization drawing its membership from three towns, Minami-Cho, Mugi-Cho, and Kaiyo-Cho in Minami-Awa Kaifu-gun, located in Muroto-Anan Kaigan Special National Park, Tokushima Prefecture. The population of each of the three towns is less than 10,000, and agriculture, forestry, and fisheries are the main industries. The flow of tourists changed after the opening of the expressway allowed tourists to begin to flow out to Kochi Prefecture. In 2004, a council was established to coordinate the three towns in Kaifu-gun (Minami-Cho, Mugi-Cho, and Kaiyo-Cho) with

Tokushima Prefecture as the originator.

This council aims to promote a variety of experiential tourism programs by utilizing local resources and has started accepting school field trips as a new initiative. Under the leadership of the government, the council started accepting fishing experience programs; the Mugi-Higashi Fisheries Cooperative began accepting school field trips in 2006, and since 2008, they began accepting elementary schools for long-term stay experience programs in farm, mountain, and fishing villages. The experiences on offer are diverse and take advantage of the primary industries of these three towns. The website and pamphlet were designed to be easy to understand, both to attract customers and reduce clerical work (see details in e-book format: <http://www.minamiawa.info/top/top.html>). Each fisher becomes an instructor, and while leading workshops, each person is brought to the front; this leads to repeat participation. Special attention is paid to safety, such as obtaining various types of insurance and holding seminars on food poisoning. As a result, word-of-mouth about instructors has led to increased popularity, and the number of annual participants has risen to 3,500. These programs also bring economic benefits to the area, and some of the fishers who work as instructors and provide lodging to tourists can earn an additional income of 1 million yen per year. Challenges faced by these programs include strengthening the management framework and making the operation profitable. Of the annual sales of approximately 40 million yen, 10% is allocated to sales commissions and council operating expenses. However, the staff salaries are paid by the program operator, Mugi-Cho, and the shortage of council operating funds is being supplemented by funds from the three towns. The major concern for the future is whether this organization can become self-sufficient.

## Conclusion: exchange between cities and fishing villages

To date, the aforementioned exchange activities have been implemented in various parts of Japan to increase the number of people experiencing the programming (to enable residents of cities to enjoy the benefits of fishing villages) and achieve regional revitalization (secure additional income for

fishers). These activities can be said to have made a defined contribution in these respects. For small fishing villages, in particular, the long-term strengthening of relationships with cities will work effectively. In addition, small fishing villages near cities are arguably meeting a need of urban residents in terms of providing a wide and unique variety of marine products that cannot be found in large retail stores, where efficiency and profitability are important.

In Japan, whose territory stretches longitudinally from north to south and has a diverse climate and culture, coastal fisheries have made a strong commitment to the coastal environment and use of regional resources under the fishery rights system, and have shaped the seafood and industrial structures of their respective regions. This can be said to have led to an abundance of programs promoting exchange between cities and fishing villages, because different fishery experiences, different seafood, and different marine products are available depending on the area. In addition, these activities help to revitalize the entire region by building a reception system centered on fisheries cooperatives that can build strong working relationships with local governments.

Although Japan's coastal fisheries and fishing villages are certainly responsible for managing exchanges between cities, with the aging of fishers, some areas have started to complain about these efforts. A phenomenon in which decreasing numbers of guides and fishers who actively accept private lodgings is affecting experiential fisheries in particular. This is especially common in areas with many small fishing operations and where there is a shortage of successors. One of the policies stated in the "Tourism Vision to Support Tomorrow's Japan" announced in 2016 calls for the "establishment of destinations in farming, mountain, and fishing towns capable of hosting overnight stays"; however, since then, the term "farm stays" has come to be used to refer to "overnight travel to farming, mountain, and fishing villages" rather than "green tourism." Among the types of trips to stay in rural areas, those involving staying at fishing villages are known as "*Nagisahaku*," and measures to develop this type of destination are being considered (I will leave "*Nagisahaku*" for another chapter.) Maintaining fisheries and fishing villages is important not only for the purpose of securing stable food supply, but

also to provide people residing in urban areas with the benefits of natural environments. Building a sustainable system while continuing the efforts to promote exchange between cities and fishing villages is crucial to sustaining the fishing industry and fishing villages.

## 22. Nagisahaku Initiatives

### **Lessons from Nagisahaku Activities in Small Fishing Villages**

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*Most fishers engaged in small-scale fishing activities live in small fishing villages located far from urban areas. Owing to the decline in fishery production in recent years, income from the fishing industry alone may be insufficient to sustain a living in such small villages. To ensure the future survival of these fishing villages, it will be necessary to create employment opportunities and raise local income. One possible solution in this regard is overnight trips to the villages that take advantage of the local resources referred to as Nagisahaku activities. However, small fishing villages may encounter substantial difficulties in establishing a framework for serving tourists, not only due to the advanced age of many of the remaining village residents and the declining numbers of both fishers and residents, but also to a deterioration of conditions of houses and other facilities. This chapter introduces the concept, the actual conditions, and the challenges of the promotion of the Nagisahaku initiative.*

## What is “Nagisahaku”?

First, I would like to present a few details relating to “Nagisahaku,” as posted on the Japan Fisheries Agency (JFA) website. Japan’s Ministry of Agriculture, Forestry, and Fisheries (MAFF) promotes overnight stay travel in agricultural and mountainous villages known as “*Nouhaku*,” and trips to fishing village regions, in particular, known as “Nagisahaku.” The JFA promotes “Nagisahaku” activities throughout Japan in order to foster further interaction between cities and fishing village regions and to revitalize fishing villages. Fishing villages have an abundance of resources attractive to tourists that cannot be found in cities, such as freshly caught seafood and local dishes incorporating the daily catch, as well as coastal scenery that can be said to evoke the classic imagery of Japan. Tourists can also experience the industry and culture of fishing, which embody Japanese tradition. When participating

in Nagisahaku, in addition to gaining a lodging experience unique to fishing villages, tourists are able to sample local ingredients and traditional foods at nearby restaurants and shops, find bargains at direct sales outlets, make their own craft goods, and enjoy fishing, marine leisure, and an overall scenic fishing village experience.

## Characteristics of fishing villages and Nagisahaku

In the past, fishing villages could secure a certain amount of income through an active fishing industry alone, and there were also many active areas of employment-related to the fishing industry. However, in recent years, the level of income earned by fishers has been decreasing due to a decline in the Japanese fish populations, and the successors of these fishers, who traditionally would have inherited the business, have tended to leave the villages to seek opportunities in cities, resulting in an ongoing decline in village vitality. In order to restore the vitality of fishing villages against a backdrop of declining fishery resources, identifying ways to secure income from activities outside the fishing industry is one solution, and in this regard, fishing villages have many attractive features that cannot be experienced in urban areas. As such, let us consider the attractiveness of regional resources and the characteristics of fishing villages from the perspective of city residents.

The most distinctive feature of fishing villages is that they offer opportunities to enjoy the fresh bounty of the sea, as well as refreshing natural coastal scenery that enables urban inhabitants to forget the hustle and bustle of city life. In addition, fishing villages offer scenes of numerous fishing boats passing through or being moored at fishing ports, seafood being unloaded and traded at markets, and the fishers' gear used for fishing and the fishers who can service it, which are exclusive to fishing villages, in areas just beyond the marina. A major feature is that tourists can experience a marked change of scenery from the cities they inhabit, such as views of quaint, closely spaced fishers' homes. In this way, Nagisahaku activities can capitalize on the local resources unique to fishing villages.

## The attraction of fishing villages and challenges for Nagisahaku

Although there are numerous fishing villages throughout Japan, the scale of their landing volume is comparatively small, primarily due to the prevalence of coastal fisheries, which are smaller in scale. These fishing villages have poor access to urban areas, and the resident fishers are aging. There are many areas where the local population is decreasing, thereby reducing the overall vitality of regions. Thus, from the perspective of considering fishing villages in terms of the “unusual” traits sought by urban tourists, these villages offer fishing marinas as well as the fishers themselves, provide sights and sounds that are quite different to those that can be found in cities, and thereby create an excellent environment for visitors to experience and enjoy marine products. Nevertheless, in order to exploit the attractive qualities of fishing villages in such a way that it contributes to the vitality of the region, it is important to establish Nagisahaku activities as a business. However, the question arises as to how this can be achieved in regions where the population is both aging and declining. It is true that there are many areas that are unaware of their marketable qualities, and thus although these areas have potential, they have yet to fully capitalize on their attractiveness. As such, a key issue is how Nagisahaku programs can be implemented to take advantage of the attractive features of fishing villages under the prevailing limitations.

### Devising Nagisahaku experiences

This section will introduce the characteristics of each of the “stay,” “play,” “eat,” “experience,” and “see” activity menus of Nagisahaku trips, and will also discuss the planning necessary for small fishing villages in which many small-scale fishing operations are run. **Stay:** There have been numerous cases of fishers operating guesthouses, which are popular in terms of the insights they can offer into the lifestyle and experiences of fishers, through activities such as enjoying freshly caught seafood and listening to their stories. Inevitably, however, some travelers may feel uncomfortable with respect to



the dilapidated state of some of the village homes and the old-fashioned toilets and bathroom amenities. To address these concerns, efforts to remodel old inns and closed school buildings in some villages have recently been making progress.

**Play:** Tourists can enjoy a variety of different offerings in fishing villages such as nature-related activities, including swimming in the sea and beach play, as well as marine activities such as fishing and diving. At fishing ports, however, local use of fishing and pleasure boats is restricted to reduce conflicts between fishers and recreational fishers. Recently, freight docks, which are now used less frequently than in the past, have been used as jumping-off points for diving. The use of the facilities and resources of fishing ports is also being promoted in accordance with regional needs.

**Eat:** One of the main purposes of tourists who visit fishing villages is to enjoy fresh seasonal seafood and traditional local dishes. However, the smaller the village, the fewer will be the restaurants and direct sales markets where tourists can purchase and eat fresh seafood. Under circumstances in which it is difficult for villages to keep such businesses open on a permanent basis, the villages hold events such as morning and evening markets and convert old homes or other buildings into cafes.

**Experience:** In addition to fishing activities such as deep-sea fishing, fixed-net fishing observation, and purse seine fishing experiences, various other experiences, such as fish handling and craft making, are also being offered on Nagisahaku trip itineraries. As these experiences do not involve the development of new facilities, typical small-scale coastal fisheries are well suited to offer brief fishing experiences. However, a disadvantage in this regard is that such offerings can be adversely affected by the weather, and thus to attract school field trips and similar excursions in particular, it is desirable to design programs that combine indoor activities, such as fish handling and craft making, that can be pursued in the event of bad weather.

**See:** Tourists can enjoy not only the natural scenery of the sea and mountains but also picturesque views of traditional fishing villages, such as the glow of lanterns on fishing boats under a starry night sky. However, first-time visitors will probably not be aware of where to seek these experiences, and thus it would

be beneficial to create walking guides and to provide other relevant and useful information.

## Toward realizing Nagisahaku programs through collaboration

As discussed previously, although the small fishing villages that comprise mainly coastal fisheries have a number of exceptional traits, there is generally a shortage of resources available to those individuals and organizations in the business of small lot fish products to enable them to organize Nagisahaku trips, which has thus tended to hamper any significant progress. To solve this problem, it is believed that combining various collaborative efforts would be an effective approach. The first aspect in this regard is local collaboration. As there is a limit to what can be accomplished by individual fisheries and fishers alone, a system should be established through which groups of local stakeholders, such as the local government and members of private industry, in addition to fisheries and fishers, can be formed and the roles of different regions can be shared, which will be effective in enabling Nagisahaku. For example, with regards to accommodation, if it is difficult for a single husband and wife to provide meals independently, meals could be provided by another fisher or a local eatery. Moreover, reservations could be made possible by utilizing the public relations capacity of the local government or tourism association, thereby facilitating the collective management of accommodation facilities in the area.

In this way, whereas the menu of tourism offerings that a single fisher can provide is limited, by combining the capacities of multiple parties, it becomes possible to provide a more diverse array of offerings for the region and reduce the burden on each individual. In addition, the local menu and system can be expected to be further strengthened through collaboration with local farmers and hotels, as well as governments and tourism associations. As the scale of Nagisahaku activities grows, it will also become easier for I/U-turners (I-turner refers to people born in urban areas moving to rural areas to work; U-turner refer to people born in rural areas, moving to urban areas for schooling,

and then returning to birthplace to work), experts, and outside parties to enter into collaborative ventures. Furthermore, given that I-turners and private companies, in particular, will not devote resources to fishing villages if they do not receive a certain return, even for Nagisahaku activities, it is important to attain a certain level of scale.

### A view of the future

In order to proceed with Nagisahaku initiatives, it will first be necessary for the residents of fishing villages to recognize that their everyday activities are an exceptional and attractive regional resource from the perspective of urban residents. Currently, although the population of these fishing villages is aging, the management of fisheries continues while the workers receive pensions. However, when the current generation of active fishers retire, there will no longer be any opportunities to work in the area, which will lead to depopulation and disappearance of the villages and fisheries in the not so distant future. The Nagisahaku initiatives would enable city residents to stay in fishing regions, thereby ensuring the viability of these areas, creating local employment opportunities, and halting the decline in local populations. To this end, it is crucial that these Nagisahaku efforts are not simply limited to event-like, one-off programs, but rather become a sustainable system, established in collaboration with people from local and surrounding regions, that makes a significant contribution to the continued survival of these fishing communities.

## 23. Fisheries Management Toolbox

### **Self-Assessment Scheme for Fishers to Improve Fisheries Co-management**

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*Scenes from fishers' workshops in Yamaguchi, Japan; S. Takemura, 2018*

*Historically in Japan, fisheries policies have been implemented through co-management. In April 2017, the New Basic Plan for Fisheries was established, in which co-management is central to the Japanese coastal fisheries policy. Since then, fishers have been required to steadily implement and improve their fisheries management activities towards sustainable resource management and community development. In this chapter, we introduce the “Fisheries Management Toolbox,” which is a self-assessment scheme for improving the management of coastal fisheries. Then, we present the results of trials in which the toolbox was utilized to improve the management activities of fisheries in coastal communities in Japan. Finally, we discuss some lessons from the trial results. Based on the findings, the toolbox supports the co-creation, co-evolution, and co-management of Japanese coastal fisheries through facilitating dialogue and mutual learning among local stakeholders (including fishers, government officers, and researchers).*

## Introduction

Fisheries co-management is a resource management regime that incorporates local fishers' activities and the legal management measures of administrative agencies (Pomeroy and Berkes, 1997; Charles, 2001). Historically in Japan, fisheries policies have been implemented through co-management (Makino and Matsuda, 2005; Makino, 2011). The co-management of fisheries is a realistic solution as management responsibilities are shared between local fishers and governments (Gutierrez et al., 2011). The Japan Fisheries Agency established the New Basic Plan for Fisheries in April 2017. In this Basic Plan, co-management is central to the Japanese coastal fisheries policy. Now, fishers are required to steadily implement and improve the management activities of their fisheries towards sustainable resource management and community development (Japan Fisheries Agency, 2018).

However, coastal fishing villages in Japan face various issues, including ecosystem alteration due to climate change, reduction of seagrass beds and tidal flats, decline in fish consumption, low fish prices, and declining and aging fishers (Japan Fisheries Agency, 2019). There is no single solution to these issues, but a combination of multiple management measures would create a system resilient to the social-ecological changes and uncertainties (Charles, 2007). If local fishers adaptively derive a combination of management measures, they can improve the management activities of their fisheries by themselves. Therefore, a new framework is required for fishers to evaluate their own activities and utilize the results for improvements. In light of the above, the aim of this chapter is to introduce the framework for the fisheries management toolbox, which is a self-assessment scheme for fishers to move towards sustainable resource management and community development in coastal communities. Then, we present the results of trials in which the toolbox was utilized to improve the management of coastal fisheries in Japan. Finally, we discuss some lessons drawn from the trial results.

## Framework of the fisheries management toolbox

In 2009, the Japan Fisheries Research Agency (FRA) developed a theoretical version of the “Fisheries Management Toolbox” (FRA, 2009), which is a kind of theoretical catalog of various management measures. However, the theoretical toolbox was not user (fisher) friendly. Therefore, a more practical version of the toolbox was developed (Makino and Tajima, 2018). Furthermore, various activities related to coastal community development were added to the toolbox, and the toolbox framework was expanded to include sustainable community development based on fisheries management (Takemura, 2018). As a result, we developed a hierarchical structure (Table 1) that comprised 3 locations (fishing ground, port, and land), 9 categories, and 46 fisheries management activities (measures). Based on this structure, we compiled photos of good practices in various areas to create a slide show to help explain to fishers the details of the 46 fisheries management activities.

Self-assessments using the toolbox were completed by applying the fol-

lowing standard fishers' workshop template. At first, facilitators explain the information, photos of good practices, and content of Table 1, which is provided in the toolbox structure. Then, fishers discuss and fill in a sheet (Table 1) with self-assessment scores (1 – 5), opinions of their own activities (strengths and/or weaknesses), and ideas for improvement. During these processes, fishers can evaluate their own management activities by comparing them with diverse fisheries management activities from other locations via a common theoretical framework. Third, facilitators compile and record all self-assessment results and opinions formed during the discussions. Here, it is assumed that facilitation will be carried out by extension officers of prefectural fisheries, Fisheries Cooperative Association (FCA) staff, and leaders of local fishers.

Location	Category	Fisheries management activities (measures)	Self assessment score (1 – 5)	Strength / Weakness	Ideas for improvements
<b>A: Fishing ground</b>	A1: Rules for fishing operations	A-1-1 Regulation of the fishing gear			
		A-1-2 Regulation of the vessels and engine			
		A-1-3 Regulation of the number of people			
		A-1-4 Regulation of the fishing season			
		A-1-5 Regulation of the operation days, times, etc.			
		A-1-6 Regulation of the catch size, species, sex, etc.			
		A-1-7 Zoning such as no-take zones, rotation of fishing grounds, etc.			
	A2: Cares for fishing ground	A-1-8 Regulation of the amount catch A-1-9 Safety (life jacket, etc.) A-2-0 Protection of nursery ground or spawning grounds A-2-1 Subsidies village for conservation A-2-2 Fish reef installation A-2-3 Fish seeds release A-2-4 Removal of wastes or harmful species			
<b>B: Port</b>	A3: Efforts to deliver good quality fish	A-3-1 Cares to quality fish on vessels (sanitation, ice, etc.) A-3-2 Primary treatment on board (fresh killing, nerve removal, etc.) A-3-3 Prevention of wounds (using plastic films, sorting, use of shelter ice, individual packing, etc.) A-3-4 Sorting for better price (size, sex, species, quality, etc.)			
	A4: Efforts to save costs	A-4-1 Group operation A-4-2 Capital sharing A-4-3 Regulation on the engine power and cruising speed A-4-4 Regulation on the fuel consumption A-4-5 Introduction of more energy-efficient gears or vessels			
	B1: Efforts to deliver good quality fish	B-1-1 Prevention of wounds at the port (using plastic films, sorting, use of shelter ice, individual packing, etc.) B-1-2 Primary treatment at the port (fresh-killing, nerve removal, etc.) B-1-3 Hygienic controls			
	B2: Efforts for higher prices and cost saving	B-2-1 Sorting for better price (size, sex, species, quality, etc.) B-2-2 Coordination of transport timing for better price and cost saving B-2-3 Development of new buyers or retailers B-2-4 Saving cost (co-ownership of the port facilities, saving the consumable goods, etc.) B-2-5 Construction and renovation of new loading area, cargo handling areas, freezing and refrigeration facilities			
	C1: Efforts for higher prices and cost saving	C-1-1 Primary processing C-1-2 Direct retailing/promotion to the consumers (not through the middlemen) C-1-3 Running restaurants C-1-4 Branding and new labeling C-1-5 Saving cost (co-ownership of the port facilities, collective measures, etc.)			
	C2: Ecosystem conservation	C-2-1 Coastal restoration for more productive fishing ground (tidal area, sea grass, coral reefs, etc.) C-2-2 Forestation and waste water management (forestation activities in the mountains, water discharge control, etc.) C-2-3 Beach clean activity C-2-4 Education and experience activities for local children/youths			
	C3: Capacity building	C-3-1 Holding seminars, lectures, training, study group for fisheries management C-3-2 Mentoring the producers C-3-3 Environmental monitoring (temperature, salinity, etc.) and stock assessment monitoring activities (logbook, etc.) C-3-4 Development of new processing techniques and Marketing research C-3-5 Re-arrangement of the operational schedule (to find extra time to side-business or training) C-3-6 Recruitment of new fishers or new staffs for FCAs			

Table 1: Structure of toolbox (practical version) and self-assessment sheet

## Trial 1: Prioritizing strategies for improvements at four coastal fishing villages in Japan

In this section, we introduce a trial for using the toolbox to prioritize the improvements of fisheries management at four coastal fishing villages in Japan. We conducted fishers' workshops between June 2014 and September 2015 in four locations across Japan. The workshops took place in the following regions and involved the following fishing gears: (1) cage fishery in the eastern area of Hokkaido; (2) small-scale bottom trawling fishery in the Kanto area; (3) gillnet fishery in the Inland Sea area; and (4) diving dart fishery in Kyushu and Okinawa area.

Fig. 1-A shows the results of the self-assessment scores in the four regions. Here, we introduce an overview of the results, the details for which can be found in Makino & Tajima (2018). In the figures, the blue-colored parts indicate high scores (over 3.5) and orange-colored parts indicate low scores (under 3.0). From the self-assessment results, fishers can identify the strengths (high scores) and weaknesses (low scores) of the management activities of their fisheries. Additionally, fishers can clarify generation gaps in the perceptions of problems by comparing the self-assessment results among fishers of different ages. Furthermore, the results of the self-assessments were confirmed by the extension officers of the prefectural fisheries who oversee each region, from which strategies for improvements were prioritized.

Focusing on the characteristics common to the self-assessment results, the extension officers from all regions gave a high score of 4–5 for the item “(A-1) Rules for fishing operations” under “(A) Fishing ground.” In addition, in all regions, this item was rated as being sufficient. Therefore, this item requires continued efforts and scientific validation of the efficacy. On the contrary, “(B) Port” and “(C) Land” were rated low in all areas, especially “(C-3) Capacity Building,” which was rated low by all. Thus, authorities and researchers in the regions must gather fishers' needs and opinions on this item and support their efforts to resolve it. In this way, the toolbox can support the prioritizing of strategies for improvements based on fishers' needs and opinions.



## 23. FISHERIES MANAGEMENT TOOLBOX

East area of Hokkaido						Kanto area					
Location	Category	Board member Class	Young Class	Fisheries Extension officer	Strategies for improvement	Location	Category	Board member Class	Young Class	Fisheries Extension officer	Strategies for improvement
N. Inland ground	A1: Rules for fishing operations	3.0	3.0	3.0	Maintaining	N. Inland ground	A1: Rules for fishing operations	3.7	3.5	4.0	Maintaining
	A2: Care for fishing ground	4.0	4.0	4.0			A2: Care for fishing ground	3.5	3.2	3.5	
	A3: Efforts to deliver good quality fish	3.0	4.0	3.0			A3: Efforts to deliver good quality fish	4.0	2.3		
	A4: Efforts to save costs	3.0	4.0	3.0			A4: Efforts to save costs	2.7	1.0	1.0	
H. Inland	B1: Efforts to deliver good quality fish	4.0	3.0	4.0	Maintaining	H. Inland	B1: Efforts to deliver good quality fish	3.3	3.3	3.0	Maintaining
	B2: Efforts for higher prices and cost saving	3.0	4.0	3.0	(D) Prioritize		B2: Efforts for higher prices and cost saving	4.0	2.2	3.0	
C. Inland	C1: Efforts for higher prices and cost saving	3.0	4.0	3.0	(D) Prioritize	C. Inland	C1: Efforts for higher prices and cost saving	4.0	1.0	3.0	Collaboration with parties other than fishers
	C2: Ecological conservation	3.0	4.0	3.0	Maintaining		C2: Ecological conservation	4.0	1.0		
	C3: Capacity building	4.0	4.0	3.0	(D) Prioritize		C3: Capacity building	4.0	1.7	2.4	
Inland Sea area						Kyushu/Okinawa area					
Location	Category	Board member Class	Young Class	Fisheries Extension officer	Strategies for improvement	Location	Category	Board member Class	Young Class	Fisheries Extension officer	Strategies for improvement
N. Inland ground	A1: Rules for fishing operations	3.0	3.0	4.0	Maintaining	N. Inland ground	A1: Rules for fishing operations	3.0	3.0	4.0	Difficulty in evaluating
	A2: Care for fishing ground	2.0	2.0	3.0			A2: Care for fishing ground	3.0	2.3		
	A3: Efforts to deliver good quality fish	3.0	2.0	3.0			A3: Efforts to deliver good quality fish	3.0	3.5	2.5	
	A4: Efforts to save costs	3.0	3.0	3.0			A4: Efforts to save costs	3.5	3.5	3.0	
H. Inland	B1: Efforts to deliver good quality fish	3.0	3.0	3.0	(D) Prioritize	H. Inland	B1: Efforts to deliver good quality fish	3.8	3.3	2.5	(D) Prioritize
	B2: Efforts for higher prices and cost saving	3.0	3.0	2.0	(D) Prioritize		B2: Efforts for higher prices and cost saving	2.9	3.3	3.0	
C. Inland	C1: Efforts for higher prices and cost saving	2.0	2.0	2.0	(D) Prioritize	C. Inland	C1: Efforts for higher prices and cost saving	2.5	2.8	3.0	Maintaining, improving
	C2: Ecological conservation	3.0	3.0	3.0	Maintaining		C2: Ecological conservation	2.5	3.0	3.0	
	C3: Capacity building	2.0	2.0	2.0	(D) Prioritize		C3: Capacity building	2.8	2.5	2.0	

Figure 1-A: Results of fishers' self-assessment scores in the four regions across Japan

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Location	Category	Fisheries management activities (main items)	Activities		Needs for improvement		Basic policy of the "Shimonoseki Revitalization Plan" X (1st plan, 2014) XX (2nd plan, 2019)
			Independent	Common	Independent	Common	
A. (Fishing ground)	A1: Rules for fishing operations	A-1-1 Regulation of the fishing gear		X	X		
		A-1-2 Regulation of the vessel and engine	X				
		A-1-3 Regulation of the number of people					
		A-1-4 Regulation of the fishing season		X		X	
		A-1-5 Regulation of the operation day, class, etc.					
		A-1-6 Regulation of the catchment area, etc.		X	X	X	
		A-1-7 Designation of no-take zones, restriction of fishing periods, etc.			X		
	A2: Cares for fishing ground	A-1-8 Regulation of the access route					
		A-1-9 Safety (life jacket, etc.)					
		A-2-1 Designation of nursery ground or spawning ground	X		X		
		A-2-2 Shimonoseki Village for commercial					
	A3: Efforts to deliver good quality fish	A-2-3 Fishery facilities		X	X	X	XX
		A-2-4 Fish catch system		X	X	X	X
		A-2-5 Removal of waste or harmful species		X	X	X	X
	A4: Efforts to save costs	A-3-1 Open to quality fish on website (market, etc.)		X	X	X	XX
		A-3-2 Primary treatment on board (fresh-frozen, water removal, etc.)		X	X	X	XX
		A-3-3 Decrease of search (using plastic films, sorting, use of detector (e.g. individual packing, etc.)		X	X	X	XX
		A-3-4 Sorting for better price (size, sex, species, quality, etc.)		X	X	X	XX
B. Port	B1: Efforts to deliver good quality fish	A-4-1 Group operation	X		X		
		A-4-2 Capital raising					
		A-4-3 Regulation on the engine power and training speed	X		X		X
	B2: Efforts for higher prices and cost saving	A-4-4 Regulation on the fuel consumption		X	X	X	X
		A-4-5 Introduction of more energy-efficient gear or vessels		X	X	X	X
		B-1-1 Improvement of search at the port (using plastic films, sorting, use of detector (e.g. individual packing, etc.)		X			XX
		B-1-2 Sorting treatment at the port (fresh-frozen, water removal, etc.)		X		X	XX
		B-1-3 By-product control		X			XX
		B-2-1 Sorting for better price (size, sex, species, quality, etc.)					
		B-2-2 Coordination of transport timing for better price and cost saving		X	X	X	XX
		B-2-3 De-refrigeration of sea bream in summer		X	X	X	XX
C. Land	C1: Efforts for higher prices and cost saving	B-2-4 Construction and extension of new landing area, large handling area, fire-dug and refrigeration facilities					
		C-1-1 Primary processing		X	X	X	XX
		C-1-2 Direct selling promotion to the consumer (not through the middlemen)		X	X	X	X
		C-1-3 Primary warehouse			X		
		C-1-4 Branding and eco-labeling			X		
	C2: Ecosystem conservation	C-1-5 Sports practice (co-ownership of the port facilities, collective transport, etc.)			X		XX
		C-2-1 General restoration for more productive fishing ground (tide area, sea grass, sand, rock, etc.)		X	X	X	X
		C-2-2 Transition and waste water management (transition activities in the mountain, water discharge control, etc.)	X				
		C-2-3 Beach cleaning		X			
	C3: Capacity building	C-2-4 Education and experience activities for local children/teenagers	X	X	X		
		C-3-1 Holding seminars, lectures, training, study group for fisheries management	X				X
		C-3-2 Monitoring the port area			X	X	
		C-3-3 Environmental monitoring (water temp., salinity, etc.) and stock assessment (monitoring equipment, logbook, etc.)		X	X	X	X
		C-3-4 Development of new processing techniques and marketing research	X				X
		C-3-5 Re-arrangement of the commercial vehicle (on the extra time to do business or training)	X		X	X	X
		C-3-6 Facilitation of new fishers or new starts for FICs		X	X	X	X

Figure 1–B: Results of the needs, opinions, and possible solutions for improvements from fishers in Shimonoseki–Gaikai Region, Yamaguchi Prefecture

## Trial 2: Improving the fisheries management plan in Shimonoseki-Gaikai Region, Yamaguchi Prefecture, western Japan

In this section, we present a trial for using the toolbox to improve a regional fishery management plan. Four fishers' workshops were conducted between August 2017 and October 2018 in the Shimonoseki-Gaikai Region, Yamaguchi Prefecture, western Japan. The workshops were conducted as part of the self-assessment scheme and used the toolbox for improving the "Seashore Revitalization Plan" that was established in this region in 2014 (Shimonoseki-Gaikai Regional Fisheries Revitalization Committee in Yamaguchi Prefecture 2014). Here, the "Seashore Revitalization Plan" is one of Japan's fisheries policies in which plans to boost fishing incomes are developed and implemented by local stakeholders (Japan Fisheries Agency, 2019).

The self-assessment results of the fishers' activities and ideas for improvements in the Shimonoseki-Gaikai Region gathered by the toolbox-based workshops are shown in Fig. 1-B. The dark gray-colored parts indicate that both the fishers' activities and ideas for improvement are common within the region, while the light gray-colored parts indicate that either the activities or ideas for improvement are common within the region. In this manner, local fishers' activities and ideas for improvement in the region were collected and compiled into a table according to the toolbox's common theoretical framework. From the self-assessment results, we can identify the fishers' activities and ideas for improvements that are common within the region.

After the fishers' workshops, we confirmed whether or not the commonly identified fishers' activities and ideas for improvements were listed on the "Seashore Revitalization Plan" for the region in 2014 (Shimonoseki-Gaikai Regional Fisheries Revitalization Committee in Yamaguchi Prefecture, 2014). Among the identified common fishers' activities and ideas for improvements in the Shimonoseki-Gaikai Region, "(A-2-4) Fish seeds release," "(A-2-5) Removal of wastes or harmful species," "(C-1-2) Direct retailing," "(C-2-1) Coastal restoration," and "(C-3-6) Recruitment of new fishers" were already

listed in the basic policy of the 2014 “Seashore Revitalization Plan,” while the rest were not listed (Fig. 2-B). Then, we reported the results of the fishers’ self-assessments to local stakeholders to revise the “Seashore Revitalization Plan” in the region. As a result, “(A-2-3) Fish reef installment,” “(A-3-1) Cares to quality fish on vessels,” “(A-3-2) Primary treatment on board,” “B-1-2 Primary treatment at the port,” “(B-2-2) Coordination of transport timing,” “(B-2-3) Development of new buyers,” and “(C-1-1) Primary processing were added” were installed as new basic policies of the “Seashore Revitalization Plan” in 2019 (Shimonoseki-Gaikai Regional Fisheries Revitalization Committee in Yamaguchi Prefecture, 2019). Now, the revised “Seashore Revitalization Plan” is being implemented by local fishers.

## Lessons learned from the trial results

During the workshops of our trials, local fishers compared their own activities with diverse fisheries management activities in other locations, and then evaluated themselves based on a common theoretical framework (Table 1). Therefore, the toolbox was useful when identifying important management measures for improvements in coastal communities. The results from four areas across Japan showed that the toolbox supported fishers and prefectural fisheries extension officers in prioritizing improvement strategies based on the results of their self-assessments (Fig. 1-A). In addition, the toolbox was useful when identifying the fishers’ needs, opinions, and ideas for improvements in the region. The results in the Shimonoseki-Gaikai Region showed that the toolbox supported local stakeholders in improving the management plans of regional fisheries, such as the “Seashore Revitalization Plan” (Fig. 2-B). Therefore, the toolbox is an effective framework for supporting the co-creation, co-evolution, and co-management of Japanese coastal fisheries by comparing diverse fisheries management activities via a common theoretical framework.

Through self-assessments using the toolbox, fishers can share the activities being undertaken in the region, the challenges they are facing, and ideas for improvements. In addition, the toolbox provided an opportunity for

government officers and researchers to recognize the challenges faced by fishers in the region and their needs through fishers' workshops. For example, information concerning the problems perceived by fishers and their needs for improvements can be useful for government officers in policymaking and dissemination work to revitalize coastal communities in the region, and for researchers in identifying new research topics. Thus, the toolbox facilitates dialogue and mutual learning among fishers (different fishing gears, different ages, and different regions), FCA staff, and government officers (national, prefectural, and municipal) (Makino and Tajima, 2018).

To promote the use of the toolbox, we have published a manual and database of innovative fisheries management activities of good practices on the FRA website (FRA, 2020). As a result, in recent years, there have been increasing opportunities for local fishers, FCA staff, and prefectural and municipal government officers to conduct self-assessments using the toolbox at study groups and training courses organized by prefectures, FCAs, and the Japan National Federation of Fisheries Co-operatives (Zengyoren). To further promote and improve fisheries' co-management in Japan, we will continue to disseminate the toolbox to fishers.

## Conclusion

In this chapter, we presented the framework and trial results of the toolbox, which is a self-assessment framework for the management of coastal fisheries. The results of two trials showed that the toolbox supports the co-creation, co-evolution, and co-management of Japanese coastal fisheries through facilitating dialogue and mutual learning among local stakeholders (including fishers, government officers, researchers). The methodology of the toolbox is very simple and could be applied to small-scale coastal fisheries in other countries. However, we still have not evaluated the other effects of the toolbox, such as stock, catch, and income gains, in coastal communities. Further research is necessary to quantitatively evaluate the situation regarding the stock, catch, and income in local communities before and after the implementation of the fishers' workshop to clarify the effects of the toolbox.

## 24. Hama-katsu Plan

**Revitalization of Fishing Villages with Coastal Fisheries as A Key Industry**

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*Operation of a fixed net fishery. Oi Town, Fukui Prefecture, Japan. Fumoto T, 2017*

*In Japan, the number of coastal fisheries is decreasing significantly, which is directly linked to the decline in the vitality of fishing villages. The “Hama-katsu Plan” is a policy based on the basic idea that local stakeholders will work to solve various and complex issues according to the actual situation. Currently, the Hama-katsu plan has been approved in 640 districts and has achieved certain results. On the other hand, issues such as differences in local power, such as the ability to formulate plans and implement initiatives, have also become apparent. This will also require more effective and smooth use of external assistance. At the turning point of the fishery, the future Hama-katsu plan will need to specifically design the local fisheries and related industries. With the arrival of an era where the region plays a leading role, and one’s own ability is tested, the Hama-katsu plan has opened its beginnings.*

## The current state of coastal fisheries in Japan

Before entering the body of this paper, I would like to give an overview of the state of coastal fisheries in Japan, based on the results of a fishery census survey conducted every five years. As shown in Table 1, the number of fishers in Japan is steadily decreasing. Thirty years ago, more than 200,000 management entities had started, but in 2018, The number of management entities decreased to under 80,000. The decline rate of coastal fisheries has increased over the years, with a reduction rate of more than 16% over the past five years. It can be said that the decreasing trend of the management entities is accelerating.

## IN THE ERA OF BIG CHANGE

layer \ year	2013		2018		Rate of change ( '18/'13)-1	2017 Fishery production (T)
		Composition ratio		Composition ratio		
Management entities total	94,507	100.0%	79,067	100.0%	-16.3%	4,244,000 ※1
<b>Coastal fisheries total</b>	<b>89,107</b>	<b>94.3%</b>	<b>74,151</b>	<b>93.8%</b>	<b>-16.8%</b>	1,879,000 ※2
Aquaculture	14,944	15.8%	13,950	17.6%	-6.7%	986,000 ※3
Other coastal fisheries	74,163	78.5%	60,201	76.1%	-18.8%	893,000 ※4
1~3T layer	14,109	14.9%	10,652	13.5%	-24.5%	
3~5T layer	21,080	22.3%	16,810	21.3%	-20.3%	
5~10T layer	8,247	8.7%	7,495	9.5%	-9.1%	
Medium-scale fisheries	5,344	5.7%	4,862	6.1%	-9.0%	2,051,000 ※5
Large-scale fisheries	56	0.1%	54	0.1%	-3.6%	314,000 ※6

Created from the Fisheries Census and the Annual Statistics of Fishery and Aquaculture Production

※1 Marine fishery production total (b+e+f)

※2 Coastal fishery production total (Aquaculture production total + Coastal fishing boat fishery production total)

※3 Aquaculture production total

※4 Coastal fishing boat fishery production total

※5 Offshore fishery production total

※6 Pelagic fishery production total

*Table 1: Position of coastal fishers in Japan*

About 94% of the total fishery enterprises are coastal fisheries. In addition, the percentage of small-scale fishing boat fishery enterprises such as 1 to 3 tons and 3 to 5 tons are high. The degree of decrease in these main classes has exceeded 20%. On the other hand, among the coastal fisheries, the rate of decline is low for aquaculture farms and those of 5 tons or more (Table 1). Japan's total marine fishery production in 2017 was 4,244,000 tons. Among them, offshore and pelagic fisheries accounted for about 56% (2,365 thousand tons). Furthermore, small-scale coastal fisheries, mainly family-owned, account for only about 44% of total production. Among them, 23% are marine aquaculture, and coastal fishing vessels produce less than 20%. However, the coastal fishing industry has a very low contribution to the volume of marine products, but it can supply a wide variety of high-quality marine products. So, it is making a significant contribution to maintaining the abundant food and food culture of the citizen.

Therefore, in the Japanese fishery production structure, offshore and pelagic fisheries with a small number of 6% of the elite (medium- and large-scale fisheries) support the majority of fishery production. On the other hand, it is suggested that 94% of small-scale coastal fisheries supply diverse and high-quality seafood to meet the needs of consumers. In addition, the



coastal fisheries live along the coast to form fishing villages and perform multiple functions such as environmental protection of coastal areas and border monitoring in Japan. As mentioned earlier, the number of coastal fisheries, especially small-scale fishing vessels, has been remarkably decreasing. Despite the effects of the 2011 earthquake and tsunami, the biggest causes are considered to be the aging of existing fishers and the lack of new fishers. A decrease in the number of coastal fisheries is directly linked to a decline in the vitality of fishing villages. For this reason, various measures have been taken so far. However, the decline that has continued for more than 30 years cannot be stopped, and in recent years it has been spurred.

## Why the “Hama-katsu Plan” now

The coastal fisheries and fishing villages, which have been key industries, have taken various measures to prevent their vitality from declining. In the past, the government has been promoting the following measures to improve the productivity of fisheries: (1) improvement of fishing port facilities and fishery-related facilities; (2) expansion of fishing vessels, development and introduction of highly productive fishing methods and techniques; and (3) efforts to streamline and brand fishery products. It seems that these measures have been basically implemented with emphasis on how to use the government and other administrative support measures. Although the measures have achieved a certain level of success, it has become difficult to achieve the expected effects with the times.

In the background, the problems in each region are diverse and complex. For example, In the case of recruitment and employment problem, in the urban area, other industries are given priority in comparison to working conditions than a fishery. In remote islands and peninsulas are difficult to employ new fishery workers caused by living environment and convenience. If we look at the situation, the same problem, but causes are different from each other. Not limited to these simple examples, fishing villages nationwide have their own unique challenges. Of course, there will be some common issues, but since local circumstances are different, it is necessary to adopt an approach to

solving problems that is appropriate to the local circumstances. To respond effectively to such situations, fishers and local residents in the areas that are most aware of the situation where the areas are located will recognize and share the issues themselves and take appropriate measures effectively. It is required to practice in an appropriate way. The “Hama-katsu Plan” is a measure created under such a basic concept. “Hama” means fishing village area in Japanese, and “Katsu” means vitality. In other words, the Hama-katsu plan means a plan to regenerate the vitality of the fishing village area. In the Hama-katsu Plan, fishers and related local residents themselves consider “what should be in the future” and “the issues to be tackled” according to the current situation in each area, and organize measures to solve the issues. In other words, it can be regarded as a regional regeneration master plan that aims to restore the vitality of fishing villages by restoring the vitality of coastal fisheries, which is a key industry in the region.

The Hama-katsu Plan aims to increase local fishery income for more than 10% during the 5-year planning period. Specific measures to achieve this goal will be reviewed and compiled from both aspects of “income improvement” and “cost reduction.” Furthermore, formulating the Hama-katsu Plan is not the purpose; it is important to steadily implement the initiatives positioned in the plan to achieve the goals. For this reason, in formulating the plan, a “Regional Fisheries Rehabilitation Committee” was set up by local stakeholders, and they can formulate effective plans independently. In addition, this committee will function as a practitioner of the initiative. The committee requires that fishers’ cooperatives and municipalities be the core members of the committee, with the participation of local stakeholders, and more effective effects according to local issues. It is a mechanism that can perform a typical approach. If the fishing area that formulated the Hama-katsu plan uses subsidy projects for the implementation of initiatives, a priority adoption system has been adopted for some projects, and the Hama-katsu plan and related measures will be linked. Based on the Hama-katsu plan, it is also necessary to cope with issues that should be addressed by each fishing village area in coordination, such as the aggregation of market functions over a wide area, the rationalization of distribution, and the development of leaders.

For this reason, fishing villages working on the Hama-katsu plan are working together on a wide area, and the formulation and operation of the “wide-area Hama-katsu plan” is also progressing. This plan sets out specific initiatives to promote the reorganization of fishing areas and the development of core players.

### Activities and results of the “Hama-katsu Plan”

Currently, the Hama-katsu plan has been approved in 640 districts. The first approved plan has a plan period of 2014 as its first year, and many districts were generally formulated between 2014 and 2016. These districts have completed Phase 1 plans from 2018 to 2019 and are entering Phase 2. In Phase 2, a plan is drawn up to reflect on the state of implementation of the efforts in Phase 1, to address the remaining issues, and to incorporate new initiatives for further progress. For example, regarding the measures to improve income, efforts such as strengthening resource management for the maintenance, conservation and sustainable use of fishery resources, and measures for improving the quality of catches (such as Initiatives include the introduction of Ike-Jime and Shinkei-Jime[1], distribution reforms such as direct sales, and value-added catch (brand establishment, processing, etc.)). In many cases, cost reduction efforts are aimed at reducing fuel consumption by practicing efficient navigation through low-speed navigation and cleaning of ship bottoms(Fisheries Agency,2017 revision).

The situation after the end of phase 1, it can be evaluated that efforts in each region have achieved certain results. It has been confirmed that the target increases in income of 10% or more have been achieved in a considerable number of districts. However, it should be noted that the factors of income improvement are greatly affected by changes in resources and environmental changes, and are not only attributable to Hama-katsu plan initiatives. Nevertheless, it is worthy of appreciation that the local stakeholders themselves considered and implemented the initiatives under the plan they had formulated and achieved certain results(Tokyo Fisheries Promotion Foundation, 2015, 2016, 2017).

On the other hand, there are some issues that have been gained throughout phase 1. The largest issue is the regional power gap. The pillar of the Hama-katsu plan is that local stakeholders in the region who are formulators and practitioners. In other words, it is necessary that local stakeholders have the power to formulate and implement plans. For example, it is necessary to have the ability to organize, analyze, and understand regional issues, the ability to create a vision of the future of the area, the coordination to share it with stakeholders, and the ability to provide concrete ideas for solving regional issues. In 2014, several regions were already had the power and others were unfortunately lacking. In particular, in the implementation stage of the initiatives after the formulation of the plan, it was difficult to achieve the initially anticipated activities in regions where there were insufficient leaders in the initiatives. In the future, more effective and smooth utilization of external assistance will be needed to bridge these regional differences. In areas where the ability to implement the approach is lacking, cooperation and cooperation with external supporters should be actively considered.

## “Hama-katsu” plan initiatives

The Hama-katsu plan sets the primary goal of improving fishery income. I believe that revitalizing key industries in fishing villages centered on coastal fisheries scattered along the coast is directly linked to the renewal of vitality in the region. However, the current fishing village area has undergone a major transformation. The workplaces of local residents are diverse, and the development of road networks has greatly improved traffic conditions. Living spheres and economic spheres are widening, and the state of fisheries and their position in the local economy is changing and diversifying. In addition, as fisheries policy reforms are progressing, the environment surrounding fisheries is in the process of changing.

In order to maintain the vitality of coastal fisheries and regenerate the vitality of fishing villages under these changes, it is necessary to draw a clearer and more concrete regional vision to survive in the changes. In other words, in the future Hama-katsu plan, it is necessary to aim not only for narrow goals

such as increasing fishery income but also for a master plan in the original sense that specifically designs the way of local fisheries and related industries themselves. In particular, in the context of fisheries, it is necessary to have the vision to maximize the sustainable production of fisheries in the region and to revitalize related industries. Specifically, it needs to take into account and draw the production capacity fishing ground in the coastal area such as the target management scale, type of fishery, number and age composition of fishers, distribution and processing industry utilizing the catches produced therefrom.

In the current status of the Hama-katsu plan, although such a position described above cannot be achieved immediately, it is considered to be an important perspective for maintaining Japan's coastal fisheries and the areas that support them. In the future, the Hama-katsu plan opened the way to establishing sustainable fisheries and the region with the ingenuity of the region. The era has begun in which the region plays a leading role, and one's power is tested.

## Endnotes

[1] A technique originating in Japan that kills fish immediately removes blood, destroys the spinal cord, etc., and keeps it fresh.

## 25. Local Innovation

### **Turning Low-Value Fish into Local Specialty Kamaboko**

***Seiichi Hiratsuka***

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*Ito Port, Izu Peninsular, Shizuoka, Shizuoka Pref. Set-Net Fisheries Association,  
2020*

*A key feature of local kamaboko is that it uses fish caught by local coastal fishers without using frozen Surimi. “Jakoten” is a specialty type of kamaboko of Ehime Prefecture made from small fish that are caught by fishing boats operating locally. Small fish usually have fewer edible parts than larger ones, so it is difficult to use them as food. In Iyo City, the women’s section of Uenada Fisheries Cooperative also manufactures Jakoten, and this manufacturing business has contributed significantly to stabilizing the price of small fish and popularizing fish-based foods in the region. In the Ito FCA in Shizuoka Prefecture, Surimi is manufactured by the fishers’ cooperative using mackerel and other fish that are locally sourced. Small fish are inexpensive and have been used as feed for farmed fish until now, but they can also be used as consumer food by processing them into Surimi. The raw materials used for kamaboko in these two fishing towns are caught by coastal fishers, implying that only coastal fishers can deliver authentic local fish to consumers.*

## Local specialty kamaboko

Different varieties of processed fishery products are available in various parts of Japan. Do you know that Kamaboko is an overwhelmingly popular variety among them? Kamaboko is a processed marine product that is obtained by extracting the meat from the fish, seasoning it with salt, kneading it, and then heating it. There are various methods used to heat the product, such as frying, steaming, baking or boiling. The fact that there are many kinds of ingredients, such as vegetables, that are kneaded into the Surimi is probably one of the reasons for the large variety in types of kamaboko. Many types of kamaboko are usually made from frozen Surimi that is imported from the United States and elsewhere. Recent years have seen increasing popularity of frozen Surimi produced from walleye pollock, etc., resulting in kamaboko being produced easily and in large quantities in various parts of Japan. Frozen Surimi has a

long shelf life and can be manufactured throughout the year, enabling efficient production planning. However, since all manufacturers use the same frozen Surimi as raw material, the uniqueness in features of the product is usually diminished.

In contrast, there are many types of local kamaboko made using locally caught fish in various parts of Japan. One of the special features of such kamaboko is that it uses only the fish that is caught by local coastal fishers on the foreshore without using frozen Surimi as a raw material. Therefore, coastal fishers are important for supplying local kamaboko to the market. Since their fishing grounds are close to the landing fishing ports, they can always supply fresh fish to the market and to the manufacturers. Even though it is not fishers who produce kamaboko usually but rather specialized fish processing companies, there are areas in Japan where fishery cooperatives are working on the production of Surimi and kamaboko; such an example of vertical integration is often referred to as the sixth industrialization. This chapter discusses the importance of local specialty marine products and the significance of the techniques used by coastal fishers for catches, using examples from the Ehime, Wakayama and Shizuoka prefectures.

## Local specialty kamaboko “Jakoten” in Ehime Prefecture

“Jakoten” is a type of kamaboko that is made by removing the head and internal organs of the fish and then mincing the meat of the fish with the bone and skin and frying it in oil (Fukuda, 2005). Jakoten is a specialty product of Ehime Prefecture and is made from small fish such as lanternbelly, called Hotaru-jako in Japanese, which is a small fish about 10 cm long and is caught by small local fishing boats. Although Hotaru-jako is abundant in the East China Sea and elsewhere, it is estimated that the Hotaru-jako in Japan is caught for food use only off Ehime Prefecture, such as the Uwa Sea and the Iyo Nada. In addition to Hotaru-jako, various other fish such as horse mackerel, hairtail (Tachi-Uo), and lizardfish (Eso) are also used as raw materials for Jakoten. Small fish such as Hotaru-jako have few edible parts that make it difficult to use them as food; thus, they end up being traded at low prices in the market.



However, in Ehime Prefecture, Jakoten has been manufactured since the Edo period and has been a local dish for a long time. There are many places where one can eat Jakoten here, including in Matsuyama City, where the prefectural capital is located.

Uwajima City, located in the southwestern part of Ehime Prefecture, has been attracting attention because Jakoten is actively used for regional development. The Jakoten manufactured in Uwajima City is registered as a regional collective trademark called “Uwajima Jakoten.” In Uwajima City, there are many shops where one can eat Jakoten both in the city and in the suburbs, and it is popular with tourists as well.

In Iyo City, which is about 25 km west of Matsuyama City, a group of women from Uenada Fisheries Cooperative manufactures Jakoten. In this process, six types of small fish, such as lizardfish (Eso) and croaker (Guchi) that are landed at local markets, are used as raw materials for the Jakoten. Growth in sales since 1995 has increased steadily, and this variety is now considered a local specialty. The Jakoten manufacturing business by Uenada Fisheries Cooperative has contributed significantly to stabilizing the price of small fish in the market. It is also used as a menu in local school lunches and has contributed greatly to the spread of fish cuisine in the region (Matsumoto, 2009).

## Local specialty kamaboko “Honeku” in Wakayama Prefecture

In Wakayama Prefecture, there is local specialty kamaboko named “Honeku,” which is as famous as “Jakoten.” In Arita City (northwest of Wakayama Prefecture), the hairtail catch is one of the highest in Japan. Hairtails are mainly caught by small trawl, single-line and coastal fixed net fishing. Hairtail is a high-quality fish that is cooked for sashimi, grilled with salt, and boiled. Conversely, small whole fish are mashed (including the bones and skin) in the same way as “Jakoten” and then fried in oil. This deep-fried kamaboko is called “Honeku,” “Honekuten,” or “Konekuri Tempura” and has been eaten locally for a long time. It has a unique texture and flavor because it contains the

bones and skin of hairtail, making it an indispensable local product. Recently, local restaurants have developed “Honeku Bowl” using “Honeku” and have won prizes at bowl competitions nationwide. Arita City is an example of the successful development of local specialty kamaboko based on cooperation between fishers and a hairtail processor. The fish processing company in Arita City wanted to use local fish in their kamaboko, even if it was difficult and costly. This is because using frozen Surimi as a raw material for kamaboko will result in price competition with major companies. Coastal fishers are proud of their hairtail fishing and can always supply fresh raw materials. The cooperation between the coastal fishers and processors in Arita City has created local specialty kamaboko “Honeku.”

## Production of “Surimi” by Ito FCA in Shizuoka Prefecture

Now let’s turn our attention towards the Izu Peninsula in Shizuoka Prefecture, where Ito Fishing Cooperative is located in the northeast region. There are different types of members belonging to the Ito FCA, such as coastal fixed net fishing, pole seine fishing, purse seine fishing, and line fishing. Here, fishery cooperatives manufacture Surimi using mackerel, three-line grunt (Isaki), dolphinfish (Shiira), and squid, all of which are locally landed. Ito FCA has also introduced a Surimi production system that enables more efficient production (Photo 1). The marketing concept of Ito FCA is to convey to the consumers the fresh and delicious taste of fish that has been caught in the morning. Processing the fish into a Surimi immediately after it is caught makes it possible to provide consumers with fresh, boneless fish meat portions. This is especially the case in small fish that are inexpensive and have been used as feed for farmed fish until recently; they can now also be used as food by processing them into Surimi.



*Photo 1. Processing of mackerel Surimi. Ito Fisheries Cooperative Association, 2014*

Ito FCA production of Surimi using locally caught fish has greatly contributed to the revitalization of the Ito region. This is because the production of various paste products using Surimi has accelerated in this region. Chinchin-age, a local dish of Ito City that is made by mixing vegetables with Surimi made from mackerel, has also become popular, notably being used for lunch at local elementary and junior high schools. Ito Fisheries Cooperative has also developed various menus using Surimi and exhibited these at various events and contests. As a result, unique products such as the mackerel sandwich “Sabao Sand” and pasta sauce have been developed. Such ongoing efforts by Ito Fisheries cooperatives will surely influence the sales of fish-based food in the future.

In addition to the Ito FCA, there are some towns in Japan that produce and sell Surimi using local fish as raw material. The Kumano Fisheries Cooperative in Kumano City in the southern part of Mie Prefecture manufactures Surimi using various migratory fish caught by coastal fixed net fishing. Fish used as raw materials for Surimi include horse mackerel, mackerel, sardine, amberjack,

and dolphinfish. The brand name is “Surimin,” which is characterized by raw Surimi without additives. A collection of recipes such as pizza and dumplings using Surimi has also been published. Kumano City is working to spread this Surimi throughout the region.

## Regional revitalization and small-scale fisheries

The regions in Japan introduced above are characterized by the fact that coastal fishers take the initiative to manufacture and sell processed fishery products using fresh seafood caught locally, contributing significantly to regional revitalization. In many Japanese fishing towns, fishery cooperatives process dried fish to increase the value of the landed fish, especially since it is usually difficult for fishers to process marine products themselves. The kamaboko manufactured in the regions introduced in this chapter are products with a high degree of processing within the fishery segment. Unlike other processed fishery products such as dried fish, it is extremely difficult to produce kamaboko by hand because of the extremely poor workability of the product. Therefore, in order to produce a certain amount of Surimi, it is necessary to utilize a production machine and process. In these regions, considerable investment has been made to produce Surimi and kamaboko, and it is conceivable that there have been various difficulties encountered in the production processes. In such situations, the producers have been able to overcome the difficulties and work hard to produce local specialties because the raw materials used in these regions were caught by coastal fishers. These fishers may prove to be indispensable in such areas because only coastal fishers can deliver local fish to consumers that are both authentic in taste and freshly caught.

In recent years the consumption of marine products has been declining in Japan, and officials from fisheries are concerned that this trend may continue. There are various reasons for this decline in consumption, with one of the key reasons being changes in the living environment. Consumers, especially children, like fish-based cuisine, and this is evident by witnessing the conveyor belt sushi chain that is often being crowded with children. Increasing the

consumer awareness of the freshness and delicious taste of seafood from the coastal fishers may be one of the solutions to arrest this declining consumption trend. The power of coastal fishers is very important to protect the fish culture of the Japanese people and stop the decline of fish consumption.

For many people, the time spent preparing meals has also decreased over the years. For this reason, fish-based dishes are often shunned because people don't have the time and skill to prepare such dishes any more. In order to change this situation, it is imperative that fishers, distributors, processors and sellers work together to provide consumers with fresh, delicious and quick-to-eat fish-based dishes. For consumers looking for food that can be cooked in a short time, processing fish into Surimi is a good idea. Teaching consumers how to eat unfamiliar fish is also an important step in promoting fish-based food. With concerns about the decline of fisheries resources, it is very important for stakeholders living in fishing towns to cooperate and maximize the use of locally caught fish. The lead role in this is that of the coastal fisher. And, as I too am a part of the fisheries stakeholders, I would like to work with everyone in contributing to the spread of fish-based foods.



V

JSSF from a Comparative Perspective





## 26. Thailand & Japan

### Differences and Similarities in Fisheries Resource Management

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*Small-scale fishing vessels in Pattani Province, Thailand, Sato A. 2019*

*Fisheries have always been an important source of animal protein for most of Thailand's population. The fishery production in Thailand had demonstrated remarkable growth during the last 40 years of the 20<sup>th</sup> century, but during this century, the country's fisheries production has decreased, mainly due to decreases in marine fisheries production. Thailand has faced various kinds of problems with regard to the management of marine fisheries brought about by over-exploitation, and a combination of factors; e.g., increasing human population and demand for fish and seafood products, increased pressure from Thai trawlers, difficulties in enforcing effective management system in small-scale fisheries, and difficult livelihood situations of small-scale fishers. This chapter provides a brief overview of the marine small-scale fisheries in Thailand, including the background of marine fisheries, development policies, marine fisheries management, and experiences in community-based fisheries management. Finally, the different features in marine small-scale fisheries management between Thailand and Japan are described.*

## Introduction

Fish is the primary source of animal protein for most of the people of Thailand. Thailand has a coastline of about 2,600 km and various kinds of fisheries have been developed with blessed natural resources. In 2017, the country's total fisheries production of 2.4million tonnes, with productions from marine fisheries, inland fisheries, and aquaculture contributing 1.3million tonnes, 0.2 million tonnes, and 0.9 million tonnes, respectively. The 1995 Census of Marine Fishery showed that the total number of fishers of marine capture fisheries during peak season was 161,667, and many fishers are engaged in marine small-scale fisheries.

## Background of Thailand's marine fisheries

Prior to 1925, fishing activities in Thailand were mainly by pole-and-line and bamboo stake traps operated along coastlines with the use of small non-motorized vessels. Then purse seine was favored by Thai fishers, and the number of purse seiners increased rapidly. In 1960, trawler brought into the country from Germany was widely used because of its efficiency to fish at daytime and nighttime, leading to drastic increases in the amount of catch. Later, when fishers developed bigger vessels, these big trawlers fished in the seas near Cambodia and Viet Nam. While the neighboring countries started claiming their respective EEZs, Thailand established its EEZ in 1981, during which time Thai fishers were allowed to fish from 770,000 km<sup>2</sup> to 245,271 km<sup>2</sup> bringing back the small commercial vessels to Thai waters. On the other hand, large vessels could go further outside of the Thai waters in search of new fishing resources, e.g., Malaysia, Indonesia and Brunei Darussalam increasing Thailand's capture fisheries production from outside Thai waters. In 2008 however, when Indonesia and Malaysia, which used to be the main fishing grounds of Thai fishers, no longer allow foreign fishing vessels in their waters, this resulted in a rapid decline of Thailand's capture fisheries production outside of the Thai waters.

## Status of the fishery resources and habitats

Thailand has been undertaking regular surveys of its resources since the early 1960s, and the results have shown that in the Gulf of Thailand, the catch per unit effort (CPUE) of trawlers declined steadily, for example from about 300 kg/hr in 1961 to about 30 kg/hr in 1990, and in 2014, the CPUE was 9% of the original CPUE. In the Andaman Sea, the CPUE also declined steadily from the 1960s, and in 2014 the CPUE was about 100 kg/hr (25% of the 1966 CPUE). Moreover, results from stock assessments using catch data in 2014, indicated that the estimated effort for demersal fish in the Gulf of Thailand exceeded the MSY effort by 32.8%, and 5.3% for the Andaman Sea. For pelagic fish (except anchovies), the fishing effort in the Gulf of Thailand exceeded the maximum

sustainable yield (MSY) effort by 27.0%, and 16.5% for the Andaman Sea.

In addition, results from research studies conducted by the Department of Marine and Coastal Resources (DMCR) in 2015, suggested that Thailand has 2,455.34 km<sup>2</sup> of mangroves, 238.33 km<sup>2</sup> of coral reefs and 255.73 km<sup>2</sup> of seagrass beds. Recently, these important habitats have been either lost or are in the worse conditions because of various threats, so Marine Protected Areas (MPAs) has expanded, in which total areas in Thailand are about 80 thousand km<sup>2</sup>, composing of about 25% of the total area of Thai waters.

## Overviews of small-scale fisheries of Thailand

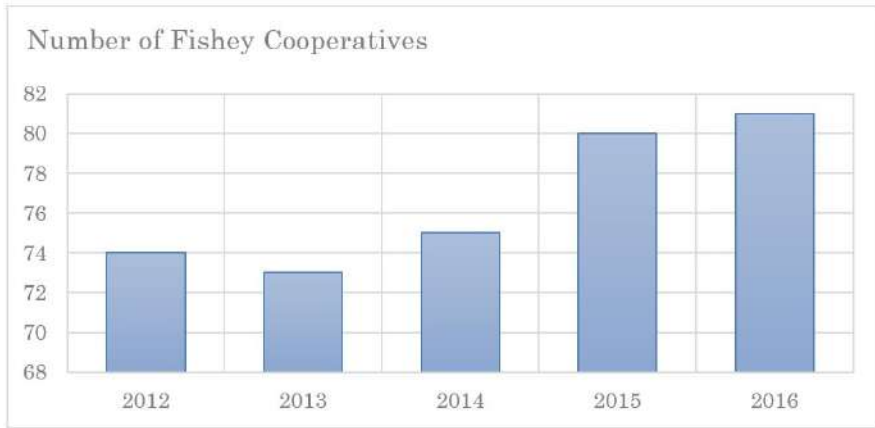
Fishing vessels in Thailand are categorized into: 1) artisanal fishing vessels, with small being less than five gross tonnage (GRT), and a large vessel, between 5 – less than 10 GRT; and 2) commercial fishing vessels (small: 10–20 GRT; medium: 20–60 GRT; large: over 60 GRT). Most of the fishing vessels are artisanal and support a large number of fishers and fishing communities. According to the survey conducted by the Department of Fisheries (DOF), the total number of marine active fishing vessels in 2015 was 42,512 (78% artisanal, 22% commercial), and within the 33,205 artisanal fishing vessels, 91% catch demersal fish, 1% anchovies, and 8% other pelagic fishes, with 14,937 of the vessels registered but unlicensed, and 4,297 were unregistered and unlicensed. The total estimated catch in 2014 was 1,557,860 tonnes, of which the estimated catch by artisanal fishing vessels was only 185,151 tonnes, notwithstanding the artisanal vessels' 78% share of the total number of fishing vessels. The majority of the fishers are artisanal, and their catch supports an important food supply chain that involves a large number of women in buying/selling and in processing, with fish comprising an important part of the livelihoods of fishing communities, including consumption at home.

## Past fisheries policies of Thailand

The Fisheries Policies of Thailand are included in the National Economic and Social Development Plan (five-year plan). During the First and Second Plans (1962–1971), fisheries policies focused on the development policies to support the need to increase marine fisheries production. Issues on fishery resources such as reduction of fishing efforts were included from the Fourth Plan (1977–1981), and the establishment of fishery cooperatives and cooperation with them on fishery management were included from the Seventh Plan (1992–1996). In the Eighth Plan (1997–2001), the establishment of fishery cooperatives for the improvement of financial management, promotion of community-based resources management with concept of fishing rights by local communities and fishers' participation in resources management, enhancement of marine protected areas, improvement of livelihoods of fishers as means of enhancing educational opportunities, health care, and better employment opportunities, etc. were included in the coastal fisheries management policies.

## Fishery cooperatives

Based on the country's "Cooperatives Act 1999", many agricultural cooperatives, non-agricultural cooperatives, and farmers' groups had been organized, including the fishery cooperatives. The main purpose of the cooperatives has something to do with addressing the concerns in production and marketing, which could be addressed through joint purchasing, access to loans and credits, increased knowledge of the fishing industry, and promotion of natural resources conservation. As of 2016, the number of fishery cooperatives was 81, which had increased year by year, but still relatively low compared with the total number of cooperatives; about 11,300 cooperatives in 2016 based on the "Cooperatives Act 1999".



*Figure 1. Annual number of fishery cooperatives based on the Cooperatives Act.*

*Source: Ministry of Agriculture and Cooperatives, Thailand.*

Nonetheless, many fishers' groups had been formed, which are not based on the Cooperatives Act. These include the women's groups that exist in many local communities, although their numbers remain unknown, considering that their sustainability is on a case by case basis.

## Fishing ports

"Fishing Port" means any place used for berthing by fishing vessels or for the transshipment or landing of aquatic animals or aquatic animal products from fishing vessels. Any person wishing to use his or her own port as a fishing port shall register such port as a fishing port with the DOF, except where such port is already part of a fish market enterprise (Royal Ordinance on Fisheries 2015). Owners of fishing ports shall record data on every fishing vessel berthed at their ports. There are several types of registered marine fishing ports in Thailand. These include 599 commercial fishing ports; 10 Port State Measure ports; 34 water and ice service ports; 62 small-scale fisheries fishing ports; 800 docking ports; and 15 fish meal fishing ports within a total of 1,520 fishing ports. After 2015, the number of marine fishing vessels, including small-scale fisheries, can be recorded periodically.

## Fisheries legislation

The main types of fisheries legislation used as a basis for managing the marine fisheries resources of Thailand include the “Act Governing the Rights to Fish in Thai Waters”, the “Thai Vessel Act” and the “Fisheries Act.” The Thai Government issued the legislation on the “Act Governing the Rights to Fish in Thai Waters” in 1939. Under the Act, the Thai fishing waters are defined as Thai territorial waters, and all fisheries resources in the Thai territorial waters belong to the nation. The country has the right over those resources, and only Thai nationals are allowed to own the fishing rights. The “Thai Vessel Act” was established in 1938, and under the Act, the owner of a fishing vessel with an engine or a fishing vessel of 6 GRT and above is required to register their rights with the Harbor Department.

The “Fisheries Act” was enacted in 1947, which is directly concerned with the conservation of fisheries. Generally, three different types of licenses are issued to fishermen: fishing license, fishing gear license, and leasing-area license. To conserve the marine fisheries resources, the DOF has implemented various management measures through the “Fisheries Act” and regulations aiming to determine the sizes and kinds of fishing operations, prohibit the use of certain types of fishing practices in some areas, and establish spawning and nursing seasons and protected areas. It also prohibits the use of certain types of fishing gear during the said seasons and areas, regulates mesh-size for purse seining, gill netting, and squid lift netting, limits the new entry of trawl fisheries, and ceases to grant new trawl licenses. The “Fisheries Act” of 1947 was replaced with the Fisheries Act 2015, and the Royal Ordinance on Fisheries 2015 was put into force in 2015 as a result of the changes in the fisheries situation and emerging international standards, rules and regulations.

## Experience in community-based fisheries management

Although various management measures have been implemented, including coastal small-scale fisheries development projects mainly by DOF for several decades, the fisheries resources have not recovered up to the satisfactory

level. Considering these situations, community-based resources management (CBRM) has been implemented in many different areas in Thailand. The concept of CBRM, which is aimed at achieving the participation of fishing communities in self-resources management and self-enforcement, had been included as a national policy in the Eighth National Economic and Social Development Plan (1997–2001). CBRM in Thailand is mainly carried out with the support not only of DOF but also of the NGOs, International Donors, DMCR, etc. These attempts might have been implemented in Thailand, sometimes under different concepts, *e.g.*, the so-called co-management and recently, the Ecosystem Approach to Fisheries Management (EAFM), but the contents of these activities are not as diverse as the characteristics of the regions and the regional resources.

An example of this type of projects is the one carried out in Nainang Village in Krabi Province, southern Thailand, which is supported mainly by DOF and the provincial government. Small-scale fisheries are major fishing activities in Krabi Province. Destructive and illegal, unreported and unregulated (IUU) fishing activities used to be practiced in the province had resulted in the decline of the fishery resources, and incidences of severe conflicts and disputes between local fishers and fishery officers in terms of enforcing the fishing regulations, leading to the removal of bamboo stake traps. Under such circumstances, co-management supporting activities have been promoted in the area, and the EAFM concept has been introduced later at the pilot site to promote sustainable fisheries management. In 2018, the fisheries management plan of Nainang Village was discussed to encourage the community to participate in managing their own resources, responding to the EAFM principles of ecological well-being, human well-being, and good governance. Through such initiative, the community and local fishers had opportunities to participate in the decision-making process, understood the importance of sustainability, and developed their sense of ownership of the fisheries resources. Thus, the stakeholders' positive attitude for resources management has been growing, leading to the resolution of conflicts between local fishers and fishery officers, and among the fishers themselves. At present, destructive and IUU fishing has been drastically reduced, and the



number of community-based activities has increased, including the creation of alternative livelihoods by the local products processing group, bee farmers group, farming group, souvenirs group, and related activities such as a fish bank, garbage bank, treebank, and environmental conservative tourist program. The case at Nainang Village presents a good example of obtaining the support by not only the concerned fishers but also the communities for the management of small-scale fisheries.

## Marine small-scale fisheries management in Thailand and Japan

So far, certain aspects related to marine small-scale fisheries management in Thailand are described in order to clarify the differences between the situations in Thailand and Japan. As it is well known, local fishery cooperatives or fisher's groups in Thailand had not established enough measures to facilitate the participation of fishers and fishing communities in self-resources management and self-enforcement compared with the fishery rights system and coastal fishery cooperatives in Japan. The Thai Government has put a lot of effort into CBRM or co-management to achieve better fishery management of the small-scale fisheries, but the success in the communities is limited by weaknesses and difficulty in enforcement to control the outsiders or illegal fishers to fish in fishing grounds managed by coastal communities. In addition, everyone can understand that community-based fisheries management activities require continuous negotiations and budgetary support. Until now, considerable numbers of projects are being supported by NGOs and international donors, so there would be problems with sustainability in many cases, which is different from the situation in Japan. Therefore, a lot of small-scale fisheries and fishing communities are faced with more difficult situations in Thailand. It is said that in Japan, fisheries are not attractive, and local young residents in fishing communities do not wish to be fishers, and the number of fishers may drastically reduce in the future, and these situations are the same or worse in Thailand.

Recently, DOF has made hard efforts to combat IUU fishing, mainly targeting

commercial fisheries to cope with international standards and regulations by enforcement of the new Fisheries Act in 2015, etc. However, the new Fisheries Act that focuses on combating IUU fishing and resource management is concerned with not only commercial fisheries but also small-scale fisheries through, *e.g.*, fishing vessel registration, and the establishment of Provincial Fishery Committees, which may be able to understand that fisheries management entity change from central to local. In addition, considering that the DOF and DMCR have a good relationship and follow relatively the same policy direction, there is the possibility that the good sustainable practices of co-management or EAFM would be continued and expanded to support the small-scale fisheries with strong cooperation among DOF, DMCR and provincial government, even if they follow different approaches and types, compared with the Japanese fisheries management system for small-scale fisheries.

## 27. Malaysia & Japan

### Challenging Tasks in Southeast Asia for Researchers

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*Local market, Terengganu, Malaysia, M. Katoh, 2020*

*Small-scale fishers are categorized as traditional in Malaysia based on fishing gear and size of the vessels. Most traditional fishers can fish the nearest fishing zone. In marine capture fisheries, commercial fishers, which are only 25% of the total number, catch about 70% of fish and shellfish. Because of the low income of traditional fishers, improvement of the socio-economic status of the traditional fishers is very important for sustainable livelihoods and fisheries. Department of Fisheries Malaysia undertakes law enforcement of licensing and the zoning system. Although Zone A near the coastline is for traditional fishers, a limited number of licensed shrimp trawlers can fish in Zone A during the monsoon season. To maintain a healthy ecosystem, we need to understand the ecology of fish and shellfish and biotic and abiotic components of the surrounding environment. Understanding the traditional fisheries in the tropics is a challenging field to be studied.*

## What are small-scale fisheries in Malaysia and Japan?

The definition of small-scale fisheries may vary among countries. People's general impression of small-scale fisheries may be that a small number of fishers catch finfish, shellfish and seaweed using small fishing vessels in the coastal area. In Malaysia, commercial fisheries and traditional (or small-scale) fisheries are distinguished by fishing gear and size of fishing vessels. Purse seine, trawl and longline fisheries are commercial, and the other fisheries using drift net, hook and lines, bag net, portable traps and lift net are traditional. In the Fisheries Act 1985, a Malaysian federal act relating to the administration and management of fisheries, traditional fishing practices means any fishing operated with the use of a non-motorized fishing vessel or a motorized fishing vessel of less than forty gross registered tonnages (GRT), using the following gears: (a) trap; (b) hook-and-line; (c) drift net or gill net; (d) seine net; (e) hand lift net; (f) bagnet or stow net; and (g) barrier net.

In Okinawa, Japan, a small fishing vessel of about 7.9 GRT with two fishers can chase bluefin and yellowfin tuna. Their trip length may be about one week depending on the catch, but they can bring back a couple of non-frozen or iced bluefin tunas. One large tuna (not too big because of air shipment) can be sold for more than USD 10,000 at Toyosu, a new fish market in Tokyo. The chosen fish will be shipped by air from Ishigaki or Okinawa islands. Based on the size of the vessel and the number of fishers, they can be small-scale fishers. However, their fish may be very expensive. Another exception of high price in Japan is abalone; traditional coastal female divers catch abalone. Some small-scale fishers occasionally have high income in Japan. Because of the lower prices of ordinary fish around the coastal area, some local fishers started online shopping sites with pictures of their harvest for customers in big cities. This eliminates middlemen. Therefore, fishers can get a higher income, and consumers are happy to buy the fish that have known origins.

## Traditional fishers and marine capture fisheries in Malaysia

Malaysia has coastlines longer than 4,000 km, according to CIA World Factbook (2020). Fishing grounds are off the West and East coasts of Peninsular Malaysia, the South China Sea and Sulu and Celebes Seas in Borneo. The total landing of marine capture fisheries in Malaysia was 1.57 million tons in 2016 (Ahmad Faizal 2018), and more than 70% of the total was commercial (e.g., 46% from trawlers and 24% from purse seiners). Therefore, small-scale fisheries are only responsible for less than 30% of the total catch. However, there are more traditional or small-scale fishers than commercial fishers in Malaysia. Fisheries Development Authority of Malaysia (LKIM in Malay) published detailed socio-economic data in 2007 about traditional fisheries (LKIM 2008). The total number of fishers censused was 21,020, and about 75% of them were traditional, which means commercial fishers comprising only 25% of the total but catching about 70% of fish and shellfish. We can imagine traditional fishers are not very wealthy. The average income of traditional fishers is 1,400RM per month (1USD = 3.44RM in 2007) and that of commercial

fishers 4,409RM. Although the poverty level for fishers is largely reduced compared to 1970, their income is still low, and only 15% of the total traditional fishers own real estates (other than a house) such as housing property or agriculture land. In addition, most traditional fishers are not very young. Sixty-nine percent of traditional fishers are between 35–59 years old. In Terengganu, seventy-one percent of traditional fishers are between 40–64 years old. Therefore, the improvement of the socio-economic status of the traditional fishers is very important for sustainable livelihoods and fisheries.

At the end of 2019, 86 Area Fishermen's Associations were registered with Fisheries Development Authority of Malaysia (31 in West Peninsular Malaysia, 22 East Peninsular Malaysia, 18 Sarawak, 14 Sabah and 1 Labuan). About 10 Area Associations have been newly established since 2003. This is a good sign and potential for local governance and co-management. The total number of fishers was 132,305 in 2017, and 72% of fishers were members of Fisheries Associations in 2007. There were about 36 thousand foreign fishers in Malaysia in 2011. They are from Thailand, Indonesia, Viet Nam, the Philippines, and others. They belong to commercial fisheries, but their income was about 1,000 RM on average (ILO Regional Office for Asia and the Pacific 2014). They have similar livelihoods to traditional fishers.

In local restaurants and bazaars in Terengganu, we see many pelagic fish such as mackerels, scads and neritic tuna. Groupers are available in restaurants but are more expensive. We see emperors (*Lethrinus* spp.), snappers and threadfin breams also. Rays such as dwarf whip ray are popular items for Ikan bakar in Malay (barbecued fish). All fishes are fully utilized in Malaysia, but consumers cannot tell whether one fish is from traditional or commercial fishers in restaurants and stores.

## Zoning system and monsoon season

The zoning system started in 1982 in Malaysia controls fishing activities. The current zoning system has five zones: A zone (0–5 nautical miles [nm]; traditional, monsoon trawlers and anchovy purse seiners; vessel size < 40 GRT), B zone (5–12 nm; trawlers and purse seiners [owner-operators]; < 40

GRT), C zone (12–30 nm; commercial; trawlers and purse seiners [owner-operators or non-owner-operators];  $40 \text{ GRT} \leq \text{vessel size} < 70 \text{ GRT}$ ), C2 zone (30 nm – EEZ border; commercial; trawlers and purse seiners [owner-operators or non-owner-operators]; 70 GRT and above) and C3 zone (High Seas and the Indian Ocean; commercial; tuna long liners and tuna purse seiners [owner-operators or non-owner-operators]; 70 GRT and above). In 2014, a new zoning system (Department of Fisheries Malaysia 2018) was introduced to reduce the number of trawlers and their encroachment activities in the traditional fishing areas for four states (Kedah, Perak, Selangor and Penang). A conservation zone (0–1 nm) was introduced in Kedah, Perak and Selangor to enhance the protection of coastal areas. In this conservation zone, no fishing is allowed. However, fishers can engage in aquaculture activities near the shore. In the new system, Zone A is wider (1–8 nm). This zone is mainly for traditional fishers, but anchovy purse seiners can operate between 6:00 am and 7:00 pm. Locally important anchovies (i.e., Ikan bilis in Malay) can be caught near the coast during the day.

Small fishes are used for traditional Malaysian rice breakfast. Traditional fishers and anchovy fishers need to use the same zone. There are anchovy purse seiners with lights in Zone B. Zone B was expanded and split into two based on vessel sizes B (5–15 nm; 100% local fishers; compulsory with Automatic Identification System (AIS) and Malaysian Acetes Efficiency Device (MAED) or Juvenile and Trash Excluder Device (JTED);  $< 25 \text{ GRT}$ ) and B1 (8–15 nm; compulsory with Automatic Identification System (AIS);  $25 \text{ GRT} \leq \text{vessel size} < 40 \text{ GRT}$ ). MAED lets juvenile fish escape and reduces the catch of trash fish. Zones C and C2 were combined (15 nm – EEZ border, compulsory with AIS or Vessel Monitoring System (VMS); 40 GRT and above). Zone C3 is the same (High Seas; compulsory with VMS; 70 GRT and above). Department of Fisheries Malaysia (DOF) undertakes law enforcement of the zoning system and licensing. DOF uses information from fishing-vessel tracking tools such as Mobile Transceiver Units (MTUs) and AIS onboard. MTUs are used in Zones C and C2, including foreign vessels, and AISs for trawlers are in Zone B1. Monitoring by DOF prevents illegal trawling in Zone A and protects resources and traditional fishers.

The east coast of Peninsular Malaysia has an additional complication. During the monsoon season, many fishers in the east coast cannot fish much. A limited number of licensed shrimp trawlers can fish in Zone A from November to March. To avoid accidental catch of sea turtles, the shrimp trawlers must equip their nets with turtle excluder devices (TEDs). This exception creates additional interaction between traditional and commercial fishers. Enough scientific information is not available about the consequences of monsoon fisheries on the east coast of Peninsular Malaysia.

## Ecosystem approach to fisheries management

The Southeast Asian Fisheries Development Center (SEAFDEC) is an inter-governmental organization established in December 1967 for the purpose of promoting sustainable fisheries development in the region. SEAFDEC, DOF and other organizations promote an Ecosystem Approach to Fisheries Management (EAFM), which is designed to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies, without jeopardizing the options for the future generations to benefit from the full range of goods and services provided by marine ecosystems. To raise awareness of the EAFM concept to the fisheries sector, including traditional fishers, the Marine Fishery Resources Development and Management Department (MFRDMD) of SEAFDEC organized several meetings. Fishers recognize that fish and fisheries are part of a whole ecosystem, and fish, habitats, fishers and other users are all connected and can impact each other. EAFM considers social and economic dimensions also.

To maintain a healthy ecosystem, we need to understand the ecology of fish and shellfish and biotic and abiotic components of the surrounding environment. Because of the high biodiversity in the Southeast Asian region, the ecosystem itself may be sophisticated. A single species stock assessment is unrealistic in the region because landing data are not available for a target species. Even targeted fisheries catch contains multiple species. Multi-species data in purse seine fisheries in Malaysia provide reasonable feedback control (Harlyan 2019). We must try multi-species analyses using limited data.



Scientifically understanding the ecosystem in the tropics is challenging. We must continue to study a diverse number of species. Global warming is another issue. Although we know the consequences of El Niño events in tropical waters, we do not know the long-term effects in tropical oceans from global warming because tropical waters are the warmest among the oceans. Prolonged periods of water temperature higher than 32 °C caused devastating effects (e.g., mass bleaching of reef-building corals) in coral reefs.

## Future direction

To improve the livelihood of small-scale fishers, many activities have been conducted in Malaysia (Mazalina et al. 2018). For example, motivational programs for the coastal community highlighted awareness on the sustainability of fishery resources and strengthening cooperation among community members. Through an EAFM program, the participants were made aware of the importance of sustainable fisheries. Moreover, through a technical skills program, the fishers learned Global Positioning System (GPS), echo sounder and AIS to reduce operational costs by trip-time saving, which brings increased income. The food processing program for fish attracted female participants to study food safety standards and value-added products for higher income. Another training program was repair and maintenance of fiberglass boats. Fishers learned how to repair fishing boats by themselves, and some of them can build new boats and fiberglass products as additional sources of income. Maritime training and scuba diving programs were offered for alternative livelihoods for coastal communities. Those activities and programs will surely improve the well-being of fishers.

In Terengganu, fishers cannot go to fish often during the monsoon season. Therefore, some new economic activities besides fisheries will help them. Tourism is one of the options and local commodities, and special food may entertain tourists. However, tourists are low during the monsoon season. We need to create new economic activities during the monsoon season. Local and non-local people can list the values of the state, and those may be coarse ideas for new industry and/or ecosystem services. Because temperate studies are

not usually applicable to the tropics, understanding the traditional fisheries in the tropics is a challenging field to be studied. Traditional fishers often use private jetties. Therefore, some of their landings are not recorded in national statistics. For better fisheries management, we need to have good statistics and need to include unreported catches. This is one of the challenges for the region, but there are many challenges. We need to overcome those issues based on their priority and importance in the ecosystem.

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## 28. Cambodia & Japan

### **Suggestions for Cambodian Community Fisheries from the Japanese System**

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*Small-scale fisher on Tonle Sap Lake, Cambodia, M. Hori, 2007*

*Over the last two decades, Cambodia has experienced two fisheries reforms. The fishing grounds granted for large-scale fisheries in Tonle Sap Lake were abolished and transferred to the small-scale subsistence fishers (free fishing without any licenses). Community-based resource management by community fisheries (CFi) was introduced to manage the fishing grounds. Fishers are responsible for patrolling the fishing grounds, however, the fishing grounds are open access. Thus, there is little incentive for the fishers to manage the fishing grounds. The CFi also lacks the budget to support patrols; instead, they rely on external funding. With reference to the Japanese system of promoting fishery activities, this essay highlights the benefits of networking CFis to share techniques, and to redefine the small-scale fisheries as an income-generating system. Doing so will encourage a stable food supply for the nation and generate income to support CFi activities.*

## Cambodian small-scale fisheries

The unique water systems of Cambodia, such as the Mekong River and pulsing Tonle Sap Lake, support rich biodiversity and produce high inland-capture fisheries. Cambodia produces approximately 500 000 tons of freshwater fish annually. Cambodian fishery law classifies fisheries by fishing gear type – small-scale, middle-scale, or large-scale (industrial) fisheries (FiA 2007). Small-scale fisheries made up 97% of the total freshwater fish production in 2018 (FiA 2018). The fishing grounds and fishing seasons are defined for large- and middle-scale fisheries, but small-scale fisheries are family-based, subsistence systems, without a defined season. Small-scale fishers can fish anywhere or anytime, except in the large-scale fishing grounds during the open season or conservation areas. The major fishing grounds for small-scale fisheries include the Tonle Sap Lake, small rivers, streams, ponds, and rice fields. There are over 650 000 fishers, and most are small-scale fishers

(Kurien 2017). Economic value of Cambodian fisheries is USD200–300 million per year at the point of landing, and fisheries harvesting, processing and trade contributes 8–12% of GDP (MAFF 2010). Major fishing gears are; gill nets, cast nets, hooks and lines, and variety of traps (FiA 2018) to target Channidae (snakeheads), Clariidae, Bagridae (*Mystus* sp.), Anabantidae, Cyprinidae, *Pangasius* sp., Siluridae, and Notopteridae, which are commercially important species (Baran 2005).

The importance of small-scale fisheries in Cambodia has traditionally been overlooked because the fisheries statistics included only large- and middle-scale operations. However, in 1999, small-scale fishery catchment was included in the national annual production report, and small-scale fisheries supplied over half of the total production until 2012 (Hori et al. 2011). The average annual supply of fish per capita is 41.4 kg (Kurien 2017). The major fishing grounds in and around Tonle Sap Lake were demarcated and auctioned to large-scale fishers as “fishing lots”. This system was introduced during the French colonial period. Fishing lot owners were responsible for fishing ground management and had to report their catches to the Fisheries Administration (FiA). Cambodia has experienced two fishery reforms in the last two decades. In 2000, the government released 56% (536 000 ha) of the fishing lots to small-scale fishers to ease the conflicts between small-scale and large-scale fisheries. Then, in 2012, the “deep reform” abolished the Tonle Sap Lake fishing lots and reallocated the areas as conservation (93 245 ha) or fishing areas (177 881 ha) for the small-scale fishers (Hori 2015).

## Community-based resource management in Cambodian fisheries

Following the two reforms, fishing ground management was transferred to the small-scale fishers. To aid this, the government introduced a community-based resource management system. The Community Fisheries Development Office (currently the Community Fisheries Development Department) was established in 2001, under the Department of Fisheries (currently FiA), to facilitate community fisheries (CFi) nationwide. The operational unit of the

CFi is the local village, with approximately 100 – 1000 members per CFi. Each CFi is responsible for approximately 300 ha to 10 000 ha. In July 2019, there were 516 CFis in Cambodia (FiA 2019). Fishery law Chapter 11 states that “All Cambodian citizens have the rights to form Community Fisheries in their own areas on a voluntary basis to take part in the sustainable management, conservation, development, and use of fisheries resources” (FiA 2008).

The CFi has 5 objectives: (1) manage the inland fisheries and related ecosystems where fishing lots have been canceled, (2) manage fisheries resources sustainably and equitably, (3) increase the understanding and recognition of fisheries resource benefits through the participation in protection and management, (4) provide the legal framework to establish community fisheries, and (5) improve the standards of living and reduce poverty (Kurien 2017). For each CFi, an elected fishery committee is charged with designing the area management plans, managing the finances, and reporting fisheries violations to the FiA (FiA 2008). However, each CFi fishing area is open access, so the neighboring villagers or outsiders can access the fishing grounds, and members can visit other fishing areas. The rules and regulations set by the CFi apply to all users, but the unrestricted access can diminish the incentive to conserve the fishery’s resources.

## Community fisheries activities on the ground

The major CFi activity is patrolling, which requires boats, fuel, cell phones, cameras, and human resources. Patrolling takes extra time because the CFi area and actual fishing grounds of the individual fishers do not always match. It is also difficult, if not impossible, to patrol entire large areas (e.g., over 10 000 ha). Furthermore, the budget for CFi activity is not guaranteed, and each CFi must seek assistance from non-governmental (NGOs) or international organizations. Therefore, the patrolling frequency is affected by budgetary constraints and often results in insufficient CFi rule enforcement. In most cases, external support lasts only a few years, making CFi activities difficult to sustain. The CFi can set a conservation area within the designated CFi area. Often, ponds are dug for fish refuge during the dry season, which is typically

supported by external organizations. Other activities, such as aquaculture, replanting of the flooding forest, micro-finance, and animal husbandry, are also supported by external organizations. Kurien (2017) suggested that the CFI should function as a multipurpose organization, catering to the needs of its entire membership, particularly for agriculture and other related interests.

In contrast, there is limited support for fishing activities (e.g., technical support for processing, marketing, or fishing gear improvements), except for micro-finance that allow people to buy fishing gear. The lack of support for fishing activities may stem from the fact that small-scale fisheries are considered subsistence activities. Also, the groups that are interested in supporting CFI activities are often environmental NGOs that prioritize conservation-related activities. External support is often project-based for a few years without extension, and each CFI must continuously seek support. There are limited opportunities for self-support because commercial fishing or the use of larger fishing gear is not allowed by the CFI. Some CFIs finish a project but are forced to suspend their patrolling activities due to the lack of additional organizational support. Following the two fisheries reforms, only small-scale fisheries exist as subsistence fishing in Tonle Sap Lake. However, the reform has increased the role of small-scale fishing in supplying fisheries products. The fisheries products are sold in markets, which is critically important to fishers with no other income sources. Nonetheless, small-scale fishing is officially a subsistence activity (non-commercial). Thus, there is a gap between policy and social necessity. What are the options for the Cambodian small-scale fisheries?

## Options for the future and experience from Japanese small-scale fisheries

Cambodian small-scale fisheries are defined as subsistence activities, but in Japan, all fisheries (regardless of scale) are tasked with supplying marine products to the citizens (Fisheries Basic Act, 2001). This act requires sound development through the management of fisheries production, processing, distribution, and marketing, and the development of fishing ports and fishing grounds (Article 3(1)). To support the development of fisheries, fishing villages and fishery operators should be promoted (Article 3 (2)). Consumers should also be encouraged to have a better understanding of fisheries activities (Article 8). To achieve these goals, fishers and the fishing villages are involved in a variety of activities, such as value-adding (e.g., processing, branding, and direct sales to consumers/restaurants) and education and cultural preservation activities (e.g., fishery experiences, homestays, and cooking classes). Even for the Japanese fishers who have long history of working together in local fishery groups, these activities were challenging to introduce.

However, Japanese fisheries research and extension systems helped to incorporate the activities. Extension officers play an important role, connecting fishers and prefectural authorities to transfer fisheries technology and guidance for management. The extension officers also communicate the needs and problems of the local fishers, while the prefectural fisheries research stations work to monitor the resources and develop new technologies for the local conditions (Makino 2011). These networks allow the fishers to share their experiences and understand the latest scientific information and policies. Value-adding and education/cultural preservation activities, as used in Japan, may help to raise the income of Cambodian community fishers. However, Cambodian community-based resource management was only introduced in 2000, and fishers may have less experience in fisher group activities. The fisheries administration system also differs between Japan and Cambodia. Therefore, this approach cannot be directly transferred from Japan to Cambodia, but instead may be used as an example that can be modified for



Cambodian fisheries.

The Japanese government conducted the Freshwater Aquaculture Improvement and Extension Project (FAIEX) from 2005 – 2010 (phase 1) and 2011 – 2015 (phase 2) (JICA 2015). This project aimed to improve the seed production and fish culture, build local administrations for fish culture extension, and expand farmer networks for fish seed production in the provinces. The target area was distant from Tonle Sap Lake to improve protein intake and generate cash income. However, the local people had no experience with aquaculture. The “Farmer to Farmer” approach was introduced, where the seed producers instruct the aquaculture techniques to small-scale farmers. This framework started with the training of provincial officers (extension staff), who trained selected seed producers (core seed farmers), then disseminated information to other seed producers and small-scale farmers. Information from the farmer administrations and problems encountered by the small-scale farmers were accumulated at the core seed farmers. This approach allowed adjustments to adapt to local situations, such as facilities or water availability. Furthermore, networking among the core seed farmers allowed information sharing about the techniques and business, which incentivized the network even after the project was finished. Phase 2 of the project was also successful; over 3000 farmers participated in the farmer to farmer training, and over 80% of the farmers experienced increased savings and profits. The farmer to farmer approach has also been applied in other countries.

As this example demonstrates, local households lacking experience in a given activity can work together and remain engaged in the network if they achieve economic and social incentives. Therefore, value-adding and/or income-generating CFi activities may promote small-scale fishers to join farmer to farmer systems, which will subsequently generate income for the CFi activities, such as patrolling. Without the CFis, the management systems of the Tonle Sap Lake fisheries may be lost, increasing the risk of ecosystem collapse. The role of small-scale fisheries in Cambodia needs to be reframed as a production and supply fishery, as in Japan. Clarifying this role will promote policies to improve the fishing and value-adding activities, which will also increase fishers’ income. Moreover, the activities for resource management

and conservation can be sustainable. Promoting the social role of small-scale fishing will contribute to stable food supplies and sustain the nation.

## 29. The Philippines & Japan

### **Some Thoughts for Japanese Marine Product Distribution through the Philippines Case Study**

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*Fish market at Kalibo, Aklan state, Philippines, T. Miyata, 2015*

*Japan is experiencing a significant decline in seafood consumption due to the relatively high price of seafood compared to chicken and pork. In contrast, the consumption of marine products per capita is high and stable in the Philippines owing to relatively low prices of seafood and supply chains. Japan's intermediate costs are about five times higher than in the Philippines, and this high cost is attributed to a decline in seafood consumption. In addition, Japanese small-scale fisheries catch a wide variety of marine products, but there are also underused or unused products. The Philippines, on the other hand, faces a serious decline in marine resources due to overfishing. To improve seafood consumption in Japan, intermediate costs have to be reduced. Moreover, the promotion of local production for local consumption, which is important not only to reduce supply chain costs but also to maintain the traditional food culture, and underused and unused marine products, should be achieved.*

## Introduction

Japan and the Philippines have many commonalities. For instance, their staple food is rice, and they eat simmered food, including fish or meat with vegetables, grilled dried fish, raw seafood in vinegar such as Shimesaba in Japan and Kinilaw in the Philippines. There are so many fish species and small-fishing boats in these countries. Moreover, both are island countries with long coastal lines. Small-scale fishing is facing problems in Japan; fishing households are rapidly decreasing, and so is the consumption of seafood. In the Philippines, overfishing in small-scale fisheries is on the rise (Muallil et al., 2014), but the consumption of seafood per capita is steady. In this chapter, I consider Japan's issues concerning seafood consumption and marine product distribution in the Philippines, especially ways to improve seafood consumption by reducing supply chain costs, wastes, and promoting local production for local consumption.

## Prices and demand for marine products

Recently, the prices of marine products in Japan are increasing based on the household consumption expenditure per capita (National Statistics, 2017). Furthermore, the average price of marine products in households has been increasing since 2009 (Figure 1). However, the consumption of marine products per capita has been decreasing since 2004 in Japan. Ariji (2012) stated a decline in marine product consumption is attributed to a suppression of household income, and the demand shift from not only marine products but also beef to affordable pork and chicken. Therefore, the demand issue of marine products is household income; households cannot keep up with high prices of marine products.

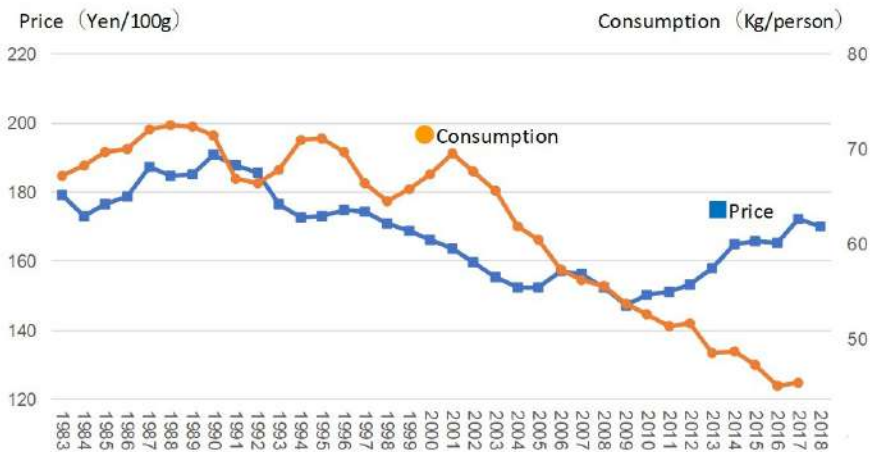


Figure 1. The average price of marine products in Japanese households. Note: The data is deflated by consumer price index (2015)

The average price of marine products in a local market, common fish species, in the Philippines is cheap, which these are cheaper compared to regular meats like beef, pork, and chicken (Amparo et al. 2017). This affordability is prompted by (1) low rental cost of selling space, as displayed in the above picture of a Fish Market at Kalibo, (2) low transportation cost from a fishing port to a market due to a short distance and cheap fee of transportation by

a Jeepney, and (3) low commission of middle person, such as a wife of local fisher (vendor) (Nakahara et al. 2017a). In the Philippines, they have one wet market/fresh market within a town where all marine products are sold at a low price; this style is native to the Philippines, and it leads to a low-cost distribution system. The total intermediate cost from buyer to the household is low, approximately 13% based on the selling price (the case of shrimp) (Nakahara et al. 2017b). In Japan, the total costs from the production area (auction market) to households in Japan are very high, an average of 67% of 10 common species (National Statistics 2017). Today, almost all Japanese consumers buy marine products from a supermarket as opposed to buying them at a fish shop in a public market or shopping avenue approximately 60 years ago. The prices were lower back then, owing to the low rental costs of selling space and low transportation costs due to a large proportion of local production for local consumption (LPLC).

## Differences in the market's needs between Japan and the Philippines

Japanese consumers have varying food cultures; for instance, they eat various marine products in each region: Washoku (local cuisines based on their intangible cultural heritage) (Ehara 2015). However, the number of supermarkets has increased since the 1950s, and the stores sell selected marine products such as large-catch-quantity species and some imported species. The marketing strategy has led to a decline in an assortment of marine products; as a result, and local seafood cuisines have been gradually declining. The selected species have been high pressure by the fisheries, and the fishery resources have led to a low-level of major species stocks (35% in 84 stocks) (White Paper on Fisheries 2017). On the contrary, various small-catch species remain underused or unused (Suzuki 2012).

In the Philippines, fresh local markets in each town/village have a larger assortment of marine products than in Japan; therefore, many local people access the markets with ease. The same with Japan cannot be said; the scenery of the fresh market is only visible at a harvest festival. The fresh local markets

in the Philippines sell various marine products in various sizes. The food culture in the country exposes the locals to a variety of seafood, including in small sizes (Photo 1). Marine products are an important protein source for the Filipinos. There are also fishers to catch marine products for self-sufficiency to gain the protein. Local fishers catch more fish using many fishing gears such as trammel net and drive-in net, which they set anywhere in the sea (Miyata et al. 2017). This overfishing is the biggest issue in the Philippines' fisheries (Altamirano and Kurokura 2010).



*Photo 1. Small shrimps on the left and regular-sized shrimps on the right, at Kalibo fresh market (Photo by T. Miyata, 2015)*

## Japanese traditional food culture by small-scale fisheries: LPLC

Supermarkets sell selected marine products, and some marine resources are underused or unused in Japan. However, consumers buy less marine products due to rising prices. The Philippines has a big issue as overfishing, but marine products are cheaper than in Japan, and consumption is steady. To solve seafood consumption problems in Japan, and also inherit their regional food cultures for Japanese food culture, the country should provide cheaper marine products to consumers. Marine product prices can be minimized by reducing wastes in the supply chain in Japan. Consumers prefer raw seafood to processed marine products due to a superior taste, and it costs a lot to process these products. However, commercial fisheries excessively catch more fish demand using large-scale purse seine and trolling fisheries; thus, they need to process the catch such as can and feed for aquaculture in this case. Conversely, a small-scale fishery can provide a moderate catch for the local demand because they can catch various species at once. The amount of catch by boats is not much. Fishers aim to meet their local demand; they use local market information before fishing (Ohtani 2012).

There are many underused and unused marine resources in Japan (Suzuki 2012); this could be due to consumers not knowing names and tastes of the marine products, not knowing how to cook the marine products, and too small a catch for distribution. A specialized company for selling underused and unused marine products provides repeated brief announcements and also point of purchase (POP) to customers at a selling space. The announcements include cooking tips, health-enhancing ingredients, and information regarding fisheries. These efforts can help raise awareness about the marine products and reduce the number of underused or unused resources.

Fishers' wives at an area sell the unsold marine products at a fish auction in a local producer's market where they are popular (Ohtani 2012). Owing to reasons stated in the previous paragraph, these marine products are rarely distributed and shipped to big cities. The wives prepare the fish for easy-to-cook by consumers; they also give them tips on how to cook. This is their



strategy to sell underused and unused marine products.

Furthermore, metropolitan central wholesale markets gather marine products from all over Japan. This improves the revenue of fishers due to a high price; however, the quantity of gathered marine products and total transportation cost is huge. For instance, it had been difficult to eat local oysters for local people within a prefecture because all products had been shipped to big cities such as Tokyo. However, oyster barbecue shacks changed the situation after the 2000s, which an oyster farmer or fisher-related runs a popular simplified restaurant (Miyata 2011). The oysters are shipped by the local Fisheries Cooperative Association (FCA); the organization decides channels to which they distribute. The FCA has not researched local consumption for oysters and had taken the best channel to ship the oysters to Tokyo for granted. Had they did, they would know there is potential demand in the local market. Today, oyster barbecue shacks are spreading to almost all oyster production areas in Japan.

As elaborated in the Introduction, there is a significant shrinkage of the small-scale fisheries in Japan, particularly in local areas. The decline of labors including fishers in local areas has to do with social trends such as over-concentration in metropolitan areas and dearth of job opportunities in local areas. The Japanese government acknowledges that forging a relationship between local and urban people is important to overcome the decline (Basic policy of overcoming population decline and the vitalizing local economy in Japan 2016). The small businesses such as fresh fish shop run by fisher's wife and oyster farmer's restaurant will play a key role in the decline of small-scale fisheries. Their businesses will increase a fishing household's income, giving local people job opportunities and increasing intercommunion between local and urban people.

Finally, I posited that the decline of seafood consumption in Japan is caused by the abundance of wastes in the supply chain of marine products and suppression of household income. Therefore, the establishment of movements to sell the underused, unused, and unsold marine products caught by small-scale fisheries could help resolve the dire situation in Japan. This includes the movement, such as the simplified restaurants run by a

fisher, which are for LPLC and the Sixth Industrialization (Integration of primary industry with secondary and/or tertiary industry) (Miyata 2018). Moreover, the movements will change the overconcentration to metropolitan supermarkets. It is increasingly important that the government, local governments, and stakeholders related to small-scale fisheries support the development of LPLC and the Sixth Industrialization.

## 30. Vietnam & Japan

### **Introducing Japanese Community-based Resource Management in Vietnamese Fisheries**

***Hidenao Watanab***

Marino-Forum 21



*Cobia aquaculture, Halong Bay, Vietnam, Watanabe, H. 2017*

*The production of both fishery and aquaculture in Vietnam has continued to grow. The production of marine fisheries is increasing year by year. Vietnam's government tries to increase aquaculture production furthermore. On the other hand, the number of fishing boats and the total engine power are also increasing. The catch amount per-vessel and by unit engine output has been declining since 2007. It is worrying that over-fishing effort has happened. At the Mekong Delta region, which is the biggest aquaculture production area, the problem of invasion of seawater has been happening by the decreased flow of Mekong River and other reasons. Such a problem also causes environmental damage to aquaculture farms and paddy fields. In addition, in the inland water area and the coastal area, water quality is deteriorating, or harmful algal bloom has occurred by increasing wastewater from home and industry due to rapid economic development and rapidly increasing human population. Such things bring an adverse effect on aquaculture and coastal fishery. Vietnam is trying to introduce community-based resource co-management using coastal fisher groups for the promotion of sustainable fishing, as the coastal and inland fisher group is doing resource management by themselves, similar to the fishery rights system in Japan.*

## **Introduction**

Vietnam is making efforts for the promotion of sustainable fisheries. Vietnam Government invited me to improve the fisheries resource management system in Vietnam from March 2016 to March 2019 through JICA technical support scheme. Vietnam is trying to introduce autonomous community-based resource management by coastal fisher group, similar to the Japanese way that coastal and inland fisher group is doing resource management by themselves through fishery rights system. During my stay in Vietnam, I shared the information and knowledge of the fishery rights system, resource

management, and Fisheries Support Officer System[1] in Japan to promote community-based resource management to the fisheries in Vietnam. In this chapter, I focused on the current situation and issues in the fisheries sector in Vietnam.

### Fisheries production

The production of both fishery and aquaculture has continued to grow (Figure 1). At first, the production of fisheries exceeded that of aquaculture, but it was reversed in 2007, and this trend is continuing. There are no catch statistics by target species or by fishing method. Almost all fishing boats are wooden, and the boats with an output of less than 20 hp (mainly engaged in coastal fishing) are the most common. The production of marine fisheries is increasing year by year, but the number of fishing boats and the total engine power are also increasing. Per-vessel and unit engine output catches have been declining since 2007, and there is concern that overfishing is occurring.

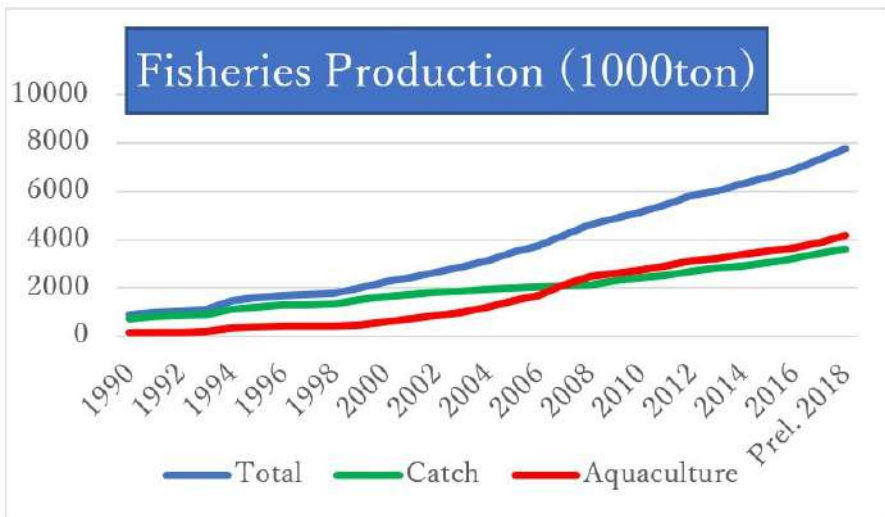


Figure 1. The fisheries production in Vietnam. Source: Vietnam General Statistic Office.

## Resource management

The fisheries law was amended in November 2017, and the fishery rights system similar to the Japanese system was introduced with reference to Japan's experience and others. This will enable fishers who use the same fishery resource in the coastal area to autonomously manage their target resources jointly. Enforcement of the revised fisheries law began in 2019, catch report by the fishing method was prepared, each fishing vessel has been required to submit at the time of port entry, and the report has also been verified by a local government officer. It is expected that resource evaluation of catch target species will be done properly by implementing these measures and accurately accumulating this information.

However, there are no catch statistics by target species or by fishing method required to evaluate stocks of target species until 2019. Therefore, appropriate resource assessment has not been done. As a result, resource management for sustainable resource utilization has not been implemented. In this background, there are not sufficient human resources with knowledge of fisheries resource management because the government did not acknowledge the importance of resource management and how to implement it appropriately. Under these circumstances, the importance of catch statistics is not recognized in the central and local governments, so it is not possible to evaluate the stocks of target species. As it is not possible to do a stock assessment, fishing and fishing efforts management and resource protection are not sufficiently done. Also, fishers do not have the ability to properly implement resource management.

Unfortunately, the Fisheries Support Officer system like Japan has not been established yet. Such a system is necessary to promote community-based resource management. I suggested that the government establishes such a community fisher support system and follows the actual procedure to work it effectively. The first step is to educate the expected support officer of the staff of local governments about resource management and how to promote it to the community fisher group by the central government. Then, such an educated staff of the local government organizes the group of coastal fishers

who use the same resources and also educates them to be able to do appropriate management of their target resources. And they will continue to support such fisher groups to manage resources for sustainable fishing. It is sincerely expected for the Vietnam government to establish such a support system as soon as possible to promote its community-based resource management.

Furthermore, concerning the resource management of eels, countries such as the EU have been asking CITES to advance resource management in eel resource utilizing countries, including Vietnam. For this reason, in order to maintain the continued sustainable use of eels in Vietnam, the urgent introduction of the following resource management measures is necessary such as the introduction of permission system or registration system for pickers and farmer of glass eel, and obligation to report aquaculture volume and catch amount of glass eel.

## Fishing and fishing effort control

The division of fishing operation area is distinguished three areas as offshore, inshore, and coastal, and the engine output of the fishing vessel to be used is also specified as follows: (1) vessel installed with the main engine capacity of 90 HP or more fishing in offshore water; (2) vessel installed with central engine capacity from 20 to under 90 HP in inshore water; and (3) powered vessels with main engine capacity of under 20 HP or non-powered vessels fishing in coastal waters.

The fishing permission to the fishing vessel is carried out by the provincial government, which is the mother port of the fishing vessel, and classification by fishing method in the fishing license is not established. A fishing license is issued at any time, not updated all at once every fixed year as in Japan. Therefore fishing effort control has not been properly done. For this reason, the total number of fishing vessels and used engine output continues to increase. In addition, since resource evaluation of target species and resource management has not been properly done, it is worried about fishing in Vietnam has been falling into excessive fishing capacity since 2007. Fishing management to species that are migrating across wide offshore areas such

as skipjack, tuna, horse mackerel, mackerel, sardine, and squid is required throughout the operating area. It is impossible to do by excising the provincial fishing license system. Fishing management to such species should be done by the national level.

After the revised fisheries law enforcement, on the management of tuna fishery, the cooperative management system was established with the main tuna fisheries provinces and the central government, but such a system has not been applied to other fish species. The offshore quota system was also established. Due to the vulnerability of the fishing operation monitoring and surveillance system, budget and manpower, illegal fishing operations in coastal areas, inshore areas by large fishing vessels which are not permitted fishing in such area, and illegal and unreported operations outside EEZ (Exclusive Economic Zone) are rampant. Because of this situation, in October 2017, the European Commission (EC) issued a warning to the Vietnamese government, stating that the activities to prevent “illegal, unreported, unregulated (IUU) fishery” were insufficient. EC requests Vietnam to improve its countermeasure to IUU fishery in half a year, and if it is deemed inadequate, there is a concern that triggering embargo on marine products to the EU may be invoked. The EC continues to ask for the implementation of corrective measures and regularly dispatches a team to check the status of its response. Vietnam has been revising the Fishery Law to improve fisheries’ operational management, in response to the points for improvement from the EU, as follows: (1) mandating fishing vessel operation monitoring system (VMS) to offshore vessels; (2) strengthening submission of catch report at the time of landing and strengthening of confirmation work; (3) strengthening of fishing vessel delivery and entry control; and (4) strengthening provisions for violating operation penalties.

The enforcement activities by the new fisheries law began in 2019, and it is expected that offshore fishery management will improve rapidly in the future. And also, I hope Vietnam will address the following issues in the near future.

A) Revise the fishing license system and the fishing vessel construction permission system to manage the fishing capacity for sustainable use of resources with proper stock assessment of the target species appropriately. For instance, introduce fishing license system that permits all licenses at one



time each fixed years to avoid increasing fishing efforts. Central government should also take the responsibility of resources management to target species which are migrating widely at the offshore area.

B) Strengthen monitoring and surveillance on the operation of large fishing vessels at offshore areas and operations outside the EEZ by introducing VMS. Strengthen inspections at the fish landing site to check the catch report, organize offshore fisherman's group, and introduce co-resource management in offshore area.

C) Implement adequate resource management on eel fisheries by introducing a licensing system to glass eel fishing. In addition, mandate reporting on the amount of glass eel purchase and product shipment to eel farmers.

D) Introduce a catch certification system in the tuna fishery.

E) Expenditure on the fishing vessel side has increased due to the strengthening of fishery management by introducing VMS and increasing its communication cost. It is necessary to analyze the effect of such an introduction of strengthening of fishery management and also consider the policies for mitigating such economic impact.

## Fishing economic situation and fishing industry support policy

The policy, plan, or strategy for support to increase the profit from fishing and progress of fisheries industry have not been made, so the statistic on fishing income and expenditure has not been done, and analysis of fishery economic situation has not also been conducted. For this reason, despite the continuous excessive fishing effort by increasing the number of fishing vessels, engine output, and the declining target resource, the government tries to increase further fishing efficiency and fishing efforts, such as increasing vessel size, promoting conversion from wooden vessels to steel and fiber reinforced plastic (FRP) ones. In addition, these policies are proceeding without joint use, such as declining measures not to increase the overall fishing effort. By the above situation, it is worried that the profit per fishing vessel is getting worse year by year.

There is another concern that an increase in expenditure due to the strengthening of operation regulations accompanying the enforcement of the revised fisheries law will have a negative impact on the fishing economic situation. I hope Vietnam will address the following issues in the near future for sustainable progress in the fishing industry. The issues to be addressed are as follows.

A) Collect information on income, expenditure, and profit of fishery and analyze the economic situation of fisheries. In addition, take measures such as limiting fishing capacity, fishing effort to create sustainable profit by fishing, based on the result of target species stock assessment.

B) When promoting policy on developing fishing efficiency and fishing effort, such as increasing the size of fishing vessels or output of the engine, and promoting conversion from wooden vessels to steel and FRP fishing vessels, should take jointly decreasing fishing efforts measures together to avoid an increase in total fishing effort like as decreasing same effort from existing wooden vessels.

C) It is also necessary to analyze the negative impact of the revised fisheries law on fishery economic management and to consider policies to mitigate the negative impact if necessary.

## Aquaculture and coastal farms, fishing ground environmental problems

As a national goal of aquaculture production, it is set at 4.5 million tons by 2020 and 6.3 million tons by 2030, nearly twice the production volume in 2016. 70% of aquaculture production is from the Mekong Delta area, and the main cultured species are shrimps and Pangasius. At the Mekong Delta region, the problem of invasion of seawater has been happening by the decreased flow of Mekong River and other reasons. Such a problem also causes environmental damage to aquaculture farms and paddy fields. In addition, in the inland water area and the coastal area, water quality is deteriorating, or harmful algal bloom has occurred by increasing wastewater from home and industry due to rapid economic development and rapidly increasing human population. Such

things bring an adverse effect on aquaculture and coastal fishery. Under such circumstances, excessive use of antibiotics, chemical material, and other bad practices are occurring in aquaculture. Such practice leads to the situation of being forbidden to export aquaculture products. Also, every time when a fish dies due to harmful algal bloom or when water pollution happens in the coastal area, consumers tend to stop purchase fish from such areas.

Concerning the export of shrimp, in the middle of 2018, the export price of white leg shrimp, the main Vietnam export product, dropped sharply due to the excess supply in overseas export markets, causing a situation in which farmers' economic management was hindered. Regarding the production plan of export products such as shrimp and Pangasius, it is necessary not only to increase production but also to proceed with an analysis of trends such as international market demand and production prospects in production competing countries. The issues to be addressed are as follows.

A) Maintain a healthy environment in coastal areas and aquaculture areas by regularly conducting water quality monitoring.

B) Develop appropriate environmental standards at aquaculture farms and thoroughly treat wastewater from aquaculture farms.

C) Encourage related ministries and agencies to promote national action plans concerning the proper treatment of domestic and industrial wastewater.

D) Periodic analysis of international demand trends of major export goods such as shrimp and Pangasius; and the implementation of production plan based on analysis results.

## Development of fresh fishery domestic market and distribution network for supply fresh fishery product and also decreasing post-harvest loss

In Vietnam, mainly in large cities, the demand for highly fresh seafood such as sushi and sashimi are increasing year by year. This is based on the fact that the increase in personal income is accompanying remarkable economic growth. However, product freshness is not well reflected in selling price. This is because there is no auction system in domestic fishery product trading, and many fishers borrow from middleman before going to fishing operation, so their catch cannot be freely sold and must be handed over to middleman. Fish is also sold by weight regardless of quality. For this reason, the selling prices are not made depending on the degree of freshness. Fishers and trading persons have not made efforts to preserve the freshness of the products during the catch stage and the subsequent distribution stage. For these reasons, many post-harvest losses have happened, and the supply of high-fresh fishery products is covered mainly by imported goods from Japan and other countries. The issues to be addressed are as follows.

A) Introduction of freshness preservation technology at fishing stage; and technology for the improvement of the cold storage capacity of the fish tank of the fishing vessel.

B) Improvement of the distribution network to reduce transportation and distribution time.

C) Open the fresh fishery market for high-quality trading products and innovate distribution network to keep freshness of products..

D) Establish a dialog scheme or a cooperative relationship between the fishing side, distributor, market side ( retail shops, restaurants) and consumers for development the distribution network and market for high-fresh marine products.



*Figure 2. Workshop on Fisheries Co-resource Management, Binh Tuan Province, Vietnam, 2017, Watanabe, H.*

## Endnotes

[1] A system introduced in Japan, where the government officers have close contact with fishing communities and fishers to support fisheries. It has reached the present through several system revisions since its first introduction in 1959 (Murakami, K. 2014. Potential of Fisheries Support System-towards the improvement of problem-solving ability in fisheries and fishing communities. Suisan Shinko. Vol 48 No 8. 1-85. In Japanese).

## 31. China & Japan

**Focusing on the Present Situation and Its Governance**

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*A typical small-scale fishing boat, Mayi Island, Dalian, Liaoning Prov. China, J.*

*Sun 2016.*

*For a long time, people have paid more attention to large and medium-scale fisheries, and almost no research has been done on small-scale fisheries. In recent years, FAO has been emphasizing the importance of small-scale fisheries to the world. According to statistics, 50% of the directly consumed fish by human beings comes from small-scale fisheries. With rising global concerns over small-scale fisheries, China needs to focus more on this critical issue. In this chapter, we mainly introduce the development of Chinese small-scale fisheries from the aspects of the concept, scale and management, and make a comparison with Japanese coastal fishery (small-scale fishery) from the aspects above to discuss the problems that Chinese small-scale fisheries still face at present.*

## Small-scale fisheries in China

At present, there is no unified definition of small-scale fishery in the world, because its size is largely related to the specific situation of each country or region. Chinese small-scale fishery has existed since ancient times, but there is no specific definition of the concept. According to the FAO report (2008), the definition standards of small-scale fishery in developing countries are given through case studies, covering the following aspects: (1) gross tonnage, engine power, and type of fishing boat; (2) workplace and local management factors; and (3) difference of concepts and contexts. According to these criteria, Chinese researchers, taking into account the specific situation in China, define small-scale fisheries as “fisheries that do not use fishing boats, use non-motorized fishing boats instead of motorized fishing boats, or use motorized fishing boats with main engine power less than 44.1kW to engage in fishing operations on or off the inland coast.” This definition is based mainly on the studies in the marine fishing industry; inland fishing is not included in the studies for the time being (Yang and Zhu and Wan 2011). In the actual marine

fishing production, there are very few cases where fishing vessels are not used or where non-motorized fishing vessels are used. Therefore, the small-scale fishers in China are mainly using motorized fishing vessels of 44.1kW or less to fish off the coast and offshore China.

Chinese small-scale fisheries are important but disadvantageous in the fishing industry. The main reason lies in the monopoly of large vessels in Chinese fisheries, which means that large fishing vessels have relatively strong viability and relative advantage over small fishing vessels in terms of fishing technology and capital sources. Under the environment of rising operating costs and heavy pressure of fishery policies, some small fishing vessels have to withdraw from the fishery because they cannot afford to operate; that is to say, large fishing vessels monopolize marine living resources to some extent. Although small horsepower fishing boats account for the majority of the total number of fishing boats in China, they are still less than 20% of the total power, and cannot compete with large and medium-sized fishing boats when operating. However, wide Chinese sea areas make it unrealistic to rely on large fishing boats for fishing operations. Therefore, coastal and offshore fisheries mainly rely on small-scale fisheries.

Chinese marine motorized fishing vessels and small-scale marine motorized fishing vessels are decreasing year by year. From this perspective, the development of small-scale fishery is very limited. But among the 166,300 marine fishing vessels in China, the engine power of about 65.8% is less than 44.1 kW, and 4,604 are non-motorized. This does not include unlicensed or poorly documented small fishing vessels. Therefore, although the number of fishing vessels is declining, small-scale fisheries have an important place in the fishery and provide more livelihood support to fishers engaged in subsistence fishery in coastal areas. At present, the number of fishers in China is about 18.78 million, of which the number of traditional fishers is about 6.18 million, almost one-third of the total population of fishers. These traditional fishers usually take individuals or families as production units, and in some areas, basic cooperative production in the form of communities is carried out. However, in the peak season of fishing, extra labors are hired (Su 2016). These small-scale fisheries are largely concentrated in the coastal



areas of China and mainly fish by using drift nets, open nets, small trawl nets and other fishing equipment.

Here, we talk about the management of the small-scale fisheries from the two aspects of government and civil society organizations. At present, Chinese fisheries basically follow the principle of “centralized, unified leadership and hierarchical management”, and adopt the same fishery management policy (Chen and Tang 2014). Starting from the Eighth Five-Year Plan (1991-1995), China implemented a “dual control” system for fishing vessels, that is, total control over the number and power of fishing vessels operating in the sea. The primary purpose was to protect marine resources by controlling fishing intensity. However, due to the livelihood problems of fishers, the implementation of the “dual control” system did not achieve the expected goals. In order to change the negative situation at that time, the Ministry of Agriculture, on the premise of realizing the sustainable development of fisheries, introduced new measures in 2003 to implement the policies of scrapping fishing boats and transferring fishers to other industries as management measures to control the number of fishing boats in real-time. In September 2003, the Chinese government set up a special subsidy fund by the central financial department to ensure the smooth transition of careers for the fishers. However, there are different subsidy standards in different provinces of China. For example, the amount of subsidy in Shandong Province is higher than the standard issued by the country. Besides, many small horsepower fishing boats are limited by the scrapping standard and their owners cannot get the full subsidy.

In addition, the Chinese implementation of a moratorium on fishing has also played a role in the management of small-scale fisheries in coastal areas. Chinese fishing moratorium system was first implemented in the east Yellow Sea area from 1995 and then extended to the South China Sea, which also effectively improved the local fishery resources and reduced the cost for fishers and fishing boats during the marine production. Chinese fishing license system was first introduced into China in 1979, and at the same time, relevant management and measures were promulgated. From December 1, 2002, the regulations on the management of fishing licenses began to be implemented.

However, because the system only limits relatively single elements such as the number of fishing boats, types of fishing gear, operation mode, permitted fishing season and fishing boats, it almost equals the standard of free access. In response to such problems, China has also come up with some new measures, such as collecting fees for the proliferation and protection of fishery resources.

At present, China has also established small-scale fishery organizations, but the number is less than 20,000, accounting for only 2% of the number of agricultural cooperatives. The establishment of fishermen's organizations in China can be divided into two types: one is based on the law of agricultural cooperatives and regulations on the management of social organizations; the other is organized by fishers spontaneously (Ma 2019). Of course, the purposes are to protect the rights and interests of fishers and also to protect the development of fisheries. Such organizations are basically in the form of fishermen's professional cooperatives.

No matter how organized, these small-scale fishery organizations are decentralized in management, and the government directly supervises and manages the fishers. In terms of operation and management, these organizations have different forms according to different situations of different provinces and cities. For example, the small-scale fishery organizations in Dongying City, Shandong Province, are relatively standardized. They operate independently and take responsibility for their own profits and losses. Some small-scale fishery organizations in Zhejiang Province are organized on a village-by-village basis and specialize in fishery service stations or fishery offices for management and operation. From a functional perspective, small-scale fishery organizations can independently operate projects, mainly as a bridge between the government and fishers in management and communication, and assist the government in the agency business, such as ship inspection, license issuance; in addition, help the government to undertake management functions, solve disputes, etc. (Yang 2011). But no matter what kind of function, these small-scale fishery organizations do not have the real power of fishery management.

## Small-scale fisheries in Japan

Japan is a developed country. Although the small-scale fishery is at a disadvantage in its own fishery, compared with small-scale fisheries in developing countries, the living of fishers is still much easier. Japanese small-scale fisheries are also not specifically defined. From the previous research, we can regard Japan small-scale fisheries as coastal fisheries, which mainly refers to the operation of small-scale motorized fishing boats with customized fishing gear or less than ten gross tons within 12 nautical miles of Japanese territorial sea, including small trawls, gill nets, pole fishing, fixed nets and other equipment. Coastal fisheries in Japan are also facing a decline in production and output value, but the proportion of Japanese coastal fisheries in total production and output value has been relatively stable or even rising. Of course, it is also because the economic value of the catches of coastal fisheries is relatively high. The number of fishers working in Japanese coastal fisheries is far higher than that in offshore and pelagic fisheries, among which the number of self-employed fishers is higher than the employed fishers (Yang 2011).

As an island country surrounded by sea, the Japanese government attaches great importance to the coastal fisheries, the livelihood of fishers who engage in coastal fisheries, and the protection of fishery resources in coastal areas. The Japanese government has formulated a series of legal provisions to facilitate the management of coastal fisheries, such as the Fisheries Law and the law of coastal fisheries revitalization, which can regulate and guarantee the use of fishing grounds and the rights that fishers can exercise from the law. The fishery rights guarantee the fishers to manage the coastal fisheries, especially the common fishery rights mainly refer to the specific fishery rights such as the fishery with seaweed and shellfish as the object, as well as the operation of the small fixed net, ground hauling net, ship hauling net of the non-motorized ship, etc. for ten years and are granted to local fisheries cooperatives. Customized fishery rights refer to the right to use large-scale fixed fishing gear to carry out fishing production and operation in a certain area, with a term of 5 years. This authority will give priority to local fisheries

associations, then to individual fishers or other groups. The coastal license belongs to a fishery license, which is managed by the governor of prefectures in Japan, thus it is also called “governor licensed fishery”, with a term of 3 years. For other technical management, such as fishing gear size, mesh size, operation time and area, as well as the relevant rules and regulations for utilization and management, they are formulated by the fishery coordination group.

## Differences

Compared with Japanese small-scale fishery organizations, Chinese small-scale fishery organizations are still developing. Japanese fishermen’s co-operative association was established in 1901, which has a history of more than 100 years. It does not only actively promote fishery production and protect the interests of fishers, but also significantly promote the sustainable development of coastal fisheries in Japan. Japanese fishery cooperatives are authorized to distribute the fishery management rights among the members. We can say that the fishery cooperative plays an important role in the marketing of the aquatic product in Japan. Moreover, the *Law of Japanese Fishery Cooperative* also provides a solid and powerful legal support for Japanese fishery cooperatives in the management of small-scale fisheries and of fishers. In terms of management of small-scale fisheries in China, first of all, there is no detailed and reliable law to support the establishment of the organizations. Although the Law of the People’s Republic of China on Farmers’ Professional Cooperatives provides certain rules and regulations for the operation of the organization, there are still substantial differences between fisheries and agriculture. The law can meet the needs of non-governmental agricultural organizations, but it cannot meet the needs of small-scale fisheries organizations. In addition, Chinese small-scale fishery management right is in the hand of the government, and non-governmental small-scale fishery organizations are unable to allocate fishery rights independently, which makes it impossible for Chinese small-scale fishery organizations to compete in management with Japanese fishery cooperative organizations.

Besides stabilizing the fishery resources, legal provisions suitable for more professional management of small-scale fisheries are also essential to Chinese small-scale fisheries.

## 32. South Korea & Japan

### **Fishery Rights Structures and Their Influence on Coastal Governance**

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Tokai University



*Small-scale fishing vessels in Minrak fishing port, Busan, South Korea, M. Joo,  
2020*

*As neighboring countries, Japan and South Korea have many things in common. Similarities also exist in their fisheries, which are analyzed in this chapter. After highlighting the history and structure of fishery rights in both countries, this text will present a discussion on how these rights frequently interfere with the activities of other coastal area users. With current examples, this chapter[1] will explain how the rights systems, which grant high use priority and resource management responsibilities, have a significant influence on coastal governance. Their impact will be explored through a comparative lens, outlining the respective characteristics of Japanese and Korean fisheries. Lastly, in light of these, challenges facing effective and efficient coastal governance are considered.*

## Introduction

It is hard to think of any two countries that are as culturally close to one another as Japan and Korea. As a Korean who was born and raised in China but is now based in Japan, I can speak from personal experience about this topic. For instance, because the Japanese and Korean languages are so closely related, translation and interpretation between the two have always come more naturally to me than any other combination of languages. Similarities in the nations' fisheries can easily be observed as well. This chapter will analyze those similarities, first focusing on the countries' respective fishery rights systems, and then identifying the current challenges facing their coastal and small-scale fisheries.

The structures of fishery rights have contributed largely to ensuring the sustainability of fishery and fishing communities in Japan. However, the role and significance of fishery rights are being questioned, as the nation's fisheries undergo downsizing and restructuring (Li 2008). In particular, as multilateral use of coastal areas becomes further diverse, critics are calling

for more limits on fishery rights, which are considered to be hampering the development of marine industries. As such, flexibility and cooperation from stakeholders will be required in responding to new demands and challenges relating to coastal use. These include harmonizing the interests of coastal area users and finding ways to improve the economy of local communities. Whether positive or negative, it is a fact that the existence of fishery rights has a significant influence on the development of coastal governance. With all this in mind, how is South Korea handling coastal governance issues, with their similarly structured fishery rights? Furthermore, what kinds of issues and challenges do they face?

## How have fishery rights been formed?

The fishery rights system in Japan has its roots in the Edo period (1603–1867). During this time, conventional relations concerning coastal use were formed based on each territory of the domain head. As a general principle, “coastal communities [were] granted the rights to have exclusive access to their bordering waters, and the outer offing of rocky shores [were] opened to fishers in nearby communities” (Tanaka 2003). In 1875, a new system was put in place, where fishery operators were required to submit an application and pay fees for the use of a marine area. These sudden institutional changes resulted in chaos, forcing a legislative revision made principally to return to previous customs. Since then, the existing structure of fishery rights has been perpetuated without change, upheld by the first Fisheries Act of 1901, its subsequent revisions, and the current Fisheries Act of 1949 (Aotsuka 2000).

The development of fishery rights in Korea can be divided into the time before and during the Joseon period (1392–1897), the Korean Empire period (1897–1910) when the nation’s Fisheries Act was first enacted, and the period of the Korean Fishery Ordinance during the annexation of Korea (1910–1945) (Kim 1992). Before and during the Joseon period, fishing is said to have been an extralegal, unregulated, and uncontrolled activity, although it was considered to be under state ownership as an extension of the concept that all land belonged to the emperor. During the Korean Empire, the Fisheries Act of



1908 was established, recognizing fishery as an industry under the national system for the first time (Kim 1992). Finally, during the annexation of Korea, the Fishery Ordinance was promulgated by the Japanese government, which abolished the existing Fisheries Act while introducing the current fishery rights system, upheld through the establishment of fishers' associations and rules on how rights would be enforced. The Korean Fishery Ordinance of 1929 then designated tendered fishing rights to be property and prohibited its transfer. This system of rights was acknowledged by the post-liberation Fisheries Act of 1953, and despite subsequent revisions, the structure of fishery rights has not changed since the time of the Korean Fishery Ordinance (Lee and Shin 2000). In summary, it can be confirmed from the historical development of the fisheries system that Japan and South Korea have similar fishery rights structures.

## How do fishery rights compare?

As can be expected, Japan and Korea define and classify fishery rights in many similar ways. Fishery rights are: (1) exclusive rights to operate fishery in a certain period and certain area, (2) granted by the head of the local government, (3) designed to be managed by fishery cooperatives, (4) deemed to be real rights which cannot be transferred or loaned, and (5) classified by technical standards or forms of management. The latter is classified based on whether they are given to fishery cooperatives or fisheries managed by individuals (Makino 2011; Kim 1992).

However, there are a number of differences in how the two countries structure the rights. Notable differences are as follows:

A) Japan divides common fishery rights into five types by fishing method, whereas Korea unifies them as community fishery rights.

B) Japan categorizes aquaculture rights into four different types: from class 1 to class 3 demarcated fisheries, and a specific demarcated fishery determined by aquaculture method. On the other hand, Korea categorizes rights into five types: collective aquaculture rights for aquaculture conducted within communal fishing areas, compound aquaculture rights where aquaculture

involves two or more species, and separate types for algae, shellfish, and fish aquaculture.

C) In Japan, set-net and demarcated fishery rights are granted for five-year periods, while common fishery rights are granted for ten-year periods. In Korea, rights are always granted for a ten-year period, without exceptions.

D) The Fisheries Cooperative Associations in Japan carry out economic activities in addition to the responsibilities in fishery management, such as the maintenance of fishing grounds, rules, and resource management, etc. In Korea, Regional Fisheries Cooperative Associations are mainly responsible for managing economic activities, leaving fishery management responsibilities in the care of Fishing Village Cooperatives.

E) With regard to the nature and scale of the fishery organizations. The Fisheries Cooperative Associations in Japan are corporate bodies with an average of 150 members. In Korea, the Regional Fisheries Cooperative Associations are corporate bodies, while the Fishing Village Cooperatives, which generally consist of 70 members, is not.

F) Finally, when joining an association, fishers in Japan join the Fisheries Cooperative Associations, whereas fishers in Korea often join both the Regional Fisheries Cooperative Associations and Fishing Village Cooperatives, because joining the former is a common precondition for joining the latter.

To summarize, although both countries have adopted a similar system of fishery rights, differences can be observed in how they are structured.

## How do fishery rights impact coastal governance?

This chapter focuses on the impact of fishery rights on coastal governance by influencing resource management and conflicts over coastal use. Before going into detail, it is first necessary to look into how the two countries define coastal fisheries, which are considered to be small-scale fisheries in this chapter. According to the National Federation of Fisheries Cooperative Associations (NFFCA 2005), coastal fisheries in Japan are considered to be fisheries that employ fishing vessels under 10 mt, and that conduct operations lasting less than a day. These also include aquaculture and set-net fisheries.

This is in contrast to offshore fisheries, which are fisheries using fishing vessels between 10 to 200 mt. These vessels usually operate trips lasting from a few days to one month, navigating multiple areas. In Korea, coastal fisheries are defined by the Fisheries Act. Article 41 describes them as fisheries that use fishing vessels under 10 mt. These differ from offshore fisheries, which include fisheries that use vessels larger than 10 mt, along with select fisheries that use fishing vessels under 10 mt in special need, based on the Presidential Executive Order. Coastal fisheries in the two countries involve fishery rights-based fisheries and governor-licensed fisheries, both of which have significant working relationships with fishery cooperatives, as well as officially recognized rule-making rights granted to fishery operators.

With this in mind, the impact of fishery rights on resource management may now be examined. Dividing the dynamically changing production of fisheries by the fishing sector allows for the observation of a distinctive phenomenon. That is, despite volatility in the total output of Japanese fisheries, trends show that the production of the coastal fishery, in particular, has remained a certain size (Figure 1a). In other words, the Japanese coastal fishery sector maintains relatively stable production, while the total output of the fishing industry expands and contracts. Apart from the changes in the international circumstance and resource fluctuations, the presence of the fisheries governance system typified by the fishery rights system is included as the cause of such a phenomenon (Lou 2014). We can find similarities in Korea when comparing coastal and offshore fisheries with distant-water fisheries (Figure 1b). However, statistics available to the public do not differentiate coastal fisheries from offshore ones. Therefore, the trends of the coastal fisheries are needed for further examination.

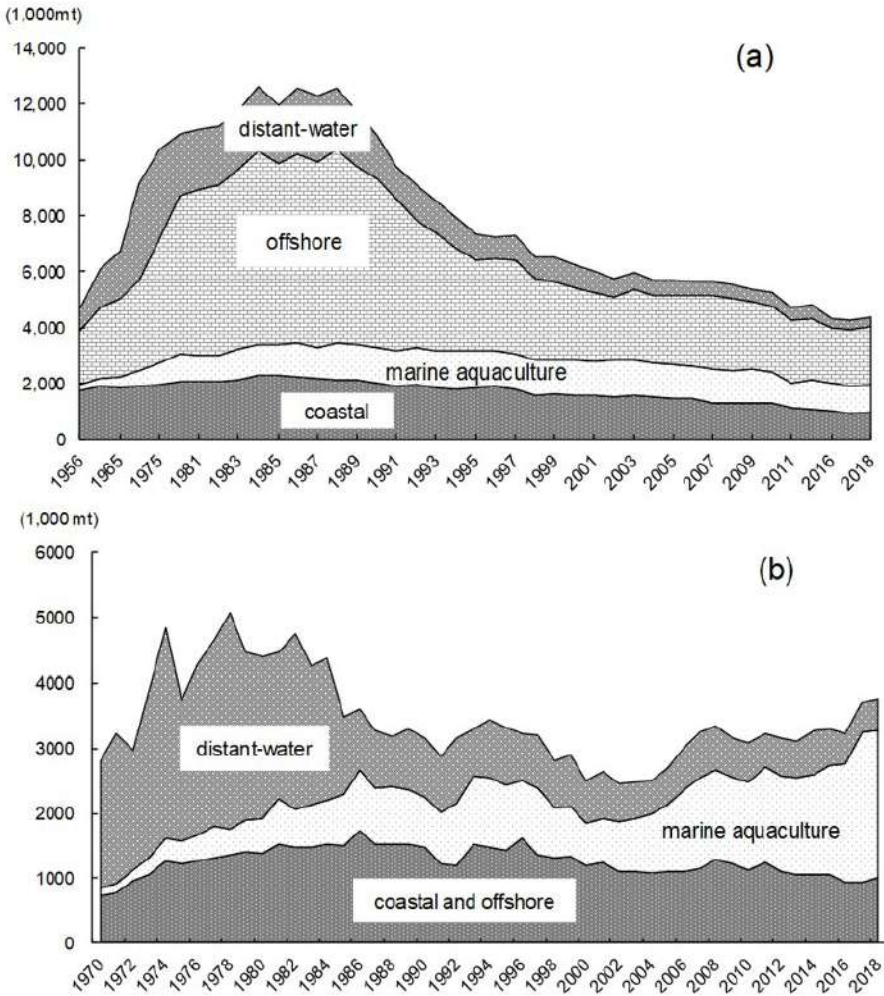


Figure 1. (a) Fishery output in Japan. Annual Statistics of Fishery and Fish Culture (Fisheries Agency website). (b) Fishery output in S. Korea. Korean Statistical Information Service (KOSIS).

Fishery rights also play a role in developing conflicts over the use of coastal areas, which has become increasingly diverse and sophisticated over time. In Japan, adjustments to fishery rights have been made in order to accommodate industrial projects such as land reclamation, as well as to make room for other fisheries that are not fishery-rights-based. More recently, fishery rights

have also been adjusted to allow for recreational fishing, commercial diving operations, pleasure boat leisure, the development of offshore wind power generation, and more use of the coast by the public. Between all of these interests, competition for fishery resources, amenities, and spaces has formed. In particular, there has been growing interest in using coastal areas to develop natural energy projects as a result of the fallout from the Great East Japan Earthquake of 2011 (Tobata 2005). Therefore, further adjustments between coastal fisheries and the renewable energy industries are being sought. Korean fisheries are also in a situation similar to Japanese in those adjustments to fishery rights that are being made to make way for an increasing number of coastal area users. That is, apart from the existing adjustment issues within fisheries as well as between fisheries and reclamation development, Korea is also confronted with the challenges of adjustments over fisheries with marine recreational activities (Park et al. 2014), and renewable energy development as news articles claim for a just development can be often seen today (e.g., “Must Stop, Reckless Development of Offshore Wind Farm”, *Busan Ilbo*, October 15, 2018).

Through formal laws and regulations such as the Fisheries Act and the Public Waters Reclamation Law, both Japan and Korea have established a compensation system for fisheries in order to help reconcile conflicts over coastal use. However, the system falls short of responding effectively to issues today in coastal governance, with its increasing wickedness and complexity (Jentoft and Chuenpagdee 2009). In an effort to improve the situation, coastal communities are working to lead new initiatives with an emphasis on shared partnerships in both countries. One example of this in Japan is a concept known as the *Umigyo* initiative, which promotes a suite of activities led by fishers and fishers’ organizations, such as recreational fishing, scuba diving services, and seafood restaurant, direct sale stores, etc. (Lou 2013). Another notable case of collaboration between fisheries and other stakeholders can be found in the Setana community of Hokkaido, where wind power generation equipment and kombu seaweed aquaculture coexist (Tobata 2005). Examples in Korea include the Fishery Experience Village Program, which promotes the engagement of fishing communities in ecotourism (Yang and Moon 2009).

## Conclusion

As discussed above, fishery cooperatives and fishery rights are similarly positioned in Japan and Korea. They play central roles in supporting local communities, cultures, and economies in both countries. On top of being vitally important for other purposes, fishery rights, in particular, are essential in protecting the standard of living of fishers, providing organizational structure to fisheries, and helping to conserve marine resources and the environment (Li et al. 2014; Choe 1998). However, the adjustment cost is massive, with the rising number of other coastal users. Various solutions are being explored to improve their outlook in addition to the conventional adjustment measures in both countries. On the other hand, Japanese and Korean fisheries differ in a few ways. For example, Fishing Village Cooperatives in Korea are small in scale and do not have as much economic influence as compared to those in Japan. As a result, they play a minor role in coastal governance but are complemented by a great variety of other structural organizations. Efforts to resolve disputes surrounding coastal use in Korea are often led or supported by the government, with fishing Village Cooperatives serving as steering and managing bodies (Kim 2017).

In order to work towards the harmonious use of coastal areas while taking into account the diversifying needs of its users, it will be necessary to promote and structure organizations with specific responsibilities such as resource management, environmental conservation, and the revitalization of profitable activities such as recreational fishing, dining, and the merchandising of local products. The creation of such a coordinated system will not only depend upon strong government support but will also require innovation and collaboration among stakeholders. Looking to the future health of small-scale communities, it would be wise to enlist the longstanding expertise of existing organizations like Fisheries Cooperative Associations in Japan and Fishing Village Cooperatives in Korea. Their attachment, pride, and commitment to the prosperity of their local environments will be invaluable to the development of healthy working relationships in coastal areas.

## Acknowledgments

This work was partially supported by JSPS KAKENHI Grant Number JP17K12861.

## Endnotes

[1] This chapter was rewritten based on the *Conference Proceedings (2018) of the Japanese Association for Coastal Zone Studies*. The Japanese fishery rights structure in this chapter refers to that before the fishery system reforms made in 2018.

## 33. Taiwan & Japan

### Small-Scale Fisheries Characteristics, Issues and Policy Comparison

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*A small fishing port with traditional temples. Pingtung, Taiwan. Chen C., 2018*



*The purpose of this paper is to describe the characteristics, status, difficulties and policy measures of small-scale fisheries in Taiwan and to compare them with those in Japan. The main content of this article is summarized as follows. Small-scale fisheries in Taiwan mainly include small fishing boats operating in the coastal waters, basically family-owned operations with low fishing efficiency and low proportion of production. However, the number of fishing boats and fishers employed is high, resulting in over-utilization of fish resources, low income of fishers, and other social economic and environmental problems. Therefore, over the past years, the government has been adopting several measures to regulate fisheries, limit fishing efforts, protect and rehabilitate resources, to pursue sustainable use of fish resources. Also, this paper illustrates the similarities and differences of SSF between Taiwan and Japan.*

## Introduction

According to the type and size of operation units, fisheries in Taiwan can be roughly divided into three types, one is far-sea fisheries, which is capitalized large-scale enterprise, engaged in international business and fishery management, mainly including longline tuna, purse seine for tuna, torchlight net for saury, squid jigging. The value of this type of fishery accounts for more than 50%. The second type is intensive capitalized aquaculture fisheries, based on high biotechnology, mainly including high-priced fishes such as eel, grouper and abalone. Its production account for about 30% of total fisheries production. The largest category of fisheries in Taiwan is the third type - traditional small-scale fisheries. Based on Taiwan's fishery statistics, it includes coastal and offshore fisheries, the former refers to unpowered fisheries, the latter for fisheries below 50 tons of fishing boats, with traditional and family style of small-scale fisheries, and operating in the coastal and offshore waters. These

are the definition and scope of the so-called small-scale fisheries (SSF) in Taiwan.

There were many types of SSF in the early years in Taiwan. Among them, Taiwan-purse-seine has the highest (58%) production, followed by small and medium trawls (20%), tuna longline and pole and lines boats (15%), gill nets and set net fisheries have the least production. Taiwan's small-scale fishing industry is characterized by the largest number of fishery operators and employees, accounting for more than 60% of the total over the past years. The fishing boats are small but numerous, and they account for more than 80% of the total. However, due to the lack of fish resources in coastal waters and the low efficiency of fishing gear, their production is quite low, less than 20% now, down from 40% in the 1970s. In addition, the fisher's income is also low, so they need to have side-jobs to support their families. The percentage of fishery production, number of fishing boats, and employed persons in past years are shown in Table 1.

Item	Year	Total	SSF	% of SSF
Fisheries production	1970	613,152	262,878	43
	1980	936,336	408,201	44
	1990	1,455,499	340,756	23
	2000	1,333,574	213,109	16
	2010	1,169,824	163,546	14
	2018	1,096,890	187,922	17
Number of fishing boat	1970	10,515	9,589	91
	1980	13,901	12,216	88
	1990	15,706	12,647	81
	2000	12,333	9,765	79
	2010	12,333	9,765	79
	2018	12173	10,368	85
Number of <u>employment</u>	2010	330,181	222,987	68
	2018	325,534	212,981	65

*Table 1. Role of SSF in Taiwan's fisheries. Data source: Calculation based on data from Taiwan Fisheries Yearbook*

In summary, Taiwan SSF has the following characteristics: Small size of fishing vessels and fishing gear: usually less than 50 tons, or no power of fishing vessels, fishing efficiency is low. Most SSF are family or partnership operations, and fishing labor mainly comes from family members of the operator; there is a labor shortage problem in recent years. Operating in adjacent waters, mainly within 20 nautical miles, not exceeding the domestic economic waters. Except for a few self-selling channels, the fishery product is mainly sold through wholesale markets or traffickers, resulting in low industry profits and low fishers' income.

## Comparison of small-scale fisheries between Taiwan and Japan

According to the relevant information and data, the differences and similarities of SSF between the two countries are as follows. In terms of similarities, the SSF in both countries are family-run, and the labor force mainly comes from members of the fishing families. The fishing areas are mainly located on the coast and near-by waters, not far from the fishing port base. The fishing boats are mainly small and medium-sized, together with lots of non-powered fishing boats and rafts. In recent years, both countries face with the problem of shortage of fishery labor. Both countries are making great efforts to promote autonomous fisheries management with a responsible fisheries system to strictly manage catch efforts. They attach importance to the conservation of fishery resources and promote the release of artificial reefs and fry. Both are promoting recreational fisheries and transforming SSF, focusing on the quality of the product, protection of fish resources, and improvement of seafood marketing. Finally, Japan and Taiwan have good fishermen's organizations, such as fishing associations in Taiwan and cooperative fisheries associations in Japan, to assist the operation of SSF.

There are also many differences between the two countries. Geographically, Japan is an archipelago country with many islands and fjords. The coastal waters are wide, and the surrounding sea area is much larger than Taiwan. With abundant and diversified fish resources in the coastal water, Japan has a large number of small-scale fishing vessels and a high proportion of production. Overall, Japan's small-scale fishing, production, and proportion are much larger than that of Taiwan. Japan's fishing technology and gear are generally better than Taiwan's. The price of fish is higher too, so the family economy of its small-scale fishers also seems to be much better.

## Problems existed and measures implemented in Taiwan

Many difficulty problems exist in Taiwan's SSF in recent years, mainly including over-utilization of fishery resources, the pollution of marine ecological environment, the destruction of important habitat ecological environment, and illegal fishing operations. These problems attribute to the following key factors. First is the insufficient fishery resources. Although Taiwan is surrounded by all sides of the sea, there is a deep and long Taiwan Strait on the west side, while the east coast faces the Pacific Ocean with wide and deep water, lack of gulf, fjords and continental shelf. This situation results in a limited sea-shed and shortage of good fishing grounds for the SSF. Second, in order to increase their income, fishers raise their fishing effort using the advanced fishing method and fishing gear in the limited resource, which leads to the vicious cycle of poor resource and difficulty of production. So, the key factors to solve the problems are effective management on the fish resource, e.g. over-utilization of resources should be strictly prohibited, and improving ocean ecological environment to increase fish stocks. In addition, some good marketing channels also need to be designed to raise product value and the producer's income. In recent years, a series of measures have been carrying out by the Taiwanese government to deal with the difficulties of the SSF, and they are classified into the following four types.

1. Measures of fishing effort reduction, which include: (1) Restrictions of fishing boat building: Since 1967, a decommissioning system has been implemented for trawlers below 300 tons, stipulating that if a new fishing vessel is built, an equal size of fishing vessels must be eliminated first. Since 1989, such a decommissioning system has been adopted on all offshore fishing vessels; (2) Acquisition of fishing vessels: The first phase of the fishing vessel acquisition plan implemented in 1991-1995, during that time, 2,337 fishing vessels of 120 million tons were acquired and eliminated. The second phase of the acquisition plan has been carried out since 2000, 921 fishing vessels, 165,000 tonnage, and 1,646 fishing rafts were acquired between 2000 and 2011; and (3) The reward for voluntary no-fishing: Reward the fishing boats for parking in port and not fishing.

2. Promote responsible fisheries and adopt conservation measures for some important fisheries. For some essential capture fisheries, set up rules of no-fishing areas and no-fishing season, restrictions of dangerous fishing gear and methods, stipulate minimum fish length and species, and measures to check catch status. Such restricted fisheries include: (1) Regulatory measures for trawl fishing: Trawler fishing vessels are prohibited to operate within 3 miles from the shore. The fishing vessels below 50 tons are not permitted to operate in the 3-12 miles water zone; (2) Regulatory measures for gill net fishing: Gill net fishing within 200 nautical miles of Taiwan shall be approved by the competent authority, their fishing vessels shall not exceed 100 tons, and the net length should be less than 2.5 kilometers. All types of fishing vessels are not allowed to convert into gill net vessels or equipped or carry with the related equipment without the approval of the government. The gill-netting prohibition zone and season are also defined, and the use of multi-layer gill-netting is also restricted; (3) Regulatory measures for anchovy touch light net fishing: Set total allowable catch and county/city quotas for anchovy touch light net fishing, and do annual review. There are three months of no-fishing start from the beginning of May. It is also stipulated that fishing vessels shall fill in fishing logs and organize self-regulatory management organizations; (4) Regulatory measures of flying fish roe fishery: The permitted harvest period is 2 to 3 months a year, and the total allowable catch and quotas for each county and city are set, which are reviewed regularly every year: the designated unloading fishing ports and berths, and the inspection of catches and fishing logs. They also have to accept boarding inspection by officers of marine patrol and fishery administration, and accept observation and inspection by assigned observers; and (5) Regulatory measures of mackerel fishery: It is stipulated that the mackerel fishing boats are prohibited from fishing within six miles, also prohibited fishing within 12 miles for the boats of more than 100 tons. All fishing boats operating in the Northeast Sea at 24 degrees north latitude must obtain the operation permit, and comply with relevant regulations such as the annual fishing ban in June each year, reporting of ship positions, restrictions on entering and exiting fishing ports, filling in the fishing log, and open trading of catches.

3. Promotion of resource cultivation and marine environmental protection to increase fish stocks. Important measures include: (1) Seedling release: By means of artificial breeding technology, healthy and high-quality fish and shellfish seedlings are incubated and released in large quantities to effectively increase the abundance of fishery resources. At present, about 10 million fish are released every year, mainly important fish species; (2) Launch artificial fish reefs and promote habitat conservation: So far, Taiwan has set up a total of 88 artificial reef areas with a total area of 237 square kilometers. The reefs include cement reefs, electric pole reefs, steel reefs, ship reefs, and warship reefs, mainly steel reefs and ship reefs. The purpose of habitat conservation is to preserve biodiversity and protect the ecological environment of coastal waters. Since 1978, important ecological areas or species have been designated as fishery resource conservation areas. So far, a total of 28 fisheries conservation areas have been set up, covering a total area of 5,362 hectares. The major protected aquatic animals and plants are: abalones, lobster, some species of clams, sea urchin, laver, coral reef fish, and sea snail, etc.; and (3) Eliminate coastal pollution sources: Under the guidance of environmental protection units, deal with pollution at the fastest speed, trace the source of pollution, and reduce the damage to the marine environment and marine life.

4. Assist SSF to transform from traditional fisheries to recreational fisheries. Transformation of SSF from traditional to recreational fisheries can reduce fishing catch and resource destruction, and increase fishers' income. The following types of recreational fisheries can be used as the direction of SSF's transformation in Taiwan: (1) The fishermen's organization jointly operates the experiential leisure fishery, including fishing village life experience and visit, fishing village homestay, visit set nets and cage net farms; (2) Guide fishing boats to transform into ecological tours, whale watching, boats cruising and other tourism and leisure activities; (3) Help fishers' families to run direct sale business in the tourist seafood market or fishing village snacks; and (4) The government conducts various cultural and educational activities to promote the traditional cultural characteristics of SSF, including fry releasing activities, fishery heritage museums, marine life aquariums,

painted fishing villages, temple fairs and festivals in fishing villages, etc.

## Main findings and conclusion

1. The government is concerned about SSF, listing it as an important target for counseling. Although SSF are of little importance in production, the government still pay attention to its operation status and various difficult issues, mainly for the following reasons. It provides fresh aquatic products that are most preferred by local people and serve as the most important source of animal protein. The number of small-scale fishers in Taiwan accounts for a high proportion of over 70% of the total. So, from the perspective of election politics, it always is given high value by political parties, and the government. The average income of small-scale fishers is generally low. In order to improve the income of fishers, the government must pay much attention to SSF and help to improve their operating environment. SSF, which cover many traditional forms, have many cultural characteristics in the lifestyle of fishers and the use of fishing gear and methods, and deserve to be preserved and promoted as part of national culture. The coastal waters and fish resource operated by SSF are the major part of natural resources of the country, but currently, fish stocks have been overfished. In order to avoid continuous damage to state-owned natural resources, the government must watch on these SSF and give appropriate guidance and management. Overall, the government's emphasis on SSF is mainly based on these socio-economic, cultural and resource protection considerations.

2. Review of the effectiveness of policy measures on SSF. To measure the various important policies and measures undertaking in Taiwan which mentioned above, they mainly include: (1) reduction of fishing effort; (2) promotion of responsible fisheries; (3) strengthening fishery management system for important fisheries; (4) conservation of fishery environment; and (5) assisting SSF to transform into recreational fisheries. The results of reviewing the implementation of these measures are as follows. With regard to the measures reducing fishing effort, including restricted construction of fishing vessels, acquisition of fishing vessels, and reward for stopping fishing,



these measures are clear in content and easy to implement. Therefore, they have an almost good immediate effect, except for large budget expenditure by the government. With regard to the measures of promoting responsible fisheries and strengthening fishing control on the special fisheries, such as trawl fisheries, shark fishing, anchovy fishing, fly fish roe fishing, Sakura Shrimp fishing, etc., the performance of all those measures, only a few, mainly the Sakura shrimp fishing achieved the best results, through a complicate cooperative marketing system. The performance of the implementation of the rest measures has not been significant. Among various measures for the promotion of resource cultivation and marine environmental protection, and it seems that the release of seedlings can most directly increase the number of fish resources. However, because the season, both the east and west sides of Taiwan, have strong large currents passing through, it is difficult to scientifically determine the effectiveness. With respect to the measures of artificial fish reefs and habitat environment settings, this has proven to be effective in the restoration of resources. In addition, in expanding education and advocacy, it can strengthen the public's awareness of marine environmental protection. I believe that it should have good long-term effects on the maintenance of the marine environment and fishery resources.

3. Prospects of SSF in Taiwan. Due to the limitation of the marine environmental space and natural fish resources, it is difficult to have more room for development. Looking ahead, its fish production ratio will continue to decline year by year, but it will continue to play an important role in the supply of the domestic fish market to maintain the necessary self-sufficiency rate of aquatic products in Taiwan and to meet the Taiwan people's preferences for fresh seafood products. In addition, with the importance of protecting marine resources and fishing village environmental, and the government's efforts in recent years to assist SSF in transforming and operating recreational fisheries, SSF in Taiwan will play an important role in the leisure industry in the future. The development of SSF should be combined with the reconstruction of fishing village communities and develop into an important peripheral industry for national leisure tourism.

## 34. The Marshall Islands & Japan

**A View of the Small-Scale Fisheries from a Small Island in the Pacific**

***Manabu Echigo***

INTEM Consulting, INC



*View of a typical remote island, Wotje Atoll, Marshall Islands, Echigo, 2011*

*The Marshall Islands is a tiny island nation in the middle of the Pacific Ocean. The scale of the coastal fisheries is very small, and they use fishing gear such as spearfishing, bottom-line with canoes and traditional drive fishing referred to as “Jolok.” The country has traditionally relied heavily on fishery resources, while on remote islands, subsistence fishery is still an important means of the food supply. The fishery activities of the Marshall Islands are also key elements of the tradition and culture; hence the Chiefs have been managing resources for important fish species. In other words, in the Marshall Islands, especially in remote islands, subsistence fisheries have a very important role in terms of food security, human health, and cultural inheritance, which cannot be replaced by money. There is much to be learned in Japan and Western countries from the cases of subsistence fisheries in the Marshall Islands.*

## What is the Marshall Islands?

Blue sea, blue sky. Coconut trees grow behind the white sands, and white terns fly in the sunny skies. A beautiful coral reef spreads out in the transparent sea that you can see in which you have an unimpeded view no matter how deeply you dive, and you can swim with damselfish, parrotfish and many other colorful fishes. Close your eyes and imagine. The country in which you can imagine the beautiful tropical coral reef seas, all with their sights, is the star of this section. Do you know a tiny island nation called the Marshall Islands? It is an island nation consisting of 29 atolls scattered almost in the center of the Pacific Ocean, near the intersection of the equator and the dateline. It is an extremely small country with a total land area of only 180 m<sup>2</sup> and a population of only 50,000. The Marshall Islands had been influenced by Japan as it was Japan's trust territory of the League of Nations approximately 25 years from 1919 to the defeat of WWII. Japan was involved heavily in the economic development of the country before the war, and at that time, Katsuobushi

(dried bonito) was produced and actively exported to Japan.

There are no mountains on the atoll. When viewed from an airplane, the low land terrain that is almost at sea level seems like a rubber band that is floating on the ocean. There are no rivers because there are no mountains. Since there is no influx of nutrients and sediment from the land, the coastal seawater is extremely transparent, beautiful and suitable for growing coral reefs. The Marshall Islands, as the name implies, is a country of “islands.” Fishes and other marine products are very important resources for people due to the small land area and its low productivity. Everyone loves fish and eating raw fish is as popular as it is in Japan. In particular, fork-tail rabbitfish (*Siganus argenteus*) and skipjack (*Katsuwonus pelamis*) are favorites of Marshallese. Many people understand the deliciousness of fresh rabbitfish or skipjack. “Sashimi” was a Marshallese language long before it became common in the Western countries. In recent years, cheap imported chicken has become the mainstream of animal protein consumption in the town area, but Marshallese’s DNA still strongly remembers that they are fish lovers. I went to the Marshall Islands for the first time in October 2002, and I didn’t expect to be involved in the country for nearly a decade. This article is based on my experience in a series of fisheries management and development projects by the Overseas Fishery Cooperation Foundation of Japan and the Marshall Islands Marine Resources Authority.

## Is there no fishing village in the Marshall Islands?

That was early 2003. As part of the baseline study for the project, I was traveling with my counterpart, Mr. Beyong, to villages on the project site of Arno Atoll (OFCF 2006). I still clearly remember walking for miles on a stony tidal flat under the strong tropical sunshine since the boat went aground due to low tide. I was welcomed by a host of mosquitoes in the villages in which I arrived after a long and tiring drive in a rusty pickup truck. Visiting the three isolated villages by two hours of boat traveling and a long drive by truck was quite taxing. It was night when I returned, but the surface of the calm lagoon lit by the moonlight was so wonderful.

Each village has a small population and a similar fisheries condition.

Interviews with village representatives almost included the response that “one in every household has a fisherman,” and together with copra (ripened coconut) production, there is no doubt that fishing is one of the village’s key industries. However, on most remote islands, the sale of catches is limited to the village, and is basically subsistence fishery. The main fishing methods on the islands are spearfishing, bottom handline fishing, skipjack trolling, and traditional drive fishing, called “Jorok or Alele.” The spearfishing is basically operated with underwater lights at night. Often, fishers enter the sea with a group from the beach in front of the village and operate for several hours while pulling a floating basket to hold their catches. Most catches are consumed by themselves and their families, along with bottom fishing by canoes. Fishing operations by boat are basically for the purpose of selling because it requires fuel costs for the engine.

“Jolok” is an interesting fishing method and element of Marshallese culture. At first, search for a target fish school of forktail rabbitfish, “Mole,” and/or parrotfish in the shallow sandy area, and install a gillnet or small scoop net. Then, a long rope in which coconut leaves are bound every few meters is set up to enclose the fish school. Divers squeeze the rope that surrounds the fish school and drives them into the gillnet. During this time, the rope floats on the surface of the water, and only a few coconut leaves drive the fish until they are easily caught by the net. As you may know, there is a similar fishing method in Okinawa.

During this survey, I had strange feelings regarding two findings. First, almost no fishing boats or gear were seen in any village. Some of Yamaha’s 18-foot fiber reinforced plastic (FRP) boats and small size outboard engines or traditional canoes were found, but the number was too small compared with the number of fishers in the village. Moreover, there were only a few sets of fishing gear, even in fisher’s houses. Few fishing boats were operating along the coast, which deviated from the information obtained in the interview. But the reason was apparent soon afterward. They use fishing boats and gear together with others in rotation. Namely, fishers who want to go fishing on a given day start work by looking for the fishing gear they will use or rent a boat from a boat owner and call others to go fishing together.

Another thing I found strange was that people of the Marshall Islands did not have specific words for the fisheries industry, professional fishers or fishing villages. When listening to the translation by my counterpart in the interview survey, I could not find the words that describe the concept of the fishery as an industry or a person dedicated to fishing as an occupation. Fisheries are a vital part of Marshallese's lives. It is strange that there are no words for it. While staying at the project accommodation in Arno Atoll, I suddenly found the answer when looking at the starry sky. The hint is a certain old fisher's words. "All Marshallese men naturally are fishers. A man should be a fisherman". From birth, Marshallese men have been fishers traditionally. That must have been going on since the first people arrived on these islands long ago. If a male has the same meaning as fisher, then life and "engaging in the fishery" are synonymous, and if fishery activity is conducted in all villages throughout the country, there is no need specific words to compare fisheries to other things. In the Marshall Islands, agriculture and the division of industry have not been developed due to the small land area, and fisheries and marine products were integrated with people's lives. The country does not have the fisheries, fishers, and fishing villages defined by the Asian and European cultural spheres.

## Culture of the subsistence fishery and its people's lives

In the Marshall Islands, most of the catch from artisanal fisheries is for self-consumption. In recent years, fisheries producing products for sale have become mainstream around the area where two populations, Majuro and Ebeye, are concentrated, and the government has led the purchase of fish catches from remote islands and sale to Majuro and Ebeye for the economic development of the islands (Echigo and Lou 2006). The accuracy is not clear because the fisheries statistics have not yet been prepared, however, more than half of the nation's catch is likely from subsistence fishery since most of the animal protein sources on remote islands are marine products. In fact, remote islanders, who have little cash income, are living healthier than town people because of eating the traditional diet of coconut, breadfruit and fish. In terms of food security, health and traditional culture, subsistence fishing

on remote islands plays an important role.

Mole is the most preferred fish in the Marshall Islands. It is the most important fish, not only in taste but also in traditional culture. The best way to eat this fish is sashimi or deep-fried with just salt as seasoning. The white meat and elegant taste will be loved by anyone who can understand fish taste. However, you should be careful to remove the guts immediately after catching, as the smell will be transferred to the meat. This fish is mainly caught in spearfishing, gillnets, or Jolok. In the past, Mole was fished only when the village chief allowed it by the whole villager participation, and catches were distributed fairly among the people. The mole was a valuable fish to eat only during important events in the village and religious events such as Christmas. In addition, Jolok catches a whole school of fish, so it will be overfishing if anyone operates freely. Since it is a symbolic fish of traditional culture, it is considered that the resource management, mainly by the chief was devised (Echigo 2007). However, the spread of underwater lights and gillnets is increasing the crisis of the traditional resource management system. Mole has a non-fish-like habit of sleeping while lying down on the seabed at night, making Toshiba's underwater lights and the Hawaiian trident-spear threatening weapons for them. The traditional rules of resource management do not require such modern fishing gear to be regulated, so a new fisheries management framework is needed.

On the other hand, dolphin drive fishing has been practiced until recently in Likiep Atoll. According to interviews, dolphin schools could enter lagoons once a year or somewhat less frequently. When fishers find a dolphin school, they have discussions with the chief and plan a dolphin drive, and then a message is sent to other villages on the atoll to inform them of the plan. At the date and time of the plan, the fishers from each village, who have set their positions in the vast lagoon, will enter the sea all at once. The men beat together the stones in their hands and encircle the dolphin school in a narrowing circle. They are swimming with large stones in both hands, so you can imagine how good the physical skills of the fishers in Likiep Atoll are. Dolphins frightened by the sound of stones will flee and are finally stranded on the beach. They are captured by villagers and mostly processed into dried

meat for preservation. Sometimes hundreds of dolphins are stranded, but based on the people's rule, they should be returned to the sea without being killed if there is capacity exceeding the local residents' possible consumption. Dolphin meat is distributed in proportion to the population of each village. The distribution of households in each village is fair, and it is said that the dolphin meat is also properly distributed to women and children who could not participate in fishing. The rules of distribution in the community also apply to meat from whales that have naturally stranded. The dolphin and whale meat is a gift from their God that people have obtained unexpectedly. There is a culture and lifestyle that everyone fairly divides food according to the rules of the village and gives thanks for having the food.

## Subsistence fishery on the Marshall Islands and Japan

In present Japan, fisheries are understood as an occupation producing an income source, even at a small scale. Of course, fishers often consume some of their catches at home, but generally, fisheries can be a source of income. It is the same in many other Asian or Western countries. It also shows that many Japanese fishers refer to the fishing operation or method as "business." On the other hand, traditional self-sufficient fishing continues in the Marshall Islands. Many remote island residents have lived rich and healthy lives, even though they have scarce cash. In addition, fishing is conducted based on ritual rules during important events and religious events in the village, and it is customary for villagers to share and eat catches. The dolphin and whale meats as a gift by God, sent once or somewhat less often a year, has been an opportunity to unite the villagers scattered around the atoll. Subsistence fisheries maintain these traditions and people's lives. This can never be replaced by cash. In other words, the subsistence fisheries in the Marshall Islands are very important from the aspects of food security, human health, and cultural inheritance. Nevertheless, it is also true that modern society requires some cash income. This is probably the issue that leads to overfishing of coastal fisheries resources, which in turn affects the continuance of the subsistence fishing. It can be said that the challenge of coastal fisheries



in the Marshall Islands in modern times is to manage fisheries resources with appropriate management mechanisms that are compatible with modern fishing methods in addition to traditional ones and ensure the sustainability of food production, cash income, and traditional culture.

Japan is a country with one of the most developed small coastal fisheries in the world, and this is proved by many of the examples in this book. The Marshall Islands, on the other hand, is probably one of the world's most fisheries-dependent and small-scale fisheries nation. The world is now experiencing rapid changing global trends, such as increased production and enclosure of resources by emerging countries as populations and living standards rise. In that context, The Marshall Islands subsistence fishery is of negligible size, but still maintains many practices and social systems which Japan and Western countries have lost and should relearn. A tiny country in the middle of the Pacific Ocean still has a primitive community amidst the wave of modernization. This is just a small case, but I still believe it is an important aspect of the small-scale fisheries study that should not be forgotten. I hope that the publication of this book will lead to further research on subsistence small-scale fisheries.

## 35. Malawi & Japan

### **Community-based Innovations Driven by Small-scale Fishers in a Least Developed Country**

***Tetsu Sato***

Ehime University



*Small-scale Fishers using chilimila net (open water seine) to catch Utaka (open water planktivorous cichlids) in Lake Malawi, T. Sato, 2019*

*Republic of Malawi is a landlocked least developed country in Southeast Africa, where Lake Malawi supports life of many small-scale fishers and fisheries industries, providing indispensable animal protein for people in the country. In riparian communities of Lake Malawi, various innovative actions to manage fisheries resources and supporting ecosystems have been mobilized by autonomous actions of small-scale fishers. In Chembe village inside Lake Malawi National Park, unforced control of fishing activities by fishers themselves contribute to reduced fishing pressures upon important resources. In Salima district, a traditional authority and small-scale fishers have continued seasonal closure of important fishing ground since 1950s with sophisticated enforcement mechanisms. Recently, Satoumi-type creation of an artificial habitat and fishing ground has been conducted successfully in Chembe through transdisciplinary collaboration among small-scale fishers and scientists. These examples indicate importance of community-driven actions led by small-scale fishers, which is common to the cases of Japanese small-scale fisheries.*

## Lake Malawi fisheries

Republic of Malawi, a small landlocked country in Southeast Africa, has Lake Malawi, one of the Great Rift Lakes of Africa bordering with Tanzania and Mozambique with an estimated age of 4.5 million years (Sturmbauer et al. 2001). The lake is famous in its extreme diversity of endemic cichlid fishes consisted of more than 700 species evolved in a relatively short geological time (Turner et al. 2001). This is the most remarkable example of explosive radiation among vertebrates, attracting intensive researches by international scientists. A southern part of the lake at the tip of Nankumba Peninsular was designated as Lake Malawi National Park in 1980 and inscribed as a World Natural Heritage site in 1984, because of this scientific value.

Cichlids and other fishes of the lake are vital resources for fishing and related industries in Malawi, which accounted for 4% of the gross national production of the country, and directly employs nearly 60,000 fishers, with over 500,000 people indirectly involved in fish processing, marketing, and other related activities (Government of Malawi 2016). Participation in fisheries and related activities is easy, providing important employment opportunities. Annual catches of fisheries in Malawi have been estimated to be about 90,000 tons. Fisheries in Malawi provided 70% of dietary intake of animal protein (40% of overall protein intake) in 1970s, which has declined as a result of the decrease in catches and rapid population growth. About 85 to 90% of catches are produced by literally small-scale and artisanal fishers, sometimes operated by two fishers with a small dugout canoe and simple gillnets or bottom longlines. Chilimila net (open water seine, see above photo) is another small-scale fishing characteristic to Lake Malawi. It is used for both daytime fishing targeting Utaka (small-sized open-water cichlids of a species complex of multiple zooplanktivorous species of the genera *Copadichromis*, *Nyassachromis* and *Mchenga*) and night fishing using lamps to catch Usipa (an anchovy-like planktivorous Cyprinid *Engraulicypris sardella*). Chilimila typically involves about four to six or more fishers with a plank boat and a few dugout canoes, which are used to spread and pull net and/or carrying lumps in the night (Nakayama 2008). These small-scale fishers account for almost 99% of fishers operating in the lake. Utaka and Usipa are caught all year round, sundried or smoked, and distributed throughout the country by small-scale traders. In Malawi, 39% of the population were living below the poverty line in 2010 and 15% fell below minimum level of dietary energy requirement (Government of Malawi 2012). Fisheries products in Lake Malawi, especially Utaka, Usipa and a few other small species, provide affordable animal protein to the vulnerable people living in extreme poverty.

## Innovative resource management actions driven by small-scale fishers

As Lake Malawi fisheries by small-scale fishers have experienced significant decrease of catches since 1980s, Fisheries Conservation and Management Act was enacted in 1997 with regulations of fishing gears and mesh sizes, restrictions of fishing seasons, and establishment of Beach Village Committees (BVC) as a community-based management institutions of fishing activities. However, these top-down regulations have not functioned very well, partly due to lack of incentives for fishers and BVCs, and inappropriate enforcement mechanisms. But there are significant exceptions of creative resource management actions driven by small-scale fishers. In the two research projects in which I play a role of the principal investigator: “Transdisciplinary Study of Natural Resource Management under Poverty Conditions Collaborating with Vulnerable Sectors (TD-VULS project)” supported by JST-RISTEX (2017–2020), and “Establishment of a Sustainable Community Development Model based on Integrated Natural Resource Management Systems in Lake Malawi National Park (IntNRMS project)” in the SATREPS program supported by JICA and JST (2020–2025), I am collaborating with diverse scientists and stakeholders in Malawi and Japan to identify such innovative actions driven by small-scale fishers in Malawi (Sato et al. 2018).

In Chembe village located inside Lake Malawi National Park, government regulations of fisheries have been combined with underwater protected areas (UPA) designated by the national park to protect rock-dwelling cichlid fishes in shallow water collectively known as Mbuna, which represents the Outstanding Universal Value (OVA) of the World Natural Heritage (International Union for Conservation of Nature and UN Environment World Conservation Monitoring Centre 2017). Narrow strips of water 100m from land protected areas of the park are designated as UPA to prevent fishing, while wide areas outside UPA are allowed for fishing observing government fishing regulations. The UPA is not designed for fisheries resource management, but it is expected to have positive influences upon important fisheries resources including Utaka and catfishes by protecting their habitats and breeding grounds. Fishers in the

village are engaging in various fishing activities including gill nets, longlines and chilimila. Gill nets are commonest in the village mainly targeting large catfishes with commercial values. In the year 2000 and 2001, UPA enforcement had not been effective with virtually no patrols by the national park authorities. However, we found that fishers tended to avoid setting gill nets near borders of UPA in the areas directly visible from the village. The areas behind an island, which was not visible from the village, were heavily exploited, but the fishers tended to use small cryptic buoys when they set gill nets near or inside the UPA, even though the possibility of enforcements was small (Sato et al. 2008). This unforced control of fishing activities had emerged probably based on acceptance of the national park and UPA regulations among villagers due to peaceful coexistence with the park, transformation of perceptions and values of villagers about lake fishes promoted by the inscription to the world heritage, and leadership of traditional authority of the village harmonized with the regulation of the national park and UPA. As a result of unforced control of fishing by fishers themselves, fishing pressures at a large portion of coastal areas were reduced, probably maintaining good stock status of commercially valuable catfishes (Sato et al. 2008). This case suggests important roles of small-scale fishers in the least developed country to manage fisheries resources by creating informal and implicit mechanisms to control fishing pressures which are acceptable to themselves, harmonized with both traditional decision-making systems and top-down regulations, and effective in maintaining stock status in certain conditions.

## Long-lasting seasonal ban of fishing led by traditional authority

In a riparian village in Salima District, local fishers and other stakeholders have been implementing a system of autonomous fishery resource management under the leadership of a traditional authority, chief Makanjira, extending over three generations starting from the period of his grandfather in 1950s. They have been enforcing a ban of fishing during rainy season to protect spawning stocks of Utaka in a fishing ground around uninhabited islands

(Mbenji islands) about 10km offshore from the village, a site for fishing camps by fishers coming from entire lake regions. In addition to closure of fishing in rainy season which corresponds to the spawning season of Utaka, other local customary laws have been introduced including a positive list system of mesh-size regulations, enforcement mechanisms operated by BVC and its subcommittees in the village, and traditional ceremonies of opening and closure of fishing season deeply rooted to their culture and beliefs. This case is a remarkable example of successful and long-lasting fisheries resource management by a community in the least developing country, which was shared by nationwide fishing villages to promote similar attempts (Scholz and Chimatiro 2004). We also found delicate and highly sophisticated mechanisms implemented by the chief and his committee to convince fishers and other villagers about the values of these resource management measures, such as opening of the shallower areas for subsistence fishing by vulnerable poor people in the village during the closure season.

However, I was truly astonished when chief Makanjira mentioned that this system was originally designed not targeting resource management. The original intention was to secure safety of fishers in rainy season when risks of fishing around the islands are especially high due to frequent thunderstorms (Sato and Pemba 2018). He said it was even unlikely that people in 1950s clearly recognized that rainy season was the spawning period of Utaka. This story by chief Makanjira gave me an impression that this innovative management system was developed as by-products of measures to secure life of fishers, which were more direct and imminent needs of the community. The perception of the chief and fishers in the village seemed to be transformed dynamically when they experienced interactions with external actors, including Malawi Department of Fisheries and international scientists in 1990s, who brought scientific discourses about the importance of villagers' actions upon fisheries resources (Sato and Pemba 2018). Chief Makanjira and his committees seemed to translate and absorb these external discourses and co-created resource management systems incorporating BVCs. Government fisheries policies has also been influenced by the sophisticated management systems of this village to emphasize importance of co-management driven by local communities and

BVCs. Interactions with external actors and transformations of the meaning of actions driven by small-scale fishers had probably promoted mutual learning process among local and external actors, influencing broader communities and government policies.

## Co-creation of Satoumi-type fishing ground by villagers and scientists

In Utaka fishing with chilimila nets in Lake Malawi, fishers are using a bottom structure called chirundu (pl. virundu) as efficient fishing grounds. Chirundu is a rocky outcrop from lake bottoms which create upwelling current to attract Utaka shoaling above it in a large number to feed on plankton attracted to the current (ICLARM and GTZ. 1991, Nakayama 2008). Another type of chilundu has also been recognized among fishers in certain areas of Lake Malawi, which is an artificial structure of submerged tree brunches (mainly Mango trees) to attract small fishes by providing hiding places in shallow waters (FISH 2017). A BVC in the western part of Chembe village with a woman leader and members of small-scale fishers has been collaborating with scientists including myself and other actors in the village in above mentioned research projects to develop the idea of combining two types of virundu to co-create Satoumi-type fishing ground.

We made a series of iterated dialogues about this idea, which was a remarkably fruitful mutual learning experience for scientists and BVC members. We eventually came up with a unique design of an artificial chirundu combining two types. It should be effective because the pile of stones mimicking rock outcrops attract Utaka shoals near the surface and tree branches on the bottom provide hiding spaces for fishes when they are disturbed. We also decided to provide other bottom structures including submerged old dugout canoes to provide breeding substrates of bottom dwelling catfishes, and bags filled with maize bran to promote quick settlements of bottom fishes. The idea of constructing a chirundu in front of the beach was also very new to us scientists, as we thought such a shallow and flat sand/mud bottom was not a good fishing ground. However, the intention of the BVC leader and fishers were totally



different. They felt it very important to have a chirundu at very near place in front of the village for its easy monitoring and management. Also, chilimila fishing is affected by fluctuations of surface currents and the catches are unstable. If small-scale fishers travel a long distance to reach virundu, the costs become very high especially if the catches are not enough. Virundu nearby the village can greatly reduce these risks. Furthermore, a chirundu near the village can provide opportunities of subsistence fisheries for the most vulnerable poor people in the village. It was a truly eye-opening experience for me to learn these ideas by the collaboration with the BVC leader and small-scale fishers.

The artificial chirundu was constructed in April 2019 near the village at a depth of 13m, and experimental chilimila fishing on the chirundu in July and September were great success with markedly more catches compared to control sites 200m away. This success attracted attention of the entire village, and other BVCs and small-scale fishers are now planning to develop similar structures along the coast of the village to enhance ecosystem functions and produce better catches by providing new habitats on the shallow flat sand/mud bottoms. The innovative grass-roots actions by the small-scale fishers are an important enabler of transdisciplinary processes involving scientists to co-create Satoumi in Lake Malawi.

## Conclusion

Through these collaborations with literally small-scale fishers in Malawi, I have recognized a striking similarity between small-scale fisheries in Malawi and in Japan regarding impacts of community-based actions led by small-scale fishers for sustainable fisheries resource management. In Japan as well as in Malawi, a least developed country, small-scale fishers are the most important caretakers of fisheries resources and supporting ecosystems. Scientists and government agencies can play effective roles by supporting autonomous actions by the fishers themselves. I believe that such transdisciplinary processes by collaboration among small-scale fishers, scientists, governments and other actors are effective both in developed and

developing countries to mobilize community-based actions for sustainable management of fisheries resources and supporting ecosystems.

## 36. Denmark & Japan

### Comparative Stories of Transitions and Challenges

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*Iconic, “blue boats” upon the beach. Thorupstrand, Denmark. A. Delaney, 2014.*

*This essay compares and contrasts on-going transitions in Japanese and Danish small-scale, coastal fisheries. Japan and Denmark are both northern-hemisphere developed-nations whose peripheral rural areas are experiencing a decline in residents with an aging population. In both countries, members of small-scale fisheries and their families often serve as the nucleus of port and community activities. This stemmed, in no small part, from the societies, which these fisheries both developed within, and themselves developed. The rise of neoliberalism and fundamental shifts in understandings of what it means to be modern, developed, economically-efficient, and practice “good” fisheries management has impacted small-scale fishers and communities. On top of this, the current “knock on” impacts EU politics will have on Danish small-scale fisheries and the impacts of the New Fisheries law (Japan) will have on Japanese small-scale fisheries adds uncertainty, anxiety and innumerable unknowns.*

## Introduction

Small-scale fisheries (SSF) members and their families often serve as the heart around which port and community activities take place, e.g. serving on the neighbourhood volunteer fire departments, providing locally caught fish, and organizing community festivals and events. In these communities, SSF are both a way of life, and an economic activity (Jentoft 2019). It is easy to romanticize coastal SSF and communities by focusing on the positives and minimizing the negatives of their work, way of life, and place in society and politics. A natural resource extraction-based work life is full of insecurity and, as often described in Japan, the “three K’s”: *kitsui* (hard), *kitanai* (dirty), and *kusai* (smelly). Nevertheless, the positive role SSF play in healthy communities and societies cannot be overstated.

As Jentoft (1999; 2019) has pointed out, healthy fisheries mean healthy

communities and *vice versa*. Small-scale fishers and their households serve as active members of communities, building strong social networks with their interactions, increasing trust in one another, strengthening social capital and practicing reciprocity. Their way of life also provides a high level of personal autonomy (Delaney 2003) and a great deal of time spent outdoors, both of which contribute to personal satisfaction and positive mental health. Despite numbers of small-scale fishers falling throughout the world, especially in the Global North, there are also many instances of sons returning to the family occupation, giving up on regimented and unfulfilling office and factory work precisely because of the personal autonomy (and sometimes better income!) SSF work provides. Japan and Denmark are in many ways, very different countries and societies. This makes comparisons challenging: Japan has a system which protected SSF through real co-management and a cooperative system, Denmark uses a top-down approach with a western fish quota-focused fisheries management system; Japan also uses an enterprise household system whereby rights are usually inherited through family heads and catch regulations are set locally.

And yet, despite their differences, in broad-stroke terms, small-scale fishers and their communities share many of the same challenges, driven by environmental, economic, social, political, and even cultural forces. These influences can come in the shape of sudden events (e.g., tsunami), or slow creeps (e.g., neoliberalism). SSF in both countries find themselves within a world in which neoliberalism has risen, economic-efficiency is the standard by which fisheries management and businesses should operate, and western ideas of what “good” fisheries management is impacts small-scale fishers and communities. On top of this, the current “knock on” impacts EU politics (e.g., BREXIT; pulse trawl bans) will have on Danish SSF and the impacts of the New Fisheries law (Japan) will have on Japanese SSF (JSSF) adds uncertainty, anxiety and innumerable unknowns.

This chapter focuses the discussion around a comparison between Denmark and Japan through one theme: transitions related to challenges faced by SSF. Transitions can be viewed as both a *state of being* and a *process* in which SSF adapt and transform. The transitions in Japanese and Danish

SSFs described here can, as Ounanian describes for Danish and American coastal communities, be “understood as the *phase* in which the processes of adaptation and transformation are revealed en route to an outcome” (2016: 1). We do not know the results of these transitions, but we can document the state and processes of transition today.

## The View from Japan

The view of JSSF presented here is from Miyagi Prefecture in the Tohoku (Northeast) region. In the more than 25 years since I began fieldwork in this area, I have seen a lot of transitions and transformations take place. In this area, just as seen in the rest of Japan and the world, SSF and communities face challenges in the form of environmental, economic, social, and political forces. The coastal areas have higher than average “greying” populations with the port areas tending to be in peripheral regions. In this area, one never knows when disaster will strike, whether that be from poor environmental conditions, a typhoon, a tsunami, an oil spill, or even from new governance regulations. I have known families who have gone from their worst harvest in a generation, to the best, all in back-to-back seasons. Another family had two sons return home to join the father on the boat, only to have an oil spill hit their fishing grounds two months later.

This uncertainty is faced on top of the already everyday uncertainty, economically-speaking, of fishing. Social changes are seen in the form of children receiving higher education becoming an expectation, elder children moving away from the family home becoming the norm, and the loss of population means no one is available to carry portable shrines or weave straw for Shinto shrine and festivals. Political forces have seen a new Fisheries Law passed, opening up the possibility for companies having fishing rights, and Disaster Recovery Laws have seen entire swaths of coastal areas labelled hazards zones with families unable to return home to areas where seawalls and concrete now cover the landscape. The changes cemented a loss of tangible cultural heritage and in some cases, hasten the loss of intangible cultural heritage.

In my main community of study, the number of fishing and cultivating families has declined significantly (40% remain), neighbourhood shops have closed, port festivals have gotten smaller, the number of town-wide fish festivals and events have increased, the majority of wives have stopped going out on the boats (*nori* cultivator subgroup), fishing cooperatives have consolidated, twice, and access to fishing grounds has been altered. Fishers seem unsure as to how they will be impacted by the new Fisheries Law. After the Miyagi Prefecture Governor's failed attempt to change fishing rights in the name of "recovery" in 2011, many fishers spoke to me about the problems of a business approach (short term profits) versus a family enterprise approach (ups and down, levelling out over the long term) and about the short-sightedness of such a move. With the new Fisheries Law, some seem to feel there would be no change, others are a bit uncertain, while some feel it could lead to positive changes. As a researcher who has also worked throughout Europe, home to 30 years of neoliberalism in fisheries management, I can't help but feel a bit of trepidation as I follow the process of this current transition in Japan.

## The View from Denmark

Denmark has a long history of maritime activities with strong coastal cultural heritage. It is a small country (population 5.8 million) surrounded by the North and Baltic Seas with its only land border being with Germany. The country has a long and varied coastline (8750km tidal; 1701km general) with both rocky and sandy shores, though sand predominates. Denmark has the second largest SSF fleet in the EU's North Sea basin. The coastal SSF fleet currently numbers around 975 vessels with the main catch including flatfish (e.g. plaice) and cod, herring, mackerel, and salmon. The fleet annually lands approximately 4,000 tonnes with a value of €12 million (STECF 2017). Danish coastal communities, like many others around the world, have historically been reliant on fisheries, yet are currently faced with changing circumstances in terms of their identities, livelihoods, and even viabilities (Hamilton and Butler 2001, Nadel-Klein 2000). These communities also tend to be located in

peripheral, rural regions, which are also sometimes described pejoratively as the “outskirts” (“udkantsdanmark” in Danish; “inaka” in Japanese).

Such rural and peripheral regions face social sustainability and development challenges stemming from the increasing urbanization of the Danish population and the subsequent closing of schools and local institutions and shops in small communities. Almost 88% of the Danish population live in urban areas. The population is also “greying” with 20% aged 65 and over; it is expected to be 25% within 20 years (Ministry of Health 2017). In Denmark, however, a new national ministry to address rural development was formed due to the concern about population loss in these regions. There are also Danish tax breaks for rural residents and EU support programmes (Local Action Groups; Fisheries Local Action Groups), which provide co-financing for projects in rural and fisheries-dependent areas (Baker et al. 2007). Despite the efforts to maintain population, the loss of employment opportunities in these regions (e.g., factory closures in the early 2000s) continues to impact the ability of families to remain in many small coastal communities.

In addition to national, societal factors, outside circumstances also impact locals’ ability to stay in these areas, especially in regards to the fisheries. The trend in Danish SSFs is one of contraction, though the decline has slowed in recent years. Much of the decline in SSF and SSF communities could be described as being a part of the larger trend in the West of the enclosure of the fisheries (Murray et al. 2010, Ounanian 2016). In this case, a broad definition of enclosure is used whereby enclosure is a “means to reorder social wealth-generating opportunities” (Foley, Mather, and Neis 2015: 395). Studying the “process of creeping enclosure” is useful when looking at the evolution of fisheries management and the cumulative impacts on fishers (Murray et al. 2010). In three Danish coastal communities, Ounanian (2016) found that enclosure included policies of limited entry, the use of market-based approaches to manage fisheries, and disputes among fleets which impacted access of local fishermen to particular fishing grounds.

Over the past thirty years, Western fisheries management has gravitated towards market-based approaches to manage fisheries, especially through catch share programs in the form of individual transferable quota (ITQ).



These quota systems have been shown to consolidate fleets and diminish opportunities in a fishery once introduced. This was seen in Denmark in 2007 when the government made new fisheries regulations, which greatly hastened the decline of their SSF. The government acted surprised when this occurred, yet any review of the literature from the previous twenty years would have shown the possibility for such as result was almost guaranteed. A decade later, the Danish government has acknowledged the importance of SSF and SSF communities for the country, advocating for aid in development.

*“... Coastal fishing contributes to growth and jobs throughout Denmark and is an important component of Danish culture. Additionally, the blue vessels fishing from the local port contribute to life and tourism especially in rural areas. Therefore, the coastal fishing and coastal communities should be strengthened and developed” (Environment and Food Ministry 2017:1–2) (translated by the author).*

One Danish SSF community in particular is well known for efforts in stopping its own decline is Thorupstrand. Thorupstrand is famous in Denmark for community members’ actions in pooling quota into a community share system, thereby keeping more boats active. They have also tapped into funds to build a space for community meetings, as well as where tourists can view fish sorting, and which also houses a local fishmonger and café. The beach fronting this building is idyllic as Danish “blue” boats are pulled onto shore, specially made to withstand the dragging up upon the beach. Local children also work at processing fish to earn money, making the small-scale fisheries a truly community-focused activity. Their active fishery with picturesque boats—a form of tangible cultural heritage—is also a large draw for tourists to the area. Thorupstrand is a good example of what a community can accomplish when they work together and are willing to try a new system. Yet the SSF still faces external threats, including the wider EU fisheries management system. In 2019 the EU shut down the Dutch Pulse Trawl programme, which in turn caused skippers to return to using their old beam trawl gear and they moved into Danish coastal waters, including areas offshore from the community.

## Commonalities

When comparing the Japanese and Danish cases there are two main commonalities which come to the surface: transitions in fisheries management/governance and the rise of the importance of coastal cultural heritage in communities during such transitions. Today sustainability is a key concept in fisheries management but there is a surprising lack of attention paid to what fishers will do when participation in the fishery moves from open or limited access to a catch share/ITQ system, especially in coastal communities where there are few employment alternatives (Charles 1998). When looking at communities and quota systems, one should consider that to many people, “place matters.” Meaning, labour is not as mobile as economists may assume when people are tied to their local areas and communities. Communities, after all, provide a sense of connection and place, identity, and serve as a focal point for shared cultural heritage.

Unique communities (e.g., Denmark’s Thorupstrand) attract new business sectors such as tourism and at the same time cultivate place identities (Urquhart and Acott 2013). These coastal communities use their tangible maritime heritage in order to make themselves distinct from other ports. Japan’s communities also use their own shared cultural heritage (environmental and intangible) to draw visitors and tourists—such as through fish festivals—thereby expanding and strengthening their economies and even strengthening their own identities. When looking at the challenges faced by Japanese and Danish SSF and the current state of transition they find themselves within, a great deal of uncertainty and innumerable unknowns rise to the surface: what will be the impact of a new fisheries system on local communities? Can communities whose members have lost their local residences re-gain place attachment and shared heritage? Though the impacts of various challenges are yet to be known, this is a first step in documenting the state and processes of these transitions.

## 37. U.S. & Japan

### **Shrinking Portfolios, Coastal Development and Climate Resilience**

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*Lobster boats and gears docked at Portland waterfront, Portland, Maine, the US, K. Tokunaga, 2019*

*Small-scale fisheries in developed economies, such as the ones in the US and Japan, face challenges that are unique to developed economies and common around the globe. In this chapter, I highlight the issues surrounding shrinking fishing portfolios and coastal development, drawing extensively from the American lobster fishery in the state of Maine (US) and the spiny lobster fishery in Mie prefecture (Japan). Both lobster fisheries are managed as territorial use rights fisheries and have implemented voluntary measures initiated by fishers. The chapter concludes by discussing climate change resilience, which has become the major topic of discussion in the Gulf of Maine, one of the fastest-warming waters in the world.*

## Economics and small-scale fisheries

Why do people fish? What are their objectives? If you are an economist, you will most likely answer that fishers harvest fish to maximize their profit. Indeed, most economists are trained to think this way. Almost all formal training that I received in economics was directed to come up with ways to correct a situation described as the tragedy of the commons. Economists strive to answer the question: what are the best ways to control the number of fishers or fishing efforts to make sure that the fishery, as a whole, can maximize gains from available resources? In theory, if fishers could coordinate and limit harvesting efforts to the level that maximizes the fishery's total profit, the fishery conserves more resources than if it seeks to achieve maximum sustainable yield. The conventional economics view is that harvesting efforts exceed the optimal level if the fishery is left unmanaged and operates as an open-access fishery (Gordon 1954). Open access fishing results in too many fishers with too big of a vessel with gears destructive to the ecosystem. Economists, thus, work with fisheries scientists and managers to curb fishing efforts through various management measures. Rights-based management, such as

individual transferable quota (ITQ) management, is one of the management approaches developed by economists following this frame of thinking.

Working with small-scale fisheries in developed countries – Japan and the US – I am constantly challenged to re-evaluate the assumptions economists make. I often hear the argument that fisheries should retain as much employment in coastal communities as possible. My training in economics would tell me more employment = more harvest efforts = suboptimal outcome. I also hear an argument against rights-based management, which states ITQ = fisheries consolidation = destruction of coastal communities. While the standard assumption of a fishery's objective is profit maximization, in reality, there are multiple objectives. For instance, in rural coastal communities where employment opportunities are limited, securing fishing jobs may be valued more highly than a small number of highly productive fishers earning larger profits. Economists are not ignorant of such social objectives; more economic studies now argue for achieving social, economic, and biological objectives – a triple bottom line — in fisheries.

## Two lobster fisheries

The American lobster (*Homarus americanus*) fishery in the state of Maine and the spiny lobster (*Panulirus japonicus*) fishery in Mie prefecture are both managed by a form of space-based management referred to as Territorial Use Rights Fisheries (TURF). Both fisheries have implemented voluntary management measures initiated by the fishers and delegated a portion of the management decisions to the fishers. The lobster fishery in the State of Maine lands approximately \$500 million worth of catch annually, which employs over 4,000 fishers (Maine DMR 2020). This fishery is managed by the State primarily by limiting the number of fishers and traps used in the fishery. The state's waters are divided into seven zones, and a council established for each zone offers a forum and voting mechanism for fishers to discuss management and other fishery-related topics as well as to represent fishers in advising the state's management. The fishery is known for its voluntary management measures initiated by the fishers. The most famous example

is v-notching. When a fisher harvests an egg-bearing female lobster, they make a v-shaped cut in its tail before releasing it back to the ocean. No one is allowed to harvest v-notched lobsters, and thus, this voluntary management measure helps protect egg-bearing lobsters.

Management of the spiny lobster fishery in Mie consists of a combination of seasonal closures and size limits imposed by the prefectural government as well as varying degrees of voluntary management measures implemented at the fishing community (*gyogyo-chiku*) level. Self-imposed measures include seasonal no-take zones, limits on the number of nets used, rotational harvesting schedules (*rinban-sei*), and effort and revenue pooling (*puru-sei*).

In Wagu, one of the largest producing spiny lobster fishing communities in Japan, fishers operate under highly coordinated effort and revenue pooling management for the first half of the season. Under this arrangement, fishers form five groups, with each represented by 4 – 6 fishers. In each group, fishers operate together on the same boat. The revenues are pooled from all groups and then shared across all the lobster fishers in the community. In the latter half of the season, however, they switch to a competitive limited-entry open access regime, operating individually, using their own boats. From anecdotal evidence and landings data provided by the local fishery cooperative association, my colleagues and I learned that their use of this complex and somewhat puzzling management system is achieving to stabilize income, provide fair fishing opportunities to all fishers, and satisfy heterogeneous individual fishing objectives – some needing to fish more aggressively and earn more income to support growing families, while others are wanting to take it easy and maintain a stable income. Each Wagu fisher who participates in the spiny lobster fishery has a different fishing portfolio – many participate in a fishery or combination of fisheries using gears such as pole-and-line, gillnet, dive, aquaculture, etc. A few participate in no other fishery.

Wagu's current management style came about in the early 2000s. Until the late 1980s to early 1990s, the fishers participating in the spiny lobster fishery relied for most of their fishing income on a pole-and-line fishery targeting species such as skipjack tuna and squid. As catches from pole-and-line fishing declined, their focus shifted more to the spiny lobster fishery.

While many are still engaged in fisheries that use other gears, the majority of their income now comes from the spiny lobster fishery. Maine's fishery shares a similar trajectory. Historically, Maine had a more diverse portfolio of fishing activities, including a groundfish trawl fishery and a shrimp fishery. Now, the lobster fishery makes up close to 80% of the state's fishery income (Steneck et al. 2011). Both Maine and Mie fisheries are now dependent on lobsters more than ever. It seems like their portfolio is less diverse than before, though this could be a phase. Historically speaking, compared to farmers, fishers have been more adaptable to environmental changes by dynamically adjusting their fishing portfolio. Yet, we should not take their ability to adapt for granted, considering the economic burden they must bear to learn new skills, switch gears, target new species, and in some cases, acquire new licenses.

## The cultural value of the small-scale fishery and the challenges posed by coastal development

With the many ecosystem services they provide, small-scale fisheries enable us to benefit from our oceans in multiple ways. The most obvious one is nutrition. In developed economies like Japan and the US, people source food from the market system rather than subsistence. Fish vendors and fishmongers have largely been replaced by supermarket chains. Yet, we can still find people engaged in the custom of local seafood, giving among families and friends within and across coastal communities. In a sense, seafood gifting not only serves to provide nutrition but also serves to benefit human relationships. Small-scale fisheries also serve to shape regional heritage and cultural identity, which are also recognized as essential aspects of value inherent in small-scale fisheries (Tengberg et al. 2012).

When we think about small-scale fisheries, we tend to picture rural coastal communities. While many small-scale fisheries are found in rural parts of the country, there are vibrant small-scale fishing communities that sit beside and inside cities as well. Small-scale fisheries in or near cities face different types of challenges, such as coastal development and gentrification (Colburn and Jepson 2012). The City of Portland, Maine, whose downtown sits next to

the fishing port that serves the local groundfish fishery and lobster fishery, faces the challenge of balancing economic development while preserving the cultural values inherent in small-scale fisheries. Since the first western settlement in the 17<sup>th</sup> century, the city's economy has mostly been supported by the fishing industry (NOAA GARFO 2019).

In part, there is a general recognition among local residents that fisheries serve to provide not only tangible benefits to local economies but also intangible benefits through the provision of cultural services. Yet, a declining catch in the groundfish fishery and predicted climate change-induced stock decline in the lobster fishery poses economic challenges to coastal landowners and marine businesses that support the fisheries. While Japanese fishing ports are managed and maintained by the public authorities (Miura 2015 p. 122), US fishing ports are often privately owned and co-exist with other users. The reduced economic importance of the fishing industry in the local community is met with pressure to convert coastal land use to accommodate the booming tourism industry. As more condos and hotels crowd downtown Portland, and as cruise ships add thousands of tourists to the city's population, a waterfront access challenge has emerged. Fishers, fish dealers, and processors now face the urban problem of traffic congestion to get to and from the boat and landings.

Portland's heritage and identity as a fishing town attract people to live in and visit the city; people value the cultural significance of the fishery. The city recognized this and established policies and zoning rules to protect access to the waterfront by marine industries, including fisheries, from coastal gentrification and development. The preservation of small-scale fisheries has value beyond what can be captured by money earned and nutrition consumed. Local restaurants celebrating locally harvested seafood, souvenir stores selling lobster keychains, boat tours offering a scenic view of Casco bay filled with lobster traps all benefit from the diverse values created by fisheries. A symbiotic relationship between fisheries and other sectors in the economy that enables multi-use coastal development is worth striving for.



## Resilience and adaptation

Examples described in this chapter highlight the dynamic nature of small-scale fisheries as a coupled social-ecological system; specifically, this chapter discussed changes in fishing portfolios and pressures from coastal development. The system faces multiple challenges, demographic change and climate change being two of the more severe and imminent. As described earlier, Maine's fishing portfolio has shrunk over the years. What is more, a study argues that fisheries management that requires a license to operate is limiting fishers from diversifying their portfolio (Stoll et al. 2016). Economic theory suggests specialization leads to increased productivity; economic theory also suggests a less-diverse portfolio leads to higher risk. The lobster fleet in Maine is attracting young fishers to enter the fishery. On the contrary, the groundfish fishery in the New England region, where Maine is located, is suffering from a graying fleet. This contrasting difference can at least partly be explained by the differences in stock conditions and fishing profitability in the past several decades. Young fishers are entering a lobster fishery backed by abundant stock; now, there is a shortage of lobster licenses available for young fishers.

The study predicts, however, that this condition will not hold in the future. As the study finds, the Gulf of Maine is one of the fastest-warming oceans with an expected sea surface temperature increase of 1 – 2.4 degrees Celsius by the year 2050 compared to the 1976 – 2006 average (Pershing et al. 2015, Pershing and Stephenson 2019). Scientists predict that the oceanic condition is now at a sweet spot for lobsters in Maine, but it will not last for long. Compared to 2014, a 40 – 62% reduction in lobster abundance by 2050 is predicted (Le Bris et al. 2018). Indeed, the lobster biomass has declined in southern New England states such as Rhode Island and Massachusetts, leading to a collapse of the lobster fishery in these states. Studies also suggest Maine lobster fishers are already experiencing some of the climate change impacts. For instance, marine heatwave events in recent years have impacted the lobster fishery and the market (Mills et al. 2013).

It is too risky to put all our eggs in one basket. A group of scientists, myself included, are now investigating ways to make fisheries more resilient and

adaptive to climate-induced changes in a social-ecological system. As studies suggest, autonomous adaptation is not enough; there is a role for management actions to make the system more resilient and adaptive (Fankhauser 2017). This is particularly true for small-scale fisheries, where financial and even human resources, especially in the case of developed economies, are lacking. Meanwhile, studies also suggest that well-managed fisheries fare well under climate change (Gaines et al. 2018). Management approaches could and should vary from fishery to fishery, depending on specific social-ecological contexts. No matter what approach may be used, I argue that it is worth investing effort in building capacity for governance, resilience and adaptation in small-scale fishing communities — for harvesters, managers, and scientists – to foster social-ecological sustainability now rather than waiting until we start seeing greater impacts from climate change.

## 38. Canada & Japan

### Characteristics, Policies and Governance: Different but Similar

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2019

*This chapter discusses required governance transformation in Japan and Canada in moving towards the holistic health of small-scale fisheries and communities. After highlighting the definitions and numbers of the small-scale fisheries in both countries, we will present the governance structures from the national level and a prefecture (provincial) level, Shizuoka Prefecture of Japan, Newfoundland and Labrador of Canada. Lastly, a comparative lens will be applied to explore the respective characteristics of Japan and Canada's small-scale fisheries, comparing and contrasting the situations in both places, especially about how fisheries are governed.*

## Introduction

The majority of small-scale fisheries and fishing communities are at risk of survival due to the lack of appropriate policies and political wills regarding them, which arise from the insufficient recognition of their meaning and significance. It is even more the case considering the accelerating global change in marine systems (Bundy et al. 2016). Looking to both Japan and Canada, a typical example of Japan is the record-breaking poor catch of the Sakura shrimp in Suruga Bay, which has been ongoing since 2018, as outlined in several chapters in this book. The society is not able to respond effectively to the drastic marine system changes and resource fluctuation, and is thus heavily impacted. On the other side of the ocean, the cod fishery of Canada, went through a fishery moratorium, creating economic hardship and vulnerability to numerous fishers and coastal (Schrank and Roy 2013, Daly and Chuenpagdee 2020). We argue in this chapter that dealing with the changing fisheries in both case requires a serious look at how fisheries are governed and how it may need to be transformed.

## Definitions and numbers

### Japan

What most Japanese people think of when hearing “small-scale fisheries” will be “coastal fisheries”. The words “small-scale fisheries” are somehow new in Japan as there is no clear definition of it and not often used either unlike the “coastal fisheries”. According to the National Federation of Fisheries Cooperative Associations (JF Zengoren 2005), coastal fisheries in Japan are considered to be fisheries that employ fishing vessels under 10 mt, which conduct operations lasting less than a day. This chapter considers the coastal fisheries in Japan as small-scale fisheries, which also include aquaculture and set-net fisheries.

According to the Digest of the 2018 Fishery Census, the amount of production in the marine fishery was 4,332,000t, about 23% of which are from coastal fisheries. In terms of fishery management entities, i.e. a household or business body that, to earn a living or for profit, engages in acquiring fish and aquatic plants from the sea or conducting marine aquaculture to be sold in a given year (MAFF 2013), the coastal fishing class constituted 74,210 (or about 94% of the total units). Among them, 81% are in capture fisheries while the rest are marine aquaculture. As just described, the amount of production in marine fisheries or the number of fishery management entities reveals that the proportion of small-scale fisheries is considerably large. The common small-scale fisheries include different types of angling fisheries, seaweed and shellfish collecting, trawl fishery, gill-net fishery, longline fishery, set-net fishery, and aquaculture.

### Canada

Fisheries in Canada are regionally diverse with different user groups, (i.e., aboriginal fishing groups, inshore harvesters) and there is difficulty in defining what is ‘small-scale’ nationwide. The initial distinction is mostly between ‘inshore’ and ‘offshore’ fleets (Charles 1991), with Fisheries and

Oceans Canada (DFO) defining inshore as “the fishing sector where fish harvesters are restricted to using vessels less than 19.8m (65’) Length Over All (LOA). There are smaller boats, however, like in the lobster fishery in Atlantic Canada and the ‘small boat’ fisheries in Newfoundland and Labrador. The regional difference is indeed noteworthy in terms of governance. For instance, a recent report to the Senate pointing to the differences in policy for inshore harvesters in British Columbia compared to Atlantic Canada (McDonald 2019).

In place of a lack of coherent national data, one of the most valuable inshore fisheries in Canada will be examined. The inshore lobster fishery, which in part takes place off the coast of Nova Scotia and New Brunswick, is comprised of almost 3,000 inshore licenses and directly employs over 7,000 people (DFO 2011). The lobster fishery in Atlantic Canada is valued at over \$814 million CAD (landed values – 2018). This fishery is widely distributed and supports rural communities throughout the region, providing economic benefits. This fishery is just one example of a ‘small-scale fishery’ in Canada, a fishery in which the majority of vessels are less than 13.7 meters (45 feet) LOA (DFO 2011). Small-scale fisheries though are also present in Newfoundland and Labrador (e.g., inshore shellfish and groundfish fisheries) (Khan and Chuenpagdee 2014), the arctic (e.g., arctic char small-scale fishery) (Roux et al. 2019) and in British Columbia on the west coast fisheries where the majority of commercial fisheries are composed of vessels less than 45 feet LOA (McDonald 2019). The ‘small boat’ category in Newfoundland and Labrador sometimes refers to vessel less than 12m (40’) LOA, constituting about 87% of the total fleet in the province (DFO 2017). The diversity of Canada’s fisheries makes identifying small-scale fisheries challenging, but they are a potent force for the livelihood of coastal communities from coast to coast.

## Fisheries governance systems

## Japan and Shizuoka Prefecture

Looking into the system of laws related to fisheries, the Fishery Act plays the most crucial role as the law for the governance of the basic fishery regime in Japan (FLSG 2005). In addition, Japan has the “Act on the Protection of Fishery Resources”, “Ordinance of Ministry of Agriculture, Forestry and Fisheries”, “Fisheries Cooperatives Act”, “Act on Preservation and Control of Living Marine Resources”, “Fisheries Basic Act”, among others. The Japanese fishing industry can be divided into four main classes of a licensed fishery, fisheries based on fishery rights, free fishery, and other fisheries by the “Fishery Act”. Licensed fishery falls into the two classes of fisheries permitted by the minister and fisheries permitted by the governor, and fisheries based on fishery rights is further separated into the three classes of the fishery by a set-net fishery right, fishery by a demarcated fishery right, and fishery by common fishery right (Makino 2011). Among these, fisheries based on fishery rights and fisheries permitted by the governor are relevant to small-scale fisheries. The Fisheries Agency is a national level management institution. For the fishers level, fishers organizations centering on fisheries cooperative associations fulfill an essential and autonomous management role, fishers supporting role, and other functions. As of 2019, there are about 300,000 fishers (members of a fisheries cooperative association) nationwide and 943 coastal area fisheries cooperatives associations.

Prefectures follow basic management policies of the national level and managed by prefecture-level fishery-related departments under the prefectural fisheries adjustment regulations and resource management policies. Take Shizuoka Prefecture as an example. The central systems of the regime are “Shizuoka Prefecture Fisheries Adjustment Regulations” and “Shizuoka Prefecture Resource Management Policy” and the Fisheries and Marine Office, Economy and Industry Department of Shizuoka Prefecture is the management institution. Furthermore, when the prefectural government makes decisions on the fishery license, fishery rights, resource management policies, and other items, consultation is made to the “Shizuoka Sea-Area Fisheries Adjustment Commission”. The Sea-Area Fisheries Adjustment Commission is established

in sea areas as an administrative commission defined by the Fisheries Act. It is a system to respect the wishes of local fishers, including choosing half, or more of the number of members must be from among the fishers of the sea area (Article 85) (Abe and Inoue 2012). The operation of this Fisheries Adjustment Commission was introduced to democratize the fishing industry in a series of postwar reforms and is a feature of the Japanese fishery regime (Kaneda 2001). Shizuoka Prefecture, where Sakura shrimp fishery, whitebait fishery, set-net fishery, and other fisheries are operated, has 17 coastal area fisheries cooperatives associations under the Shizuoka Prefecture Federation of Fisheries Cooperatives. These fisheries cooperatives associations support 2,200 fishery management entities and 4,814 fishery workers (The 2018 Fishery Census: Shizuoka).

## Canada and Newfoundland and Labrador

Fisheries in Canada are principally governed by the Federal government through DFO. The *Canadian Constitution Act* of 1867 outlines the federal government's control over fisheries management (i.e., quota and access decisions), and subsequent acts layout DFO's jurisdiction in greater detail. The *Fisheries Act*, passed in 1985 but amended as recently as 2019, provides a framework for: (1) "the proper management and control of fisheries" and (2) "the conservation and protection of fish and fish habitat, including by preventing pollution" (Fisheries Act 1985, Section 2.1). This Act gives the Minister of Fisheries and Oceans broad discretion in fisheries management and for the first time in 2019, allows the minister to take into account "social, cultural, and economic" considerations as well as "the preservation or promotion of the independence of license holders in commercial inshore fisheries" in decisions making (Fisheries Act 1985, Section 2.5 (g) and (h)). Although the most recent amendment to the Act elevates Indigenous rights and formalizes the considerations of inshore harvesters in Canada, there continues to be limited capacity within the federal government to incorporate social science and governance considerations (Silver and Bennett 2018). DFO's role in fisheries is to "protect and manage Canada's fisheries, including aquaculture,



and support Indigenous participation in fisheries. We also ensure our national network of harbours is open and in good repair” (DFO 2020)—a mission that balances both economic and social considerations, although recent analysis of Canadian policy has found it weighted towards conservation goals over social, economic and institutional considerations (Paul and Stephenson 2020). At the regulatory agency level, DFO has numerous policies that aid in governing fisheries management and conservation, some of which are agency-wide (i.e., Sustainable Fisheries Framework), and some that are regionally specific (i.e., Atlantic Fisheries Regulations and Policies). DFO, which is centrally located in Ottawa, Canada, is divided into six regions for Canadian fisheries and oceans governance.

In Newfoundland and Labrador, Canada’s eastern-most, DFO is headquartered in the provincial capital of St. John’s. Although the federal government has jurisdiction over fisheries management decisions, the province, through the Department of Fisheries and Land Resources, is the lead authority in fisheries and aquaculture development, licensing for fish processing operations, and inspection/ compliance and regulatory enforcement for fisheries and aquaculture industries. While fisheries in Newfoundland and Labrador cannot be easily explained due to their rich history and many periods of social and economic reorganization (Bavington 2010), there are other multiple actors and institutions that comprise the web of fisheries in this region. These include the Northwest Atlantic Fisheries Organization (NAFO) and the Marine Stewardship Council at the international levels, and the Fish, Food and Allied Workers Union (FFAW-Unifor) and local fisheries organizations at the provincial and regional levels. Like fisheries that face wicked problems globally, the fisheries of this province are hierarchically governed by agencies and policies that “are not often in synergy with the reality on the ground” (Khan and Chuenpagdee 2014, p.609)

## Seemingly different, shockingly similar

In this last section, we will peek at small-scale fisheries in both countries through a comparative lens. In one sentence, it feels “seemingly different (but) shockingly similar.” Of course, because they are on different continents and different countries, it is apparent that they exhibit many differences. Examples of the differences in governance structure are as follows. Firstly, Japan has adopted a co-management method combining management by the government and voluntary management by fishers, whereas Canada is centered on management by the government, an administrative-oriented mode. Secondly, Japan has fisheries based on fishery rights, granted as quasi-real rights to fishers and fishers organizations, whereas Canada has mostly licensed fishery. Moreover, there is no substantial difference in management systems at both the administrative level and fishers level by region in Japan, whereas there is quite a large difference by province, including the presence or absence of a fisheries administrative department in provincial governments and fishers organizations in Canada. Finally, there are port-level fisheries cooperatives that manage resources, maintain fisheries rules, and support fishers in Japan, whereas there are fishers organizations in some provinces but not in others in Canada, and in the provinces that have fishers organizations such as in Newfoundland and Labrador, still, no port-level fishers organizations.

Reading up to here, one may wonder, “which governance structure is more desirable?” We do need to take some time to look at the following similar points before responding to that question. First is the vulnerability of fishing communities in both countries. Fishing communities in Canada or Japan are facing major changes that they are not able to sufficiently respond to, such as environmental change, resource decline, and other adverse circumstances. Then there are the problems of depopulation, aging population, replacement shortage, marginal village, etc. Japan has pointed out these problems for years and years (Asakawa et al. 2008) and tested various initiatives to avoid them. On the other hand, Newfoundland and Labrador, as the province with the most thriving fisheries, is reporting disappearing fishing villages and replacement

shortage in existing fishing communities (Higgins 2008).

Furthermore, inequality and injustice are also cited as problems. It has become apparent in Japan about the disparity in adjustments among the fishing industry, marine leisure industry including pleasure boats, and offshore wind power generation, and others. Also, there are growing concerns about the competition between small-scale fisheries and private capital concerning the revision of the Fisheries Act, which was enacted in December of 2018 and will take effect within two years after the promulgation in Japan. On the Canadian side, inequality in catch allocation and resource access between small-scale fisheries and large-scale fisheries (Barnett et al. 2017), incompatibility between domestic fisheries policies and international trade policy (Daly and Chuenpagdee 2020), conflicts between Indigenous fisheries and federal government science policy (Pinkerton et al. 2019), are visible. As described, Canada and Japan have seemingly different concepts and forms of small-scale fishing industries and governance structure. However, they face shockingly similar challenges today, and needless to say, both countries are expected to seek a better way of transforming the governance of small-scale fisheries (Chuenpagdee and Jentoft 2018). While there is no easy solution or one size fits all for such a transformation, both Japan and Canada can learn from each other, and from elsewhere, to find the most desirable governance structure and to design appropriate fisheries policies that take into consideration the characteristics and conditions of small-scale fisheries.



# VI

## JSSF from a Global Lens



## 39. Ocean Warming

### The Impacts on Marine Ecosystems and Human Societies in Japanese Coasts

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### Sushi in future ?



Present



by ocean acidification?



by ocean warming?



by overfishing ?



by acidification + warming + overfishing?

Source: <http://www.ees.hokudai.ac.jp/carbon/mfujii/en/research/>

*Schematic photographs showing the possibility of a reduction in sushi species in the future caused by various factors*

*Coastal ecosystems exhibit high biodiversity and biological productivity, encompass various ecosystem services, and afford many benefits to coastal societies, especially via local fishery and tourism industries. The global-scale rise in water temperature caused by global warming has significantly affected coastal ecosystems, and several quantitative assessments or projections of such changes in the Japanese coasts have been made recently. These include the finding that long-term, high-frequency, exquisitely sensitive monitoring data, along with climate models affording high-level spatiotemporal resolution, are required to minimize uncertainty when projecting the future distributions, biodiversity, and functionalities of coastal ecosystems. Second, the quantitative distributions of coastal ecosystems have changed dramatically, and such changes are projected to continue, triggered by ocean warming. Third, it is a royal road to globally reduce CO<sub>2</sub> and other greenhouse gas emissions, but practical adaptive actions are also essential. Especially, aquaculture regions should be moved appropriately to minimize the influence of ocean warming on coastal societies, based on scientific insights and guidelines.*

## Introduction

Global warming and the subsequent rise in water temperature impact marine ecosystem distribution, biodiversity, and function. For example, the habitat of tropical corals around Japan is expanding poleward by 14 km/year (Yamano et al. 2011), which may have affected coastal biodiversity (Yamano et al. 2012). The impacts of ocean warming on species living in coastal regions are of particular concern because the habitat ranges of such species are narrow. These impacts directly affect human societies, especially local industries that are heavily dependent on marine ecosystems, including fisheries and marine tourism. The principal actions that might counter ocean warming are



mitigation, adaptation, protection, and repair (Gattuso et al. 2015). Of these, most previous studies have focused on mitigation and adaptation, but very few have sought to quantify the impacts of ocean warming on coastal ecosystems. Japan offers a unique opportunity to study the effects of ocean warming on coastal ecosystems, because the archipelago covers a wide latitudinal range, stretching from subtropical to temperate areas. Further, because of Japan's relatively small landmass in comparison with other temperate settings (e.g., the United States, Africa and Australia), distribution is likely to be less disturbed by terrestrial influence, which means our Japanese case studies could provide baselines to detect and project changes due to ocean warming.

## Impacts of ocean warming on coastal ecosystems and human societies

Coastal regions foster various marine species and provide high marine biodiversity and ecosystem services. The coastal regions are also of great importance for the Japanese society because Japanese people enjoy various economic values, especially through fisheries and marine tourism, from the coasts.

### Coral reefs

Yamano et al. (2011, 2014) constructed a dataset on coral reefs around Japan. The data include information on coral coverage and the number of species recorded since the 1930s. The timeline is sufficiently long to filter out interannual-to-decadal fluctuations and to extract long-term ocean warming trends. The long-term dataset on coral reef habitats clearly reveals declines in coral cover in subtropical regions and poleward expansion of subtropical corals into temperate regions, in response to rises in water temperatures (Yamano et al., 2011, 2014).

Yara *et al.* (2012, 2016) studied the ambient water temperatures of known coral habitats and identified biological indicators of the northern limits of tropical/subtropical and temperate corals; these were the isothermals of

annual water temperature minima of 18°C and 10°C, respectively. These authors also developed a biological indicator of induction of severe coral bleaching, which may trigger massive coral death, due to anomalously high water temperatures; this was the isotherm of an annual water temperature maximum of 30°C (e.g., Kayanne et al. 1999). The biological indicators were combined with climatically modeled water temperatures for future projection. The simulated results were averaged over ten years and used to filter out the influences of inter-annual variations, such as the Kuroshio meander and the El Niño and Southern Oscillation events (Yara et al. 2011, 2012, 2014). The results show that the habitat suitable for tropical/subtropical corals around Japan may be reduced by half by the 2020s to 2030s, and is projected to disappear by the 2030s to 2040s, primarily because of severe coral bleaching and ocean acidification (Yara et al. 2012, 2016).

In-situ monitoring revealed that corals growing close to the northern limits of their habitats are at risk of cold-water bleaching and death if the water temperature falls dramatically in winter (Nomura 2009; Yamano and Namizaki 2009). Such sporadic events were not considered in the previous studies employing 10-year average outputs. Using newly-developed, empirical, lowest-water temperature thresholds for coral survival derived from in-situ monitoring data, together with water temperature outputs of a climate model, Takao et al. (2015b) evaluated coral death caused by the sudden development of extremely low water temperatures. When the inter-annual variations in water temperature were included, the model yielded realistic poleward expansions of coral habitat. This implies that, apart from inter-annual variations in water temperature, inter-annual variations in other environmental factors must also be considered to realistically assess, and reliably project, the impacts of ocean warming on coastal ecosystems.

## Seaweed beds

Although seaweed beds are extremely important in terms of supporting coastal ecosystems and providing benefits to human societies, the spatial extents of such beds around Japan have fallen because of coastal reclamation, changes

in water quality, rising water temperatures, and heavy grazing by herbivores. Kumagai et al. (2016) described the flora of habitat-forming seaweeds (fucoids and temperate kelps) along the Japanese coasts. Data on 86 species were collected from 355 literature sources. The dataset contains information on seaweed species with survey years, geographical locations, and their scientific descriptors. The dataset can be used to study the biogeography of, and long-term changes in, particular species, and the diversity of habitat-forming seaweeds along the Japanese coasts.

Takao et al. (2015a) identified biological indicators distinguishing water temperatures suitable or not for the growth of *Ecklonia cava*, a major kelp species found predominantly along the southern coast of Japan, and the impact of grazing on *E. cava* by *Siganus fuscescens*, a herbivorous – in fact an omnivorous, but seaweed-preferring – fish species. Then, by combining the biological indicators with water temperature results from climate models for the coming decades, they quantitatively projected the effects of warming seawater on the spatial extents of suitable (versus unsuitable) habitats for the temperate seaweed *E. cava*, and on grazing of *E. cava* by the herbivorous fish *S. fuscescens*. The presently available habitat for *E. cava* is projected to disappear around Japan in the 2090s under the highest-level greenhouse gas (GHG) emission scenario. Under the lowest GHG emission scenario, the projected poleward expansion and decrease in seaweed bed area are not significant, and grazing of *E. cava* by *S. fuscescens* will become common all year-round. Recent studies have predicted seaweed distribution and community shifts in more precise ways by combining climate model outputs with such as climate-velocity trajectories and species distribution models (e.g., Kumagai et al. 2018; Sudo et al. 2020).

These previous studies suggest that it is essential to: (1) further elucidate the impacts of ocean warming on food webs, between-species interactions, and individual species; (2) minimize anthropogenic GHG emissions including CO<sub>2</sub>; and (3) institute adaptations preventing herbivore grazing of seaweed beds, especially on the Pacific coast of Japan.

## Aquaculture

Despite the worldwide high demand for living aquatic resources, the potential amount supplied has been decreasing as a result of the lower abundance caused by various factors such as overfishing and ocean warming. Accordingly, the importance of aquaculture has been relatively magnified. Aquaculture is also considered to be affected by ocean warming and also needs to be modified to adapt to further ocean warming in the future. Aquafarms of target species in the temperate coasts of Japan is projected to shift northward in response to ocean warming (Figure 1). Balloon fish is mostly eaten in Osaka and the other western regions of Japan. In addition, the species is poisonous and a national license is needed to cook the species. Therefore, the projected shift of aquafarms of balloon fish implies that Japanese society may need to consider the shift of food culture as well as the location of aquafarms if the Japanese would very much like to continue to eat the species in the future. The Japanese scallop *Mizuhopecten yessoensis* inhabits coasts of northern Japan and is one of the most important fishery resources of that country. Previous studies found that Japanese scallop habitats were generally cooler than 23°C (e.g., Kuwahara et al. 2006, Shibano et al. 2014). Higher-temperature water has recently appeared off the south-western coast of Hokkaido; this will become more prevalent in the future due to ocean warming.

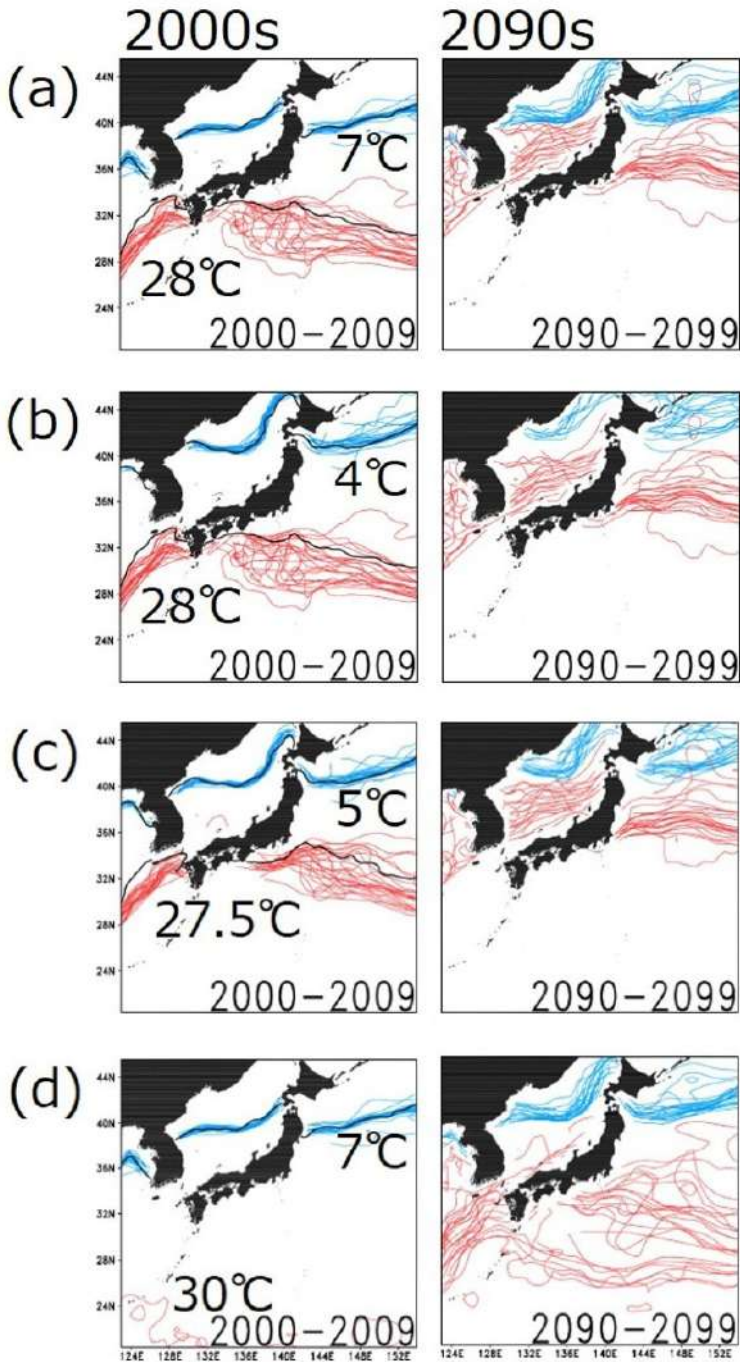


Figure 1. A projected shift of aquafarms of (a) sea bream, (b) balloon fish, (c) flatfish, and (d) amberjack from the 2000s (left) to the 2090s (right) in response to ocean warming. Each target fish has a suitable water temperature range. For example, the location of balloon fish aquafarms was defined as the domains between isothermal lines of annual minimum and maximum water temperature (4 and 28 , respectively; Fujii 2020). Multiple isothermal lines show the uncertainty of projection by different climate models.

Shibano et al. (2014) collected data on Japanese scallop catches and water temperatures off the coasts of Hokkaido from 1980 to 2009. Then, by developing and using a simplified water temperature index to define suitable habitats for Japanese scallops, and combining the index with future water temperature results from climate models, the authors projected that Japanese scallops and relevant local industries including aquaculture off the coasts of Hokkaido would be at risk from future water temperature rises, but that the extent of the risk varied greatly among the GHG emission scenarios. All current Hokkaido aquafarms producing Japanese scallops are likely to experience suboptimal-to-excessive summer water temperatures under the highest-level GHG emission scenario, but only the coastline of the Sea of Japan is affected under the lowest-level GHG emission scenario. This implies that, again, mitigation of anthropogenic GHG emissions is essential; laboratory adaptation of the Japanese scallop in terms of temperature-tolerance is also necessary. It is also important to collect data from all coastal regions, to improve both assessment and projection.

## Conclusion

Because Japan is one of the most suitable regions to detect and project changes due to ocean warming, previous studies focusing on Japan could have strong implications to examine the world's coastal ecosystems. The previous studies showed that coastal ecosystems are changing rapidly in response to ocean warming and that such change is projected to continue into the future. They have also suggested that reductions in GHG emissions, including CO<sub>2</sub>, would

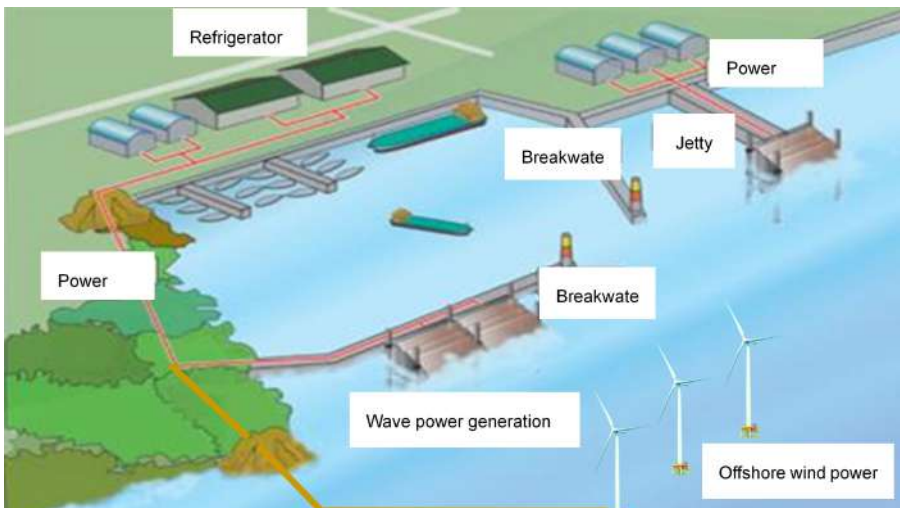
still usefully mitigate the effects of ocean warming on coastal ecosystems. Also, individualized adaptation strategies are urgently required in coastal regions. Such strategies might include modification of local industries (fisheries and tourism) to reflect changes in coastal habitats and the areas suitable for aquaculture. Many Japanese marine parks prioritize scenery. In the future, however, marine parks and protected areas must prioritize the conservation of biodiversity and ecosystems. Previous studies have quantitatively assessed and projected changes in coastal ecosystems triggered by ocean warming, and have developed objective guidelines that could be used to establish new marine parks and protected areas and to modify aquaculture areas. As emphasized in the previous studies, further in-depth development of biological indicators is essential to improve the accuracy of current assessments, and the projection of future changes, in coastal ecosystems affected by ocean warming. To this end, climatic models of high spatiotemporal resolution, and the availability of long-term, high-frequency, in-situ biogeochemical data, would facilitate more accurate simulations.

## 40. Ocean Renewable Energy

### Towards the Sustainable Ocean Development

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*External view of overtopping wave power generation and offshore wind power utilization at fishing ports. Tanaka, H. 2020*



*Because of global warming due to the increase in CO<sub>2</sub> concentration in the atmosphere, abnormal weather arises and influences ecosystems everywhere in the world. In the future, it will be necessary to research and develop renewable energies, not fossil fuels. Among renewable energies, solar power, wind power, biomass, and geothermal are technically put to practical use and become commercial power sources. Still, ocean energies other than tidal power generation and offshore wind power generation are currently in the research and development stage. Here, we describe wave power generation and offshore wind power generation, which are renewable energies that can be utilized at fishing ports. In particular, the overtopping wave power generation developed by the author will be described in detail. It also describes the legislation that was amended or newly enacted to realize them.*

## Ocean renewable energy

Among the power generators utilizing ocean energy, those that have been put to practical use and have been developed are tidal power generation, ocean current and tidal current power generation, wave power generation, ocean temperature difference power generation, and salinity difference power generation. In addition, offshore wind power generation using sea wind has been constructed in various countries around the world for a long time. Tidal power generation is a device consisting of a floodgate and a dam installed at an inlet or river mouth where the tidal range is large. The ocean current is a global circulation of seawater caused by friction due to wind or the difference in density due to temperature difference and salinity difference, and tidal current is a periodic seawater flow caused by the tidal phenomenon. Power generation using the flow energy of ocean current and tidal current is called ocean current power generation and tidal current power generation, respectively. Sea waves are caused by winds over the sea. Wave power generation is

the conversion of wave energy into electrical energy. Ocean temperature difference power generation uses the difference in water temperature between warm seawater at the surface of the ocean and cold seawater at the deep layer. Salinity difference power generation uses osmotic pressure due to the difference in concentration between freshwater and seawater. Offshore wind power generation is the generation of power by installing a windmill on the sea. Practical applications of ocean energy are tidal power generation and offshore wind power generation, and others are at the stage of research and development. Renewable energies available at fishing ports are wave and offshore wind. Therefore, wave power generation and offshore wind power generation are described here.

## Offshore wind power

The sea wind has a higher wind speed than the land wind, is stable with less wind turbulence, and has a uniform wind speed distribution in the height direction, which is a favorable condition for wind power generation. Offshore wind power generation has a different structure depending on the location of installation in the sea area. Pile type offshore wind power generation will be used in coastal areas where the water depth is shallow, and floating wave power generation will be used in sea areas where the water depth is 100 m or more. In the case of floating wave power generation, mooring and transmission line construction costs are incurred. The introduction of offshore wind power generation is increasing year by year in Britain, Denmark, and the Netherlands, where the conditions of sea wind are good, and about 8,000 MW is currently being generated. A wind farm is an array of many wind turbines offshore. The world's largest wind farm with 175 units (output 3,600kW per unit) was completed off the southeastern United Kingdom. It has a total output of 630,000 kW and supplies power to 500,000 households. In Japan, the capacity of offshore wind power generation at wind speeds of 7 m/s or more, a shore separation distance of 30 km, and the water depth of 200 m is calculated to be approximately 1.2 billion kW. In Japan, offshore wind power generation has been constructed in recent years led by New Energy and Industrial Technology

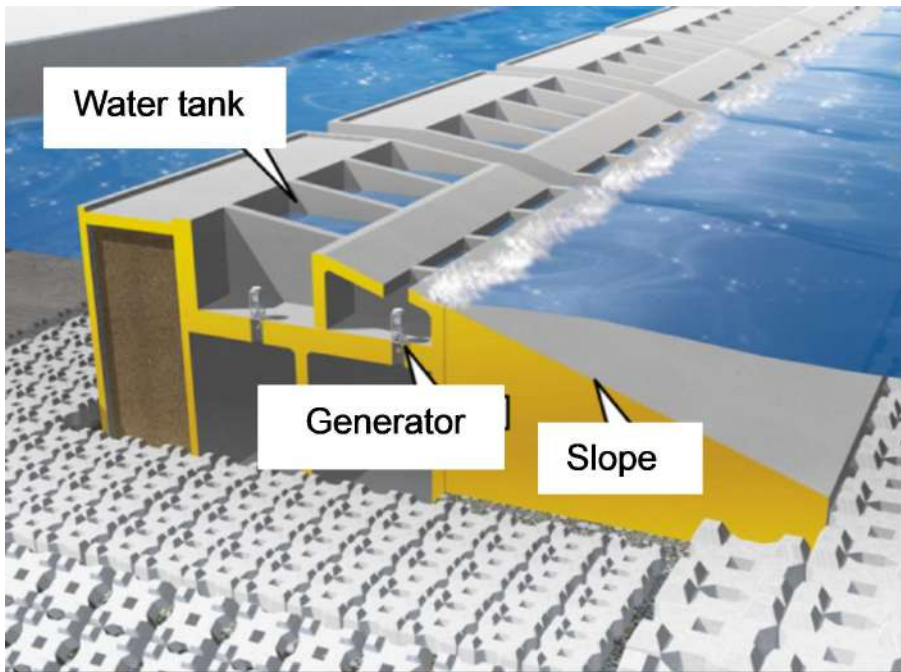
Development Organization (NEDO) (NEDO 2014). Due to the effect of fishing reefs on the sea bottom of the offshore wind tower, the EU's offshore wind power generation is cooperating with fisheries. In Japan, where coastal waters have long been licensed to the coastal fisheries, it is important to coordinate fisheries when constructing offshore wind power generation. Amendments to legislation on fishing rights and new legislation on the use of waters have been enacted to build offshore wind power and other uses of marine energy in coastal areas. This will be described at the end.

## Wave power generation

Wave power generation is roughly classified into eight types (EMEC 2020) from the method of converting wave energy into electric energy. These methods are determined by wave conditions and installation conditions. Attenuation type and point absorption-type are used in large offshore waves, and oscillating water column type, pendulum type, wave force conversion type and overtopping type are used near breakwaters and coasts. Overtopping wave power generation is suitable in the sea area around the fishing port, and this type should be installed outside the fishing port breakwater. The author is currently conducting comprehensive research on the practical application of the overtopping wave power generator (Tanaka et al. 2015, Tanaka et al. 2016).

In the overtopping type wave power generation shown in Fig. 1, wave energy is converted into potential energy as the wave travels up the slope, and flow energy is generated due to the water level difference between the water tank and the surrounding sea area. The principle of overtopping type wave power generation is generating power by utilizing the torque received by the propeller to convert the energy using a power generator. It is assumed that this overtopping-type wave-power generator is not to be installed offshore but installed in front of offshore breakwaters and around offshore structures, which receive incident waves directly. This wave overtopping type wave power generation is composed of a slope, a water tank, a water pipe and a generator, and has a simple structure. The simple structure reduces the construction

cost. In addition, since many marine organisms, such as pearl oysters and barnacles adhere to marine structures, it is important that the structure is simple.



*Figure 1. Imaged figure of wave overtopping type wave power generation equipment*

Since the actual wave height and period of each wave differ from wave to wave, they are treated statistically as irregular waves. Since ocean waves are irregular waves, the average value of  $1/3$  of the observed wave height and period, whichever is larger, is defined as the significant wave height and is used for the design. The period uses the significant wave period defined by the average value of  $1/3$ . The significant wave height and the significant wave period are represented by  $H_{1/3}$  and  $T_{1/3}$ , respectively. Since the significant wave height and the significant wave period are almost the same as the visually observed wave height and period, it was decided to treat them as the average value of the irregular wave height and period. In order to calculate the wave

energy, the Bretschneider-Mitsuyasu type spectrum of ocean waves shown in Eq. (1) was used.

$$E(f) = 0.257 H_{1/3}^2 T_{1/3} (T_{1/3} f)^{-5} \exp\left\{-1.03 (T_{1/3} f)^{-4}\right\} \quad (1)$$

The wave power ( $E_w$ ) calculated from the Bretschneider-Mitsuyasu spectrum, and group velocity is expressed as Eq. (3). The coefficient is a value obtained from the density of seawater ( $\rho = 1030 \text{ kg / m}^3$ ).

$$E_w = 0.429 \rho D H_{1/3}^2 T_{1/3} = 0.442 D H_{1/3}^2 T_{1/3} \quad \text{---(kW/m)} \quad (2)$$

$$D = \left(1 + \frac{2kh}{\sinh 2kh}\right) \tanh \frac{2\pi h}{L} \quad (3)$$

Now,  $D$  is related to the group velocity defined by Eq. (3).  $h$  is the depth of water,  $L$  is the wavelength, and  $k$  is the number of waves. Since the location of the overtopping wave power generation is in the shallow sea wave region ( $0.04h/L < 0.5$ ), the coefficient  $D$  was introduced.

As shown in the equation (2), since the wave energy is related to the product of the square of the wave height and the period, it is naturally preferable that the wave power generation output under good wave conditions. Therefore, it is necessary to calculate the amount of wave energy on the coast of Japan and determine the suitable site for installing wave power generation. The wave energy of the whole country was calculated for 61 places with few missing data among the 2008 observation data of the National Port Wave Information Network (NOWPHAS), which has 63 wave observation stations nationwide. The appearance frequency statistics by wave height and period published by NOWPHAS are observation data every two hours. Wave power per unit width ( $E_w$ ) from the Eq. (2), which is the wave energy equation obtained from the Bretschneider-Mitsuyasu spectrum using the significant wave height ( $H_{1/3}$ ) and the significant wave period ( $T_{1/3}$ ) every 2 hours Was calculated.

Regarding the calculated annual wave energy, the characteristics of each region are described (Tanaka et al. 2016). The yearly wave energy is over 20,000kWh/m at all stations in Hokkaido. Above all, the Setana Observatory

facing the Sea of Japan exceeded 60,000kWh/m. In the Tohoku region, the annual wave energy of almost all stations exceeds 30,000kWh / m, and there are many stations over 40,000kWh/m on the Sea of Japan side. Above all, the Fukaura and Sakata observatories exceed 80,000kWh/m. Since the Aomori Observatory is an inner bay, it is as small as 1500kWh/m. In the Kanto region, the annual wave energy at Hitachi Naka Observatory and Habu Observatory exceeds 70,000kWh/m. The values at the Ashika Island Observatory and the Second Kaiho Observatory were less than 10,000 kWh/m. On the Sea of Japan side of the Chubu region, there are many stations where the annual wave energy exceeds 50,000kWh/m. However, the Fushiki Toyama and Tsuruga Observatory in the inner bay were less than 10,000 kWh/m. On the Pacific side, Shimoda and Omaezaki Observatory exceed 18,000kWh / m. The Shimizu Observatory was 10,000kWh / m or less. The annual wave energy at Shibayama Observatory on the Sea of Japan side of the Kinki region exceeds 60,000kWh/m, but at Shibayama Port Observatory installed in the port was less than 10,000kWh/m. The Shiono Misaki Observatory on the Pacific Ocean side exceeds 30,000kWh/m. The Isewan and Kobe Observatory in the inner bay were less than 10,000kWh/m. In the Chugoku region, the annual wave energy at Tottori and Hamada Observatory exceeds 5.000kWh/m. The Sakaiminato Observatory was 10,000kWh/m or less. The annual wave energy of many stations in the Shikoku region was over 15,000kWh/m, but that of Komatsushima Observatory was under 10,000kWh/m. The annual wave energy at the Genkai Sea Observatory on the Sea of Japan side in the Kyushu region exceeds 30,000kWh/m, but at the Aijima and Iojima Observatory, it was less than 15,000kWh/m. On the Pacific side, only Hososhima Observatory exceeds 35,000kWh/m. Other stations were less than 10,000kWh/m. In the Amami region of Okinawa, the annual wave energy at the Ishigaki-Oki Observatory was less than 10,000kWh/m, but at other stations, it was over 20,000kWh/m. In general, there are many sites with large wave energy at the stations on the Sea of Japan side. In the Tohoku region, there are many wave energy reserves on the Sea of Japan side and the Pacific side, and the average annual wave energy on the Sea of Japan side was 71,240kWh/m, and on the Pacific side was 37,321kWh/m. Therefore, it can be said that the Sea of Japan side and the

Pacific side of the Tohoku region and the fishing ports of the Izu Islands are suitable sites for wave power generation.

To develop the overtopping type wave power generator, the most important factor is to determine the volume of overtopping waves. Partially reflected by them, and the residue is transmitted. In the case of overtopping-type wave-power generation, transmission energy becomes dissipated energy on the slope and overtopping energy. In the past, overtopping volume related to offshore structures was summarized by wave height, foot-of-slope to depth-of-water ratio, wave steepness, and overtopping head. However, natural motional phenomena can be argued based on the energy theory. The author conducted a detailed experiment on the relationship between wave energy and overtopping volume with the overtopping head as a parameter. As a result, the wave energy and the amount of overtopping ( $q$ ) were proportional to each overtopping head, as shown in Eq. (4).

$$q=E \quad (4)$$

When the overtopping head ( $R$ ) is 0.8 m, 1.0 m, 1.5 m, and 2.0 m, the values of are 0.02312, 0.02234, 0.01390, and 0.00840, respectively. Since the technology of converting wave energy into larger potential energy is important for overtopping wave power generation, we created four-stage water tanks and measured the amount of overtopping waves flowing into each water tank. The total volume of overtopping waves in each tank is related by Eq. (4). If the overtopping volume for each  $R$ -value can be calculated from the relation between  $R$  and wave energy, it will become possible to estimate the capacity of wave power generation based on the NOWPHAS data of each area. The amount of power output can be obtained by observing the waves in the sea area where wave power generation is installed, such as fishing ports, for one year, calculating the wave energy from the observed values, and multiplying the overall efficiency of wave power generation. The electric power obtained by wave power generation in the sea area around the fishing port can be used as electric power for refrigerators, ice makers, and offices.

## New legislation promoting the use of ocean energy

In order to promote the use of the sea area related to the development of marine renewable energy power generation facilities, measures such as the establishment of an underlying policy, the designation of a promotion area, and the establishment of a certification system for plans related to the occupancy of the sea area within the area will be taken. In Japan, the Law Concerning Promotion of Utilization of Marine Areas Related to Development of Marine Renewable Energy Power Generation Equipment was enacted on November 30, 2018, and was promulgated on December 7, the same year. The law was enacted to facilitate the construction of offshore wind power, but it also applies to other ocean energy.

However, to utilize the sea area, it is crucial to have the correct recognition that the sea is a shared capital, with active fisheries to increase the food self-sufficiency rate, and that it is the marine environment that requires protection. In particular, it is essential to recognize the multi-functionalities and significances of small-scale fisheries that take place in every nook and corner of the coastal areas. It is no exaggeration to say that without these recognitions, there is no real ocean energy development. It is expected that further research will proceed in the future regarding the ideal way of cooperation between renewable ocean power generation and the small-scale fisheries.



## 41. Forest-River-Ocean Nexus

### Enhancing Seafood Intrinsic Value by Environmental Education

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*Hei River Cherry Salmon MANABI Project (Salmon Project), Iwate Prefecture, Japan, Fig.1 [3], A. Ito, 2019*

*Japan is an island country and has a privileged natural environment with bountiful forest, river and ocean. Traditionally, people living in the islands have taken care of nature, such as forest-river-ocean nexus (FRON) over generations. Traditional communities have maintained biodiversity through a sustainable way of conservation and utilization of biological resources, which also benefited the Japanese society and culture. One of these traditions is small-scale fisheries, and it is a resource-efficient, low-carbon industry that can promote sustainable livelihood in small villages where FRON has existed. This chapter introduces the methodology, concept and practice of Aquatic Marine Environmental Education that can help people/learners realize the importance of small-scale fisheries, and the definition of FRON consciousness and food intrinsic value (FIV) will also be introduced.*

## Introduction

Over 6800 islands including 418 inhabited islands exist in Japan archipelago. It has a privileged natural environment with bountiful forest-river-ocean nexus (hereinafter FRON). Traditionally, people living in the islands have taken care of these conditions over generations (Wakana 2001). Therefore, biodiversity has been maintained by traditional communities through a sustainable way of conservation and utilization of biological resources. This tradition has also benefited the Japanese society. People could live a stable life without worrying about resource depletion, which laid the foundation for Japanese subsequent cultural development (Ministry of the Environment 2016). One of these traditions is small-scale fisheries (SSF), such as sea urchin and abalone fisheries, kelp and wakame farming, and inland freshwater fisheries. SSF is a resource-efficient, low-carbon industry that can promote sustainable livelihood in small villages where FRON exists (FFPJ 2020). In terms of sustainability, SSF is consistent with the direction of Aquatic Marine

Environmental Education (AMEE), which aims to create an endogenous community-based on the FRON. This chapter presents the methodology, concept and practice of AMEE that can help people realize the importance of SSF.

## Aquatic Marine Environmental Education and learning cycle theory

AMEE was defined in 2007 and has been implemented to date (Sasaki 2012). The direction of AMEE is consistent with international initiatives such as the United Nations' Belgrade Declaration in 1975, the Tbilisi Declaration in 1977, the ESD in 2002, the SDGs in 2015, the Ocean Decade in 2017 and national initiatives such as new national curriculum and environmental education (Sasaki 2018a). The principle of AMEE aims to lead learners to become autonomous, increase their intrinsic motivation (Deci, Ryan 1985), and develop the necessary skills to identify and solve environmental problems.

As defined in the AMEE, an aquatic environmentally literate person can: [1] observe the surrounding aquatic marine environment in a scientific way; [2] inquire questions related environmental problems and the well-being of human communities; [3] obtain the required comprehensive knowledge such as aquatic marine environmental literacy (AMEL); [4] make responsible decisions and take responsible actions based on outdoor learning experiences with the comprehensive knowledge such as AMEL; and [5] have the ability to convey effectively what is learned (Sasaki 2011). It was confirmed that the implementation of the AMEE program not only prompts learners' active learning but also inspires participants' ownership and creativity (Waki et al. 2015).

The learning cycle theory is designed to promote learning corresponding to the learning processes of learners. According to the learning cycle theory, the recognition and understanding phase of the learner is divided into five steps: Invitation, Exploration, Concept Invention, Application, and Reflection. Learners can enrich understanding and knowledge depending on their own understanding while progressing through these five steps. The details are

as follows: [1] Invitation – ascertain the interests of the learner, focusing on observations and detailed statements, and combining past experience with learning objectives. [2] Exploration – remind the learner to research new educational materials. [3] Concept invention – guide the learner to new understanding. [4] Application – remind the learner to deliberate and analyze the problem independently, as well as produce a new idea or conclusion, place oneself in real problem solving and critical thinking situations. [5] Reflection – steps from Invitation to Application are reviewed to renew the learning cycle for later learning (Lawrence Hall of Science 2009).

Next, the principle of AMEE is explained in accordance with the learning cycle theory and knowledge creation model (Nonaka, 2017). [1] Invitation, with it focus on improving the independence of the participants, when applied to AMEE, instructors should stimulate the curiosity and interest of participants and guide them to observe the familiar aquatic environment independently. This is the first stage in willingly finding issues and tackling them. At this stage, the participants are confronted with the aquatic marine environment using their tacit knowledge related to past experience and knowledge. [2] Exploration – this stage gives participants the opportunity of considering the issues found in the stage [1]. Participants mutually discourse and respect each other's hypotheses and ideas, deepen their inquiry and consideration. Through these deliberations, their tacit knowledge is communicated, generating new ideas and discoveries. [3] Concept Invention – this stage makes participants compare and combine new ideas/discoveries with AMEL (this is externalized as common, explicit knowledge), thus creating new explicit knowledge. [4] Application – in this stage, participants will transform the explicit knowledge into tacit knowledge to solve the problems in another situation. [5] Reflection – in educational psychology, introspection is essential to the establishment of learning goals; therefore, it is necessary to look back on the process of developing knowledge and establishing learning goals. By repeating these steps, participants can deepen their understanding and generate more ideas and lead to more innovations.

## FRON consciousness and food intrinsic value (FIV)

The natural experience in the watershed environment can help the participants realize that the food that sustains their life is closely related to the healthy FRON. Kiso (2014) listed four conditions of healthy FRON. Firstly, there exists a forest that can absorb and retain water, maintain high levels of organic matter like minerals and nutrients in the soil, and improve the water quality. Secondly, this area should have enough spawning habitat like sand, shallows and ridges for fish or other aquatic animals. Third, the aquatic and marine environment should be rich for organisms that build up the bottom of the food web, such as aquatic insects, algae, zooplankton, small fish, etc. The fourth is that there are few obstacles, such as dams that hinder the return of migratory fish. In other words, the healthy FRON refers to the good connection between forest, river, and ocean, which allows the creature to maintain their sustainable life.

The creatures living alongside the river are affected by human activities and they also have an impact on human health and well-being. If the river area has healthy FRON condition, it is not only suitable for the aquatic animals to spawn, for the fry fish to hide from predators and find food, but also an appropriate environment for wild vegetables to grow. Such a condition makes the biodiversity. The creatures can also be used as food and the source of nutrition for humans. This means spatial connections between humans and FRON has existed, and a relationship between living creatures and people alongside the river has been connected since the past to present and to the future. Even today, the healthy FRON allows the people to be able to capture food such as ancestor's "hunting and gathering". They have taken the responsibility to stay in a healthy FRON in order to sustain the abundant food resources not only for contemporary circumstances but also for future generations. These imply that a temporal connection between humans and FRON has existed.

As mentioned above, in order to obtain food, we have lived and maintained a healthy FRON while maintaining harmony between humans and nature from a spatial and temporal angle for generations. In other words, the food produced

by nature requires the existence of healthy FRON through the efforts of people living in the watershed. That is the real value of food, i.e. food intrinsic value (FIV). Such awareness of the importance of healthy FRON is defined as FRON consciousness. It is a part of AMEL, which consists of scientific knowledge and traditional knowledge (Mizutani, Sasaki 2018, Mizutani et al. 2019).

## The Hei River Cherry Salmon MANABI Project

The FRON-based AMEE program for solving problem endogenously at the local site, “the Hei River Cherry Salmon MANABI Project” (hereafter Salmon Project) has been conducted at the Hei River (Length: 75.7km) since 2013. The Hei River runs from west to east in Miyako city, Iwate prefecture located at the easternmost point in Honshu. Miyako City along with its efforts for tsunami reconstruction has stated in the Citizen’s Charter: “A town of peace where people coexist with forest, river, and ocean” to promote town development utilizing rich natural resources of forest, river, and ocean conducting environmental conservation (Miyako City, 2018).

In this Salmon Project, stakeholders such as residents, researchers, administrators and companies in the watershed collaborated and started to conduct the development, practice of the AMEE program. This program is a whole year program to learn the life history of cherry salmon, intended for K-12, their parents and university students not only in Miyako City, but also Tokyo, Kanagawa, and Saitama in Kanto area, and oversea participants such as Taiwan, China, Indonesia, Philippine, etc. Annual activities include “The World Cherry Salmon Summit” in IWATE at headstream of Hei River in May; River Drifting Experience (Field experience in Hei River) at Middle of Hei River in August; Experiencing artificial fertilization of cherry salmon and observing the hatched salmon fry at Oshikado Salmon Farming Center in October; Tracing the Marked Cherry Salmon at Oshikado Salmon Farming Center in December; Releasing Event of the Marked Cherry Salmon at the middle of Hei River in April. Events taking place the whole year include Observation of Natural Cherry Salmon Spawning and Hatching Juvenile and Ocean Camp at Jodoga-Hama Beach. These series of programs are implemented continuously

every year. In the past four years, the number of participants, including project staff, were over 1,000.

This project is effective for participants to enhance FRON consciousness, which is recognition of the nexus of the healthy natural environment from the headwaters to estuaries. It is impossible to enhance FRON consciousness through experience activities in urban area like the center of a big city (Suga, Sasaki 2018). With more than half of Japan's population living in cities today, it is difficult for urban residents to understand the importance of such rich natural environment "FRON" to maintain food culture and sustainable society.

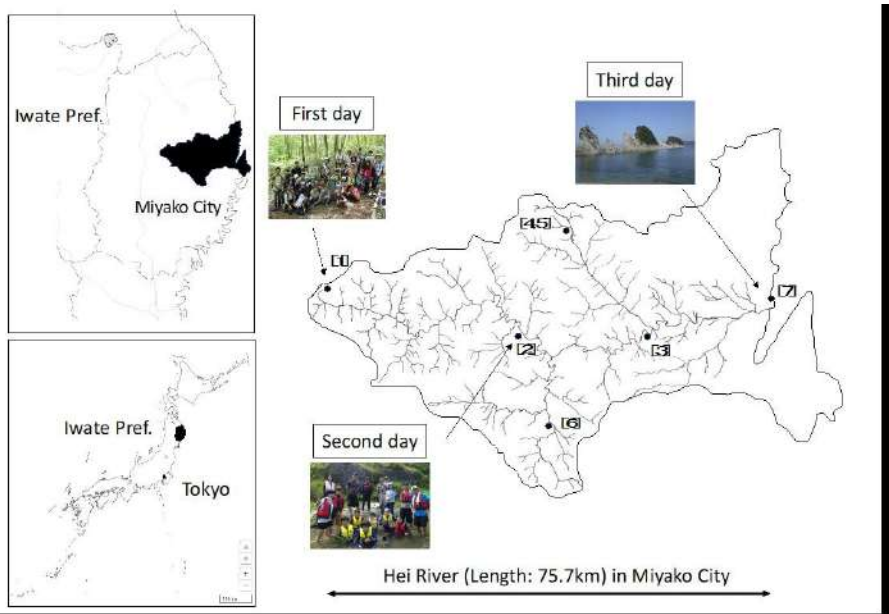


Figure 1. The Hei River Cherry Salmon MANABI Project (Salmon Project) was conducted at the Hei River (Length: 75.7km) with 240 branches, which runs from west to east in Miyako city, Iwate prefecture located at the easternmost point in Honshu. [1]–[7] show activity site. Activities of the First day to the Third day are presented in the next section.

## Transformation of FRON consciousness after the experience

This section describes the transformation of FRON consciousness before and after the exploration in headwater [First day] and the river experience [Second day] and ocean camp in Jodogahama Beach [Three day]. These activities have been conducted continuously since 2013 targeting for children and their parents not only local but also other area such as Tokyo, and overseas.

### First day

On the first day, participants spent an hour and a half climbing the stream to the headwaters of the Hei River (see Fig.1 [1]). Before that, they were asked on a 6-point scale (6 - very high to 1 - very low), as to how they felt about FRON. We found that before the exploration, they did not feel much about FRON Consciousness (3 points or fewer) “, but after they felt strongly connected (5 points or more). The following are some of the participant’s impressions after the experience.

*Through climbing the stream to the headwaters, I realized the existence of FRON and learned that humans have a strong influence on nature, and I found that FRON is very important in our lives.*

*From the headwaters to the ocean, we can learn how nature benefits humanity and how human beings affect nature.*

*I thought that FRON and human beings were connected with eating fish and shrimp. I also noticed that I was eating a lot of natural food.*

*Cherry Salmon is a very amazing fish. If you cut trees, cherry salmon will decrease.*

These can be interpreted as words to show what extent they understand FRON. Not only they understood the role of fish as food but the importance of FRON to maintain the life cycle of cherry salmon.



## Morning of the second day

On the second day morning, in the Hakoishi area in the middle the watershed (see Fig.1 [2]), about 30km downstream from the headwater, a river drifting experience and aquatic organism collection and observation were conducted for children. Local residents were interviewed for their past memories related to FRON. One of their impressive memories of childhood was playing in the river. In this area, until the 1960s, schools had no swimming pool, so the river was a natural swimming area (Mukaeguchi 2017). The venue is held in the watershed area where abundant water flows from the mainstream and tributaries. It is the best place for swimming and water flow training. However, after the 1970s, pools were built in elementary schools around the country, even if the river and ocean still exist, they no longer swim there. This area is also the same, classes in the river were no longer held, and the voices of children from the river decreased.

On that day, local people concerned about safety at first, but they feel reassured by wetsuits, life jackets and professional backup. What's more, they praised the safety education, including how to use rescue ropes and how to do river drifting in a proper way. The locals were reenergized by noticing that the children were drifting and swimming well in the river. Under the guidance of specialists, the children learned the river drifting method and enjoyed working independently and actively. After the river drifting experience, it seemed that they worked on observation and collection of aquatic organisms, and everyone was immersed in observation and collection. The children were able to see the precious salmon swimming and caught sculpins, dace and aquatic insects.

Here are some of the impressions of the children.

*Small fish lives in places where water flows slowly, while bigger fish is staying in places where the flow is fast.*

*I found that the river is home to not only people but a wide variety of flora and fauna, and these organisms maintained a balanced river ecosystem through the food chain.*

These comments suggested that children who played did not only observe the water well and understand the nature of aquatic organisms but also deeply understood that humans are also a part of the ecosystem.

### Lunch time at the second day

At lunchtime, freshly-baked landlocked cherry salmon was provided by Hei River Fisheries Cooperative Association. The fish was grilled in a unique way by AMEL leaders, who were taught by the head of the fisheries cooperative and practiced this skill for three days. The taste was quite good. Some children even ate four plates of fish.

Here are the impressions of the children.

*Because I learned that salmon at any stage need cold, clean, oxygenated water to survive. I understood the reason for good food was good water quality.*

*Maintaining clean water quality is important for fish as well as humans.*

This feedback suggested that children understood the importance of the environment and keeping the environment in good condition are the prerequisites for having delicious food.

### Afternoon of the second day

In the afternoon of the second day, they learned about the morphological observation of salmon, especially otoliths. Children who had experienced mountain climbing, river drifting, gathering creatures, eating salmon, were deeply interested in the life history of salmon.

*I'm glad I learned a lot about otoliths in the afternoon. I really enjoyed the process of removing otoliths.*

*I was surprised that otoliths were smaller than I thought.*

*The otolith line showed how many days the fish lived, and the type and size of the otoliths differed depending on the type of fish. The fish also had ears.*

Some students understood that otoliths analysis could be used for studying various fish and is an indispensable technique for understanding fish ecology and FRON, presented these experiences at the school festival about the research results that otolith analysis revealed a new life history (Sasaki 2018b).

### Third day

The third day's activities were conducted in the Jodogahama Beach including collecting marine organisms such as fish (sculpin), echinoderms (sea urchin, starfish), seaweed (ulva, laminaria), and crustaceans (hermit crab, barnacle). After the field study, AMEE promoting Leaders gave a lecture on marine organisms. Next, Children visited the largest fishing port in Iwate Pref. and observed the following marine creatures: fish (cod, salmon, yellowtail, mackerel), echinoderms (sea urchin, sea cucumber), bivalves (oyster, scallop, abalone), crustaceans (horsehair crab), mollusks (squid, octopus). After that, they enjoyed dinner that consisted of local ingredients, including the above-mentioned seafood. Children realized maintaining a suitable river condition from upstream to downstream not only leads to keeping a wealthy marine environment, but also fosters abundant marine organisms and creates an opportunity for humans to enjoy delicious seafood.

### Summary

The Salmon Project will contribute to the increase in the consciousness of people in terms of FRON. By conducting activities in each watershed of the Hei River, participants can have a deeper understanding of FRON by integrating the explicit knowledge obtained from experience at the headwater and the new one obtained at next places. Without FRON, food that can sustain our life will no longer exist. In addition, in order to keep enjoying delicious food,

it is necessary to maintain the natural environment in a sustainable state. Lastly, a growing desire to convey what they learned from the Salmon Project to others is also important. Improvement of FRON consciousness in the Hei River watershed leads to understanding the relationship between creatures and humans that exist in the same ecosystem.

Mr. Olivier Roellinger, vice president of the International Association of Relais & Chateaux, said, *“Food is life, and life does not exist apart from nature. Iwate Prefecture is blessed with rich ingredients. The reason is that there are grandiose forest and ocean, that is to say, “sauvages” where people and nature are in harmony. They have been cultivated for a long time by local people. It cannot be created from large-scale industries”* (Roellinger 2019). People who have lived in the FRON across several generations have secured food while preserving the ecosystem. One such balanced relationship between creatures and humans is SSF. Essentially, SSF is a sustainable industry that has continued to be this day with maintaining such the ecosystem. FRON consciousness will lead to a deepening understanding of SSF and creating additional value in terms of sustainability of SSF. But we could not clarify how the improving of FRON consciousness contributes to the creation and sustainable development of watershed societies and sustainable SSF progress. In the future, further education practices and research will be required.

## Acknowledgement

I gratefully acknowledge to all the people involved in this project, especially SANRIKU ESD Hei River Academy, Hei River Fishery Cooperative Association, Miyako Fishery Commercial Cooperative Association. This research was funded by RIHN( No. 14200084) and KAKENHI (No. 15K11951).

## 42. Marine Protected Areas

### **Can Japanese Small-Scale Fisheries Coexist with Conservation?**

***Joji Morishita***

Tokyo University of Marine Science and Technology



*Togura fishing community, Shizugawa Bay, Miyagi Prefecture, Japan. Y. Li, 2018*

*The Aichi Target, adopted at the 10th Conference of Parties to the Convention for the Conservation of Biodiversity (CBD) in 2010, set the goal of protecting 10% of coastal and marine areas by 2020. However, fishing interests often oppose the establishment of marine protected areas (MPAs). This article explores the following issues in relation to MPAs and Japanese Small-Scale fisheries (JSSF). First, according to the Ministry of Environment, 8.3% of Japan's 200 mile waters are covered by MPAs. However, most of them are area-based fisheries management measures. Can they be counted in the 10% goal? Are fisheries including JSSF and MPAs mutually exclusive? Second, the wide-spread perception is that MPAs should be for high seas, big and permanent, and no-take zones. However, if the purpose of MPAs is the conservation of biodiversity, they should mainly cover waters within EEZs through bottom-up and adaptive approaches. Third, JSSF has long been conducted in the coastal waters while protecting the marine environment and conserving biodiversity through co-management. Rich marine biodiversity is a prerequisite for coastal fisheries to be feasible and prosperous. JSSF and MPAs are thus not conflicting concepts. Establishment of MPAs with bottom-up, local knowledge-based, stakeholder inclusive co-management concept would contribute to the MPA goal.*

## Aichi Target - 10% MPA goal

The establishment of Marine Protected Areas (MPAs) is attracting strong interests both domestically and internationally as an effective tool for the conservation of marine biodiversity and protection of the marine environment. Numerous declarations, statements, and reports support and promote the establishment of MPAs. Particularly the Aichi Target, adopted at the 10th Conference of Parties of the Convention for the Conservation of Biodiversity (CBD) held in 2010 in Nagoya, JAPAN, set forth the goal of covering 10% of

coastal and marine areas by protected areas by 2020. This numerical goal was endorsed by the United Nations Conference on Sustainable Development (Rio+20) held in Rio de Janeiro, Brazil, in June 2012 through its outcome document “The Future We Want (A/RES/66/288)”. Therefore, the 10% goal is regarded as an international commitment. Japan is striving to meet the goal, as seen in the 1<sup>st</sup> Basic Plan on Ocean Policy (March 2008; [https://www8.cao.go.jp/ocean/english/plan/pdf/plan01\\_e.pdf](https://www8.cao.go.jp/ocean/english/plan/pdf/plan01_e.pdf)).

*“As one of the means to ensure the biodiversity and realize sustainable use of fishery resources, the government should, in accordance with the Convention on Biological Diversity and other international agreements, clarify how to establish marine protected areas in Japan under coordination between related ministries and appropriately promote the establishment thereof.”*

## Perception of MPAs

One of the issues of this 10% MPA goal is what kind of MPAs are eligible for inclusion in the 10% count. There is a widespread perception that an MPA is, or should be, a no-take zone, e.g., the total prohibition of fisheries. The perception is present in both those promoting the establishment of MPA and those opposing MPA (Caveen 2015). For example, the author received many emails as Japan’s representative to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) when the organization was considering the establishment of MPAs in the Antarctic Ocean, and they encouraged us to establish large no-take zones.

*“Please create a legacy for humanity by agreeing at CCAMLR in 20[xx] to large scale, permanent, marine protected areas and no-take marine reserves in Antarctica’s Ross Sea region and East Antarctica. Antarctica’s waters are a remarkable home for wildlife and include some of the least impacted parts of the world’s oceans. We’re relying on our leaders to show leadership to protect our oceans for future generations.”*

On the other hand, the fishing industry often opposes MPAs as they also have a perception that MPAs would destroy their fisheries. In my view, both proponents and opponents are making MPA issues too simplistic. Here we need to confirm the language of the Aichi Target (<https://www.cbd.int/sp/targets/>); Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

### **Target 11**

*By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.*

The general understanding is that both “protected areas” and “other effective area-based conservation measures (OECM)” are to be counted in the 10% goal.

## **Japan’s MPA and OECM**

According to the Ministry of Environment ([https://www.env.go.jp/council/12nature/y120-35/mat02\\_4.pdf](https://www.env.go.jp/council/12nature/y120-35/mat02_4.pdf)), Japan’s MPAs cover approximately 8.3% of the 200-mile zones, i.e., territorial waters and exclusive economic zones (EEZs), as of the writing of this article (March 2020). Out of the 8.3%, 8.1% is fisheries-related conservation and management measures, e.g., “Protected Water Surface” and areas governed by the fishing rights system, based on the Act on the Protection of Fishery Resources (Act No. 313 of December 17, 1951) and the Fishery Act (Act No. 267 of December 15, 1949). In other words, they are management measures for Japan’s coastal fisheries that are generally small-scale fisheries (JSSF). There are differences of views as to the eligibility of those fishery conservation and management measures to be counted in the 10% MPA goal. CBD also recognizes this issue and



therefore had carried out a series of meetings to discuss, including an expert workshop on OECM (February 2018, Montreal, Canada) and the 22<sup>nd</sup> meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA, July 2018 Montreal, Canada). Eventually, the 14<sup>th</sup> meeting of the Conference of the Parties (COP14) to the CBD (November 2019, Sharm El-Sheikh, Egypt) adopted decision 14/8 (Protected areas and other effective area-based conservation measures) (CBD/COP/DEC/14/8) on 30 November 2018. This decision is accompanied by guidance and scientific and technical advice regarding OECM. While these documents provide extensive provisions, fisheries-related measures can be included as an OECM and therefore counted in the 10% goal only when the measures contribute to the conservation of marine biodiversity. In other words, fisheries conservation and management measures aimed at specific target species are not regarded in general as OECMs.

## JSSF and MPAs

Why is there a view that fisheries measures such as Japan's "Protected Water Surface" areas should not be counted in the 10% goal? It is regarded that many of the fisheries measures are introduced for the recovery or sustainable use of specific fishery target species, not for the conservation of the marine environment and marine biodiversity. The concept of OECM, on the other hand, allows measures and systems that are not necessarily established for the conservation of environment or biodiversity to be regarded as OECM if they consequently conserve a high degree of biodiversity in the subject areas. Therefore, they can be counted in the 10% goal. Examples of this type of measure and systems are protected areas for their historical and cultural values and religiously sacred areas (e.g., a grove of a shrine, ancient Emperor's tomb) that keep a high degree of biodiversity as a result of restrictions on land/sea use.

Then what kind of relation exists between JSSF and MPAs? In other words, does JSSF damage the marine environment and biodiversity to be protected by MPAs? Do MPAs harm JSSF? Answers to those questions could vary depending on a definition of MPA and OECM, scale, target species and fishing gears of

the JSSF concerned, and other conditions. However, one thing is certain. JSSF will not be able to exist and continue unless the marine environment and biodiversity are well conserved. Many JSSF have been conducted for hundreds of years in Japan's coastal waters, and for many small coastal communities, JSSF is their way of life. Does this mean that they are guardians as well as users of the marine environment and biodiversity?

There are several definitions of an MPA. One example is the definition adopted by COP 7 of the CBD;

*“Any confined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, and historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings.” (CBD COP7 Decision VII/5*

The International Union for Conservation of Nature (IUCN) also has its definition of an MPA ;

*“Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.”*

*(Resolution 17.38 of the IUCN General Assembly, 1988, reaffirmed in Resolution 19.46 (1994))*

They have many common features. Both definitions require MPAs to protect the environment and biodiversity but do not specify how. The CBD definition asks for “a higher level of protection than its surroundings,” while the IUCN definition uses the word “reserved”. According to the definitions, MPAs could be no-take zones but could also be other levels of protection. IUCN, as a matter of fact, has the Protected Areas Categories System that allows various levels and types of protection for Protected Areas (IUCN

2019) (<https://www.iucn.org/theme/protected-areas/about/protected-area-categories>).

When we follow the CBD definition, the purpose of the establishment of an MPA seems to be the protection of marine biodiversity. Then it would be logical to target marine areas with high biodiversity or with rare and valuable biodiversity for conservation. What kind of marine areas are candidates for the MPA conservation? CBD designates areas called EBSA (Ecologically or Biologically Significant Marine Areas, <https://www.cbd.int/ebsa/about>), and they are logically priority areas for establishing MPAs. While areas meeting the EBSA criteria include high seas, many of them are in coastal waters. This is especially evident in waters around Japan (Figure 1).

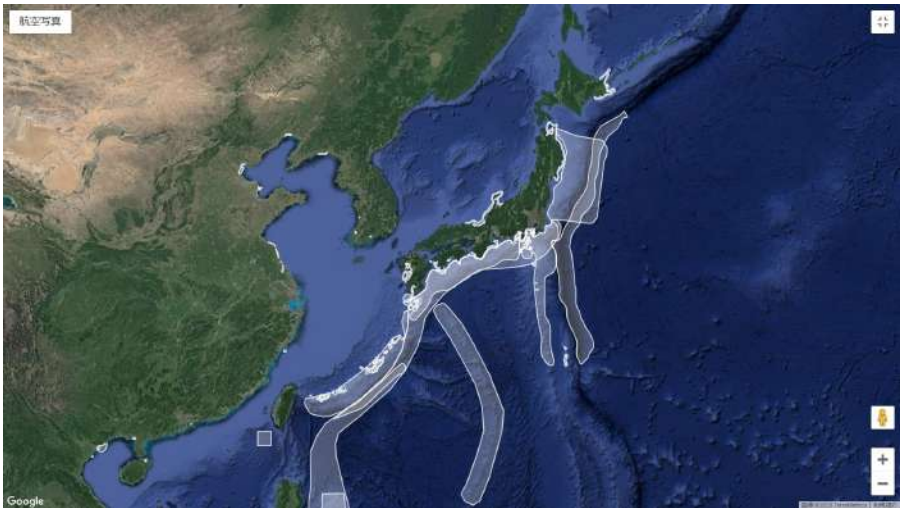


Figure 1. EBSA areas around Japan (<https://www.cbd.int/ebsa/>)

Non-governmental organizations (NGOs) often argue, and the media promotes, that big and permanent no-take MPAs should be established in the high seas (sea areas beyond national jurisdiction) that occupy approximately 50% of Earth surface areas (Southampton Oceanography Centre, International Union for Conservation of Nature and Natural Resources, 2001), thereby protecting untouched nature. Is this logical and scientific? If the real purpose of an MPA is the conservation of marine biodiversity, conservation measures

should be introduced in areas with a high degree of biodiversity, mainly in coastal waters, and they should be tailored to specific characters of an ecosystem and specific threats to the ecosystem. The conservation measures should also be flexible, adaptive, and specific to the local situations, as the marine environment and ecosystem will change and dynamic rather than static. Keywords and concepts for MPAs should be coastal, adaptive, and bottom-up.

There is an argument that MPAs are necessary in order to regulate, or prohibit, high seas fisheries because they damage abundant and pristine biodiversity in the high-seas areas. However, as a general trend, biodiversity decreases from coastal areas to offshore and high seas areas. Furthermore, high seas fisheries are at most 10% of the total fisheries catch from the seas, probably much less than 10%. Most of the fisheries are conducted within EEZs and territorial seas of coastal countries. Of course, this does not mean we don't need to regulate high seas fisheries, or high seas biodiversity is less important. It is very important to regulate fisheries in the high seas areas and conserve the biodiversity of the high seas. However, if the biodiversity as a whole should be conserved and protected, it would be logical and essential to emphasize the consideration of appropriate conservation and management measures within EEZs and territorial seas.

## Contribution of JSSF to MPAs

Then what can we, and should we, do to conserve marine biodiversity within the areas under national jurisdictions of coastal countries? Should we restrict coastal fisheries such as JSSF? Are coastal fisheries damaging marine biodiversity? Rich marine ecosystems and biodiversity in the coastal waters are prerequisites for coastal fisheries to be feasible and prosperous, aren't they? The main threats to the coastal ecosystem and biodiversity have been marine pollution, including land-based one, the disappearance of tidal flats and shallow seagrass areas by reclamation, loss of coastal ecosystems such as coral reefs, climate change, to name a few. In order to protect the marine ecosystem and conserve biodiversity from those threats, we need good

scientific information and local knowledge regarding the target sea areas and ecosystems, the participation of local stakeholders in decision making, effective implementation of conservation and management measures, and monitoring of the effectiveness of the measures. They require comprehensive, adaptive, and bottom-up governance systems.

JSSF has long been conducted in the coastal waters while protecting the marine environment and conserving biodiversity through co-management. JSSF is also based on a traditional system of adaptive, stakeholder participation, bottom-up, and local knowledge-based measures through co-management (Makino 2011). JSSF and MPAs are not in conflict, or they should not be understood as conflicting concepts. There can be scenarios where JSSF contributes to the protection of the marine environment and conservation of biodiversity, thereby achieving both promotions of coastal fisheries such as JSSF and conservation of marine environment and biodiversity. This is an antithesis against the widespread MPA perception; high seas, big, and permanent.

It is already suggested that a post-Aichi Target for MPAs should be 30% coverage, substantially expanded from the current 10% goal. This argument follows the high seas, big, and permanent MPA perception. Again, if the genuine purpose of establishing MPAs is the protection of the marine environment and conservation of biodiversity, they should be mainly cover waters within EEZ and territorial waters to be practically effective. Also, they should be based on the co-management concept of JSSF, not the top-down restriction of fisheries and other human activities but bottom-up establishment/management/monitoring of MPAs. Establishment of Japanese style MPAs, with bottom-up, local knowledge-based, stakeholder inclusive co-management concept, like the JSSF system, would contribute to the MPA goal.

## 43. SSF Guidelines

### Challenges of Japanese Small-Scale Fisheries to Work as a Role Model

**Haruko Yamashita**

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*JF Itoshima in Fukuoka prefecture operates retail store and invites member fishers to bring their products packed, processed and even priced by themselves.*

*Yamashita H. 2019*

*Since SSF Guidelines (SSFG) focus on fisheries in developing countries, many of the recommendations may be considered irrelevant for Japanese small-scale fisheries (JSSF). Nevertheless, JSSF should be reassessed in light of the SSFG. Since Japan has a large small-scale fishery sector, it is worth identifying and improving issues even if they are not serious, and Japanese performance can be used as a benchmark for SSF in developing countries that pursue economic development while preserving their SSF sector. The reason for JSSF to fulfill most of the SSFG recommendations stems from its nature, such as well-organized fisheries cooperative associations (FCAs), de facto entry barriers, fishers' collective power through FCAs, and availability of jobs in and outside the sector. On the other hand, there is room for improvement in such areas as value-adding process, status of women, status of foreign trainees, and risks that threaten JSSF.*

## Introduction

Since the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (FAO 2015: hereafter called SSFG) focuses on fisheries in developing countries, many of the recommendations may be considered irrelevant to Japanese small-scale fisheries (JSSF). Nevertheless, JSSF should be reassessed in light of SSFG. One reason is that Japan has a large SSF sector, normally categorized as coastal fishery, and JSSF plays a significant role both in terms of volume of production—0.97 million tons, or 22% of total production (MAFF 2020)—and number of self-operated coastal fishers—89 thousand, or 97% of total fishers (MAFF 2018). This is unique for a developed country, since the fishery sectors in developed countries are typically operated off-shore and deep-sea, and coastal lines are dedicated to large-scale aquaculture. Therefore, Japan's performance with respect to SSFG will serve as a benchmark for SSF in developing countries that pursue economic development while preserving

their SSF sector. Another reason for reassessment is that an opportunity can be taken to reflect on the fishery sector and take action to improve JSSF if JSSF does not fulfill the recommendations. When difficulties are overcome, JSSF will work as a perfect role model of the SSFG. It should be noted that JSSF in this chapter only refers to marine fishery, as inland fishery production is too small (27 thousand tons) to be significant for this discussion. In this chapter I first briefly introduce the SSFG. Then, I explain the structure of JSSF, which enables it to be in accordance with SSFG. Lastly, I indicate four points where JSSF does not fulfill SSFG.

## Outline of SSFG

SSFG is a compact, 44-page document consisting of a Forward and a Preface, followed by three parts. In the Preface, it states that “*the document is developed as a complement to the 1995 FAO Code of Conduct for Responsible Fisheries* (italics indicate direct quotes from the SSFG). The SSFG support the visibility, recognition and enhancement of the already important role of small-scale fisheries and to contribute to global and national efforts towards the eradication of hunger and poverty (FAO, 2015). In addition, the Preface states that SSFG are “voluntary, global in scope and with a focus on the needs of developing countries”.

The main texts in the SSFG are organized as follows. “Part 1: Introduction” briefly illustrates the objective, nature and scope, guiding principles and relationship with other international instruments. “Part 2: Responsible Fisheries and Sustainable Development” is the main part of the report, dealing with five subjects that are shown in the following table. “Part 3: Ensuring and Enabling Environment and Supporting Implementation” provides recommendations on the following four points: “policy coherence, institutional coordination, and collaboration; information, research, and communication; capacity development; and implementation support and monitoring.”



## Characteristics of JSSF

In my view, one reason for JSSF to fulfill most of the SSFG recommendations stems from the four structural characteristics of JSSF. First, JSSF is organized into fisheries cooperative associations (FCAs), and all coastal fisher families are members of one FCA or another. Second, conditions to be a member of an FCA are strict, as a fisher should live in the local coastal area and operate their fishery more than 90 days per year. Since a new entrant from outside the region cannot fulfill these conditions, the rule works as a *de facto* entry barrier. Third, because of these structures, FCAs hold collective power over government and other marine-related industries. Therefore, coastal fishers are not vulnerable or marginalized, unlike the SSF characterized in the SSFG. Fourth, many job opportunities are available in and outside the fishery sector, and all workers possess freedom of movement and choice of work. Based on these characteristics, I will examine the applicability of JSSF to SSFG according to the five SSFG recommendations listed in Part 2, the main section of SSFG. Table 1 below gives a comprehensive display of how JSSF does and does not meet SSFG requirements.

### Well-organized FCAs

JSSF has 943 coastal FCAs that are unified into prefectural units of FCAs under a centralized national FCA organization called JF (JF 2020). Therefore, SSFG recommendation 5.17 (see Table) is fulfilled. TURFs or fishing rights in the coastal area are managed by the local FCA, entrusted by the prefectural government (5.1). Local and prefectural FCAs negotiate with marine-related industries on behalf of their members in advance of large projects (5.10), and they can refuse or agree to coastal area use depending on the degree of negative impact on fishing activities and the amount of monetary compensation.

Section numbers	Selected clauses of SSF Guidelines in abbreviated form	Status of JSSF
<b>5.1-20</b>	<b>Governance of tenure in SSF and resource management</b>	
5.1	SSF communities have secure tenure rights to the resources	Done
5.3	Special attention is paid to women with respect to tenure rights	Not yet
5.5	SSF conserves and co-manages local aquatic ecosystems	Done
5.10	Consider impacts of large-scale development projects on SSF	Done
5.13	Adopt measures for long-term conservation of fisheries resources	Done
5.16	Establish monitoring, control, and surveillance systems	Done
5.17	SSFs are represented by professional associations	Done
<b>6.1-18</b>	<b>Social development, employment, and decent work</b>	
6.3	Promote social security protection for workers in SSF	Done
6.4	Access to savings, credit, and insurance schemes	Done
6.5	Recognize SSF's value chain and part-timers as professional	Not yet
6.7	Meet national and international human rights standards	Not yet
6.8	Develop complementary and alternative income generation	Not yet
6.14	Respect youths' career choices	Done
6.16	Safety-at-sea issues consistent with FAO, ILO, and IMO	Not yet
<b>7.1-10</b>	<b>Value chains, post-harvest, and trade</b>	
7.1	Recognize unequal power among value-chain actors	Not yet
7.3	Develop capacity to produce high-quality and safe fishery products	Not yet
<b>8.1-4</b>	<b>Gender equality</b>	
8.1	Challenge practices that are discriminatory against women	Not yet
<b>9.1-9</b>	<b>Disaster risks and climate change</b>	
9.1	Combating climate change requires urgent action	Not yet
9.7	Emergency response and disaster preparedness	Done

*Table 1. Correspondence of JSSF to SSFG. Note: Section numbers and selected clauses are quoted from FAO SSFG (2015). The status of JSSF is judged by the author.*

Social security policies, such as medical insurance and retiree pensions, are applied to fishers as well as all citizens (6.3), although many fishers are reluctant to pay pension fees (Otani 2015). JF operates its own financial institution called Shingyoren, where individual fishers' sales at an FCA's auction market are deposited. Shingyoren also provides loans with low-interest rates for fishery-related investments and livelihood-related expenditures. A government-subsidized income insurance policy called Tsumitate-Plus mitigates income fluctuation by refunding income deficit (6.4).

## De facto entry barriers

Although it is typically not good to limit entry into any industry, in the case of the coastal fishery, such barriers to entry are accepted in order to protect local marine resources at a sustainable level. As a result, fishers in the common fishing grounds are limited and known to each other. JSSF practices autonomous fishery management, currently known as Community-Based Fishery Management, or CBFM (5.5). Fishers are incentivized to pursue long-term utilization of the common resources (5.13) by making and agreeing on their own rules in terms of fishing methods and off seasons, and monitoring if the rules are followed (5.16). It should be noted that the amount of catch has been decreasing for decades, despite fishers' effort through CBFM. Self-imposed input controls may not be enough to sustain the resources. Therefore, output control like TAC (total allowable catch) was introduced in 1997 for eight types of fish, and an IQ (individual quota) system will be implemented to cover 80% of commercial fishing, according to the amended fishery law that will go into effect in 2020.

## Collective power over the industry and the government

Because of the aforementioned structural characteristics, JSSF possesses a certain collective power over marine-related industries to withdraw their development plans (5.10) and over the government to subsidize income insurance (6.3 & 6.4). Additionally, in the case of natural disasters, central and local governments make restoration plans and subsidize most of the reconstruction cost of damaged facilities (9.7). However, increasing disasters such as typhoons, heavy rains, and high tides attack facilities that were newly rebuilt after the Great East Japan Earthquake and Tsunami in 2011, and restoration seems to be an endless effort.

## Job opportunities within and outside the industry

It seems that abundant job opportunities, or shortage of labor, is one of the unique characteristics of Japan. Despite the fact that the Japanese GDP growth rate has been at most 2% per year for the last two decades, the unemployment rate has remained lower than 5%, except in a few severe years before and after 2000. The minimum wage applies to all workers. Sons and daughters of fisher families take advantage of the freedom of choice of work, and they often opt out of the fishery sector (6.14). As a result, only 17% of fishery households have a successor (Fishery Agency 2020), and many invite foreign trainees to compensate for the lack of labor force. The average income of a JSSF household is low, at about 2.2 million yen per year (Fishery Agency 2020), or 40% of the average household income of employed workers. This can give the impression that JSSF is driven to a vulnerable, marginal position. However, this average is somewhat tricky, as 38% of JSSF fishers are over age 65 (MAFF 2018); elderly fishers work at their own pace while receiving pensions, so their income is low. This brings down the average to a lower figure than what is truly representative of income in the industry.

## JSSF challenges under SSFG

The rest of this chapter is devoted to the negative aspects of JSSF, which can also be seen in the Table. Though none of these issues are very serious, there is certainly room for improvement in order for JSSF to become a perfect role model of the SSFG. The issues can be categorized into four topics: processing and value chain, the role of women, the status of foreign trainees, and risks that threaten JSSF. It is worth mentioning that the fisher's revenue, as a share of the retail price of fish, is 32% (Fishery Agency 2020); in other words, 63% is taken by the wholesale and retail sectors. Fishers always complain that they cannot decide the selling price of fish and that middlemen depress fish prices when they purchase through auction (7.1). In order to overcome this inequality, the Fishery Agency suggests that fishers add value by undertaking processing and sales themselves. The photo shown in this chapter is a successful example.

Such an extension of fishers' activities can be recognized as alternative income generation (6.8); however, fishers always struggle due to shortage of labor, unstable fish supplies, and little monetary compensation compared to the effort spent.

JSSF falls behind some developing countries in terms of verifying the responsibility, either by obtaining a Marine Stewardship Council (MSC) certificate or by obtaining the MSC-equivalent Japanese certificate MEL-J. Obtaining a Hazard Analysis and Critical Control Point (HACCP) certificate is the same (7.3). Research results show that it is too costly, while the price premium is too low (Wakamatsu 2017), because the scale of JSSF is too small to achieve an economy of scale. Two different issues affect the role of women in JSSF. One is the issue of FCA membership status and the associated position in the community. In many cases, FCA membership is given to one member per household. The male fisher is primarily registered as a member (5.3), although their wives normally take on pre- and post-harvest tasks, including processing and sales, and some go fishing to assist their husbands. Otherwise, the wives work part-time in local processing firms. The work of fishers' wives should be reassessed and properly appreciated for being essential and professional tasks (8.1).

Another issue is the status of women who are not wives of fishers. Even though the fishing sector is seeking labor, women have not been regarded as candidates except as Ama, shellfish-picking divers (8.1). However, progress has been made. In the annual events to recruit unexperienced young people to become a fisher—called the Gyogyo Shugyo Shien Fairs—the question “Can women apply?” was the first to appear in the questionnaire for employer recruiting conditions in 2019. In terms of foreigners, the fishing sector has accepted foreign trainees, and a new law allows foreign workers starting in 2019. As far as wages, the Japanese minimum wage applies to foreign trainees, and it fulfills human rights standards (6.7). However, some issues persist. For instance, trainees cannot be accompanied by their families, they cannot work more than three years, they cannot change jobs, and they must take out expensive loans for language lessons, visa documentations, and flights before work even start (Hurights Osaka 2020). JSSF may need to pay more attention

to women and foreign workers.

Lastly, I would like to mention that certain risks threaten JSSF. One is safety at sea (6.16): the Japanese sea faces risks like potential unnoticed missile attacks from a neighboring country. Another issue is climate change (9.1). One of the reasons for the rapid decrease of fish resources like squid and saury is the increase in ocean temperatures (Fishery Agency 2020). Global warming and the associated rise in temperature threatens fish and other marine resources in the middle to high latitudes. JSSF does not have any tools to mitigate or combat this kind of threat, in addition to the increasing natural disasters.

## 44. The 2030 Agenda for Sustainable Development

### **Interlinkages between the Sustainable Development Goals and Japanese Small-Scale Fisheries**

***Irianna Vlachopoulou***

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*Ousatsu fishing port, Mie Prefecture, Japan, I. Vlachopoulou, 2015*

*The modus operandi of Japanese small-scale fisheries (JSSF) and the mentality behind it, particularly in the case of satoumi, provide numerous benefits not only for the users of the fisheries, but also for the local communities, the environment, as well as other stakeholder groups. JSSF offer sustenance, employment opportunities, ecosystem services, and importantly, educational opportunities on resource management, among other advantages. These benefits, when examined through the lens of the 2030 Agenda for Sustainable Development, indicate the significant contributions of JSSF to sustainable development, through engagement towards a wide range of societal goals, reaching almost all 17 Sustainable Development Goals of the 2030 Agenda. Nevertheless, existing, as well as additional utilization of new technologies can increase significantly the capacity of JSSF to contribute further to the achievement of the 2030 Agenda.*

## Introduction

Japanese Small-Scale Fisheries (JSSF) constitute a distinctive case in global fisheries management due to the uniqueness of the way they formed and have been evolving to modern times. For centuries, the formulation of local fisheries associations (Fisheries Cooperative Associations – FCAs) into formal entities happened organically, in response to local institutional requirements, namely the traditional rights of common use (*iriai*), and has been greatly encouraged and is supported to this day by governmental entities, like the Japan Fisheries and Research Agency through the provision of technical assistance, information and formal consultations, among others (Makino 2011, 2017, Lim et al. 1995). This is not to say that the governing regimes have remained unaltered all this time. On the contrary, along with the FCAs (and their preceding structures), the governance has shifted significantly, taking even a very centralized form during the Meiji Restoration period



(1868–1953). Nevertheless, a centrally-supported local self-organization scheme seems to be the most relevant to the reality of JSSF, as it has been the most prevalent regime throughout Japanese history, including the present. Self-organization and local management are the most essential aspects in the ways FCAs operate and organize themselves; the concept of “resource management by the resource users themselves” (Makino 2017: p. 22), namely the fishers being the main actors and the main decision-makers in a fishery, is the cornerstone of the structure of JSSF (Makino 2010).

A very common similarity observed among the various JSSF is the adoption of a holistic approach to management based on the idea of *satoumi*, which are “coastal landscapes that have been formed and maintained by prolonged interaction between humans and ecosystems” (Matsuda 2010). The key concept in the *satoumi* framework is the interaction between human activity and ecosystem management (UNU-IAS 2011); prolonged human activity within the coastal ecosystems often results in higher biodiversity and productivity. In this narrative, the notion that if the relationship between human activity and ecosystems is properly managed, then the relationship is mutually beneficial, is the most essential aspect and affects national policy-making significantly (Japan Satoyama Satoumi Assessment, 2010).

## The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals

In late 2015, the 2030 Agenda for Sustainable Development (2030 Agenda) was unanimously adopted by the General Assembly of the United Nations with the objective to act as a roadmap and a destination for the future humankind wants for its planet: a more equal, sustainable and prosperous Earth to be inherited by future generations. The 17 goals included in the 2030 Agenda targeted the most pressing issues of today’s global society, from elimination of poverty and promotion of global health to prosperous natural environment to achievement of world peace, equality, and cooperation (United Nations 2015).

The 17 Sustainable Development Goals (SDGs) have become a universally

recognizable brand and the ideas behind them are widely adopted across the globe. Yet, the SDGs constitute a very high-level set of global values and by themselves cannot be implemented through concrete actions and initiatives. For that reason, 169 targets have been identified and adopted by the 2030 Agenda. These targets indicate the specific aspects of the respective SDG that should make up the objectives of policymaking aiming towards the achievement of the SDG. Each of these targets comes with a set of indicators (one or more), which constitute the means of monitoring the progress made towards the achievement of the targets, and, consequently, the SDGs. Currently 232 indicators are recognized under the SDG framework and they are re-evaluated at regular intervals to ensure their relevance.

Even though the 193 Member States that make up the UN General Assembly decided that the 17 SDGs are the ultimate objectives that every nation should be striving towards, the actual implementation plans were subdelegated to the national level (United Nations 2019). Ever since, each Member State has developed their own strategy to translate the high-level SDG framework into a day-to-day, reportable reality for national policymaking and consequently, its citizens. Nevertheless, in many cases, human activity preceding the adoption of the SDG framework and the relevant implementation strategies, was already contributing to the goals and continues to do so, quite often without the existence of a clear feedback circle between the actors and the policymakers in charge of the national SDG implementation strategy.

## SDGs and JSSF

This pre-existing linkage between the SDGs and human activity is evident in the case of the JSSF. Apart from the obvious contribution of JSSF to the eradication of hunger and poverty as a significant source of income for local communities, as well as food at the local, regional and occasionally even the international level, JSSF contribute to a range of other SDGs and their targets. For example, as Mizuta and Vlachopoulou (2017) note, the central ideas of *satoumi* can be identified within at least three different SDGs, all linking back to and impacting upon the main pillar of Life Below Water

(SDG14) where *satoumi* as a whole would intuitively fall under, considering its main scope of sustainable use of marine resources. The focal point of the framework, namely the community of users, adopts under the *satoumi* lens a sustainability-oriented approach to local development (SDG11: Sustainable Cities and Communities), through inclusive employment opportunities for its members (SDG8: Decent Work and Economic Growth) and the promotion of sustainable production methods, as well as consumption of local produce (SDG12: Responsible Consumption and Production).

It is important to note, however, that in order to understand better the actual contributions of JSSF to the 2030 Agenda, the examination and interpretation of the various contributions cannot be limited to the SDG level. Local policymaking exhibits many more specific interlinkages with the SDG framework if examined at the SDG target level. The targets have, after all, been designed to guide policymaking and trigger case-specific initiatives and actions. Nevertheless, having to explore policies that predate the framework means that we need to run a matching exercise between the objectives of the targets and the various JSSF activities that have been initiated independently of the SDG framework. Running such an exercise showcases that JSSF contribute to many targets seemingly unrelated to the obviously relevant SDGs – namely SDG2: Zero Hunger and SDG14: Life Below Water.

Taking the earlier example of *satoumi* as a whole, research has shown that *satoumi* arrangements contribute to SDGs 8, 11, and 12. If we examine specific JSSF examples operating within the *satoumi* framework and compare them with the targets, we can explore the range of direct contributions; we can take for example, activities that address targets under SDG4 (Quality Education). Target 4.4 requires “[b]y 2030, [to] substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship” (United Nations, 2015). The Rausu FCA, operating in Hokkaido prefecture, has been passing down from generation to generation the traditional fishing skills and gear, particularly local knowledge of the fishery and the territory. Operating on this base, they have been developing adaptive management strategies (gear rotation; target species reallocation) to cope with perceived changes in the system. They have

been supporting the adoption of such measures by the members of the FCA through the provision of vocational training and transitional assistance to make the adoption of new gear and activities as widespread as possible, while fulfilling the original objective of resource conservation (Vlachopoulou and Makino 2017).

In similar fashion, target 6.6 calls for “protect[ion] and restor[ation of] water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes” and members of JSSF like Omura Bay, in Nagasaki Prefecture, and Kesenuma, Miyagi Prefecture, partake in traditional conservation and restoration activities, including replanting seagrass beds (Hidaka 2018) or even initiating reforestation activities, as local knowledge indicates an intricate relation between healthy terrestrial and marine ecosystems within the same geographical location (Vlachopoulou and Mizuta 2018). Multiple other targets receive contributions from the various JSSF, either individually or in general. Another illustrative example would be target 17.16, which calls for “[e]nhance[ment of] the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries”. Knowledge relevant to the implementation of adaptive management under the *satoumi* framework accumulated in JSSF constitutes an invaluable source of know-how that can be adopted by developing countries, adjusted to their respective circumstances. Toolboxes created for JSSF have already been tested in South-East Asian countries, allowing them access to benefits from tailor-made adaptive management (Makino and Perry 2017). This exchange of experience and expertise aligns perfectly with the need for flow of knowledge and information from developed to developing countries.

## New technologies

An important aspect of the process towards the achievement of the SDGs is the adoption of new technologies. Many of the targets mention some explicitly, not only in terms of monitoring the progress towards sustainable development, but also their direct contributions to the achievement of the goals (e.g. SDG14). In order to highlight the importance of new technologies for sustainable development, the Secretary General of the United Nations issued, in 2018, the Strategy on New Technologies to foster the adoption of new technologies also through initiatives originating from the UN system itself.

Following the example of the Shiretoko JSSF, where extensive data collection takes place through the fishery itself, with data flowing from the fishers to the research community and vice versa (Makino 2017), we can safely conclude that JSSF could benefit significantly from enhanced processes for extensive data collection not only for the management of each individual fishery, but also for monitoring JSSF contributions to the SDGs overall. Data scarcity is a common problem in small-scale fisheries globally (Gill et al. 2019), with many fisheries having too fragmented, quite often temporally, datasets and suffering from non-inclusive data collection processes. The adoption of new technologies, especially space-based ones, can provide solutions complementary to traditional approaches to this problem. Space technologies can offer significant management tools, particularly for monitoring of fish stock status and environmental conditions, but also to provide insight on the use of the fishery through mapping of local knowledge of the resource and individual fishing routes and activities for example (Sakita 2016). Furthermore, space technologies can be used to enable data collection at the fishery level; the data could then be fed back to research and from there to the relevant statistical authorities responsible for national reporting on the progress towards the achievement of the SDGs.

Such an approach would enhance the existing adaptive capacity of JSSF for adaptive management, while fostering legitimacy of community-based management with vigorous monitoring of the resources and the environmental conditions of the fishery. At the same time, the data collected can be used for

research, as well as reporting on the progress made towards the achievement of the SDGs.

## Conclusions

The extensive contributions of JSSF across the SDG framework reinforce not only the understanding of the 2030 Agenda as a collection of interlinked global priorities, but also the interpretation of JSSF as a holistic approach to fisheries management with significant spill-over effects in multiple pivotal aspects of society. The various impacts of JSSF appear to positively affect all three pillars of sustainability, namely society, the environment and the economy, making their contribution to the achievement of sustainable development an inherent characteristic of their functionality. With less than ten years left to achieve the SDGs, the need for innovative and inclusive action is more urgent than ever. In light of this, the Secretary-General of the United Nations declared the Decade for Actions, calling for the mobilization of all levels of society, encouraging particularly local action and people action. The current contributions of JSSF towards the achievement of the SDGs, coupled with their potential for innovative approaches to management, especially through the adoption of new technologies, highlight the relevance of JSSF as strong actors in the context of the Decade of Action. With strong local initiatives and heavily involved stakeholder groups, JSSF constitute a global best practice case of local resource management for sustainable development.

## Disclaimer

The views expressed herein are those of the author and do not necessarily reflect the views of the United Nations and of its Office for Outer Space Affairs.

## 45. Transdisciplinarity approach

**A Co-Design, Co-Production and Co-Delivery Process Driven by  
Small-Scale Fishers**

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*Coral restoration by Onna Village Fishery Cooperative in Okinawa promoting  
collaboration of various scientists and stakeholders, T Sato, 2013*

*Transdisciplinary approach is consisted of three elements: co-design of research agenda to visualize societal and academic challenges, co-production of integrated knowledge to provide visions and way forwards for solutions, and co-delivery of actions and applications to tackle with these challenges. Throughout this process, diverse stakeholders (including scientists/experts) experience collective thinking and actions to stimulate mutual learning and adaptive improvement of knowledge and actions to cope with uncertainty and unpredictability of complex social-ecological systems. Two case examples of transdisciplinary processes led by small-scale fishers in Okinawa and Hokkaido, Japan, revealed that these processes were effectively initiated and promoted by the small-scale fishers themselves, while scientists, government agencies and other actors were playing supportive roles. Functions of leading roles of small-scale fishers in the transdisciplinary processes are discussed in the light of importance of their livelihood-based knowledge and skills to support establishment of networks and collective actions among diverse actors.*

## Transdisciplinary approach

Small-scale fishers and other stakeholders associated in fishing industries in Japan, as well as in the world, are facing various challenges in sustainable management of fisheries resources and ecosystems supporting them, with complex interlinkages to management of fishing efforts and pressures on the sea, and effective processing, profitable marketing and fair and equitable supply chain of the products on land (Makino and Tajima 2018). These challenges are extremely complex in structure, with diverse trade-offs and synergies associated with interventions by various relevant actors in the society. Such complex social-ecological systems are difficult to understand and manage based on conventional science driven by curiosity of discipline-



based scientists/expert, nor solely through experience-based measures of individual actors, such as fishers themselves. Issue-driven and solution-oriented integration of diverse knowledge sets of different stakeholders (including scientists) are required to tackle with these complex and ‘wicked’ challenges associated with small-scale fisheries. As the future of the resources, well-being of fishers and the trends of related industries are extremely difficult to predict due to scientific uncertainties associated with complex social-ecological systems, adaptive management/governance and collective learning processes with full participation of diverse stakeholders are essential to mobilize dynamic actions toward more sustainable and equitable futures (Sato et al. 2018). Therefore, I have been strongly advocating importance of transdisciplinary approaches based on partnership among diverse stakeholders in the consecutive two research projects in which I took a responsibility as the principal investigator: “Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge (ILEK project)” supported by RIHN, Kyoto, Japan (2012–2017), and “Transdisciplinary Study of Natural Resource Management under Poverty Conditions Collaborating with Vulnerable Sectors (TD-VULS project)” supported by JST-RISTEX (2017–2020). In these two research projects, I endeavored to establish equal partnership in terms of knowledge production processes with extremely diverse stakeholders/actors including small-scale fishers and traders.

Transdisciplinary approach is composed of the following three elements: co-design of research agenda, co-production of knowledge, and co-delivery of collective actions and applications (Mauser et al. 2013). All these elements are supported by collective thinking and actions by a wide range of stakeholders including scientists. Co-design plays major roles in visualizing societal as well as academic challenges and collaborative design of transdisciplinary and solution-oriented research and actions. In the process of co-production of knowledge, all participating stakeholders/actors are expected to experience mutual interaction and learning in the process of exploring visions and approaches toward potential solutions, resulting in adaptive integration of diverse knowledge sets to co-produce and share the integrated knowledge sets which we termed Integrated Local Environmental Knowledge (ILEK, Sato

et al. 2018). Such integrated knowledge sets provide diverse stakeholders with legitimate bases for collective actions toward solutions. Note, however, that this is not a linear and stepwise process starting from co-design to proceed to collective actions. We can begin with any of these three elements and going through the learning processes driven by the feedbacks from other elements. For example, we may begin with designing and implementing collective actions for sustainable management of fisheries resources using existing knowledge bases, and we move into co-design of the research agenda toward solutions of challenges visualized or broadened through the initial actions. Then we may try to co-produce integrated knowledge to design a new resource management measure or improve existing ones. The range and diversity of participating scientists and stakeholders may also change dynamically throughout the process. We may begin with participation of a small range of scientists from a few disciplines, say, fisheries scientists and marine ecologists, and limited number of stakeholders outside academia, for examples a few fisheries cooperatives. The numbers and diversities of participants may also increase, or sometimes fluctuate in the subsequent processes. We may try to incorporate more (or less) research disciplines such as sociology, economy and cultural studies, and types of stakeholders/actors including actors in supply chains and consumers. Such a dynamic and flexible feature is the most important aspect of the transdisciplinary approach to mobilize adaptive processes and mutual learning to cope with uncertainty and unpredictability associated with complex social-ecological systems. With these dynamic interactions among diverse scientists and other stakeholders to tackle with complex real-world challenges, the transdisciplinary approaches create ample opportunities of interactions between academic and societal processes moving on in parallel, resulting in producing academic and societal impacts simultaneously (Lang et al. 2012).

## Small-scale fishers as the key actors

Together with dedicated members of the two previous research projects including scientists from diverse research domains and creative practitioners from various societal sectors outside academia, we have been successful in accumulating case examples of transdisciplinary processes emerging in various communities in Japan and in the world. Taking a close look at the processes and mechanisms behind these examples made me convince that the most significant actors to mobilize the transdisciplinary processes were the small-scale fishers, farmers and foresters utilizing natural resources. They are not simply dependent on indispensable natural resources, but at the same time important care takers of the resources and supporting ecosystems. I was truly astonished by recognizing many creative and innovative collective actions initiated by small-scale fishers and other grass-roots actors in coastal communities to manage, improve or restore fisheries resources and supporting ecosystems through the transdisciplinary approach inviting collaborations of diverse stakeholders/actors. In many examples, professional scientists and government agencies were not leading actors of the transdisciplinary processes, but rather attracted by creative and innovative features of the actions initiated by small-scale fishers, which stimulated their scientific or political curiosities to participate and collaborate. Therefore, it seemed obvious for me that small-scale fishers should be regarded as the major actor to lead transdisciplinary processes and collective actions to achieve sustainability of resources and to improve well-being of people. Here, I try to convince the readers that my initial impressions were right, based on two case examples of transdisciplinary processes promoted by small-scale fishers in Japan.

## Coral restoration of Onna Village Fishery Cooperative

Onna Village Fishery Cooperative in the west coast of Okinawa Island has about 290 members of small-scale fishers mainly engaging in Mozuku seaweed (*Nemacystus decipiens*) aquaculture in shallow waters. They were the first

developer of aquaculture techniques of the species in 1970s. In this sense, they have been the producers of knowledge and skills regarding important fisheries resources supporting their livelihood. The cooperative and fishers have long been aware of importance of coral reefs offshore of the Mozuku farming grounds as a source of nutrients for the seaweed. However, the corals along the coast had been deteriorated by outbreaks of a coral predator and massive breaching in 1998 and 2001. The cooperative made extensive efforts to mitigate the damages in collaboration with local governments and tourism industries, and successfully established stakeholder networks for ecosystem management, which stimulated sociological analyses of the importance of initiatives driven by fishers themselves (Yanaka 2018). The cooperative dynamically moved forward to launch the program to develop their original aquaculture technologies of reef-building corals in 1999, applying accumulation of aquaculture experiences of important fishery species including Mozuku, and this effort eventually attracted attentions of coral scientists (Higa and Omori 2014). The coral aquaculture attempts have made a significant success, with the world largest scale of coral reef restorations and mass-spawning of artificially planted corals in natural waters (Zayasu and Shinzato 2016). Molecular biologists are actively engaged in evaluating impacts of coral restoration by the cooperative from the viewpoint of genetic diversities (Zayasu et al. 2018). The coral planting activities using cultured corals have engaged tourists, consumer cooperatives, diving industries, Mozuku processing/marketing companies and other business sectors in Japan to provide diverse stakeholders with opportunities of participation to revitalize local social-ecological systems through various channels. The coral restoration led by small-scale fishers of the fisheries cooperative are playing catalytic roles to mobilize broader scale transdisciplinary processes incorporating scientists from various research disciplines and broader scale stakeholders across the nation.

## Watershed Restoration by Nijibetsu Kor Kamuy Society

In the Nishibetsu River Watershed in the eastern part of Hokkaido, a local voluntary organization called Nijibetsu Kor Kamuy Society has been mobilizing various community actions to restore natural environment along the Nishibetsu River Watershed covering three towns (Teshikaga, Shibecha and Betsukai) to sustain dairy industries in the upper and middle reaches and coastal fisheries along the river mouth. Their goals are to secure a long-term sustainability of these key industries through restoration of habitats of Blakiston's fish owl, an endangered owl species endemic to Hokkaido and adjacent areas, as an environmental icon of riverine and terrestrial environment. The Society has been led by two leaders: the director who are now retired, with a long carrier of municipal government officer in charge of river management, and the secretary general who is a small-scale salmon setnet fisher in Betsukai Town near the river mouth and the owner of a small aquaculture facility of Donaldson Trout at the headwater of a tributary of Nishibetsu River. Blakiston's fish owl requires healthy riparian forest as nesting sites and fishes in the river as food resources. Therefore, the society made a series of efforts for the past 25 years to plant trees along the river to restore forests as the nesting sites of the owl, to install hand-made nest boxes for the owl using recycle materials from dairy industries, and to improve fish habitats in the river by protecting water crowfoot colonies in the water. These efforts have resulted in a total of ca. 80,000 tree seedlings planted along the river and about 30 chicks of the owl fledged from their nesting boxes (Kitamura et al. 2018). Their recent dynamic development of restoration activities of water crowfoot, an aquatic plant symbolizing clear water and providing salmon juveniles with suitable habitats, has started because the plant was decreasing due to feeding pressure by Sika deer in winter. A scientist of plant ecology has been collaborating with the Society to support the restoration activities. The Society has been successful in engaging diverse stakeholders including municipal governments from three towns, dairy farmers, coastal fishers and scientists/experts from various disciplines including myself, to contribute to their actions from different angles. These people are probably attracted to the

Society because of the two leaders' clear and consistent visions of future of the watershed addressing importance of sustainable dairy and fishery industries supported by watershed environment which is essential for survival of the owl and well-being of the people (Kitamura et al. 2018). The secretary general, the salmon fisher, has been providing various livelihood-rooted knowledge and skills, which have played critical roles in establishing intellectual bases of restoration activities at watershed scale and providing practical skills to diverse collective actions (Kitamura and Ohashi 2018). He had a long-term experience on planting trees from his childhood guided by the vision of his father, who was also a fisher, that riparian forests are critically important to maintain healthy coastal environment and fisheries resources. He has a wide range of knowledge about freshwater ecosystems and aquaculture of salmonid fishes. His farm is located at the headwater of the river in the feeding area of the owl parents reproducing in the nest boxes installed by the Society. The farm has functioned as feeding ground for the owl parents as he opens a part of the ponds free for feeding by the owls. His techniques of managing set nets in the sea have been used to develop protective nets for water crowfoot from feeding by the deer. He has been working hard with the director who has strong ties with the municipal governments to mobilize collective actions involving all towns in the watershed across jurisdictions. The knowledge and skills deeply rooted to livelihoods and experiences of these leaders have played significant roles in mobilizing transdisciplinary processes at the watershed scale toward sustainable environments and industries.

## Conclusion

Based on these stories of two case examples, I think it is reasonable to conclude that small-scale fishers have a huge potential to initiate and lead the transdisciplinary approaches by promoting collaborative interactions and collective actions among diverse stakeholders including scientists. Integrated knowledge sets are produced in this process, which include understanding the challenges (systems knowledge), future visions of the environment and human life of the region (target knowledge) and indispensable skills and

institutions to move toward the vision (transformation knowledge, Wiek and Lang 2016). I feel happy and deeply honored that I have been a part of such transdisciplinary processes with these innovative practitioners and have learnt a lot from them to fuel my research. Basic principles of transdisciplinary approach partnering with small-scale fishers and other stakeholders will certainly be maintained in the forth-coming 5 years research and development project in Malawi starting 2020: “Establishment of a Sustainable Community Development Model based on Integrated Natural Resource Management Systems in Lake Malawi National Park” by the SATREPS program supported by JICA and JST.

## 46. The Role of NGOs

### **Catalyzing Innovation and Partnership for Forging Sustainable Small-Scale Fisheries**

***Masanori Kobayashi***

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*Men walking in the sea water trying to catch fish with a throwing fishing net in Pohnpei, Federal State of Micronesia. Kobayashi, M. 2018*



*Sustainable small-scale fisheries (SSF) are an important component of Sustainable Development Goal (SDG) 14 that addresses life under water. To achieve sustainable SSF, it requires an interdisciplinary approach and cross-sectoral partnership. As an independent non-profit policy research institute, OPRI-SPF actively participates in policy dialogues, science research and field actions. The high-level policy discourse at the global level provides an important policy framework. It needs to be translated into concrete policies and measures at the national and local level. Countries and communities have common challenges while the solutions need to be tailored to meet the local socio-economic and topographic conditions. It is also deemed useful to pursue co-benefits and innovation in promoting sustainable small-scale fisheries. The enhanced science, policy and field action nexus supported by international partnership appears to be important in effectively achieving SDGs. Actions driven through these approaches will help creating policy and institutional framework conducive to achieving sustainable SSF.*

## Multifaceted actions for fostering a sustainable blue economy

Does the old man catch the fish for food, money or the proof of his worth? A boy in *The Old Man and the Sea* by Earnest Hemingway wanted to know it. To explore policies for promoting sustainable small-scale fisheries (SSF), it is important to know the reason why fishers catch fish in their way. We need to know their mind-set, behaviors, surrounding conditions, the impacts of their work, and their views thereon. Technology, governance and people's mindset all need to amalgamate to achieve sustainability (Crocker and Lehmann 2013 and Wamsler and Brink 2018). World leaders have recognized sustainable fisheries as a pivotal pillar of the Sustainable Development Goals (SDGs) by underling it in SDG14 that addresses "Life under water" (UN 2015a). SDG14.b,

for instance, calls for actions to provide access for small-scale artisanal fishers to marine resources and markets. Sustainable SSF continue to remain as a priority policy agenda item. Sustainable SSF is designated as one of the eight themes for the interactive dialogues at the Second United Nations Ocean Conference scheduled to take place in Lisbon, Portugal in June 2020 (UN 2020). The importance of SSF to local economy, food security and nutrient provision is also emphasized in the report of the High Level Panel for a Sustainable Ocean Economy (HLP-SOE 2019).

Yet, SSF face various mounting challenges posed by fish stock depletion, coastal and marine ecosystem degradation, sea water warming, acidification, deoxygenation, and increasing heavy storms. Fishers alone cannot resolve such challenges. Multi-stakeholder collaboration and an interdisciplinary approach are indispensable in order to catalyze innovation and partnership towards achieving sustainable SSF. The Ocean Policy Research Institute of the Sasakawa Peace Foundation (OPRI-SPF) based in Tokyo, Japan, an independent non-governmental and non-profit ocean policy research institute, facilitates policy research, multi-stakeholder policy dialogues and field actions towards achieving sustainable development through the conservation and sustainable use of marine and coastal resources. OPRI-SPF is actively engaged in various global, regional and national policy dialogue on ocean governance and marine resource management as a member of various prominent bodies including the Advisory Network of the High Level Panel for a Sustainable Ocean Economy launched as an initiative by the Government of Norway. Prime Minister Erna Solberg of Norway and President Tommy Remengesau Jr. of Palau act as co-chairs of the High Level Panel and Prime Minister Shinzo Abe of Japan acts as its member (HLP-SOE n/d). OPRI-SPF strives to work in the various domains from high level and multi-stakeholder policy dialogues, interdisciplinary science research and field actions with the view to promoting a sustainable ocean economy or blue economy where sustainable SSF is a vital component.

## Taking a lead in multi-stakeholder ocean policy dialogues

One of the challenges in advancing effective policy dialogues is how to go beyond conventional silos and compartmentalization and facilitate interdisciplinary multi-stakeholder dialogues. As Albert Einstein said, we cannot solve our problems with the same thinking we used when we created them. If we have undermined SSF and need to revive it, we have to change the way with which we addressed SSF. The importance of having technical discussions on SSF among fishery experts is not deniable. However, such an approach is now considered as insufficient and limited in resolving challenges faced by SSF in a broader scale particularly when SSF is challenged by multiple factors that go beyond the boundary of their local communities.

Ocean was brought up and appeared in the document in the climate change negotiations at the 21<sup>st</sup> Session of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC/COP21) in Paris in December 2015. OPRI-SPF attended COP21 and advocated the importance of integrating ocean in the climate change discussions. The Paris Agreement adopted there refers to, in its Preamble Paragraph 13, the importance of ensuring the integrity of all ecosystems including oceans (UN 2015b). This has paved a way to address the nexus of climate change and ocean in policy discussions with an extended stakeholder constituency. The nexus of climate change and ocean was reinforced as a centerpiece at the Climate Change Action Summit held in San Francisco in September 2018. Ocean advocates called for more aggressive actions to promote renewable energy and reduce the use of fossil fuels as a way to save ocean, coral, fish and shellfish from ocean acidification. At the Food and Agriculture Organization of the United Nations (FAO) headquarters in Rome in November 2019, OPRI-SPF supported the International Symposium on Fisheries Sustainability. Many speakers asserted repeatedly that fish stock depletes and migrates in different patterns in many parts of the worlds due to overfishing and ocean warming (FAO 2019 and FAO 2019). In the light of the contributions made by SSF to food security and resource stewardship, they called for support to SSF organizations in pursuance with the Voluntary Guidelines on Securing

Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines, FAO 2015). It is vital to carry out interdisciplinary multi-stakeholder policy dialogues from holistic viewpoints, demonstrate and share scientific findings, embody key principles in policy tools and advance their implementation at the field level (Kobayashi 2017).

## Advancing transformation and forging confidence in the policy dynamism

Policies discussed at the global level mean nothing unless they are implemented at the national and local levels. World leaders called for collective actions at the 2017 UN Ocean Conference to make a meaningful difference to our people, our planet and our prosperity. In this context, OPRI-SPF contemplates to address sustainability in Ocean policy at the national and regional level as well as at the global level. With Palau, for instance, OPRI-SPF has facilitated information exchange on marine resources and ecosystems within and beyond national boundaries. In August 2019, OPRI-SPF, the government of the Republic of Palau, and the Palau International Coral Reef Center (PICRC) convened a multi-stakeholder policy dialogue on marine resources at PICRC. It was considered important to assess the achievements and challenges in implementing the Palau National Marine Sanctuary (PNMS) Act adopted in October 2015 and revised in June 2019. PNMS is considered as a progressive policy as it prohibits commercial fishing in the 80 per cent of the Palau's Exclusive Economic Zone (EEZ) and allows commercial fishing only in the fishing zone equivalent to the 20% of EEZ. With the 2019 amendment, the fishing zone was relocated from the surrounding of the main island to the west of the Palau's EEZ thereby securing the connectivity of the fishing zone with the adjacent high sea and placing the southern border of the fishing zone at latitude 7°N for ensuring more effective compliance and enforcement. Research on deep sea ecosystems, plankton dynamics and marine plastics in the Pacific were discussed. A part of the outcome was presented at the side event of the third session of the Intergovernmental Conference on an international legally binding instrument under the United Nations Convention

on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction held in New York in August 2019 (IISD 2019). OPRI-SPF, the government of Palau, the government of Norway and the Norwegian Institute of Marine Research convened a side event on 23 October 2019 during the 6<sup>th</sup> Our Ocean Conference held in Oslo to explore a framework to review the implementation of policies and activities aimed at a sustainable ocean. President Remengesau Jr. of Palau delivered a keynote address on ocean policies and international partnership at the International Symposium Commemorating the 25<sup>th</sup> Anniversary of Japan – Palau Diplomatic Relations held at the Sasakawa Peace Foundation in Tokyo on 11 November 2019. The activities mentioned above are just a part of the process where OPRI-SPF work with overseas partners in advancing the implementation of policies and activities aimed at achieving a sustainable ocean at the national and regional level and forging policy and institutional framework conducive to sustainable SSF. It is vital to build upon sequential enabling programs in international partnership to address common interests in ocean governance and marine resource management.

## Connecting macro policies and local actions

Like other countries, how to draw a line between conservation and sustainable use of marine resources is a critical policy challenge for the Republic of Marshall Islands (RMI). The Protected Area Network (PAN) Act was adopted in September 2015. Even a year after the PAN Act legislation, the Act was not well known to the local stakeholders. The Environment Protection Authority of the Republic of Marshall Islands conducted a pilot study with the support of SPF and released a report pointing out the discrepancy between local communities regarding the awareness on the PAN Act and the difference in response to the possible conservation measures (Kobayashi 2017). In the Federated States of Micronesia, OPRI-SPF conducted a research on the impacts of pollutants and erosion from the land on marine ecosystems. Pollutant and erosion control measures were promoted by the Department of Resources and Development and the Department of Environment, Climate Change,

and Emergency Management. Support was provided under the Ridge-to-Reef project that was executed by the Secretariat of the Pacific Regional Environment Programme (SPREP) and funded by the Global Environmental Facility. It was revealed that increasing pig farming in the backyard of houses on hilly areas was a source of livestock manure that cause adverse impacts on the coastal marine environment. In Guam, the local poachers who hunts deer illegally set bush fire that causes soil erosion and sedimentation and damage coral reefs and reef fish habitats. OPRI-SPF intends to share Pacific island stakeholders the good practice in Okinawa and Kagoshima where measures are implemented to arrest soil erosion with increased vegetation cover during the fallow period and the installation of tillage, ponds and stone walls to trap soil. Sustainable SSF require sustainable coastal and land management as well. Stakeholders from the Pacific islands reviewed the common challenges and exchanges ideas for solutions, for instance, at the International Workshop - Fostering Innovation and Developing Partnership for Blue Economy that OPRI-SPF and the University of Hawaii Center for Pacific Island Studies co-organized at the East West Center in Honolulu in February 2019.

## Co-benefits and innovation for implementing SDGs

Doing one thing and achieving more than one goals. This is a thinking of co-benefits and synergies that are also emphasized by the declaration of 2017 UN Ocean Conference (UN 2017). At the meetings of the Friends of Ocean Actions held in Davos in January 2020 in conjunction with the World Economic Forum Annual Meeting, OPRI-SPF shared the highlight of its policy research on the co-benefits from renewable energy and sustainable aquaculture. In Kumejima, Okinawa-prefecture, renewable energy is generated by the system called Ocean Thermal Energy Conversion (OTEC). It turns the turbine by HFC (Hydrofluorocarbon) that is evaporated by warm sea surface water and liquefied by cold deep-sea water. The interesting part of OTEC is the multiple use of deep-sea water. After generating renewable energy, deep sea water is used for shrimp and sea grape aquaculture, cosmetic production and thalassotherapy at a spa facility. OTEC supports local economy of Kumejima

in an estimated value of 23 million US dollars and the employment of 140 persons. OTEC is not always a viable option as it is possible only under certain conditions such as the presence of warm sea water and a steep underwater cliff. However, the case of OTEC in Kumejima demonstrates the importance of a co-benefit approach and cross-sectoral partnership in multiplying the socio-economic benefits of sustainably utilizing marine resources.

In Minamisanriku, Miyagi-prefecture after the 2011 tsunami, oyster farmers decided not to restore the oyster farming gears at the pre-disaster level but to restore only up to one third of the pre-disaster level. Such an approach reduced the density of oyster farming and allowed oyster to grow bigger and faster. In 2018, with the assistance of WWF Japan, farmers succeeded in acquiring the Aquaculture Stewardship Council (ASC) certificate. Shizugawa Bay, their oyster farming area, was also designated in 2018 as a site to be protected under the Ramsar Convention in the light of the importance recognized in kelp and seaweed biodiversity and migratory bird habitats. In Hinase, Okayama-prefecture, the seagrass that used to cover the sea area of 590ha in 1940's plunged to 82ha in 1961. Local fishermen and local junior high schools collaborated in restoring seagrass to 250ha in 2016. Local fishermen report an increase in the stock of fish species that habituate on seagrass beds such as crab, squid and bream. On the other hand, in Rikuzentakata, Iwate-prefecture and Hayama, Kanagawa-prefecture, local fishermen and divers expressed concerns over the disappearance of seaweed and seagrass and the spread of sea urchins presumably because of the sea water warming. Sea urchins, that can be delicacy, do not contain much eggs (more precisely gonads) due to the nutrient deficiency. Fishers thus have no incentives to harvest sea urchins and the sea urchins continue to spread as a vicious cycle. Divers volunteer to exterminate sea urchins and experiment their use as fertilizer in the vegetable farm on the land. By conducting case studies on fisheries and aquaculture, OPRI-SPF intends to distill the success factors in the methods and approaches used for designing and managing fisheries and aquaculture production systems, seafood marketing and value creation. Innovation and partnership are key success factors and likely to remain important in the midst of growing changes and uncertainty in the ocean that sustains the livelihood

of so many small-scale fishers around the world.

## Role and challenges of grant making foundations in promoting sustainable SSF

There are a number of private foundations that make grants to support sustainable marine resource and fishery management. SPF in recent years gives a priority to self-operating programs rather than grant making programs. OPRI-SPF promotes collaborations with partners to advance the implementation of the programs that OPRI-SPF develop and manage autonomously. OPRI-SPF can collaborate with its partners to apply for grants from other grant making organizations. However, a formula is not common in the current portfolio of OPRI-SPF. OPRI-SPF strives to address the common challenges of ocean policies building upon the its institutional strength in the areas of interdisciplinary ocean policy research, facilitating multi-stakeholder dialogues and forging collaboration with its partners that have their own thematic, geographic and operational focuses. The ocean, that Rachel Carson considered as an eternal safe haven 70 years ago, has turned to be increasingly vulnerable and we were warned to stop going down on the path to the end of life in the ocean (Carson 1951, US Congress 1970 and Robert 2012). It must be a top priority to maintain sustainable life in our ocean and buttress the livelihood of the people who depend on the ocean and marine resources. Policies for ensuring a sustainable ocean and marine resource management must be pursued persistently as our priority policy goal (US Congress 1974). OPRI-SPF continues a voyage with its partners to pursue policy and institutional frameworks conducive to achieving sustainable small-scale fisheries.



## 47. Blue Justice

**“A Just Space” for Small-Scale Fisheries in “Seichosangyoka”**

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*A Kinme (Splendid Alfonsino) fisher with a peace sign, Inatori, Izu Peninsular, Shizuoka Prefecture. Japan. Inatori Branch of Izu FCA. 2018*

*Blue Justice is a concept that calls for a critical examination of how small-scale fisheries (SSF) and their communities may be affected by ocean development initiatives such as those promoted under Blue Economy and Blue Growth agenda. The relationship between the “seichosangyoka” (growth industrialization), which is the main aim of the fisheries policy reform, and SSF in Japan is an example of tension between development and SSF livelihoods, which may lead to social injustice. Because of the lack of sufficient discussion and communication between fishers and government authority, it is unknown how many and what types of justice issues will SSF face under the new Fishery Act. From the justice perspective, there are many aspects about SSF that need to be considered before realizing “seichosangyoka.”*

## A new concept but not new to Japan?

The Blue Justice concept calls for careful consideration about ocean development to avoid marginalizing SSF, which seem to be happening under the Blue Economy and Blue Growth agenda. Several observations and evidences have been made about how SSF are disadvantaged in policies that exclude SSF from access to resources and work space. Concerns were raised at the 3rd World Small-Scale Fisheries Congress hosted by Too Big To Ignore (TBTI) in Chiang Mai, in Thailand 2018, that things could be a lot worse as countries and aid agencies are promoting new ocean development initiatives under the Blue Economy and Blue Growth agenda. Our argument is that while Blue Economy and Blue Growth can be desirable for ocean sustainability, it needs to be done in a way that does not negatively impact SSF. Talking about “Blue Justice” in Japan could bring up unexpected connections. For people who enjoy sports, especially wrestling, they may think of “Yuji Nagata”, the New Japan Pro-Wrestling, who gets a reputation as a blue ring costume-clad wrestler, and thus his ring name: Blue Justice. There is another interesting connection that

can work in our favour. While not all concepts put forward by international society can be written in Kanji at the time they infiltrate Japan, the word Blue Justice can in fact be described by Kanji. These connections may signal that the time has come for the discussion about Japanese SSF through a Blue Justice lens.

## Why blue justice now?

As part of the ambitious Sustainable Development Goals (SDGs), SDG14: Life Below Water emphasizes the importance of ocean and the need to provide balances between conservation and sustainable development. Blue Economy and Blue Growth agenda have been proposed as a way to achieve sustainable ocean development. Similar to other development agenda, however, not all stakeholders benefit equally from it. Given that SSF are often marginalized and have less political connection and power, they are often left out of the discussion about Blue Economy/Blue Growth. Quite a contrary, they are further excluded and made vulnerable by many ocean development initiatives, with their rights and access to resources being violated and with social injustice as a result. By calling for a critical examination of how SSF and their communities may be affected by ocean development initiatives, Blue Justice acknowledges the historical rights of SSF communities to marine and inland resources, and coastal space, as traditional users for thousands of years in some cases. Thus, as a concept, it seeks to investigate pressures on SSF, from other ocean uses, including industrial fisheries and coastal/marine tourism, aquaculture or energy production, promoted in the blue economy and blue growth development agenda. Issacs (2019) defines the Blue Justice approach as one that “critically examine[s] the political, economic and ecological processes of blue economy development initiatives.” Jentoft (2019) builds on this call by highlighting the inclusion of SSF and coastal community members as stakeholders with an eye towards power imbalances and equity. Further, some have called for SSF to secure their space, a “just” space, in the increasingly crowded ocean environment populated by powerful users (Cohen et al. 2019).

At the foundation of a Blue Justice approach are social justice and human rights principles. Blue Justice builds off of environmental and climate justice, which have focused on the unequal distribution of harm exerted on marginalized communities. Social justice has, at its core, a concept of fair and just relations between individuals and society (Rawls 1999). Blue Justice parallels these movements because of its focus on the injustices faced by small-scale fishers, and to the disproportionate impacts they may feel from new global policy discourses (i.e., blue economy and blue growth initiatives). The injustices faced by small-scale fishers and the communities they support have been extensively documented in the past few decades (Chuenpagdee & Jentoft 2019, Bavinck et al. 2018, Bennett 2018, Jentoft & Eide 2011, Kooiman et al. 2005, Perry et al. 2011, Macinko & Schumann 2007). In the blue economy context, they have faced particular pressures such as the implementation of rights-based fisheries, forms of ocean enclosure such as marine protected areas (MPAs) (Said et al. 2017) and marine spatial planning (MSP), which lead fisheries to run the risk of being both forced in and out (Jentoft 2019).

To address these long-standing issues, international instruments that explicitly reference human rights principles have been adopted. The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the context of National Food Security (FAO 2012) and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the context of Food Security and Poverty Eradication (SSF Guidelines; FAO 2015) are instruments that have social justice backings with language that calls for “responsible governance of tenure because land, fisheries and forests are central for the realization of human rights...” (FAO 2012; p. 6), and that “States should ensure that effective fisheries management systems are in place to prevent overexploitation driven by market demand that can threaten the sustainability of fisheries resources, food security and nutrition.” (FAO 2015; p. 11). These instruments are necessary to secure the historical use rights and customary use rights (FAO 2004) of SSF while centering the importance of human rights, dignity, and gender equality in their governance.

## JSSF from the Blue Justice lens

The types of justice that SSF face includes distributive justice, social justice, economic justice, market justice, infrastructure/wellbeing justice, procedural justice, environmental justice (TBTI 2019). Looking at JSSF through this lens can reveal many things. The revised Fishery Act is a good starting point for the analysis. As mentioned throughout a number of chapters in this book, the Fishery Act was revised in December 2018 for the first time in 70 years, with heated discussion about the pros and the cons. With the goals of “balancing the proper management of fishery resources and industrialization of fisheries into a growth sector (“seichosangyoka”) and establishing the rise in incomes of fisher and a well-balanced fishery employment structure of different ages,” the reform included a new resource management system, an improved distribution structure resulting in fishers’ income growth, a reconsideration of the fishing permit issuance system to increase productivity, and formal revision of the coastal area utilization system contributing to the development of aquaculture and coastal fisheries (MAFF 2018).

Among them is the revision of the coastal area utilization system, which puts an end to the current priorities when granting fishery rights (Table 1). Fishery rights in Japan include common fishery rights, demarcated fishery rights, and set-net fishery rights, with different priority orders as follows (Tanaka 2003, Lou 2014, Makino 2011). The common fishery rights fisheries are mainly aimed at shellfishes and algae. The eligibility of the rights is granted only to fisheries cooperatives where a vast majority of local fishers are the members. Such fisheries are generally run by individual fishers and require coordination among fishers regarding fishing grounds. Aquacultures by specific demarcated fishery rights (e.g., oyster, seaweed) are operated in the same way. Because of the ease of entry in terms of technology and necessary capital, the coordination between fishers becomes very important; therefore, the fishery cooperative is first in line. Comparatively speaking, for demarcated fishery rights and set-net fishery rights, because there is a need for high technology and significant capital, the rights can be granted to individuals. For the former, those with experience in fisheries, including local fishers, have the priority; while for

the latter, fisheries cooperatives and the juridical persons with more local fishers are given the priority. Such order of priority has been abolished by the revised Fishery Act (gray part in Table 1). This implies that fishers who are not operating the “most effective and appropriate” fisheries will not be able to obtain the fishery rights (MAFF 2018). Yet, there are no clear evaluation criteria for the judgment of what “most effective and appropriate” fisheries mean.

The discussion about the pros and cons came out at a symposium “The use of coastal fishing grounds by corporations and fishery rights system” hosted by the Japanese Society of Fisheries Economics (JSFE) in June 2018. This symposium critically examined opening up fishery rights with a focus on the aquaculture industry to the private sector, which triggered the following statements: “Fishery is preceded by the site (fishing communities and fishers) to be followed by the system. It is unusual for it to be preceded by the system to transform the site so it certainly will lead to failure.” and “Without a future vision of aquaculture in the proposed reform, it is not a reformed system to bring it to reality.” Immediately following the symposium, a statement condemning fishery reform of the government was issued by 50 concerned individuals in the society (JSFE 2018, Suisan Hokkaido Blog 2018).

Another symposium was held on the theme of “Can the new Fisheries Act start? – Problems and challenges involved in the enforcement of the new Fisheries Act –” by The North Japan Fisheries Economics Society (NJFES), again with critical deliberation of the new Fisheries Act. It raised serious questions about “a new Fisheries Act that slights the production site, which has been handed down for generations” and that “despite the reality of most of the heads of the cooperatives on site not knowing the contents of the revision, the drawing up of cabinet orders and ministerial orders is moving on” (NJFES 2019, Choshu Newspaper 2019). Despite many objections (Shinbun Akahata 2018(a), Shinbun Akahata 2018(b), Asahi News 2018, CDP 2018), the new Fisheries Act was passed and will become effective within two years after the promulgation. Under the new Fishery Act, and without sufficient discussion and communication with the fishers, it is unknown how many and what types of justice issues will JSSF face from here on.

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	Demarcated fishery rights	Specific demarcated fishery rights	Set-net fishery rights	Common fishery rights
<b>Example</b>	Pearl aquaculture	Oyster, seaweed aquaculture	Mackerel, horse mackerel by set-net fishery	Abalone, sea urchin by skin diving
<b>Granting Period</b>	10	5	5	10
<b>First</b>	Existing fishers and others, (priority given to local and experienced ones) *Removed	Fisheries cooperatives (exercised by cooperative members) *Removed	Juridical person including more than 70% of the local fishery households. *Removed	Fisheries cooperatives (exercised by cooperative members)
<b>Second</b>	Others (Newcomer) *Removed	Juridical person including more than 70% of the local fishery households. *Removed	Juridical person consists of more than 7 local fishers. *Removed	
<b>Third</b>		Juridical person consists of more than 7 local fishers. *Removed	Existing fishers and others (including juridical person) *Removed	
<b>Fourth</b>		Existing fishers and others(including juridical person) *Removed	Others *Removed	
<b>Fifth</b>		Others *Removed		

Table 1. Priority orders regarding fishery rights.[1]

What is revealed through the lens of Blue Justice is more than the fishery policy reform. Others include the adjustment issue between the fisheries and leisure fishing boat /pleasure boat users. This is an issue of the fish species, hauled by leisure fishing boats/pleasure boats, but are managed by professional fishers. What is much-talked these days is the fishing of bluefin tuna by leisure fishing boats in Aomori Prefecture. Though the resource management of bluefin tuna has become stricter internationally and fishers have “settled” to set a limit to the amount of fish catch, fishing by leisure fishing boats can still be seen, and it is claimed to go as far as to sale (The Asahi Shimbun 2020). The Kinme (Splendid Alfonsino) fishery in the Inatori area of Shizuoka Prefecture is another case. Since there have been increasing numbers of pleasure boat users fishing the Kinme in recent years, a strong sense of unfairness and injustice has been growing among fishers, notably since the fish stock has

declined and is still not in a stable condition (Li 2019).

The coordination issue between SSF and offshore wind power generation is also a hot topic in recent times. In Japan, where energy resources are scarce, offshore wind power generation is underway because the introduction of renewable energy is not only necessary for the environment but also for the improvement of energy self-sufficiency rate. However, in most cases, it requires space where SSF take place, and there could be direct effects, including restrictions and obstacles in fishery operations and indirect effects on aquatic life and the fishing ground environment (JASTA 2019). Meanwhile, the way to coordinate between SSF and offshore wind power generation is being discussed; and it is necessary to prevent SSF from being marginalized and displaced in such ocean development. Fishers and fishers organizations should also fully recognize this point and not to give up their rights and seas to private companies just because of some promised profits.

And then the COVID-19 related justice. SSF across the globe receive a heavy blow from COVID-19, and it's been already observed that the support that small-scale fishers have been receiving so far is minimal or inadequate (TBTI 2020). What about Japan? A detailed investigation is underway; but we already hear the voices of a plaint and regret from small-scale fishers through social media. These include statements such as: "the amount of support is lower compared to agriculture"; "some support measures set unified application requirements to all business operators, but because of fisheries are influenced by various factors like the weather and stock status, in many cases, fisheries don't qualify for the support"; "supports are not with a good understanding of the nature of fisheries," and so on.

### "A just space" for JSSF in "Seichosangyoka"

Cohen et al. (2019) argue "the need to recognize SSF in the outset of the solution design of the Blue Economy, if the Blue Economy is to be a legitimate vision for governing the oceans." We feel that the relationship between the "seichosangyoka" (growth industrialization) policy and SSF in Japan is a miniature version of the problem over the Blue Economy or Blue Growth



policy and SSF in international society. “Of the 755 fisheries cooperatives nationwide, only 77 fisheries cooperatives have properly heard about why and how the policy reform (Choshu Newspaper 2019).” This concern is related to the procedure justice, e.g., restricted access to decision-making due, for instance, to the process of policy designs without due consideration to the SSF context. It is one thing to hope for improving fisheries efficiency and fisher’s income through growth industrialization. But we argue that if the “seichosangyoka” is to be a reasonable vision for the sustainability of the fishing industry, the importance of JSSF must be fully recognized from the onset.

While many countries are moving forward for the implementation of the SSF Guidelines, we hope that Japan is not going backward. Moving forward will require careful considerations about mechanisms, processes, initiatives, and innovative approaches that will move Blue Justice from principles to actions. And in that context, the Transdisciplinarity and the Interactive Governance perspectives will be useful, as the former “integrates knowledge of multiple academic disciplines and the contextual and ethically founded phronetic knowledge of stakeholders (Jentoft and Chuenpagdee 2019, p.5)”; and the latter suggests “relating governability to qualities of the object of governance (the system-to-be-governed), its subject (the governing system) and the relation between the two (Kooiman et al. 2008, p3).”

It seems the photo of the fisher with a peace sign matches perfectly with this chapter. No justice, no peace. No Blue Justice, no “seichosangyoka”.

## Acknowledgement

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## Endnotes

[1] Source: Referenced from the Mainichi News Paper, August 26, 2018. In Japanese. <https://mainichi.jp/articles/20180826/ddm/008/070/113000c>. Accessed May 2020.

## 48. TBTI Japan

### Steering the Ship of Too Big To Ignore Japan Research Network

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*Fishing boat launch, Suzaki Port, Shimoda, Shizuoka Pref. Japan. T. Sato. 2019*

*The problems facing Japanese small-scale fisheries (JSSF), which are exposed to both societal and institutional changes, in addition to global environmental changes and recurrent disasters, are “too big to ignore”. Amidst such circumstances, the ship of Too Big To Ignore (TBTI) Japan research network is out into the ocean and expected to play a significant role in JSSF research towards solving these problems. This chapter firstly introduces the TBTI project, which is a global partnership on small-scale fisheries research, and the World Small Scale Fisheries Congress being organized by TBTI every four years. Then it takes a look at JSSF through the TBTI lens and lastly describes the vision of the TBTI Japan research network.*

## Inspiring experience with Too Big To Ignore community

It was our inspiring and fascinating experience attending the 3rd World Small-Scale Fisheries Congress (WSFC) organized by Too Big To Ignore (TBTI) two years ago (2018) in Thailand. The conference participants seemed to be coming from all countries and regions in the world. Their occupation was also wide-ranging, and it was an extremely transdisciplinary space, including government officials, fishers, NGOs, and researchers. Not only regular sessions but also interactive sessions, including a science cafe and fishers talk circle, were provided and the free exchange of ideas by those who have a deep relationship with the fisheries, including experienced specialists, young researchers, and fishers and their supporters was impressive. The interactive sessions were carried out in the process of the presentation of challenges and problems and discussion toward understanding and solutions. Given that the regions of origin are very different, when considering solutions, the system of each country and its issues are raised, allowing awareness of the response in various countries and relative positioning of the problems. It was an extremely fruitful meeting allowing us to fully enjoy it; however,

one thing is a little shame to us was the low participation from the Northeast Asian region including Japan. There are more than 6,000 fishery settlements in Japan, where most of them are small-scale fisheries, there should have been a lot of topics to be presented and discussed. Furthermore, through the conference, we deeply felt the meaning of existence and importance of fishery rights enjoyed by small-scale fishers in Japan, and in that light, we had a burning desire to stimulate participation from Japan. In such a situation, we are truly pleased that the TBTI Japan Research Network is established, and this book is being published.

## A large-scale research network for small-scale fisheries

TBTI is a global research network and knowledge mobilization partnership that focuses on addressing issues relating to small-scale fisheries, opposing the marginalization of small-scale fisheries in national and international policies, and developing research and governance capacity to tackle global fishing challenges (TBTI website: <http://toobigtoignore.net/about-tbti>). Based on the realization that small-scale fisheries were too important to be continually treated marginally at the World Fisheries Congress held every four years, fisheries academics convened the first World Congress on Small-Scale Fisheries in 2010. It was then that the global small-scale fisheries research network was formed, which has since been known as TBTI (Jentoft and Chuenpagdee 2015).

TBTI comprises of close to 500 members in 80+ countries, with research, knowledge mobilization and training activities evolving around 14 research clusters. These include: Global synthesis, SSF Guidelines, Diverse SSF values, Market opportunities, Economic viability, Fish as food, Transdisciplinary fisheries, SSF stewardship, Inland fisheries, Indigenous marine fisheries, Transboundary interactions, Global change responses, Small-Scale Fisheries Rights, and Women and Gender. The goals of TBTI are to identify key concerns affecting small-scale fisheries, stimulate a concerted research effort to address them, and direct policy attention to this vital sector in order to raise its profile.

TBTI lists the following six objectives for its activities (TBTI website: <http://toobigtoignore.net/about-tbti>): (1) Understanding the importance of small-scale fisheries with respect to livelihoods, poverty alleviation, and food security; (2) Exploring the contribution of small-scale fisheries to economic development, sustainability, and community viability; (3) Assessing the vulnerability of small-scale fisheries to global change processes; (4) Improving policy discussions and decision-making regarding small-scale fisheries; (5) Enhancing knowledge with regards to small-scale fisheries and the built capacity in research governance; and (6) Advancing the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Alleviation (SSF Guidelines). TBTI facilitates networking opportunities, organizes meetings, workshops, and webinars, develops capacity in transdisciplinary research, connects science to policy and society, produces books, papers, reports, and briefs, and hosts the World Small-Scale Fisheries Congress.

## A large-scale transdisciplinary forum for small-scale fisheries research

The World Small-Scale Fisheries Congress (WSFC) is a large-scale transdisciplinary forum organized by TBTI every four years, which enables those interested in small-scale fisheries to participate in interactive discussions regarding the future of the world's small-scale fisheries. The overall goal of the WSFC is to facilitate opportunities for researchers, students, young professionals, practitioners, fishers and fishers' organizations, environmental groups, and policy-makers to share information on all aspects of small-scale fisheries and to formulate action plans and capacity development programs to support the implementation of the SSF Guidelines. The WSFC congress consists of panel presentations, speed and poster presentations, and field excursions. The first WSFC, held in Bangkok, Thailand, from October 18 to 22, 2010, focused on "Issues and Solutions (TBTI 2011)," and the second WSFC, held in Merida, Mexico, from September 21 to 26, 2014, focused on "Options and Opportunities for Small-Scale Fisheries (TBTI 2014)."

The 3rd Congress was held in Chiang-Mai, Thailand, from October 22 to 26, 2018, the theme of which was “Transdisciplinarity and Transformation for the Future of Small-Scale Fisheries (Photo 1).” On each day of the five-day Congress, the schedule was divided into “science,” “community,” “policy,” “field excursions,” and “action plan” sessions, and the following five questions were set as common issues to address (TBTI 2019): (1) What is the major knowledge gap in small-scale fisheries? (2) What are the major challenges facing small-scale fisheries? (3) What type of changes in science, community, markets, and policy are required to improve the viability of small-scale fishing communities, reduce their vulnerability, and promote small-scale fishery sustainability? (4) What actions are required from civil society organizations, the research community, and policy-makers in order to implement small-scale fishery guidelines? (5) What measures are needed to strengthen the policy–science interface? A point worthy of a special mention is that at the 3rd Congress, the concept of “Blue Justice” was presented and discussed. All involved personnel was urged to critically examine what “Blue Economy” and “Blue Growth” initiatives meant to small-scale fisheries and their communities in terms of distributive justice, community empowerment, human rights, food and nutritional security, gender equity, and sustainability (TBTI 2019).



*The opening address by TBTI director, Prof. Ratana Chunpadee. The 3rd WSFC. Thailand, Y. Li. 2018*

## Japanese small-scale fisheries from the TBTI lens

Japan's fisheries governance is based on the fishery rights and fisheries cooperative systems, which in turn are based on the existence of small-scale fisheries. Therefore, the presence of small-scale fisheries cannot be ignored in Japan's fisheries policy. However, only a few projects are devoted explicitly to small-scale fisheries and attract little interest from Japanese society as a whole. Nonetheless, fishery reforms are currently underway with the aim of transforming the fishery industry into a growth sector (Headquarters for the Revitalization of Food, Agriculture, Forestry, and Fisheries 2015), which is why it is deemed necessary to secure a new perspective on small-scale fisheries. Small-scale fisheries are essential for achieving SDG14 (Life Below Water) but are at risk on several fronts. These fisheries contribute approximately half of the global fish catches, and the majority of fish caught by small-scale fisheries are destined for human consumption (FAO 2015). These fisheries, the



majority (approximately 95%) of which can be found in developing countries, employ more than 90% of the world's capture fishers and fish workers, and in turn support another 84 million people in jobs associated with fish processing, distribution, and marketing (FAO 2015).

Accordingly, small-scale fisheries are considered to make a substantial contribution to the economy of people living on the waterfront and also shape the social and cultural values of these communities. However, despite their importance and potential, these small-scale fisheries communities are often vulnerable and marginalized, and *Life Above Water* written by Prof. Jentoft has rightly highlighted the importance and endangered status of small-scale fisheries, fishing villages, and societies (Jentoft 2019). As evidenced by its first super-large grant in the field of social sciences related to fisheries, TBTI's work to protect small-scale fisheries is of global importance. In Japan, which has an advanced fishery industry and has designed fishery systems based on the existence of small-scale fisheries, there is a need to refocus on small-scale fisheries, clarify the situation pertaining to small-scale fisheries, and promote measures that will contribute to diversifying and sustaining the activities of these fisheries. The revised Fishery Act was promulgated, and JSSF are in a great change, including reform in fishery rights. To enable the sound continuance of JSSF into the future, it is important that more people examine its issues and challenges. At the same time, we give importance to the dispatch of knowledge and experiences cultivated by JSSF to the world. The problems facing Japan's small-scale fisheries, which are exposed to both societal and institutional changes, in addition to global environmental changes and recurrent disasters, are "too big to ignore. "

## The vision of Too Big To Ignore Japan research network

Like the launch of the new fishing boat, the ship of the "TBTI Japan research network" is now out into the ocean. To keep things in the right direction, we need to steer the ship with the right vision. Here, while also referring to the opinions received from commentators, we would like to confirm the vision of the TBTI Japan research network.

First, as the primary goal of this book is to ensure the widespread of the importance of the existence and roles of JSSF within Japan and overseas, TBTI Japan research network needs to dispatch the information actively along with systematical research on the various functions, importance, and latent strength of JSSF, including the contribution to the implementation of its sustainability. There is one (comment No. 3, Ch. 51) that refers to the coastal fishing ports and fishing villages throughout Japan as the outline of the land and symbolic of the identity of Japan, which we are much in agreement.

Next is to adopt transdisciplinary perspectives in JSSF governance. With all the “triple pains and triple changes,” we argue that the governance of JSSF are “confronted with problems that are inherently wicked and therefore its governance must rely on the collective judgment of stakeholders involved in a process that is experiential, interactive and deliberative (Jentoft and Chuenpagdee 2009).” We can see this point also from the comments, including the comment No.3 (Ch. 50) and No.2 (Ch. 51).

Then it is about the improvement of gender equality and equity. The news that Japan was 121st in the world ranking of gender equality at the end of last year and passed to the lowest level on record was shocking. It was pointed out that “Japan’s standing in the international community will keep plummeting due to its failure to empower women” (The Asahi Shimbun 2019). As comment No. 4 (Ch. 50) illustrates, we see various initiatives and activities of rural women that can change even a small part of the inequalities like these, and as comment No. 1 (Ch. 51) indicates they are much anticipated in the future. TBTI Japan research network should continue research and dispatch of information to enable the improvement of gender issues in Japan by the initiative of the JSSF.

Also, securing fishers’ income and the successors are urgent issues for JSSF, and we have to push hard for new initiatives and concepts such as the Sixth Industrialization (Chapter 19), Nagisahaku (Chapter 22), Fish branding (Chapter 20), Urban-Village Exchange (Chapter 21), Hamakatsu (Chapter 24), Umigyo (Li and Lou 2018) and so on. To do that, the power of women and young people, the power of cooperation and collaboration, the power of organizations, the power of technology and science, etc. are needed, and the

TBTI Japan research network must establish a research base to forge ahead with these.

Furthermore, amid the “Seichosangyoka” circumstances, we need to approach JSSFs from the standpoint of Blue Justice. Among the comments, there are voices concerned about social justice, procedural justice quoted as saying that “the Japanese fishery management system centered on community-based management and co-management has moved toward administrative-oriented management and coastal waters could be used by companies for extortion (comment No. 6, Ch. 51).” The concerns about environmental justice are also heard. These include the issue regarding the relationship between the poor catch of Sakura shrimp and “turbidity” produced by the quarrying industry in Shizuoka Prefecture, and the issue between the sandfish fisheries and large-scale wind farm in Akita Prefecture (comment No. 5, Ch. 51). TBTI Japan research network must continue with theoretical discussions on Blue Justice and advance research to relay it to practice.

Lastly, we would like to emphasize that the TBTI Japan research network should help Japan to recognize the SSF Guidelines and promote its implementation fully. Though the provisions of SSF Guidelines are partially cleared by the Japanese fisheries governance system, it is no exaggeration to say that awareness of the guidelines is extremely low. The SSF Guidelines are only featured in the press and bulletin of some institutions, including the Japanese Institute of Fisheries Infrastructure and Communities (Namikawa 2019) and the Nippon Japan Foundation Nereus Program (Rivas 2018). If the SSF Guidelines were well recognized, maybe there were no worrisome fisheries policy reform in place. In the future, it is essential to make a conscious effort on its implementation in Japan.

## Apart but together

Viewed in this light, the vision of the TBTI Japan research network does not differ much from the framework of the stated vision of TBTI project. As such, small-scale fisheries in the world at a glance are divided into each continent and country where the history, culture, tradition, and governance system

are different; however, they actually share many common issues. “Apart but together” may have been the most powerful message transmitted in the time of the COVID 19 pandemic, and this is probably an important indication for small-scale fisheries around the world. No matter how separated by physical distance, the power born as a result of cooperation, coordination, collaboration, and partnership is infinite. In the 4<sup>th</sup> WSFC to be held in 2022, along with a number of stories of “infinite power” like these to be reported from across the globe, we should expect the possibilities and contributions of the TBTI Japan research network.

## VII

### Short Communication



## 49. Suisan Jyoshi Project and Small-Scale Fisheries

***Shiho Tateoka***

Ezo Shinsen Gumi Association



*Community tourism, Otoshibe fishing port, Hokkaido, Japan, Tateoka S., 2019.*

“Umi no Takara! Suisan Jyoshi no Genki Project (The Treasure of Ocean! Women in Fisheries Project)” was started by Fisheries Agency in November 2018. The number of members, which was 16 at the time of its launch, increased to 60 as of January 2019. It consists of multi industries related to fisheries, such as fishers, processing industry, brokerage, fish food promotion, and singer-songwriter community. Very few women are working in this field, and we share various issues in fisheries, we work to promote more people to eat fish and protect the sea, individually or sometimes as a team.

Although there are many issues in coastal fisheries in Japan, the decline of fisheries industry due to the aging of fishers, shortage of workers, sluggish fish price, poor resource, and marine environmental problems has become more serious. Aging and lack of successors are not limited to fisheries, but there is still a strong tendency. For instance, it’s more difficult for female workers to engage in fisheries than in other industries. The number of fishers is decreasing year by year. As the workplace of women’s employment in society expands, the number of women who choose to marry fishers is decreasing, and the succession problem is becoming serious. The sluggish fish price is related to the balance between supply and demand that has collapsed due to the decrease in distribution by consumers’ separation from fish. Also, the lack of resources has been brought by changes in the environmental condition and overfishing. In the marine environment, the plastic problem is becoming more serious, and in the context of the situation where society as a whole needs to tackle, a few fishers still dump the garbage.

How do we solve these problems in coastal fisheries? As a woman involved in fisheries, I feel that women’s perspectives, thoughts, networks, and actions will be essential for this. From my experience, I’m sure that there is a possibility of establishing a new fishery by bringing a good change to the fishery caught in the existing fixed concept by the fineness, the viewpoint, the idea unique to woman, and to expand the range of the “fishery” by other industry connections and suppleness. I grew up in Tokyo and was a nurse, and I was interested in the fishery and moved to Hokkaido. I have been involved in the fishery for five years already, but it is still only five years. Currently, I’m working as a consultant for planning a new event, fishery tourism, marketing,



product development, the Six-Industrialization support, and more. Of course, I am just an advisor, and it is each fisher who will do the work. My job is to arrange schedule for them as not to interfere with fishing while drawing out potential ideas from them.

Using the examples of “Women” and “Fisherman’s Wife” will be weapons for marketing. Since it is not popular that women talk about the fishery, almost all people will have an interest. Also, in terms of product development, women can think of new package designs, ways of cooking, and consumers’ needs because their viewpoint is the gift for somebody. In addition, women can think and act to solve environmental issues because they take future generations into consideration. By communicating with the surroundings rather than letting people “bring the garbage” and assume “the sea will not be polluted,” it can be addressed as a problem for the whole region, which can also lead to beach cleanup activities.

This way, as women, even if you are not a fisher, you can be involved in fishing. In the future, it is expected that the number of women fishers will increase because of the weight reduction of information and communication technology (ICT) and materials by advances in science and technology, and the improvement of the functionality of machines will make fishing easier for women and the elderly. Since population decline is still ongoing, how women can be incorporated into the fishing industry will influence the future of coastal fisheries. That is why it is expected that the members of the Fisheries Women’s Project will be active in the future, and each person must be aware of the activities and spread it so that the promotion of women’s participation in the fishery will proceed quickly in order to play a part in contributing to sustainable fisheries that support each other throughout society.

## 50. Fishers' Perspectives on JSSF

The characteristics of the JSSF, along with the issues, concerns and opportunities for this sector, have been well captured in the preceding chapters, in their own contexts, when comparing with other countries, and as part of the global discourse. Yet, there are many voices from the ground, from people with first-hand experiences in the fisheries, which we have not heard. Using the opportunity of the launch of the TBTI Japan Research Network, we are asking leaders of fisheries and fisher's organizations in various regions to comment on the current situation in JSSF and their vision for the future, by asking them to provide short answers to the following questions: (1) What are the most pressing problems currently affecting JSSF? (2) What are the most significant factors for their sustainability? And (3) What are their thoughts on the vision of the TBTI Japan Research Network and its priorities? Below are what they have to say on these topics.

## 1. Fujio Abe



### Most serious problems affecting JSSF

As a resident living in one of the areas that have severely suffered from the East Japan Earthquake disaster (2011), I would like to comment on the post-disaster reconstruction issues. In post-disaster reconstruction, the restoration of the original (the way it was) is often the case; however, if the thing affected by the disaster is old, it is often that it does not match with the present state. I cannot help but feel that it also needs to be fixed for the future to put it in place.

### Most significant factor for sustainability

The high-density culture was a serious problem before the 2011 disaster in Shizugawa Bay, Miyagi prefecture. Before the disaster, with virtually no environmentally conscious aquaculture, a large burden was placed on the environment. After the disaster, reducing the number of facilities of oyster culture to one-third and sped the harvest period resulting in the harvest in 1 year. The amount of production per management body resulted in double the number in pre-disaster amount and an increase by half of the production in money terms, hours of labor significantly improved, and young successors increased. We obtained Japan's first international Aquaculture Stewardship Council (ASC) certification, and I think that undertaking the task of the fishery that takes into account a sustainable environment for years to come is the most important factor.

## Commentator bio

Fujio Abe was born in March 1963. He graduated from the Japan Fisheries Cooperative School in March 1982 and joined the Togura Fisheries Cooperative in Shizugawacho in the same year. Mr. Abe became the head of the Tokura field office of the Miyagi Prefecture Fisheries Cooperatives in April 2007. He has committed to obtaining the international ASC certification for oysters and achieved the Excellence Award of the 5th Biodiversity Japan Award of the AEON Environmental Foundation in September 2017. In April 2018, he became the head of the Shizugawa Branch of the Miyagi Prefecture Fisheries Cooperatives. Mr. Abe also achieved the Emperor's Cup in the Fisheries Division of the 58th Agriculture, Forestry and Fisheries Festival in November 2019.

## 2. Kaneo Ishikawa



### Most serious problems affecting JSSF

Coastal fishery, in particular, is heavily impacted by worldwide environmental concerns, and not thinking of mountains, rivers, and oceans in a comprehensive way will make coastal fishery impossible.

### Most significant factor for sustainability

Because Mikawa Bay is low on fish catch, we have a severe shortage of successors. To ensure sustainability, we have to let people know the problems confronting coastal fisheries around the country and seek strategies not to

make them worse.

### Vision and priorities for TBTI Japan research network

I sat on the board of a fishery cooperative in 1979, and the ocean that time was healthy. There were also many fishers, and the market was bustling. Nevertheless, fishes are decreasing across the ages, and this year, the environment has dramatically changed more than ever before, and the impact on fishers was shocking. At present, the leaders of the fisheries cooperatives work toward a bountiful ocean, and I, as a member, am committed to environmental concerns as well. I desire to let people from other industries and children to know the present situation that fishers are in and state of the coastal environment to increase environmental awareness.

### Commentator bio

Kaneo Ishikawa has been the head of the Higasihazu Fisheries Cooperative Association since 2003 up to the present date. Since assuming office, he has been addressing various environment conservation and environmental education activities as a member of the Higasihazu District Association Promotion Council, Association for Intertidal Flat and Seagrass Bed Conservation in Higasihazu District, Fisheries Revitalization Group of the Rural Area Council in Higasihazu District, Association to Make Yahagi River Beautiful, and Mikawa Bay Environmental Reclamation Project.

### 3. Masanori Jitsuishi



## Most serious problems affecting JSSF

With environmental changes, the volume of landings is decreasing and as such import goods are increasing. Furthermore, because of the rise of aquafarming technology, it is difficult to reflect local produce thought of as scarce, seashore products, and natural products with fish prices. For the decrease of fishery workers, we have revenue instability, mechanization to save labor, etc. The handling of resource conservation and management differs in neighboring prefectures, and a cooperative and broad-based response should be taken. If any of the resource management, the lives of fishers, and the marine product processing industry falls into bankruptcy at all, I think that there is no future in Japanese fisheries.

## Most significant factor for sustainability

Without resource management, we fail to secure sustainability. Various resources need to be computed based on scientific grounds, and I think TAC management works depending on the fish species; however, the understanding of fishers is essential to implement that. Not response by prefectures but by broad-based response, one needs to dispel a feeling of restraint all by oneself.

## Vision and priorities for TBTI Japan research network

It is needed to present scientific evidence; however, it is also necessary to deepen further the understanding of people depending on the fishery for a living. I hope the research network will stress dialogue with fishers and build an organization that can make broad-based initiatives.

## Commentator bio

Masanori Jitsuishi is the president of the Shizuoka Prefecture Sakura Shrimp Fisheries Association and member of the board of directors of the Yui Fisheries Cooperative Association.

## 4. Megumi Kodera



## Most serious problems affecting JSSF

For Japanese coastal fisheries, in combination with official regulations based on the Fishery Act, local fishers have entered into a voluntary pact, to protect common resources across the entire fishing village, and to conduct responsible fisheries. This points to the need for long-term, stable, high-mixing, low-volume production in coastal areas. By the easing of regulations in fishery rights and structural reform of small-scale fishery cooperatives, new participation in firms and widespread merger were promoted, and the management system of fishing grounds was altered. However, insufficient illegal, unreported and unregulated (IUU) fisheries countermeasures are a problem. The reef fishing that I operate is able to fish at ease and a high price market rate is a severe example.

## Most significant factor for sustainability

The composite fish price is flagging in markets in production regions and markets in consuming areas, including the aging of fishing villages, shortage of successors (leaders), decreased numbers of fish hauls (amount of money), increased imported marine products, and mismanagement of resources. Without fishers and the realization of income maintenance and improvement for us, we will fail in securing the sustainability of Japanese coastal fisheries. We consider it essential to strengthen price formation in the consignment/purchase/sales business of fishery cooperatives and raise awareness of fishers as producers.

## Vision and priorities for TBTI Japan research network

Japanese fisheries returned to coastal fisheries of “growing fishing industrialization (with proper management of fishery resources)” from distant seas “from the coast to the offshore, from the offshore to distant seas”. Management of fishers is important more than the fish amid competition and sharing so as not to cause tragedy again from over-exploitation and over-crowded operation for biological resources, which repeat natural fluctuations. Furthermore, we see the offshore but fail to see the rocky shore, and we see the tree but fail to see the forest. Initiatives in the linkage of mountains, rivers, and seas and the water cycle are a significant priority. As a fishery manager, I would like to build a future where I could bequeath to subsequent generations a smile on their faces saying “Itadaki-Masu” (thank you for the meal) at a table loaded with fresh seafood in season from the ocean in front of them.

## Commentator bio

I returned to Sugashima, Toba City, Mie Prefecture, on the occasion of the business succession of my husband. I am operating as an “ama”, a female diver. I feel that being an ama (female diver culture) is a way of being independent and coexistent within nature and society as part of life



at home and at work. Other than a mother, wife, and daughter-in-law, what I can do as a woman of a fishing village is to manage the local fisheries sustainable through a trial and error process, and hold a cooking class for the popularization of fish, take part in the fish branding and 6th industrialization initiatives. I am a member of the “Fresh Ms. Group” in the National Association of Fisheries Cooperative Women’s Groups and “Suisan Joshi (fishery women)” project run by Fisheries Agency. I am a mother of boy and girl twins.

## 5. Junichi Miyahara



### Most serious problems affecting JSSF

Seawater temperature is high, fluctuations in fish species are wide, and Japanese coastal fishery is hard-hit. Coastal seagrass beds are in a devastating condition, and by the improvement of the hygienic environment in which we live, the nutritive environment of the sea continues to worsen. Currently, the plastic problem is covered globally; however, the environment of mountains, which are the upper river basins, is worsening. The sea, which is down-river, is polluted, and because coastal and fishing ports must be cleaned days on end, representing a decrease in fishery income. It is needed to build a mechanism to solve various problems with people’s efforts.

## Most significant factor for sustainability

Without knowing the cause of the decrease in Sakura shrimp resources, fishers are suspending fishing and designating major spawning grounds as no-fishing areas, but we must make efforts even without knowing how many years it will take. However, separately from resource measures, we need to discuss economic policies of how to secure the endurance of related industries. Toward the revitalization of Suruga Bay, experts from outside of and within the prefecture converged and built a research group, and by aiming to propose the need for scientific investigation, a cooperative system will come along from all quarters. We would like to strive together as fishers.

## Commentator bio

Junichi Miyahara became the representative director and president of the Yui Fisheries Cooperative Association in April 2002. He also assumed the position of Chair of the Shizuoka Prefecture Trust Federation of Fisheries Cooperative Association in June 2007. Mr. Miyahara also has been the Chair of the Sea-area Fisheries Adjustment Commission in Shizuoka Prefecture since August 2012 and assumed the position of Chair of the National Federation of Fisheries Cooperative Association in June 2019.

## 6. Keisuke Mori



### Most serious problems affecting JSSF

One is a personnel shortage of fishers and the staff of the fisheries cooperative. The former incurs decline of not only the fishery productivity but also motivation in the fishing village. To most fishers in Japan, the role of the fisheries cooperative is critical in steering fisher's operation and living in the right direction. Second, the dwindling of fisheries resource is due to the malfunction of the resource management system and the environmental change in the sea. Though fishers are called for some control such as limiting of the catch, when a number of concerned groups intervene, deciding the measure to be taken is so difficult.

### Most significant factor for sustainability

In rural coastal areas in Japan, the fisheries cooperative is a core hub of the community, and the fishers are core subjects of governance. Hence, when we think of securing the sustainability of Japanese coastal fisheries, it is necessary to have the perspective that it is a problem of the community itself. Both local and national governments should have a view that the problem of such an area is the problem of the fishing community itself and also the people in the fishing village.

## Vision and priorities for TBTI Japan research network

The excellence of Japanese coastal fisheries is unprecedented such as the spirit of mutual aid and common ownership of resources, the decision making as a community based on maximum profit, and the governance system enabling sustainable production. In the situation where concerns about the sustainability of fisheries resources grow globally, it is extremely meaningful to introduce Japanese fisheries. We expect TBTI Japan to diffuse these points and boost the worthiness of Japanese fisheries.

### Commentator bio

Keisuke Mori was born in 1957. He held an administrative post and a research post at the Tokushima Prefectural Government Office and on loan to the Tokushima Prefectural Federation of Fisheries Cooperative Association in 2013 up to the present date.

## 7. Harue Oyama



### Most serious problems affecting JSSF

The particularly large problem in small-scale fisheries is the difficulty with the maintenance of fishery management. The contributing factors are the unstable income in fishery due to the decline of fish price and decrease of fish catch, irregular hours of labor, and professionally risky, making it difficult for successors and young crew members to gain a foothold. In particular,

for small-scale fishery managers, the fish price and fish catch easily become unstable, and without an unstable income, providing employee benefits is difficult, so this problem is of particular note.

### Most significant factor for sustainability

To secure the sustainability of fisheries, the stability of fishery income is essential, and the improvement of fish price and management of resources are particularly important elements. To improve fish prices, we need to raise the demand for fish by transmitting information on ocean-fresh fishery products of coastal areas and each geographical area and informing a lot of people of the local characteristics and deliciousness of the fish. On the other hand, to prevent the exhaustion of resources and continue stable fish haul in the future, fishery operators themselves must appropriately manage resources.

### Vision and priorities for TBTI Japan research network

Because this project aims to inform the public of coastal fisheries and its importance, we hope the TBTI project can transmit information on the size of the role played by fisheries in the area. Coastal fisheries are tied intimately with the area and may remain as the center of the local industries. I think if many people know about coastal fisheries, they may also discover the charm of the area and find the importance of fisheries.

### Commentator bio

Harue Oyama was born in 1937. She has been working at Senaka Net Fisheries since 1961 and became the president of the company in 1992 up to the present date. She became the representative director and association president of the Shinminato Fisheries Cooperative Association in 2008 up to the present date. She is also acting as an executive officer of a fisheries-related group in Toyama prefecture, including the Toyama Prefectural Federation of Fisheries Cooperative Associations from the same year. She became the representative

director and association president of the Toyama Prefectural Federation of Fisheries Cooperative Associations in 2016 up to the present date. In addition, she has been serving as the chair of the Toyama Prefectural Federation of Fisheries Cooperative's Women's Groups since 1990 up to the present date.

## 8. Masakazu Saito



### Most serious problems affecting JSSF

Elderly people without successors have decided to quit fishery in their generation, and not promoting the future of the fishery and local successors (continuation of technology) presents a major difficulty. The inability to see that we have lived until now in terms of the fishery, the local area, association, and the importance of fishery as the local industry is problematic.

### Most significant factor for sustainability

To contain costs by partnerships and pooling methods, the existing fishery business policy needs to be changed. We would like to take cost-cutting measures including human costs, fuel costs, etc. and link them to fish price stability, development of the market for fish.

## Vision and priorities for TBTI Japan research network

Understanding the state and concept of fisheries and for the old fishers to have a heart-to-heart talk with young people is important.

### Commentator bio

Masakazu Saito was born in 1955. He graduated from Shizuoka Prefectural Yaizu Fisheries High School in March 1974. He boarded the Saimasamaru (whitebait barge hauler fishery) the same year, and later in 1989; he became the owner of the Saimasamaru. Mr. Saito assumed the positions of the president of the Shizuoka Prefecture Whitebait Barge Hauler Fisheries Association in 2002 and left office in 2019. He became the president of the Shizuoka Fisheries Cooperative Association in 2007 (Changed to Mochimune Branch of Shimizu FCA from 2009), and up to current. Mr. Saito also assumed the positions of Shizuoka Prefecture Hometown Tourism Ambassador and Chairman in July 2019.

## 9. Taiichi Sato



### Most serious problems affecting JSSF

The main problem is that the resources, including the Kinme (Splendid alfonsino), squid, and abalone caught on the coast of the Izu Peninsula, are decreasing in the medium and long term. Because the fish price of the Kinme remains on the upward trend, expense increase such as fuel price hikes has

been absorbed thus far, maintaining the business of fishing households. The sustainable use of resources is a basic premise to keep fishing households in business, and there is an increased need for fishers who use the same resources to consider what to do to relieve the pressure to reduce catch together and promote the resource management-oriented fishery with practice.

### Most significant factor for sustainability

We need a plan for substitute fishery to relieve the pressure to catch Kinme resources, but the price of mid- and high-price fish, including the Japanese butterfish and red sea bream, continue to decline, and the choice of substitute fish species is difficult. It is important to strengthen efforts to promote, popularize fish-eating to increase demand. On the other hand, because the Izu area is a tourist destination to the immediate vicinity of the areas around Tokyo, the strengthening of a system for fishery cooperatives to produce manageable primary processed products is also anticipated. Izu has productive power, and small amounts of supply in different varieties are possible; however, fish price consistent with the expenses from the perspective of fishers is required.

### Vision and priorities for TBTI Japan research network

We have genuine problems, including fishery resources and successor shortage in the fishery. Because without a good prospect for a high salary, there are no successors to the fishery, so what needs to be done is to provide a steady supply of marine products and stable income to fishers. I believe that doing those things will create revitalization of fishing villages and the development of fishing village economy. The fundamentals of the fishery are to catch fish, and we would like to protect the bountiful ocean by introducing a new resource management system. There are also many problems facing this; however, by being a little bit patient with the quantity of catch, we would like to be in a virtuous cycle where resources increase, and income goes up further down the road.



## Commentator bio

Taiichi Sato was born in 1949 to a family of fishers (father and grandfather). He was retired from the hotel business in 2000 and became a fisherman who catches Kinme, Japanese butterfish, marbled rockfish, etc. He became the representative director and president of the Izu Fisheries Cooperative Association in 2011 and currently in his 10th year.

## 10. Kuwashi Suzuki



## Most serious problems affecting JSSF

It is problematic whether fishers engaged in the coastal fishery will be able to earn a living. Some ports are simply a coastal levee stretching along the coast, and with limited available boats, the fishery to be operated is confined to certain types. It is not possible to expand and consolidate town-managed fishing ports, and eight areas that can only manage traditional fishery remain in existence in the Inatori area. The fisheries cooperative is essential to support and lead various small-scale fisheries. I also believe that to fathom the cause of a good catch and a bad catch by combining on-site and research institute data and get this across on-site fishers is necessary.

## Most significant factor for sustainability

As two heads are better than one and 100 heads are better than ten, organizing community exchanges to stimulate unity among peers with the same sense of purpose is necessary. For coastal fishery, there are a lot of one-man boats and many fishers who have strong individuality. Fostering leaders who will sort these out, I believe, will make a powerful organization, which will significantly contribute to activating all community activities.

## Vision and priorities for TBTI Japan research network

The priority is for on-site fishers and TBTI network members to trust in each other. I consider that sharing a common aim by working alongside on-site and discussions between researchers from research institutes and fishers is the most important.

## Commentator bio

Kuwashi Suzuki is the president of the Inatori Branch, Izu Fisheries Cooperative Association, Shizuoka. He is also the co-chair of the Shizuoka Sea-Area Fisheries Adjustment Commission and the committee member of the Pacific Ocean Wide Sea-area Fisheries Adjustment Commission. He was awarded the Distinguished Persons in the Field of Fisheries in 2020.

## 51. Organizations' Perspectives on JSSF

In addition to fishers and their organizations, TBTI Japan Research Network is planning to engage with other fisheries actors and stakeholders who play important role in research, governance and capacity development in JSSF, as it moves forward. Thus, we asked the same questions to civil service workers, members of public interest organizations, members of the mass media, and researchers from key fisheries-related institutions, about the problems facing JSSF, factors affecting their sustainability and the vision for the network. The following presents the thoughts and viewpoints of these commentators.

## 1. Osamu Hashimoto



### Most serious problems affecting JSSF

1. Senior high schools, universities, etc. are unevenly distributed in urban areas, and a large percentage of children in fishing villages can't choose but to leave the villages for education. Furthermore, after the end of higher education, we see a gap between the demand for their desired profession and fishery-related vocation in the fishing village community, and a lot of people cannot return.

2. Coastal fishery and local food culture are deeply connected, however, with global warming in recent times, fishing grounds and fish catch period are greatly changing, and the fish and seafood caught and season are not in tune with consumer tastes.

### Most significant factor for sustainability

1. To aim for recovery of all fishery resources that habitat in coastal areas in the course of their lifetime by collecting information on all aquatic life, tracing their life history, and having environmental conditions necessary for their survival in place.

2. Because of fewer children, fishery employment is certain to decrease in the current system. We need to elicit opinions from women and young people and build an organization where fisheries cooperatives and related organizations will further participate in the planning of the distribution, processing, etc. of fisheries products. I believe that we also need enhancements such as training, concessions and others to employ workers from outside the community.

## Vision and priorities for TBTI Japan research network

1. The coastal fishery is a unique form of industry that has emerged and developed for people to survive in coastal areas, and there are not only the full time but also various types of additional operations, including part-time farming and part-time fishing, seasonal migration, fishers-running guest houses. After an inventory and analysis of the past, seeking the future of coastal fishery based on future needs is one idea.

2. Proposing a living and working environment that is different from big cities by revamping fishing villages to a safe, convenient, eco-friendly, compact city with nature remains will lead to the increase of young people and tourist satisfaction.

## Commentator Bio

Osamu Hashimoto is the president of the National Association of Fisheries Infrastructure and Association for Innovative Technology on Fishing Ports and Grounds. During his tenure with the Fisheries Infrastructure Department of the Fisheries Agency, he took a lead role in the realization of measures and policies in coastal fishery revitalization including sea desert measures, forest development for fisheries conservation, the realization of multiple functions of the fisheries industry and fishing villages, and fishery environmental improvement.

## 2. Satoshi Ishikawa



### Most serious problems affecting JSSF

The most important thing is that fishers themselves understand the environmental cause affecting the high variability and reproduction of natural resources. At the same time, other than fishers, developers and administrative officials, in particular, should understand that the environmental changes have the most potent impact on fluctuations in fishery resources. These are not recognized by fishers, governmental officials, and developers, and one could argue that points not reflected in management policies and development plans are the problems.

### Most significant factor for sustainability

It is essential to create better environmental conditions to smooth out the reproduction of the biological resources, which are the target species of small-scale fisheries. The environmental conservation of spawning grounds is most important, including the close season and no-fishing area, and it is also critical for stakeholders engaged in coastal areas to understand that.

### Vision and priorities for TBTI Japan research network

To create a network of researchers, developers, fishers, consumers and decision-makers, in order to share information relating to fluctuation and reproduction of fisheries resources. Then, to involve those with important scientific findings of smooth reproduction to developmental planning.

## Commentator Bio

Satoshi Ishikawa is a professor at the School of Marine Science and Technology, Tokai University. Dr. Ishikawa conducted academic practices on resource management and rural development, particularly in Southeast Asian countries. His current interest is to create a new method and concept to solve global environmental problems, especially biodiversity losses, correlating with quality of life improvement in rural areas through the “area-capability approach.”

## 3. Akira Nagano



### Most serious problems affecting JSSF

The rights originally granted to Japanese fishers have been lost without considering future possibilities. The fishery is one unit of industries, but one unit alone cannot support itself. The fishery is established with consumption distribution. However, in Japan, fishers are not able to play a role in the industry of the consumer and distribution sector.

### Most significant factor for sustainability

Existing coastal fisheries with a two-dimensional extent are inherently sustainable. Fisheries with short-term efficiency and efficient capture by a few actors impede sustainability. The following are two examples of elements: (1) to recognize that the seafood, which is the target of the fishery, is cultivated by

the environment in a place that has a two-dimensional spread, and to protect them; and (2) to establish a mechanism that allows fisheries to, directly and indirectly, control the distribution consumption that the fishery industry depends on.

## Vision and priorities for TBTI Japan research network

The Japanese coastal fishery is an industry that spreads flat along the coast of Japan. This widespread industry spreads in harmony with the changing environment. Moreover, its harmonization guarantees future sustainability, including inland Japan. For that purpose, the fishing ports, which are the production base, should be spread out in a horizontal plane and should be distributed and arranged with the function of controlling distribution processing.

Furthermore, Japanese fishing port fishing villages are distributed throughout the country to form the outline of the country, that is, to represent Japan's identity. In order to maintain the contours of Japan, fishing grounds, fishing ports and fishing villages must be arranged as a network with a flat and wide area along the coast of Japan.

## Commentator Bio

Akira Nagano graduated from Hokkaido University in 1969 and had worked in the Fisheries Agency until 2003. During that time, he obtained a Ph.D. in engineering for research on the development of fishing port fishing villages. Dr. Nagano was a professor at Future University Hakodate from 2003 to 2011, and the director of the All Japan Fishing Port Construction Association from 2011 to 2020. At present, he is the representative of Nagano Fishing Port engineer firm Co., Ltd. and is an emeritus professor at Future University Hakodate. For 50 years, he has been conducting administration, research, and construction on fishing port fishing villages with the following ideas.



#### 4. Hikaru Oikawa



##### Most serious problems affecting JSSF

The problem is that fishers cannot respond quickly to global-scale climate change. It means changes in fishing grounds, fishing seasons, fish species, etc., and it is not easy for fishers to deal with it. Furthermore, not only fishers but also processors and distributors are adversely affected regarding the reduction of the economic vitality of the whole region.

##### Most significant factor for sustainability

I think that “constructing new mechanisms” is very important, e.g., mechanisms for improving the added-value of marine products or for fostering cooperation/collaboration with others. By constructing such mechanisms, it is expected that fishers will be able to diversify risks for various problems, and as a result, management will be stabilized, and a sustainable supply of marine products can be expected. And the most important thing is that administrative organizations and researchers will support the construction of these mechanisms.

##### Vision and priorities for TBTI Japan research network

As for my own vision, I would like to learn about the various mechanisms that fishery is working on to achieve sustainability through participation in the TBTI Japan research network and provide feedback to the field. As a matter of priority, I hope that workshops for students in addition to the existing

activities, will be enhanced. If the students not only can get to deepen their understanding of the fishing field but also be given a job in the fishing field, the existence of the TBTI Japan research network may become more meaningful.

## Commentator Bio

Hikaru Oikawa was born in Iwate, Japan, in 1992. He received a master's degree in marine science from the Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology in 2018, and is presently a government officer in Iwate prefecture. He has worked on fishery administration and researching fishery management.

## 5. Masanobu Sakamoto



### Most serious problems affecting JSSF

The Shizuoka newspaper company has unfolded a long campaign titled “Changes in Sakura Shrimp” from December 2018. It covered a story about environmental concerns, culture, forms of fish catch, etc. surrounding the Sakura shrimp, which is managed by specialized fishing only in Suruga Bay in Japan. Through working on the topic, I realized that we are utterly blind to the Maehama, the foreshore ocean in front of us. This is the insufficiency of fundamental inquiry into the marine environment by the government, local towns, and research institutes.

## Most significant factor for sustainability

Not only fish catch surveys but also environmental surveys should be vigorously conducted accountably for a prolonged period with a budget. Furthermore, I feel that the media should understand and report the meaning. Local newspapers nationwide only take up coastal fisheries as a “special feature” and are not delivered as serious economic news. I think there is a trend of taking primary industries lightly in Japan.

## Vision and priorities for TBTI Japan research network

For the poor catch of Sakura shrimp, some fishers acknowledge that the “turbidity” produced by dams or the quarrying industry churning sediment upstream of the Fuji River emptying inner part of Suruga Bay, which is a spawning ground, is a problem. Furthermore, a large-scale wind farm project was raised near the spawning ground of the sandfish, which is known as the prefectural fish of Akita prefecture, fanning the fear of fishers. I am also hoping for discussions inclusive of how a country (Japan) should be in the TBTI research network.

## Commentator Bio

Masanobu Sakamoto was born in 1978. He joined the Mainichi newspaper company in 2002. After working at the business news department, Mr. Sakamoto started his career at the Shizuoka newspaper company in 2010. After being the head of the legal department in the Shimoda branch office, he became the head of the group of reporters of “Sakuraebi Yihen (changes in the Sakura Shrimp)” from December 2018.

## 6. Katsunori Tanaka



### Most serious problems affecting JSSF

Small-scale fisheries on the local community have been self-managed in Japan over 10,000 years and yielded sustainably by entry management. Its system was installed in the “Meiji Fishery Act” approximately 100 years ago as the fishery rights system. However, by the revision of the Fishery Act in 2018, the self-management of the Japanese coastal fishing community changed to administrative-management and has been exploited by corporate control.

### Most significant factor for sustainability

Nobel laureate, Professor Ostrom said that the management of shared resources is a more workable system by self-management of the local community than the public or market-management. Before the policy reform, the fishery rights system of Japan was based on the self-management of the local community. Unlike public-management, the established rule of the system was well obeyed. “The Decade of Family Farming” and “United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas” have advocated the importance of small-scale fisheries. Hereafter, there is a need to recognize the importance of “community self-management of the local community” in coastal fishery management.

## Commentator Bio

Katsunori Tanaka was born in 1955. After retirement from the Fisheries Agency, he has been a lecturer in the School of National Federation of Fisheries Cooperative Associations and an academic expert member of the Sea Area Fisheries Adjustment Commission of Shizuoka Prefecture. Also, he is working as a consultant in the fishery industry and making efforts to restore the natural environment of Tokyo Bay.



# Japanese Abstracts

## 1. 大変化時代を生きる日本の小規模漁業

日本小規模漁業の概念、ガバナンス、課題と役割

李銀姫（東海大学海洋学部）

浪川珠乃（一財 漁港漁場漁村総合研究所）

本書の企画を進められている真ただ中、思いのよらぬ COVID-19 パンデミックに陥った。日本小規模漁業はこれまで以上に、厳しい状況に晒されているのである。その中でも、この難を乗り越えようと、すでに多くの努力が全国各地でみられている。今がまさに、日本の小規模漁業が持つ意義とその役割について再認識が必要な時期である。本書はその意味でも時宜的なものである。本チャプターでは、まず、本書を読んでいくのに必要な概念、すなわち、小規模漁業なのか沿岸漁業なのかについて解説・整理を行った。次に、日本の小規模漁業が抱える今日の大きな課題について、「三重苦」と「三重変化」に分けて解明した。第3に、日本の小規模漁業が持つ大きな意味について、ガバナンスシステムの特徴、水面上の生命を守る役割、水面下の生命を守る役割、地球規模の小規模漁業の持続可能性の実現における役割等について解説・議論した。最後に、本書の構成の説明とともに、本書のねらいは日本の小規模漁業の存在と役割をアピールすること、そして、日本の小規模漁業・漁村において、厳しい環境の中でも様々なイニシアチブが見られているように、今日の小さな努力は明日の大きな変化をもたらすこと、変えようとする意志さえあれば道は必ず開くというメッセージを伝えることにあると述べた。

## 2. 鳥の目で見ると小規模漁業

多様な沿岸漁業と漁村のこれから

原田幸子（東京海洋大学）

四方を海に囲まれ豊かな漁場を持つ日本では、人々は古くから水産資源を利用してきた。日本の沿岸漁業は、その自然条件から多様な漁業が展開されていることと、大半が

家族経営を基本とする小規模漁業であることが特徴として挙げられる。日本の水産業は、遠洋漁業、沖合漁業が著しく縮小するなかで、海面養殖を含めた沿岸漁業の重要性が高まっているが、沿岸漁業をめぐるのは漁業就業者数の減少や高齢化などの課題も山積みとなっており、漁業者、地域、地方自治体、国など、さまざまなレベルで対策が講じられている。課題解決のために多くの努力が払われているものの、沿岸漁業を取り巻く現状は依然として厳しい。そこで、近年では漁業の強化とともに、いわゆる「海業」と呼ばれるような地域資源を活用したビジネスも展開されるようになってきた。漁村は、水産物を国民に安定的に供給するという役割だけでなく、自然環境の保全や国境監視、海難救助、伝統文化の継承といった多面的な機能も併せ持つ。こうした機能を維持してためにも、沿岸漁業と漁村の持続的な発展が不可欠であることは言うまでもない。日本沿岸は豊かな海洋環境に恵まれているが、水産資源の悪化や地球規模の気候変動など置かれている状況は厳しく、地域資源を活用した新たな取り組みなどによる漁村ビジネスの実現が求められている。

### 3. 漁業者組織と小規模漁業 漁業協同組合の役割と課題

望月政志（一橋大学）

この章では、日本の漁業協同組合（以下、漁協と略す）を取り上げ、漁業権の管理や共同販売、漁協と地域コミュニティのかかわりに焦点を当て、小規模漁業に果たす漁協の役割や漁村が直面している今日的な問題について解説する。漁協は、日本の漁業者が加入している全国的な組織であり、水産業協同組合法に基づき設立された。そして、組合員である漁業者の経営安定化や経済的・社会的地位の向上、および水産資源の管理を目的に組織され、様々な経済事業や漁業権の管理に取り組んでいます。また、漁村の伝統的な祭りやゴミの清掃活動などにも積極的に参加し、漁村地域の社会活動を支える中核的な組織としての役割も担っている。なかでも日本の漁協が農業協同組合などの他の漁協と大きく異なる点は、漁業権の管理主体であることです。漁協が管理する共同漁業権漁場は、漁村コミュニティをベースとする管理であり、コミュニティ・ベースド・マネジメントとして世界的に有名で、慣習的管理と法的管理が組み合わさった成功事例であるといえます。また、漁協が販売事業の一環で行っている共同販売は、生産量の少ない小規模漁業者から水産物を集荷・販売し、一定水準の品質に均一化し、規模の経済を働かせるといった役割を担っています。さらに漁協は産地市場を開設・運営し、産地市場を通じて組合員である漁業者の漁獲物を消費地市場へ供給するといった社会的な役割も担っています。しかし、近年、若者の流失により漁村そのものが過疎化し、漁村の伝統的な祭りが消え去ったり、漁村単位での漁協の維持が困難になったりといった問題も現れている。



#### 4. 漁業関連女性組織と小規模漁業

漁協女性部の意義と課題及び新たな女性ネットワークの構築による女性活動の展開

関 いずみ（東海大学）

本稿は、初めに、漁業関連女性組織の最も基本的な組織として漁協女性部を取り上げ、その設立の経緯や活動内容、女性部が抱える問題点について整理した。漁協女性部は、1950年代に生活改善運動をきっかけに組織化された。その後、女性部の活動は、時代とともに変化する社会問題に対応するように行われてきた。公害問題が深刻化した70年代からは合成洗剤追放運動や、植樹運動など環境保全に関する活動が行われるようになった。また、水産物の消費の減退を背景に、魚食普及活動が活発化する。近年は、地域の高齢者支援に関する活動も行われている。一方で、女性部数及び部員数の減少や、部員の高齢化という課題にも直面している。次に、近年活発化している漁村女性による起業活動について概観した。これまで無償のボランティアとして地域活動を行ってきた女性部だが、起業活動をきっかけに、女性の経済的自立や、生きがいの創出というような新たな活動の意義が見出されるようになってきている。また、起業活動は、漁村における任意のグループの創立も促している。女性たちによる起業活動は、経済的効果だけでなく、水産資源の有効活用、水産物の消費拡大といった役割も担っている。最後に、漁村の新たな女性ネットワークについて述べた。現在、若手漁村女性のネットワークを目的とするフレッシュミズ会議や、漁業や水産業に関わる女性たちを広域につなげる水産庁によるプロジェクト、起業に関わる漁村女性のネットワークを図るうみ・ひと・くらしフォーラムなど様々な試みが行われている。今後、漁村女性の組織は、地域内外の様々な分野の人々との連携を広げていくことが期待される。

#### 5. 水産政策の改革と小規模漁業

水産政策の改革による効率性の向上とそれを補完するコミュニケーション

日高健（近畿大学）

現在、日本において漁業法改正を中心とした水産政策の改革が進められている。漁業法は日本における漁業制度の基本的な枠組みを形成するもので、沿岸の小型漁業に関しては共同漁業権、養殖漁業権、定置網漁業権といった漁業権制度の枠組みを提供する。改正漁業法では、これまで目的であった漁業の民主化が削除され、漁業の効率化による漁業生産性の向上が目的とされている。漁業生産性を上げるには効率性を追求するのが適している。しかし、沿岸の環境管理や資源管理を長期的に効率的に遂行するには、関係者の合意と参加が必要である。そもそも漁業法は漁業生産性の向上と漁業の民主化という相反する概念を内包していたが、資源管理型漁業

のような形でそれを解決してきた。今回の改正でもこれまでの知恵を生かすべきである。我々は、改正漁業法によって削除されたコミュニケーションを補完するものとして里海概念を提案している。

## 6. 里海概念と小規模漁業

### 沿岸域管理の新しい概念としての里海と小規模漁業者の役割

日高健（近畿大学）

現在、沿岸域管理の新たな手法として、里海が注目されている。里海概念は柳（1998）によって提案されたものであり、現在では日本国内だけでなく海外にも広まりつつある。日本では、漁村による地先管理の伝統的慣習が漁業法によって制度化され、共同漁業権として現在に至っている。しかし、近年の沿岸域を巡る社会環境の変化によって、漁村が地先を管理するのが難しくなっている。そこで、登場したのが里海である。里海は、自然的、社会的要因が似ている狭い地域において形成される。新しい里海の特徴は、漁業以外の活動も対象となること、様々な人たちが参加すること、科学的な根拠や客観的な観察が重要になることである。さらに、里海は環境や経済だけでなく教育にも効果がある。そのような里海に対して、小規模漁業者は公共用水面における管理活動の正当性、海や水産資源に関する知識や海上での活動手段の保有、地域の居住者として様々な人たちの窓口になることといった役割がある。

## 7. 沿岸域管理と小規模漁業

### 沿岸レジャー利用管理における地域漁業者の役割

浪川珠乃（一般財団法人 漁港漁場漁村総合研究所）

沿岸域は環境的に高い価値を有するとともに、社会経済的にも価値の高い地理的空間である。経済成長や科学技術の進展に伴い沿岸域の利用ニーズが多様化する中で、沿岸域の適正な利用をいかにルール化し、利用者に浸透させるか、いわゆる沿岸域における利用管理体制の確立が重要になっている。本稿では日本の沿岸域管理の変遷を漁業の管理、空間の管理、レクリエーションの管理の面から概観し、長らく水産資源を得る場として管理されてきた日本の沿岸域が、開発空間や海洋性レクリエーションの場等利用の範囲が拡大し、ローカルコモンズからオープンなコモンズに変化している状況を示した。そのような状況の中、首都圏から最も近い離島である静岡県の中島を事

例に、沿岸域の利用管理において、地域の漁業者が重要な役割を果たしている状況を示し、日本の沿岸域管理における漁業者の果たす役割について考察した。

## 8. 日本のジェンダー政策と小規模漁業 “気づき”から行動へ

副島 久実（摂南大学）

カティア・フランクドゥス（西ブリュターニュ大学 AMURE センター）

ジェンダー平等は、国際条約の批准に対する公約を果たすために国が取り組まなければならない項目であるが、日本ではジェンダー平等を目指す「ジェンダー平等政策」ではなく、経済への女性の参加を強化することを目的とした「女性活躍推進政策」を展開している。農業や漁業などの産業分野においても同様である。持続可能な農漁業と地域を目指すためには、農業や漁業の分野における女性の労働の社会的・経済的評価と意思決定過程への参加を促進する必要がある。しかし、それらを実現させるには、いまだ根深く残るジェンダー不平等により難しい状況にある。また、漁業や漁村では漁協の存在が大きいが、そこには男性優位の考え方が強く残っているため、女性が漁協における意思決定過程に参画していくことはまだまだ難しい。このチャプターでは、ジェンダーの平等に関連する農業および漁業のいくつかの政策を検討し、理論的な目標と実施の効果との間のギャップについて焦点をあてる。そしてジェンダー平等に関する漁村女性たちのいくつかの意見を紹介する。

## 9. 政府サポートと小規模漁業 静岡県における沿岸漁業支援の現状と課題

中平 英典（静岡県経済産業部水産・海洋局）

日本における沿岸漁業に対する行政のサポートにおいては、都道府県が果たしている役割が大きい。このため、本稿においては、沿岸漁業に対する行政のサポートの意義や現状、課題について、遠洋・沖合漁業と比較した沿岸漁業の実情において日本全体の縮図ともなっている静岡県が実施している沿岸漁業サポートの現状や課題を事例として論じる。静岡県において、沿岸漁業は、地域の雇用の創出や、日本の多様な食文化の形成、さらには、地域の特色ある文化の発展に重要な役割を果たしている。このため、このような沿岸漁業を持続可能なものにしていくため、静岡県では、資源管理の徹底、魚価の向上、適切な流通、消費対策を実施している。特にこれまであまり行われてこな

かった流通,消費対策においては,観光業との連携,ICT ツールを積極的に活用した地場流通の拡大,地域内の物流システムの構築が重要となっており,それらの取組を今後更に拡大することにより,地域の特色にあふれる沿岸漁業の可能性をもっと伸ばせるものと考えている。

## 10. 沿岸漁業の伝統と文化

### 若手シラス漁民のライフスタイルを事例に

小林孝広（東海大学海洋学部）

本稿は,地域の過疎高齢化が進む中で,なぜ若者が用宗のシラス漁に集まるのかについて,若者個々人のライフスタイルに着目しながらその理由の一端に迫ることを目的とした。ライフスタイルに着目するのは個人の動機に着目し,一般に語られやすい収入の多寡にだけに着目するのではなく,彼らを取り巻く他の社会的要因にも目配りするためである。この調査は大学の実習授業の中で共同で行われた。特に今回調査対象となったのは若手シラス漁師5名である。彼らの職業と余暇活動についての語りを収集し考察した。若手漁師たちはそれぞれに漁に対する職業としての誇りを持っている。また,用宗のシラス漁は,年間操業が130日と短く,また午前中に漁を終えることができる。午後の時間は季節的には由比の桜エビ漁のほか様々な副業にも充てられる。またそれだけでなく様々な世代を超えた共通の余暇活動に充てることができる。このように,職業に対する誇りにあわせて自由になる余暇の時間が豊富であること,またそこで展開される豊かな人間関係が,若者をシラス漁に向かわせることが明らかになった。

## 11. 海女と小規模漁業

### 日本の漁村における海女漁の特性と社会的地位

吉村真衣（三重大学）

本章では,日本の沿岸漁業の一形態である海女漁について,三重県鳥羽志摩地域を事例に紹介する。海女漁は2000年以上続く伝統的な素潜り漁で,近年では持続可能な漁業のロールモデルとして評価され,文化遺産,観光資源としても注目が集まっている。海女漁の特性は,厳しい資源管理と高い共同性である。主要な漁獲物であるアワビは漁の期間や時間,捕獲できるサイズに制限がかけられており,海女は自主的な管理と相互監視のもと資源管理を図っている。また海女は「かまど」という

小集団で出漁し、互いの安全を常に確認している。「かまど」をもとにした共同性は、海女漁という枠を越え、日常生活の相互扶助の基盤にもなっている。これらの特性は、漁村の地理的・自然的条件や漁獲物の性質、漁にともなう生命の危険性を背景に形成され、海女によって長い間維持されてきた。近年海女漁は、後継者不足という問題を抱えている。その解決のため、行政の介入のもと海女漁に関心のある都市部の女性を移住者として受け入れる漁村が現れた。この取り組みは、社会的背景や職業観の異なる移住者をいかに受け入れ、ローカルな共同性を再構築するかという新たな課題を漁村にもたらしている。海女漁の存続のためには、海女漁と漁村をとりまく構造的な問題を十分に理解し適切な施策を講じることが重要である。また何よりも、海女や漁師の声を丁寧に聞き取り、漁村の歴史、社会文化と沿岸漁業との結びつきをとらえることが欠かせないだろう。

## 12. 小型捕鯨漁業 現状と将来の課題

瀬木志央（甲南女子大学）

日本の沿岸村落においては縄文時代から何らかの小型捕鯨がおこなわれていたと考えられている。小型捕鯨漁業が急速に発展した明治以降、小型捕鯨漁業は、捕鯨地域に留まらず、遠く離れた地域の人々の生活に、食料供給、雇用、そしてエンターテイメントを通して密接に関わりを持ってきた。本章は小型捕鯨漁業、すなわち農林水産大臣の許可による小型捕鯨業、そして都道府県知事の許可による追い込み漁と突きん棒漁に焦点を当て、それぞれの発展過程と現状について概観する。小型捕鯨漁業は、戦後の食糧難、母船捕鯨等の大型捕鯨業との競合、国際捕鯨委員会による商業漁業モラトリアム、調査捕鯨との競合、そして国際捕鯨委員会脱退と商業捕鯨再開といった、捕鯨者の力の及ばない外部要因により大きく翻弄されてきた。加えて、反捕鯨グループによる捕鯨に対する批判や抗議活動の拡大、捕獲量を割り当てられている鯨類の捕獲量は、いずれの捕鯨タイプでも近年大幅に落ち込んでいることも懸念される。持続可能な小型捕鯨業の実現のためには、商業捕鯨再開を契機とした調査捕鯨に依存した経営からの脱却、後継者の確保、捕鯨技術・地域環境地の継承が欠かせない。

### 13. 漁業安全システムと小規模漁業 漁業安全と漁村社会

三木奈都子（国立研究開発法人水産研究・教育機構中央水産研究所）

日本における漁業安全システムに関する研究は、主に漁業の労働科学研究のなかで行われてきた。その研究を中心的に担ってきたのは、労働科学研究所と海上労働科学研究所であった。これらの研究所で行われた漁業に関する研究の主な対象は、沿岸漁業よりは遠洋・沖合漁業であったが、労働科学研究所の設立に関わった暉峻義等氏は、もともと漁業、特に海女漁業など沿岸漁業を労働科学研究の主な研究対象にとらえ、そこに漁業安全についての観点も含めていた。労働科学研究の初期に関心を集めていた海女漁業も含め、従来、沿岸の小規模漁業の漁業安全システムは、漁村の社会慣行のなかに含まれていた。海難発生時の相互扶助的な対応や漁業者集団による出漁の可否や出港時間、操業時間などの取り決め、水揚げ作業や漁獲後の加工処理作業など主に漁業陸上作業を対象とした労働交換や共同作業、海上での船団操業による情報交換などである。技術的な面からの漁業安全の向上がめざましい近年であるが、関係者の間でコミュニケーションをとり、漁業者が技術を使いこなせるソフトを共有し、また、これまでの社会慣行とすり合わせていくことが重要であると考えられる。

### 14. 漁港整備と小規模漁業

水産業・漁村が果たす多面的な機能を支える漁港整備

高吉晋吾（一般財団法人 漁港漁場漁村総合研究所）

周囲を海に囲まれた日本にとって、水産業や漁村は多様な水産物を国民に供給するだけでなく、沿岸環境の保全、国境監視、海にまつわる文化の維持継承など多面的な役割を有している。このような役割を将来にわたり発揮し続けられるよう、産業政策と地域政策の両面から漁港整備をはじめとする水産政策が進められている。日本の漁村は良好な漁場に近い場所に生まれ、山が海に迫る平地の少ない場所に立地することが多い。そのような漁村にとって漁港は重要なインフラである。防波堤や岸壁、漁業活動に必要な用地などを整備することにより安全・安心で快適に漁業活動を実施できる。また、漁港の用地は災害時の救援活動や憩いの空間などを提供しており、漁村の生活環境の向上にも貢献している。近年は漁業就業者や漁船が減少しており、漁港の整備については、規模の拡大といった量的整備から、多目的な利用や衛生・品質管理など質的な整備に重点が移っている。また、老朽化した漁港施設の長寿命化対策も大きな課題となっている。

## 15. 産地市場と小規模漁業

### 様々な水産物の流通の出発点

林浩志（一般財団法人 漁港漁場漁村総合研究所）

我が国には、800 近くの産地市場がある。一方、漁港は約 3,000 あり、約 4 つの漁港のうち 1 つには産地市場がある。この中には、取引規模の小さい産地市場もあり、価格形成力が弱いことなどが課題となっているところもあるが、沿岸漁業を中心として多様な魚種が各地で水揚げされる我が国において、産地市場は、水産物を効率的に流通させるために重要な役割を担っている。つまり、水産物は、野菜・果物・肉などと異なり、産地市場と消費地市場の二つの卸売市場を経由して消費者に届けられる。これは、魚や貝類などは傷みやすく、その一方で、刺身や寿司、酢の物といった非加熱食品を好む日本の食文化から、より新鮮な商品を消費者に届けるためである。そして、これら多くの産地市場は沿岸漁業による水揚げによって成り立っており、そして、沿岸漁業は産地市場を介して地域産業の中心的な存在となっている。しかし、近年は、取扱量の減少、魚価単価の低迷、買受人の減少などから産地市場における価格形成力が低下してきている。今後は、これらに対して、産地市場が有する情報の活用や品質管理のより一層の向上が求められる。

## 16. 漁場整備と小規模漁業

### 遊漁における人工魚礁の間接的効果

伊藤靖（一般財団法人 漁港漁場漁村総合研究所）

人工魚礁とは水産生物の増集や保護培養を目的に、人工的に造成した魚礁構造物の総称である。投石による築磯等が 17 世紀頃から行われてきたが、国の施策として体系化したのは第二次世界大戦以降である。主に漁業の利用を主たる目的としているが、遊漁にも利用されていると考えられる。遊漁案内業は沿岸漁業者が兼業で営むことが多く、漁業者の収入増にも寄与している。しかし、人工魚礁の遊漁による利用実態は必ずしも明らかではなく、具体的に遊漁の利用による便益を計測した事例はほとんどない。ここでは、遊漁を営む代表的な漁業地域として、神奈川県大磯町、静岡県御前崎町、京都府丹後半島、和歌山県印南町、香川県高松市・庵治町、福岡市長崎県野母崎町を選出し、これらの地域の遊漁案内業者および遊漁者等へのアンケート調査により、人工魚礁の遊漁による利用実態を明らかにし、事例的に便益を試算することで、沿岸漁業における人工魚礁の間接的な効果を明らかにした。

## 17. 自然災害と小規模漁業

### 災害予防と漁業地域の業務継続計画

影山智将（全国漁港漁場協会）

日本の周辺海域には世界有数の好漁場が形成されており、古くから漁業が盛んで魚食文化が育まれてきたが、一方、日本は自然災害の多い国である。環太平洋造山帯に位置し、火山活動、地震活動が活発である。また、毎年台風が上陸し暴風雨や高潮による被害をもたらしている。近年は地球温暖化の影響によると思われる台風の巨大化、梅雨や秋雨の集中豪雨化が著しく、被害を拡大している。日本の漁業は常に災害と隣り合わせであり、災害のリスクを常に意識し、予め備えておくことが重要な課題となっている。災害への対処は、自助を基本として、共助、公助を災害の時間的経過にあわせた各段階、すなわち、災害予防、災害応急対策、災害復旧・復興の各段階ごとにうまく連携させていくことが重要である。日本では、東日本大震災以降、漁業地域において漁業、水産加工業、輸送業、行政等の関係者による協議会をつくり、防災・減災対策や災害発生時の役割分担と協力体制を決めておく業務継続計画づくりが行われている。世界の他の地域の沿岸漁業について考える際、参考になれば幸いだと思う。

## 18. 漁業就業と小規模漁業

### 人材育成システムの拡充とマッチングこそが漁業者を増やす近道

竹ノ内徳人（愛媛大学 南予水産研究センター）

この小論文・コラムは、日本の小規模漁業における漁業就業者について現状と展望を述べることである。漁業就業というテーマは、日本の沿岸漁業を守っていくためにとても重要な論点である。日本の沿岸漁業は、きわめて小規模であり、ほぼ 9 割以上が家族経営である。そして日本の小規模沿岸漁業が、これまで漁業就業の中心的役割を果たしてきたことも事実である。しかしながら、就業機会の多様化や漁業自体に魅力が乏しくなってきたために、漁業の後継者不足の問題が顕在化してきた。日本の漁業が強かった 1960 年代から、近年の極めて危機的な現状までに関して、漁業就業に関する制度的な取組、就業状況について分析する。まず、日本の小規模漁業の制度的な側面から構造や構成、ならびにその特徴を明らかにする。また、小規模漁業の就業に関する後継者問題も外せない議論である。そのうえで日本の小規模漁業がかかえる制度的ならびに構造的な問題を指摘する。このような問題を改善するために、近年は、全国各地で人材育成システムが活発化している事実についても紹介する。最後に日本の小規模漁業と漁業就業に関する対策と展望を述べる。



## 19. 六次産業化と小規模漁業

変動する漁業所得を補完するしなやかな就業所得機会と地域の魅力の創出

富田 宏（株式会社漁村計画）

日本の沿岸漁業や小規模漁村は、日本列島の隅々に立地することで、安全、新鮮で多様な水産物を国民に提供すると同時に、自然環境の保全や沿岸域管理、伝統文化や景観の維持など多面的機能を発揮している。一方、このような沿岸漁業や漁村成立の前提となる多くの個人経営漁家の所得水準は、一般的世帯所得の半分程度である。このことが、漁業の担い手の減少と後継者不足の大きな要因になっており、今や、漁村地域の存続さえ危ぶまれる状況を招いている。6次産業化は、沿岸漁業や小規模漁村の持つ多種多様な資源を活用した持続的なコミュニティビジネスを創出することで、これらの問題を解決しようとする取組である。つまり、小規模で不安定な漁家所得を補完する所得機会を創出すると共に、持続可能な沿岸漁業と小規模漁村の振興を目的としたものである。6次産業化の取組内容は、地域の実態により多種多様であってよく、必要なことは、漁業者を始めとした地域住民が将来のビジョンを共有しつつ、目的や取組内容、担い手や運営体制を確立し、自立的に継続させていくシステムを地域に定着させていくことである。そのためには、自立と継続、モノではなく地域のブランド化、持続可能なコミュニティビジネスの視点が重要である。

## 20. 水産物のブランディングと小規模漁業

～水産物ブランドの新たな展開～関さば・あじの事例から

波積 真理（熊本学園大学）

関さば・あじが水産物の商標登録を取得した90年代後半以降、水産物のブランド化は活発化してい。水産物のブランド化の歩みとしては、およそ30年が経過したことになる。水産物を取り巻く厳しい状況に対してブランド化への取組がはじまり、その結果ブランド化に成功した水産物における魚価の向上、認知の高まりなど一定の成果をあげた。しかし、リーマンショック以降経済状況の悪化により市場環境が大きく変わり、その後景気は持ち直してきたが、魚価上昇にはつながっていない。水産物を取り巻く厳しい状況において、水産物のブランドのあり方も変化を迫られている。本稿ではブランド・ポジションでも最上位に位置する「セレブレティ・ブランド」の代表である「関さば・あじ」を事例として、ブランドを確立するための品質管理や新しいビジネスモデルの必要性を考察する。さらに資源減少の問題について資源管理や消費者の意識変化が必要であることを述べていきたい。

## 21. 都市漁村交流と小規模漁業

### 小規模漁村における都市漁村交流の意義

浪川珠乃（一般財団法人 漁港漁場漁村総合研究所）

“都市漁村交流”とは、都市住民が漁村地域を訪れ、漁村の自然や水産物を楽しむとともに、漁村地域に活力を与えることを指し、漁村地域活性化のための施策の一つとして位置づけられている。漁村は、新鮮な水産物を安定して供給する機能を有するとともに、海洋性レクリエーションの場の提供や地域色豊かな食文化・伝統行事の継承などを通じて都市部の人々にゆとりある生活、癒しやうるおいを提供している。一方、漁村にとっては、漁村に人を呼び賑わいをもたらすことによって地域の活性化に大きく貢献するものとして機能するのである。本稿では都市漁村交流活動の変遷を整理しつつ、特に直販および体験漁業に着目し、交流人口の増加（都市部の人々への漁村の価値の提供）や地域活性化（漁家の副収入の確保）という点で、沿岸漁業地域に一定の貢献をしている状況を示した。

## 22. 渚泊と小規模漁業

### 小規模漁村における渚泊実践に向けての一考察

後藤卓治（一般財団法人 漁港漁場漁村総合研究所）

小規模漁業に営む漁業者の多くは、都市部から離れた小規模な漁村で暮らしている。近年の漁業生産量の減少からこのような小規模な漁村で生活していくには、漁業だけの収入では所得が不足してしまうため、生活するための所得を確保すべく漁村から若者が流出しており、このままでは漁村の存続が危ぶまれる状況となっている。今後も漁村が存続するためには、地域での雇用を創出し所得向上を図ることが必要で、その解決策の一つとして、漁村が持つ地域資源を活かした漁村への滞在型旅行である渚泊の取組（泊まる、遊ぶ、食べる、体験する、見る）を実践することが考えられる。渚泊の取組は様々だが、観光客が旅行するのは、都会では味わえない非日常に触れることを求めており、小規模な漁村ほど都会とは違う非日常を得られるとも言えることから、観光資源としての潜在能力は高いと考えられる。しかし、小規模漁村では漁業者や住民の高齢化や減少や家屋や施設の老朽化等、観光客を受け入れる体制を構築出来ず、渚泊の取組を実践している地域が限られている。ここでは、漁村への滞在型旅行である渚泊の内容を紹介し、小規模漁村で渚泊を実践するための工夫や様々な連携により小規模な漁村での体制の構築方法について考察した。

## 23. 漁業管理ツールボックス「浜の道具箱」と小規模漁業 漁業関係者による沿岸漁業管理の自己評価・改善の仕組み

竹村紫苑（水産研究・教育機構）

牧野光琢（東京大学）

但馬英知（水産研究・教育機構）

日本の漁業管理制度は歴史的に共同管理に基づいておこなわれてきた。また、2017年4月に閣議決定された新たな水産基本計画では、共同管理が沿岸漁業政策の中軸に位置付けられている。したがって、漁業者は、持続的な資源管理と地域振興に向けて、資源・漁業管理の着実な実施と改善が求められる。そこで本章では、漁業関係者が沿岸漁業管理を自己評価・改善するための仕組み「漁業管理ツールボックス（浜の道具箱）」をについて紹介する。そして、ツールボックスを日本の沿岸漁業管理の改善に適用し、その試行結果を通じて学んだ教訓について述べる。日本の沿岸4地域における試行結果から、ツールボックスは地域の漁業関係者（漁業者、行政、研究者など）が地域の資源・漁業管理の取り組みを評価することを通じて、優先的に改善すべき項目の同定に有効であった。さらに、山口県下関外海地域における試行結果から、ツールボックスは同地域の漁業管理改善計画である「浜の活力再生プラン」の改善にも有用であった。以上の結果から、ツールボックスは漁業関係者による対話と相互学習を促進させることを通じて、日本の共同管理に基づく沿岸漁業管理の高度化に貢献することが期待される。

## 24. Hama-katsu プランと小規模漁業

沿岸漁業を基幹産業とする漁村地域の活力再生に向けて

麓 貴光（株式会社 水土舎）

日本の漁業生産構造は、少数精鋭による沖合・遠洋漁業が漁業生産量の大半を支える一方、経営体数の94%を占める小規模な沿岸漁業層が、日本の沿岸一帯に居住して漁村地域を形成し、多様で高品質な水産物を供給するとともに多面的な機能を発揮している。現在、沿岸漁業層の減少が顕著で漁村地域の活力低下に直結している。これに歯止めをかけるべく、様々な施策が講じられてきたが、地域が抱える課題の多様化、複雑化に伴い、十分な成果を得ることが難しくなってきた。地域の多様で複雑な課題に対し、実状に応じた課題解決に取り組むことを基本的な考え方とした施策が”Hama-katsu Plan”である。Hama-katsu Planは、漁業者及び関係する地域の住民自らが策定する計画である。個々の地域の実状に合わせ、計画期間5年間で地域の漁業所得を10%以上向上させることを目標とし、「収入向上」及び「コスト削

減」の両面から方策を取りまとめ、これを着実に実施する。補助事業の活用で優遇措置も講じられる。現在、Hama-katsu プランは 640 地区で承認されている。第 1 期の各地の取組は一定の成果を上げていると評価しうる。地域の関係者自らが策定した計画の下で、取組を実践し、一定の成果が見られたことは評価に値する。一方、地域の力の差といった課題も顕在化した。計画策定の企画力、取組の実践力が不足する地域が見られた。これに対し、より効果的で円滑な外部支援の活用も必要になるだろう。変容する漁村地域や政策の転換期にある漁業の下で、今後の Hama-katsu プランも地域の漁業や関連産業のあり方を具体的にデザインすることが求められるだろう。地域が主役となり、自らの力が試される時代の到来、その端緒を Hama-katsu プランが開いたといえよう。

## 25. 水産加工技術と小規模漁業

### 低利用魚から地域特産かまぼこへの転換

平塚聖一（東海大学海洋学部）

地域商品となっているかまぼこの特長は、原料に冷凍すり身は使わず、前浜で地元の沿岸漁業者が漁獲した魚のみを使うことである。「じゃこ天」は愛媛県の名産品で、地元の小型底曳網漁船が漁獲した小型魚が原料になっている。通常、小型魚は可食部が少ないため、食用としての利用が難しく、市場では値がつきにくい。宇和島市で製造された「じゃこ天」は「宇和島じゃこ天」として地域団体商標登録されている。伊予市でも、上灘漁協の女性部が「じゃこ天」を製造している。上灘漁協の「じゃこ天」製造事業は雑魚の価格を安定化させることと魚食の普及に大きく貢献した。静岡県泉のいとう漁協では地元の水揚げされるサバなどを用いて漁協によるすり身の製造が行われている。特に、小型の魚は価格が安く、これまでは養殖魚の餌になっていたが、このような魚もすり身に加工することで食用として利用できるようになった。漁協ではすり身を使った数々のメニューを開発し、サバのサンドイッチやパスタソースなどユニークな商品が誕生している。この 2 つの地域でかまぼこ製造に使っている原料は沿岸漁業者が漁獲した水産物である。沿岸漁業者のみが真正銘の地元の魚を消費者に届けることができるのである。したがって、日本国民の魚食文化を守り、魚食の減少を止めるためには沿岸漁業者の力は重要である。また、最近では人々が食事の準備にかかる時間が減少し、その結果として魚の料理は敬遠されがちになっている。魚をすり身に加工することはその打開策になるだろう。

## 26. タイと日本における小規模漁業：

タイの小規模海面漁業管理を中心に

佐藤昭人（SEAFDEC）

タイの多くの人々にとって、漁業は動物性タンパク質の重要な供給源となっている。タイの漁業生産は 20 世紀の終わりまでの 40 年の間に著しい成長を示したが、今世紀中に漁業生産は減少してきている。これは主に海面漁業生産の減少によるものであるが、タイでは海面漁業管理と海面漁業の乱獲において様々な問題に直面している。これらの問題は、例えば、人口の増加と伴に魚介類や水産物に対する需要の増加、タイのトロール漁業による漁獲圧の増加、効果的な小規模漁業管理システムの構築の難しさ、小規模漁業者の厳しい生計状況等の様々な要因が重なり合っており起こっている。直ぐに解決できるものではない。本報告では、タイと日本の小規模海面漁業の異なった特徴やその背景について概観するために、タイの海面漁業の経緯や海面漁業を取り巻く現状、海面漁業の政策や海面漁業管理制度の経緯を紹介するとともに、これまでの集落共同体による漁業管理の取り組みの経験を分析した上で、日本とタイでの小規模海面漁業の違いとして、タイでは日本の沿海漁協のような組織化や日本の地先共同漁業権のような地域による自主管理が進んでいない状況の中ではあるが、これまでの取り組みの経験も踏まえつつ、厳しい漁業調整のみならず行政からの財政支援や漁業者のみならず地域住民の参加も含めた息の長い地域主体の共同管理の取り組みへの継続的な支援が重要であるとの考えを示した。

## 27. マレーシアと日本における小規模漁業

研究者にとって東南アジアに残る大きな課題

加藤雅也（東南アジア漁業開発センター 海洋資源開発管理部局）

小規模漁業の定義は国によって異なる。マレーシアでは、小規模漁師を、漁具と船のサイズに基づいて、伝統的な漁師として分類する。ほとんどの伝統的な漁師は、最も岸から近い漁場で漁をすることができる。海洋の漁獲漁業では、総数でわずか 25% である商業的漁師が魚介類の約 70% を漁獲している。船のサイズや人数の少なさでは、船員が 2 名で高価なクロマグロなどを捕っている沖縄の小型マグロ漁船や高価なアワビを捕る海女などは、小規模漁業ではあるが高い収入を得る事もある。低所得のため、伝統的な漁師の社会的経済的地位の改善は、持続可能な生活と漁業にとって非常に重要である。マレーシア水産局は、漁業免許とゾーニングシステムの法執行を管轄している。海岸線近くのゾーン A は伝統的な漁師向けだが、モンスーンの季節にはゾーン A で許可された限られた数のえびトロール漁船が漁をすることができる。

健康な生態系を維持するためには、魚介類の生態と周辺環境の生物学的および非生物的要素を理解する必要がある。温帯地域での研究を熱帯には通常応用できないので、熱帯の伝統的漁業を研究することは困難な分野だが、それにチャレンジして行く必要がある。トレンガヌ州では、モンスーンの影響により漁業ができない日が多い時期があるため、漁業以外の収入源も含めて、州の特徴を再検討する必要がある。

## 28. カンボジアと日本における小規模漁業

日本の水産政策からみたカンボジアの漁業コミュニティ制度への提案

堀美菜（高知大学）

カンボジアでは過去 20 年間に 2 回の漁業制度改革が実施された。この改革により、トンレサップ湖における商業的な大規模漁業の漁業区画はすべて撤廃され、保護区又は小規模漁業の漁業区へと転換された。小規模漁業は自家消費目的の自由漁業と定められており、漁業許可は不要である。新たに小規模漁業の漁業区へと転換された。漁業区の管理には、漁業コミュニティによる住民参加型の資源管理が導入された。漁業者には漁業区監視の義務があるが、担当する漁業区を占有し使用することは認められておらず、管理のインセンティブが働きにくい。更に、漁業コミュニティには管理活動のための十分な予算がなく、活動予算を国際機関や NGO などの外部支援に頼っている。本稿では、日本における水産基本法に基づいた漁業振興策と、都道府県水産試験研究機関や水産業普及指導員による研究開発、技術普及の仕組みを概説した上で、カンボジアで実施された農民間普及を用いた養殖改善普及プロジェクトの事例を紹介し、日本の制度のカンボジアでの適用可能性を示した。最後に、カンボジアの漁業コミュニティ活動を円滑に実施するためには、漁業コミュニティ間のネットワーク化による成功例の共有、経済活動としての小規模漁業の再定義、小規模漁業の国民への食糧供給源としての役割の再認識に基づいた漁業コミュニティの支援が必要であることを指摘する。

## 29. フィリピンと日本における小規模漁業

フィリピンの実態を勘案した日本水産物流通の一案

宮田勉（水産研究・教育機構）

日本の水産物消費量の著しい低下は、水産物価格が鶏肉や豚肉と比較して相対的に高いことが主要因である。また、日本の小型漁船漁業によって多種多様な水産物が

水揚げされるが、低利用の魚種も多く、加えて未利用資源も多く存在する。フィリピンでは過剰漁獲による水産資源の悪化が深刻であるが、1人あたりの水産物消費量は高位で安定しており、これは低コストなサプライチェーンによって魚介類の販売価格が低く抑えられていることが要因の1つである。日本の中間コストはフィリピンの約5倍高く、このサプライチェーンが日本の水産物消費量低迷に大きく影響している。中間コスト圧縮の観点から、地産地消の推進、未利用・低利用水産物の活用が日本の状況改善に向けてのキーワードになろう。地産地消は、物流コストを削減するだけでなく、伝統的な日本の食文化“Washoku”を維持する観点からも重要である。さらに、スーパーマーケットに依存した消費者の購買行動に、購入場所の選択および購入する魚介類の種類を増加させることができる。

### 30. ベトナムと日本における小規模漁業

日本型自主的資源管理の導入を目指し、持続的漁業の促進を図るベトナム

渡邊英直（一般社団法人マリノフォーラム 21）

ベトナムの漁業生産量は成長を続けており、漁獲量、養殖生産量とも増加してきており、2018年には約780万トンとなっている。養殖生産量の伸びは漁獲漁業より伸びが大きく、2007年から養殖生産量が上回る状況となっている。政府は更なる養殖業の振興を図り2030年には生産量630万トンの目標を掲げている。この一方で、漁船数及び漁船の総エンジン出力も毎年増加してきている。一隻当たりの漁獲量及び単位エンジン出力当たりの漁獲量は2007頃から減少してきており、過剰漁獲努力量の状況になっていると懸念される。養殖生産の70%はメコンデルタ域で行われているが、近年メコン川の流量が減少しており、このため河口域付近での海水流入が発生し養殖場や稲作に悪影響を与えている。また、急速な経済の発展と人口の増加に伴い生活排水や産業排水が増加してきているが、排水処理能力増強が追い付けない状況で内水面、沿岸部で水質が悪化してきており、赤潮のが頻繁に発せして来ている。このため、沿岸部での漁獲や養殖業に悪影響を及ぼしている。ベトナムでは資源管理を適切に実施できる体制がまだ十分ではなく、EUからIUU漁業撲滅に向けた取り組みを強化するように勧告を受けている。このような中で政府は、持続的な水産資源利用を目指すために、日本で漁業権の下で実施されてきている漁業者グループによる自主的資源管理や共同資源管理を取り入れるべく取り組みを開始してきている。

### 31. 中国と日本における小規模漁業 小規模漁業の現状と管理を中心に

陳放 (大連海洋大学)  
楊晨星 (上海海洋大学)

長い間、研究者達は大・中型漁業に注目することが多く、小規模漁業はほとんど研究されていなかった。漁業統計や漁業管理措置においても、大・中型漁業に関しては詳しく明記されているが、小規模漁業については簡単な一言しか記載されていない。特に、既存の漁業管理措置は小規模漁業にはほぼ適用されていない。ところが、統計によると、直接消費された魚類の50%は小規模漁業によるものである。また、特に沿岸域における小規模漁業は、漁船や漁民の数が多く、漁業だけでなく漁業資源の保護にも重要な役割を果たしている。近年、FAOは世界へ小規模漁業の重要性を強調してきた。小規模漁業に対する各国の重視度が高くなるにつれて、中国も小規模漁業に注目をし始めた。小規模漁業の重要性と現在のギャップを鑑みて、小規模漁業とその管理に関する研究が特に重要である。本文はまず小規模漁業の概念、規模、管理等面から中国の小規模漁業の発展を紹介し、上記の観点から日本の沿岸漁業（小規模漁業）と比較をした上、現在日中の小規模漁業の現状について論じる。

### 32. 韓国と日本における小規模漁業 漁業権利構造の実態とそれが沿岸域管理に及ぼす影響を中心に

李銀姫 (東海大学海洋学部)

隣国としての日本と韓国は極めて多い共通点を持ち合わせている。それは、漁業から探してみることも難しくない。本チャプターでは、漁業資源管理に大きな役割を果たしてきている一方、高い利用プライオリティを有することにより、しばしばスムーズな沿岸域利用を妨げる存在とも認識されている漁業権の権利構造に分析の焦点を当て、日本と韓国の両国におけるその実態を把握するとともに、それが沿岸域管理に及ぼす影響について見てきた。特に、似通う権利構造を有しながらも各自の特性をもつ日本と韓国両国の比較分析を通じて課題にアプローチした。具体的に、まずは日韓両国における漁業制度の展開を概観するとともに、日韓における漁業権利構造の実態について把握した。次に、漁業権利構造が沿岸域管理に及ぼす影響について、資源管理の側面や海面利用調整の側面から分析した。最後に、それらを踏まえて、効果的・効率的な沿岸域管理に向けての今後の課題について考察した。すなわち、資源管理や環境保全、遊漁・漁業体験・ダイビング・魚食・地域資源の価値創造に関する事業などを担う組織づくりの推進が必要である



こと、組織づくりのための積極的な行政支援が必要であること、その際、地元の海域・沿岸域に愛着・プライド・責任感等を持つ漁村契・漁協のような組織の生かし方を工夫することが必要であること等を主張した。

### 33. 台湾と日本における小規模漁業 台湾における小規模漁業・沿岸漁業を中心に

陳清春（台湾海洋大学）

本稿では、台湾における小規模漁業の定義、特性、重要性、産業上の困難さ、およびその対策について説明し、日本における小規模漁業の概要と比較する。その概要は以下の通りである。台湾の小規模漁業は主に近隣海域で操業する小型漁船を含むが、基本的には家族経営であり、漁獲効率は低く、生産量の比重は低い。漁船数と操業する漁民の数の比率が高いため、魚資源の過剰使用、漁民の所得の低下など海洋環境、社会経済的な問題がある。このため、政府はこれまで、漁業を規範化し、漁獲量を制限し、資源を保護、復元し、魚類資源の持続的利用を追求し、漁業のモデル転換経営を指導するための多くの措置方法を講じてきた。また台湾と日本の小規模営業との相違点についても解説した。類似点として、両国は小規模家族経営の漁業を主体とし、政策措置において資源の管理を重視し、漁業責任制を推進し、観光レジャー漁業への転換経営を指導している。異なる点としては、日本は地形的には群島に属し、多くの内海とフィヨルドがあり、さらに大きな漁場があり、魚類資源が豊富であることから、日本の小規模漁業の全体的な重要性は台湾をはるかに上回る。

### 34. マーシャル諸島と日本における小規模漁業 太平洋の小さな島からの小規模零細漁業への視点

越後 学（インテムコンサルティング株式会社）

マーシャル諸島は太平洋の真ん中にある小さな島国である。全ての陸地は環礁で構成されているため、海は素晴らしく美しいが土地が極端に狭いことから農業は発達せず、自給漁業を中心とした社会や文化が形成されてきた。漁業は極めて小規模で、素潜りでの潜水突き漁やカヌーでの底釣り、引き縄、そして伝統的な追い込み漁などで、漁船は18フィート程度のFRP船に船外機が中心である。追い込み漁は多くの場合コミュニティのチーフのもとで管理され、大事な行事に併せて解禁、漁獲物は公平に分配する等の伝統ルールに基づいて実施されてきた。マーシャル諸島では伝

統的に海と水産資源に強く依存した生活が営まれており、男は生まれつきの漁師であると考えられるなど漁業と人々の生活は不可分であった。離島部では未だに重要な食料調達手段として自給漁業が続けられている。また、追い込み漁に見られるように漁業は伝統や文化そのものでもあり、重要な魚種に対してはチーフを中心とした資源管理も行われてきた。すなわち、マーシャル諸島のとりわけ離島部において自給漁業は、食糧の安全保障、人々の健康、文化継承などの側面から極めて重要な役割を持ち、金銭では代替できないものである。日本をはじめとする多くの国で漁業は、小規模であっても現金収入源として捉えることが多いが、マーシャル諸島における自給漁業の事例から日本や欧米が学ぶべきことも多いと考えられる。

### 35. マラウイと日本における小規模漁業

後発開発途上国の小規模漁業者が駆動するコミュニティ主導のイノベーション

佐藤 哲（愛媛大学）

アフリカ大陸東南部の後発開発途上国である内陸国マラウイでは、マラウイ湖において多数の小規模漁業者が漁業を営んでいる。小規模漁業者が中心の水産業は、国民に不可欠な動物タンパク資源を供給する重要産業である。マラウイ湖沿岸の漁村では、小規模漁業者自身によって、水産資源とそれを支える生態系の持続可能な管理のための、さまざまな内発的かつイノベティブな活動が創発されている。マラウイ湖国立公園内に位置するチェンベ村では、漁業者自身による内発的な漁業活動の制限によって、重要な水産魚種に対する漁獲圧の低減が実現している。サリマ県の沿岸漁村では、伝統的首長を中心とした小規模漁業者による管理委員会によって、1950年代から重要な漁場の季節禁漁が継続されて顕著な成果を挙げており、そのためコミュニティ独自のルールについて、高度に洗練されたエンフォースメントの仕組みが機能している。最近では、科学者と小規模漁業者の密な協働を通じたトランスディシプリナリー（超学際的）な取り組みによって、チェンベ村において重要な水産魚種の生息場所・漁場を人工的に構築するという里海的な活動が行われ、成功を収めている。これらの事例は、マラウイにおいても、JSSFと同様に、小規模漁業者が駆動するコミュニティ主体の活動が、持続可能な水産資源管理に重要な役割を果たすことを示している。

### 36. デンマークと日本における小規模漁業 転換期における小規模漁業の実態と課題

デレーニ・アリーン（東北大学）

本チャプターでは、現在、大きな転換期を迎えている日本とデンマークにおける小規模漁業について比較分析を行うことを目的としている。両国ともに北半球に位置し先進国である日本とデンマークにおいては、農山漁村における高齢化や過疎化が大きな課題となっている。日本とデンマークにおいては、小規模漁業者や小規模漁業者の家族が、しばしば港やコミュニティ活動の中核を担っている。これは、少なからず、これらの漁業がその内部で発展するとともに、彼ら自身が発展させたことでもある社会から起因するのである。新自由主義の勃興や、現代的・発展的・経済効率的であることの意味に関する考えや理解の根本的な変化、及び「よい」漁業管理の実行などは、小規模漁業者と小規模漁業地域に影響を与えてきた。さらに、現在の EU 政治がデンマークの小規模漁業に与える連鎖的な影響、及び日本の改正漁業法が日本の小規模漁業に与える影響は、不確実性や不安、そして数えきれない未知数を抱えているのである。

### 37. アメリカと日本における小規模漁業 漁業種ポートフォリオの縮小、沿岸開発、気候変動レジリエンス

徳永佳奈恵（Gulf of Maine Research Institute）

米国や日本などの先進国の小規模漁業は、他の小規模漁業と共通の課題を抱える一方で、先進国ながらの特別な課題も抱えている。本章では、米国メイン州のロブスター漁業と三重県のイセエビ漁業を取り上げながら、これらの小規模漁業が直面している課題である漁業種ポートフォリオの縮小について議論する。さらに、都市部の小規模漁業において、沿岸開発と漁業活動が共存する上での課題について、小規模漁業の文化的価値の観点から議論する。本章で紹介する日米のロブスター・イセエビ漁業は、共に区画利用権漁業（TURF）であり、漁業者による自主的な管理手段がその管理に用いられている。また、メイン湾は、世界の海域の中でも温暖化が最も早く進んでいる海域の一つであり、当該海域にあるメイン州のロブスター漁業においては、今後、海洋温暖化を原因とする資源量の大幅な減少が予測されている。漁業種ポートフォリオの減少により、ロブスター漁業への依存が高まっている中で、どのようにしてレジリエンスを高めるべきか。まとめとして、気候変動に対するレジリエンスについて考察する。

## 38. カナダと日本における小規模漁業

特徴、政策、ガバナンス体系：異なるが類似する

李銀姫（東海大学海洋学部）

ジャック・デイリー（Too Big To Ignore プロジェクト）

ラタナ・チュンペッディ（ニューファンドランドメモリアル大学）

気候変動や政策変化等大変化時代における小規模漁業や漁村は、様々な存続の危機にさらされており、それらが持つ諸意義への正しい認識とともに、適切な政策やガバナンス策が問われている。本チャプターでは、日本とカナダにおける小規模漁業のより望ましいガバナンス策のための基礎的な情報共有を図ることを目的としている。具体的には、まず小規模漁業への概念・定義とともに、小規模漁業にかかわる様々な「数字」について概観した。それから、漁業に関するガバナンス体系について、国レベル及び県（州）レベルにおいて解説した。県（州）レベルについて、日本では、サクラエビ漁業で名を知られている静岡県を、カナダにおいては大西洋タラ漁業で知られるニューファンドランド&ラブラドル州を取り上げた。最後に、比較的視点から、両国における小規模漁業のガバナンス体系や課題について分析した。それを通して、両国は一見異なる政策・ガバナンス体系でありながら、驚くほど似通う今日的な課題を抱えていること、よって小規模漁業・漁村の総合的な「健康」に向けて適切なガバナンス体系への転換が必要であること、簡単な解決策や「ワンフォオール」の対応策がない現状では、両国は相互及び他国から学ぶことにより、望ましいガバナンス体系の模索や小規模漁業の特徴と条件をきっちと考慮した適切な漁業政策をデザインすることができると等について指摘した。

## 39. 海の温暖化と日本の小規模漁業

日本沿岸の海洋生態系や人間社会に及ぼす影響

藤井 賢彦（北海道大学大学院地球環境科学研究院）

高い生物多様性・生産性を有する沿岸生態系は様々な生態系サービスを提供し、とりわけ地域の漁業や観光業を通じて沿岸社会に多大な便益をもたらしている。地球温暖化によって生じる全球規模の海水温上昇は沿岸生態系に顕著な影響を及ぼしており、日本沿岸に対してもその影響の定量的な評価・予測が近年行われるようになった。これらの研究結果は以下の事柄を示唆している。まず、将来の沿岸生態系の分布・生物多様性・機能を予測する際に生じる不確実性を最小化するためには、長期間・高頻度・高精度の観測と高時空間解像度を有する気候モデルが必要である。また、沿岸生態系の定量的な分布域は地球温暖化によって劇的に変化しており、そ

の変化は今後も続くと予測される。そして、地球温暖化対策としては CO<sub>2</sub> や他の温室効果ガスの排出を削減することが王道だが、並行して実践的な適応策を講じていくことも大切である。特に、沿岸社会の地球温暖化影響を最小限に食い止めるためには、科学的知見・指針に基づき、養殖場所を適切に移行していく必要がある。

#### 40. 海洋再生可能エネルギーと小規模漁業 持続可能な海洋発展を目指して

田中 博通 (REJ, 東海大学名誉教授)

大気中の CO<sub>2</sub> 濃度の増加による地球温暖化により、世界各地で異常気象と生態系への影響が生じている。再生可能エネルギーである海洋エネルギーは、潮汐発電、海流及び潮流発電、波力発電、海洋温度差発電、塩分濃度差発電、洋上風力発電がある。ここでは、漁港周辺海域で導入可能な洋上風力発電と波力発電について詳述する。波力発電は、様々なタイプがあるが、漁港の防波堤に設置できる越波式波力発電について述べる。海上風は陸上風と比べ風速が大きく、風の乱れが少なく安定しており、高さ方向にほぼ様な風速分布であることから風力発電にとっては好条件である。設置水深によって杭式洋上風力発電と浮体式波力発電になる。海上風の条件の良い EU 諸国は、洋上風力発電の導入が年々増加し、約 8,000MW が現在稼働している。日本の洋上風力発電賦存量は、約 12 億 kW と言われている。著者らが開発している越波式波力発電は、波が斜面を遡上することにより波エネルギーが位置エネルギーに変換され、貯水槽と周囲海域の水位差によって生じる流れのエネルギーが生じる。その流水エネルギーをプロペラが受けるトルクにより発電機で発電する方式である。この越波式波力発電は、シンプルな構造であり、防波堤の前面と海洋構造物の周辺に設置することを想定している。海洋再生可能エネルギー発電設備の整備に係る海域の利用を促進するため、「海洋再生可能エネルギー発電設備の整備に係る海域の利用の促進に関する法律」が 2018 年 11 月 30 日に成立した。海域を利用するためには、海は社会共通資本である正しい認識を持つこと、食料自給率を高めるために漁業を活性化すること、海環境を守ることを成立させることが重要である。

## 41. 環境教育と小規模漁業

環境教育による水産物の価値向上を目指して

佐々木剛, 水谷史門, 廖凱 (東京海洋大学大学院)

日本は島国であり, 豊かな森, 川, 海を有する自然環境に恵まれ, 人びとは何世代にもわたり森川海のつながり (FRON) を大切に維持し続けてきた. その結果, 資源の枯渇を招くことなく, 持続可能な生活を送ることができた. このような伝統的な習慣は, 持続可能な生物資源の利用・管理の手法を生み出し, それによって生物多様性が維持され, 人びとが自然環境から多くの恩恵を受けることにつながった. 生産地のみならず消費地の人びとが FRON を理解し, 健全な状態を保持しようとすることは, 今日だけでなく, 将来世代のための豊富な食料資源の維持に貢献する. FRON を重視した取り組みの一例として, 小規模漁業がある. 小規模漁業は, 経済性, 効率性を優先する大規模経済活動の対極にあり, 省資源, 循環型で持続可能な生産性を維持してきた. 本章では, 小規模漁業の理解促進をはかる水圏環境教育の方法論, 概念, 実際の教育実践について解説するとともに, 水圏環境教育によって育まれる森川海のつながり意識ならびに食の本有的価値 (food intrinsic value: FIV) について紹介する.

## 42. 海洋保護区と日本の小規模漁業

日本小規模漁業は海洋保護区と共存できるのか

森下丈二 (東京海洋大学)

2010 年に名古屋において開催された第 10 回生物多様性条約 (CBD) 締約国会議は, 愛知目標を採択し, その目標 11 において, 2020 年までに海洋の 10%を海洋保護区 (MPA) とすることを打ち出した. 他方, MPA とは漁業など人間活動を禁止するものであるというイメージも強く, MPA の設置には漁業関係者からの反対を招く場合も多い. 本稿では日本の沿岸小規模漁業 (JSSF) と MPA との関連について, 下記のような考察を行った. (1) 日本は愛知目標の実現を目指しているが, 環境省によれば現時点での MPA カバー率は約 8.3%であり, その大部分は漁業関係法令に基づく保護水面や漁業権が設定された海面である. その漁業の保存管理のための保護水面などの措置を MPA と呼ぶことはできるのかについては, 議論もある. それでは, 漁業と MPA は相互に対立するものであるのか. (2) MPA とは広大な海域, 特に公海水域を永久に漁業禁止とするものなのか. 生物多様性の保全が MPA の目的であるとするならば, むしろ高い生物多様性が存在する沿岸域の特定海域を, 地域知に基づき, ボトムアップ, 順応的に保全していくべきではないのか. (3) JSSF は長い歴史の中で地先の海洋環境を

守りながら、ボトムアップ、地域知、ステークホルダー参加などのキーワードで表現される共同管理による漁業を営んできた。また、JSSF の存続と振興のためには、海洋環境の保護と生物多様性の保全が必要である。したがって、JSSF と MPA は対立概念ではなく、むしろ JSSF の共同管理の方法を取り入れた日本型 MPA のコンセプトを確立し推進していくことが、真に海洋の生物多様性を保全し、漁業と MPA の共存を実現し、愛知目標を含む国際的なコミットメントに貢献することにつながるのではないか。

#### 43. FAO 小規模漁業ガイドラインと日本の小規模漁業 小規模漁業ガイドラインの良き見本となるための日本の挑戦

山下東子（大東文化大学）

SSF ガイドライン（SSFG と呼ぶ）は途上国の小規模漁業向けに作成されているため、先進国である日本の沿岸漁業（JSSF と呼ぶ）にとってはすでに到達済みであったり、適用することが適当でない項目も多い。それでも JSSF を SSFG に照らして再評価する意義はある。それは日本が大きな JSSF 部門を有しているために、マイナーな問題であっても気づき、改善に取り組むことで JSSF をより良くするきっかけになるという点と、途上国が今後経済発展をしつつ大きな SSF 部門を維持していくうえで、JSSF の到達点とその前提条件をベンチマークとして提供できる点である。日本の場合、全員加入の漁業者団体が存在し、それが事実上の参入障壁を作っていること、団体としての交渉力を有していること、および漁業内外において失業問題がほとんど存在しないことが SSFG を達成できる前提条件となっている。一方で、JSSF の抱える問題として、小売価格に占める漁業者の取り分が少なく、より付加価値を創造する余地があること、エコラベル等の認証取得が進んでいないこと、女性と外国人研修生の立場が SSFG の要求レベルに達していないこと、自然災害のみならず、ミサイルや海水温上昇の脅威にさらされていることが挙げられる。これらの課題を克服して SSFG の良き見本となることが、今後の課題である。

## 44. 持続可能な開発のための 2030 アジェンダ

SDGs と JSSF との相互関連性について

ヴラホプル・イリアナ（国際連合宇宙局）

日本における沿岸漁業(JSSF)の運用とその背景にあるメンタリティは、漁業従事者だけでなく、海洋環境や各ステークホルダーに多くの利益をもたらしている。中でも沿岸漁業によってもたらされる食物、雇用機会の創出、生態系サービス、資源管理に関する教育については、特筆すべき利点といえる。さらに「持続可能な開発のための 2030 アジェンダ」の視点から上記利点を検証すると、それらは 17 の「持続可能な開発目標」(SDGs) 全てに関連していることが伺え、SDGs 達成に向けて沿岸漁業が大きく貢献できる可能性が見えてくる。現在使用している新技術に加え、さらに新技術を将来的に取り入れることで、沿岸漁業の能力を大幅に向上できる可能性も秘めている。一般的に漁業管理は社会における複数の側面に大きな波及効果を与えうる。つまり、SDGs の枠組みにおける沿岸漁業の広範囲な貢献により、結果として世界的な優先事項への我々の理解を深め、持続可能性の 3 つの柱である社会、環境、経済に前向きな影響を与えられるようにも見受けられる。2020 年から SDGs の達成目標である 2030 年までは「行動の 10 年」とされ、国際社会ではこれまで以上に革新的で包括的な行動が求められている。こうした観点から国連事務総長も社会のあらゆる分野での行動を呼びかけており、特に地域的な行動や各階層の人々による行動を推奨している。日本の沿岸漁業はさらなる漁業管理のアプローチやさらなる新技術の活用によって、この「行動の 10 年」に大きく貢献できるだろう。

## 45. 超学際的アプローチと日本の小規模漁業

小規模漁業者が駆動する多様なアクターによる超学際的アプローチ

佐藤 哲（愛媛大学）

超学際的アプローチ（トランスディシプリナリー・アプローチ）には、社会的・学術的な課題を可視化することを通じた「研究の協働企画」、課題解決のビジョンとそのための手法を明らかにする「統合知の協働生産」、および統合知を活用した課題解決のための「集合的实践」の 3 要素が含まれる。多様なステークホルダー（科学者・専門家を含む）が参加するこのプロセスでは、集合的思考を通じてすべての参加者の相互学習が促され、その知識と実践が順応的に改善される。この順応的なプロセスによって、社会生態系システムの複雑性がもたらす不確実性に対応することが可能になる。沖縄および北海道における、小規模漁業者が主導してきたトランスディシプリナリー・プロセスの事例から、小規模漁業者自身がこのような超学際的アプ



ローチを主導し、効果的に促進していることが明らかになった。その際に、科学者・専門家や行政機関などのアクターは、主導的役割を果たすのではなく、むしろ小規模漁業者が主導する動きを支援する立場に立ってきた。このような小規模漁業者が主導するトランスディシプリナリー・プロセスが持つ意義を考えるために、漁業者の生業に起源をもつ多様な知識・技術が果たしてきた役割に着目する。特にこのような知識・技術に基づく多様なステークホルダーの協働のためのネットワーク構築と集合的実践の創発という視点から、超学際的アプローチを小規模漁業者が主体となって実践することの重要性を議論する。

## 46. 公益助成財団と日本の小規模漁業

持続可能な小規模漁業を支える革新的取り組みと連携構築を目指して

小林正典（笹川平和財団海洋政策研究所）

持続可能な小規模漁業（SSF）は海洋を扱う持続可能な開発目標 14 の重要な要素である。持続可能な SSF を実現するためには、学際的な手法および分野横断的な連携が求められる。独立した非営利の政策研究機関として、笹川平和財団海洋政策研究所（OPRI-SPF）は政策対話、科学的研究や現場での取り組みに積極的に関与している。国際的なハイレベルな政策対話は重要な政策枠組みを提供する。そうした政策対話は、国内および地域社会レベルで具体的な政策や取り組みとして実践されなければならない。各国や各地域社会は共通の課題に直面しているが、解決策はそれぞれの地域の社会経済的および地勢的条件を踏まえたものでなければならない。持続可能な SSF を目指すにあたっては、相乗効果や革新的取り組みを模索していくことは有効である。科学、政策そして現場での実践を繋ぎ、国際的な連携を進めていくことは SDGs の効果的な実現を図る上で重要である。こうした取り組みを通じて活動を進めていく、持続可能な SSF の実現に求められる法制度の構築に寄与するものと考えられる。

## 47. ブルージャスティスと日本の小規模漁業

「成長産業化」における小規模漁業の「ジャストスペース」の確保

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ジャック・デイリー（Too Big To Ignore プロジェクト）

ラタナ・チュンペッディ（ニューファンドランドメモリアル大学）

ブルージャスティス概念は、一言でいうと、この頃盛んに耳にするようになったブルーエコノミーの関連政策において、小規模漁業が埋もれてしまわないように、適切な海洋開発政策及び小規模漁業のガバナンスを主張するものである。配分的ジャスティス、社会的ジャスティス、経済的ジャスティス、マーケット関連ジャスティス、インフラ・福祉関連ジャスティス、手続き的ジャスティス、環境的ジャスティス等々がある。日本の小規模漁業をブルージャスティスの視点から覗いてみると、ひとまず、今般賛否両論が激しい中で改正された新漁業法関連の懸念である。日本の成長産業化政策と小規模漁業の関係は、国際社会におけるブルエコノミー政策と小規模漁業をめぐる問題の縮図のように感じる。十分な議論、現場との十分なコミュニケーションがないまま強行されたという印象が払拭され難い新漁業の下で、今後小規模漁業が幾種類のジャスティス問題に直面するかは未知数であると言えよう。他にも、漁業と遊漁船・プレジャーボートとの調整や、洋上風力発電との調整、加えて COVID-19 対応策関連等、多くのジャスティス問題が発生または懸念されている。「ブルーエコノミーが海洋ガバナンスにおける正当性のあるビジョンなのであれば、そのソリューションデザイン当初から小規模漁業を認識することが必要である」と叫ばれているように、日本の成長産業化政策が持続可能な水産業に向けた合理的なビジョンなのであれば、そのソリューションデザインに、津々浦々で展開されている小規模漁業の存在意義を十分に認識することが必要不可欠であり、そのためのガバナンス体系の構築が必要である。

## 48. TBTI と日本の小規模漁業

TBTI ジャパン研究ネットワークの船出

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李銀姫（東海大学海洋学部）

Too Big To Ignore プロジェクト主催の第3回世界小規模漁業会議への参加は、私たちの刺激的で魅力的な経験だった。世界のあらゆる国、地域から参加者が集まり、行政関係者、漁業者、NPO 等の支援者、研究者等、きわめて学際的な空間であった。唯一残念なことは、日本を含む北東アジアからの参加が少なかったところである。

そのような中、TBTI ジャパン研究ネットワークが設立され、本書が出版できたのは、本当にうれしく思う。本チャプターでは、まずTBTI プロジェクト及びTBTI プロジェクト主催で定期的に開催される世界小規模漁業会議について紹介した後、日本の小規模漁業(JSSF)をTBTI の視点から覗くとともに、TBTI ジャパン研究ネットワークのビジョンについて、コメンテータの皆さんからの意見も交えながら述べた。そのビジョンには、(1)JSSF の多様な機能と重要性及びその潜在力について、体系的な研究とともに積極的に発信すること；(2)日本のジェンダー問題を JSSF から率先して改善できるように推進すること；(3)漁業者の所得向上と後継者の確保のための様々な取組を推し進めるための研究基盤となること；(4)「成長産業化」政策の中でJSSF が埋もれることがないように、ブルー・ジャスティスの理論的検討を重ねるとともに、実践へつなげるための研究を進めること；(5)日本において「持続可能な小規模漁業を持続するための FAO の自主的ガイドライン」を十分認識するとともに、意識して履行していくことを推進すること等が含まれる。最後に、日本を含む世界の小規模漁業は一見するとそれぞれ異なるが、その実は多くの共通課題を抱えており、連携・協働・共同・パートナーシップ等により生まれる無限大の力を生かし、革新的な変化を生み出すべきことについて触れた。

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Ching-Chun Chen is an agricultural economist with a Ph.D. in fisheries economics. In the early years, Dr. Chen had served in the Council of Agricultural, Executive Yuan of Taiwan, in charge of agricultural and fishery economic research and policy evaluation for 20 years. Then he taught at National Taiwan Ocean University (NTOU) for 15 years.

After he retires from NTOU, he continues to serve as an emeritus and adjunct professor up to now. In the past, he had studied at the University of Florida and researched at Oregon State University. He served as a visiting professor at Hokkaido University and Tokyo University of Marine Science and Technology in 2002.

## Fang Chen



Fang Chen is a marine social scientist with a Ph.D. in Marine Science from the Tokyo University of Marine Science and Technology, Japan. Her research expertise lies in fishery mutual insurance between China and Japan. Now she is working at Dalian Ocean University and researching the leisure fishery based on marine ranching and marine

ranching management.

## Ratana Chuenpagdee



Ratana Chuenpagdee is a university researcher professor at Memorial University in St. John's. She leads the global partnership for small-scale fisheries, Too Big To Ignore (TBTI), which aims at elevating the profile of small-scale fisheries and rectifying their marginalization in national and international policies. Some of the current activities are 'Blue Justice' for small-scale fisheries, transdisciplinary capacity training to support the implementation of the SSF Guidelines, and innovative fisheries governance. Ratana also co-leads a research module on informing governance responses in a changing ocean for the Ocean Frontier Institute, another major collaborative research between universities, governments, private sectors and communities.

## Jack Daly



Jack Daly is a marine social and policy scientist with an M.A. in Geography from Memorial University, Canada. Daly's Master's degree research analyzed global trade in the context of inshore fisheries and coastal communities in Northwest Newfoundland. Daly's other research interests include ecosystem-based fisheries management and examining linkages between international instruments that promote sustainable development and social equity. He is a member of Too Big To Ignore – Global Partnership for Small-Scale Fisheries Research (TBTI), and a communications officer for the U.K. based Marine Social Sciences Network (MSSN).

## Alyne Delaney



Alyne Delaney is based at the Center for Northeast Asian Studies (CNEAS) at Tohoku University in Sendai, Japan. As an environmental anthropologist, Dr. Delaney investigates human-environmental interactions in coastal zones. Her expertise lies in social science research methods and analyses of marine governance, social organization, resource rights, and fisheries management. She is particularly interested in social sustainability, innovation and adaptation, and risk and resilience. Additional

current interests include disaster and revitalisation, and visual research methodologies, such as ethnographic film. With a primary, long-term field site in Japan, she has also worked in Greenland, various EU countries, South Africa, Botswana and Cambodia.

## Manabu Echigo



Manabu Echigo is a technical consultant for the international development of the fisheries sector, which is employed by INTEM Consulting Inc., Japan. Dr. Echigo has a Ph.D. in Marine Science from the Tokyo University of Marine Science and Technology. His achievements in development consulting include coastal fisheries management in the Marshall Islands, integrated aquaculture development in Kiribati, coastal pelagic fisheries development in Seychelles, planning of national fisheries development plan of the Maldives, coastal fisheries resource management in Vanuatu, etc., as technical assistance by the Overseas Fishery Cooperation Foundation of Japan (OFCF) and Japan International Cooperation Agency (JICA). He also has experience working as a Japan Overseas Cooperation Volunteer in Malaysia 1989-1991.

## Katia Frangouides



Katia Frangouides is a senior researcher at the UMR 6308 AMURE of the Université de Bretagne Occidentale, France. Her research fields are gender equality, social dimensions in fisheries and aquaculture in the EU. She is leading the Women-Gender Cluster of Too Big to Ignore network. She publishes with Siri Gerrard of the Nordic University of Norway and Danika Kleiber of ARC Centre of Excellence for Coral Reef Studies and WorldFish, two issues on gender in coastal communities in *Maritimes Studies* journal. She collaborated with Kumi Soejima during a research stay at the National Fisheries University of Japan as a JSPS fellow in 2017.

## Masahiko Fujii



Masahiko Fujii is an Associate Professor of the Faculty of Environmental Earth Science, Hokkaido University, with a Ph.D. in Environmental Science. Dr. Fujii's research interests and expertise lie in future projection and mitigation/adaptation of the effects of ocean warming and acidification on coastal ecosystems and human societies. As one of the mitigation strategies, he has also been interested in education and research for developing renewable energy locally.

## Takamitsu Fumoto



I was born in 1973 in Otohe town, Hokkaido, where fishing is thriving. I entered Hokkaido University's Faculty of Fisheries in 1991. After that, I went to Hokkaido University, Graduate School of Fisheries, and completed my course in 1997. I went around fishing villages while I was at university and received various teachings from the fishing industry. After graduation, I joined SUIDOSHA Co., Ltd. For more than 20 years since joining the company, I have visited fishing villages throughout Japan, and I have been consulting on the theme of promoting the fishing industry, revitalizing the region, and preserving the water environment. I want to continue to work hard.

## Takuji Goto



Takuji Goto was born in Zushi, Kanagawa Prefecture. After completing graduate studies at Nihon University, he engaged in construction consulting services and fishing port design and planning. Since 2007, he has been working with the Japanese Institute of Fisheries Infrastructure and Communities, focusing mainly on operations related to the planning of fishing ports and villages. Recently, he has also been involved in disaster prevention and mitigation planning with respect to fishing ports and villages, BCP surveys, and research concerning efforts to restructure the capabilities of fishing ports, revitalization planning for beaches, and initiatives, such as Nagisahaku, to revitalize fishing regions.

## Sachiko Harada



Sachiko Harada obtained her Ph.D. in marine science from Tokyo University of Marine Science Technology, Japan, in 2009. Dr. Harada is an associate professor at the Tokyo University of Marine Science and Technology. Her research interests include the use and management of local resources in fishing villages. Recently, she has also been working on a study of international trade in seafood.

## Hiroshi Hayashi



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## Mari Hazumi



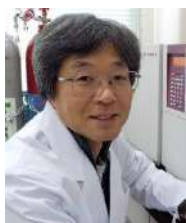
Mari Hazumi is Professor, Kumamoto Gakuen University. She is a Marketing Researcher with a Doctor of Economics, Kyoto University, October 2002, Kyoto, Japan. Dr. Hazumi is aiming to build brand theory from empirical research on marine products. Therefore, marine products need to be a power brand. The current direction requires cooperation with the region. To do so, it is necessary to increase brand loyalty to consumers. She is a member of The Japan Regional Fisheries Society (JRFS), The Japanese Society of Fisheries Economics (JSFE).

## Takeshi Hidaka



Dr. Hidaka received a Ph.D. in Fisheries from Tokyo University of Fisheries and an MBA from Kobe University. In 1980 he became a fisheries engineer at the Fukuoka Prefectural Office, and in 1998 he moved to Kindai University as a lecturer at the Faculty of Agriculture. In 2007, he became an associate professor at Kindai University's Faculty of Humanity-oriented Technology and Science, and has been a professor since 2010. He has been studying fisheries management and coastal zone management. Most recently, in 2016, he published “Satoumi and Coastal Zone Management: Managing Satoumi” from the Agriculture and Forestry Statistics Association.

## Seiichi Hiratsuka



Seiichi Hiratsuka is a Ph.D. scientist researching seafood processing and chemistry. Dr. Hiratsuka conducts research using scientific approaches to help increase the added value of local marine products. His main research subjects are processing technology for marine products, technology for maintaining freshness and nutritional components, etc. Some of his main books are on Product development and hygiene management using local marine products, dried fish science, national fishery products overview and features of deep-sea fish.

## Mina Hori



Mina Hori is an associate professor at Graduate School of Kuroshio Science, Kochi University, Japan. She received her Ph.D. in Agricultural Science at the University of Tokyo (2008). She has been researching on socioeconomic issues and resource management systems on small-scale fishing in Tonle Sap Lake, Kingdom of Cambodia. Recently, she has been working on fish trading systems and eco tourism in coastal area of Japan, Thailand and the Philippines. Currently, she is a member of the committee on fisheries policy of the Japanese Society of Fisheries Science.

## Yasushi Ito



Yasushi Ito was born in Iwate Prefecture. He worked for the Japan Coastal Fisheries Promotion Association and the Japanese Institute of Fisheries Infrastructure and Communities (JIFIC), became a general manager of the Second Division in 2011, after working as a director of the Fishing grounds and Umigyo research department in JIFIC. He is focusing mainly on research, development, and dissemination of achievements related to fishing ground development. In 2014, he obtained a Ph.D. from Hokkaido University Graduate School. Major research themes include the behavioral ecology of fish on artificial reefs, the effect of food culture on breeding grounds, and cost-effectiveness verification of fishery development.

## Tomomasa Kageyama



Tomomasa Kageyama is an adviser of the National Association of Fisheries Infrastructure and is also a visiting professor of Tokyo University of Marine Science and Technology in Japan. He was an official of Fisheries Agency, the Ministry of Agriculture, Forestry and Fisheries, Japan, and has been working on fishing port planning and fishing community development for more than forty years. In recent years after the earthquake in the Indian Ocean off Sumatra in 2004, he has been interested in disaster prevention and post-disaster restoration in the fisheries area. He is a member of the Japanese Association for Coastal Zone Studies (JACZS).

## Liao Kai



Liao Kai is a Ph.D. student of Tokyo University of Marine Science and Technology. She studies the mariculture agglomeration and its externalities in China from the perspective of environmental economics, and will try to apply the results to environmental education. She is a member of Asia Marine Educators Association.



## Masaya Katoh



Masaya Katoh has studied the molecular ecology of aquatic species for three decades. Dr. Katoh obtained his BS and MS from the University of the Ryukyus and his Ph.D. from Louisiana State University. He studied the population genetics of freshwater species at the University of Zürich as a postdoctoral researcher. His last post at Japan Fisheries Research and Education Agency was Director of Research Center for Bio-informatics and Biosciences, NRIFS. He started the DNA bar-coding project of shark and ray species at Marine Fishery Resources Development and Management Department (MFRDMD), SEAFDEC in Malaysia. He works for fishery management as Deputy Chief of SEAFDEC/MFRDMD.

## Masanori Kobayashi



Mr. Masanori Kobayashi is Senior Research Fellow, Ocean Policy Research Institute (OPRI) of the Sasakawa Peace Foundation (SPF) in Tokyo, Japan undertaking research work on ocean and sustainability policy including marine and coastal resource management, ocean governance, blue economy, and fishery policies. He worked on sustainability issues throughout his past career working in Japan, Europe and USA. He holds LL.M, M.A. and LL.B. and completed the doctoral course on natural resource management without degree. He has written articles on the topics including Sustainable Development Goal 14 for Pacific small island developing states, sustainability science and leadership development.

## Takahiro Kobayashi



Takahiro Kobayashi is a social anthropologist with a Ph.D. in Human Sciences from Waseda University, Japan. His research interest is the methodology of life story studies and the moral economy. Till today, he has conducted surveys on the daily life strategy of the residents in fishing villages along the coast of Panay Island, the Philippines, with a focus on the use of local markets and fishing grounds. His academic interest is also extended to petty trade practices, which is demonstrated in his study



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## Yinji Li



Yinji Li is a marine social scientist with a Ph.D. in Marine Science from the Tokyo University of Marine Science and Technology, Japan. Dr. Li's research interests and expertise lie in coastal governance, coastal fisheries governance, and coastal community revitalization issues in the Northeast Asian countries such as Japan, Mainland China, Taiwan, and South Korea. She is a member of Too Big to Ignore – Global Partnership for Small-Scale Fisheries Research Project (TBTI), and the Human Dimensions Working Group as part of the Integrated Marine Biosphere Research (IMBeR) project.

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Tsutom Miyata is a Ph.D. in the field of Fisheries Resource Management from Tokyo University of Fisheries and chief researcher at the National Research Institute of Fisheries Science, Japan Fisheries Research and Education Agency. His specialty is fisheries socioeconomics with quantitative analysis and qualitative analysis. The main research field is Japan, and the sub-field is southeast Asia, especially the Philippines and Thailand. He focuses on marine products marketing, fishing village improvement, and fishing/aquaculture household analysis. He has a part-time lecturer at Kitasato University and lectures regarding small-scale fishing commissioned by JICA (Japan International Cooperation Agency) and SEAFDEC (Southeast Asian Fisheries Development Center).

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## Joji Morishita



Joji Morishita is a Professor in Tokyo University of Marine Science and Technology. He served as Director-General of National Research Institute of Far Seas Fisheries from 2013 to 2016. He was involved in international fisheries/ocean issues since 1982 in the Fisheries Agency of the Japanese Government and served as Fisheries Attaché at the Japanese

Embassy in the United States from 1993 to 1996. He represented Japan at the International Whaling Commission (IWC), the North Pacific Fisheries Commission (NPFC), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Convention on Biological Diversity, CITES, and UN meetings. PhD, Kyoto University, Master of Public Policy (MPP), Harvard University.

## Hidenori Nakahira



Hidenori Nakahira is a Bureau & Department Director of the Economy and Industry Department and Fishery and Marine Bureau of Shizuoka Prefectural Government. He received his B.A. degree in Economics from Hosei University, Japan, in 1999. He entered the Ministry of Agriculture, Forestry and Fisheries in 2003. After that, he has held various posts in the

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## Tamano Namikawa



Tamano Namikawa was born in Kanagawa Prefecture. After graduating from the Department of Construction, Faculty of Engineering, Yokohama National University, she engaged in port planning and coastal planning at a construction consulting company. After leaving the company, she received a Ph.D. in Marine Science from the Tokyo University of

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Tsuyoshi Sasaki is a marine social scientist with a Ph.D. in Marine Science from the Tokyo University of Marine Science and Technology, Japan. Dr. Sasaki's research interests are aquatic marine environmental education, UNESCO ocean literacy education and nature's contribution to people of IPBES. He is a chair of Asia Marine Educators Association, and Japanese Aquatic Marine Environmental Educators Association and a member of Japanese Society of Environmental Education and National Marine Educators Association.

## Akito Sato



Akito Sato is the Deputy Secretary-General of SEAFDEC based at SEAFDEC Secretariat in Bangkok, Thailand. Before his tour of duty at SEAFDEC, he was engaged in several works and projects as a technical officer at Fisheries Agency, Cabinet Office, etc. in Japan related to rural development, planning and design of fishing port and fishery infrastructure, improvement of fishing communities, disaster recovery from the Great East Japan Earthquake and coastal habitat management such as the isoyake recovery project and coral reef recovery project. He has a master's degree in engineering from the Graduate School of Tokyo Institute of Technology.

## Tetsu Sato



Tetsu Sato studied ecology of cichlid fishes of African lakes for 20 years, and then expanded his research into adaptive governance of complex social-ecological systems. Throughout his career as Conservation Director of WWF Japan and professor of Research Institute for Humanity and Nature, Kyoto, and Ehime University, Ehime, Japan, he focused on transdisciplinary co-creation of knowledge supporting stakeholder-driven management of natural resources. As the project leader of the ILEK and TD-VULS projects, he has been exploring transdisciplinary approach to co-produce integrated knowledge bases for decision making and collective

actions of diverse stakeholders for societal transformations toward sustainable futures.

### Shio Segi



Shio Segi is an anthropologist by discipline and holds a Ph.D. from the Australian National University. His research interests include the socio-politics and socioeconomics of coastal resource use and management in the Asia-Pacific region, especially concerning community representation and participation of small-scale fishers in establishing and implementing marine protected areas and regulating commercial/industrial fishing. While his geographic interests are extensive, his work has been done mainly in the Philippines and Japan, and most recently, Vanuatu.

### Izumi Seki



Izumi Seki is a sociologist, specializing in fishing village sociology with Ph.D. from Hokkaido University, Japan. Dr. Seki is currently a professor in the School of Marine Science and Technology at Tokai University, Japan. Her research interests focus on life, culture, and people's activities in fishing communities, and conducts research in fishing communities throughout Japan. She has been focusing on the possibility of regional tourism as a new industry in the region, and entrepreneurial activities that have been carried out mainly by women in fishing communities.

### Kumi Soejima



Kumi Soejima is an associate professor at Setsunan University of Japan. She received her Ph.D. from Hiroshima University, Japan. Her work has focused on women's roles and issues in small-scale fisheries. She obtained a fellowship from the Co-operative Research Programme: Biological Resource Management for Sustainable Agricultural Systems of OECD from May 2018 to September 2018. The subject title of her research fellowship was Using Gender Perspectives in Small-Scale Fisheries Research to Improve Policy and she collaborated with

Alyne Delaney as a guest researcher at Innovative Fisheries Management (IFM), Aalborg University, Denmark.

## Hidetomo Tajima



Hidetomo Tajima received his B.S. degree from Hokkaido University, Japan, in 2004 and his M.S. and Ph.D. degrees from Hokkaido University, Japan, in 2006 and 2010 respectively. From 2011 to 2018, he was a researcher at Tajima Laboratory Co., Ltd., Japan. After the Great East Japan Earthquake, he has worked with various stakeholders for proposing promotion plans and measures in fishing villages across Japan. Since 2019, he is a researcher at Japan Fisheries Research and Education Agency. His research interests include the promotion of sustainable fisheries and fishing villages.

## Shingo Takayoshi



Shingo Takayoshi is a civil engineer specialized in fisheries infrastructure. He has been involved in the management of fishing ports and grounds planning, maintenance, and promotion of fishing villages at the Fisheries Agency for many years. He has also worked for the Ministry of Transport, the National Land Agency, the Embassy of Japan in Peru, and the Nagasaki Prefectural Government, where he was engaged in technical research on ports, national land planning, overseas technical cooperation, and local fisheries administration. As President of the Japanese Institute of Fisheries Infrastructure and Communities, he is currently supporting surveys on the promotion of measures related to national fisheries infrastructure, as well as fishing ports and ground development throughout Japan.

## Shion Takemura



Shion Takemura is researcher at Japan Fisheries Research and Education Agency. He is interested in theory and methods to understand and enhance the linkages between science and policy for the sustainable resource management and community development. Currently, he conducts in research on developing a fishers' self-assessment scheme

toward sustainable fisheries and utilizes it to cooperatively define challenge and implement solutions with local stakeholders (fishers) in Japan.

## Naruhito Takenouchi



Naruhito Takenouchi is a fisheries social scientist with a Ph.D. in fisheries science from the Kagoshima University, Japan. He is currently an associate professor at South Ehime Fisheries Research Center at Ehime University. Dr. Takenouchi's research interests and expertise are in exploring the production, distribution, processing, and sales of marine products in Japan to stimulate stakeholders in local fisheries. He has, in recent years, also conducted a survey research about marketing strategy and logistics strategy for the marine products export of Japan.

## Hiromichi Tanaka



Hiromichi Tanaka received Dr. Eng from Tohoku University. My specialty is river engineering and coastal engineering in civil engineering. I retired from Tokai University in March 2018 and am now Professor Emeritus at Tokai University. During my tenure, I continued to ask what the essence of learning was and was researching themes to create a

sustainable natural environment and society. After retirement, I established Renewable Energy Japan Co., Ltd. (REJ), a venture company that researches and develops renewable energy and is currently the representative director. I am the chairman of the committees of the Ministry of Land, Infrastructure, Transport and Tourism, Shizuoka Pref., and the city.



## Shiho Tateoka



Shiho Tateoka grew up in Tokyo and worked as a nurse back then. In 2014, she moved to Hakodate city, Hokkaido, and opened up a direct wholesale fish market in Funka Bay, "Goryuujin-maru," concert with fishers. She married a fisherman in 2016, then moved to Yakumo town near Hakodate city, and started a new business, Navire noir, a fishery consultant. She also became a board member of fishers' organization, Ezo Shinsengumi, a product manager of Otoshibe Blue Tourism, and a member of the Suisan Joshi (Fisherwoman) Project run by Fisheries Agency. Her activities cover a wide range of areas in fisheries, including the promotion for women joining the fisheries.

## Kanae Tokunaga



Kanae Tokunaga is Associate Research Scientist in Coastal & Marine Economics at the Gulf of Maine Research Institute (GMRI). Her research focuses on fisheries co-management, climate change, and coastal ecosystem valuation. Prior to joining GMRI, she worked as a research scientist at the University of Tokyo's Ocean Alliance, where she researched marine spatial planning and coastal fisheries management. She received her Ph.D. in Economics and Graduate Ocean Policy Certificate from the University of Hawaii. She values and enjoys collaborative research with researchers from diverse disciplines as well as working closely with coastal communities, policymakers, and industries. She continues her love of economics outside of work, where you can find her visiting fish markets around the globe.

## Hiroshi Tomita



Hiroshi Tomita, the President of Fishery Communities Planning Co., Ltd., was born in Kumamoto Prefecture in 1955. He studied architecture and regional planning in university, going on to work on projects to revitalize communities and protect coastal environments in fishing regions. He takes a very hands-on approach and has explored the narrow roads of fishing villages across Japan for many years,



eating the freshest seafood while drinking and arguing with local fishermen and residents. His current focus and passion are implementing community-run businesses in small and mid-sized fishing villages, often working together with local fishing associations, as an effective method of local revitalization.

## Irianna Vlachopoulou



Irianna Vlachopoulou is a social scientist specializing in marine sociology and natural resource management, with focus on capacity-building. Before joining the United Nations, she conducted research on governance of small-scale agriculture (Scotland) and fisheries co-management (Japan). She received her PhD in Sociology with focus on marine issues from the University of the Aegean, Greece, preceded by an MSc in Environmental Sustainability (University of Edinburgh, Scotland) and a BA (Hons) in International and European Economic Studies (Athens University of Economics and Business, Greece). Currently, she is working on space-based capacity-building at the UN Office for Outer Space Affairs.

## Hidenao Watanabe



Hidenao Watanabe is the President, Marino-Forum 21, which is the officially incorporated association to develop and disseminate new technologies for sustainable fisheries and also to contribute to the development of the fisheries in developing countries through the overseas fisheries cooperation. He belonged Fisheries Agency of Japan (FAJ) from 1987 to 2016, and he had also been seconded to Japan External Trade Organization (JETRO), Food and Agriculture Organization of the United Nations (FAO), and South East Asia Fisheries Development Center (SEAFDEC). He was a Fisheries Management Policy adviser to Vietnam (JICA expert) from 2016 to 2019.

## Haruko Yamashita



Haruko Yamashita, Ph.D., is a professor of Economics at Daito Bunka University in Saitama, Japan. Her interest is in fishery policies that achieve sustainable fishery. She has written several books and articles in Japanese, including: Research on the change of consumer preference of salmon, Journal of Regional Fishery 59-2, 2019; Swimming road of skipjack: SDGs for Pacific countries, Keizai Seminar 711, 2019; Aging Fishers and Fishing Villages in Ten Years (edited), Hokuto Shobo, 2015; and Essays on Fishery, Nihon Hyoronsha, 2012. She is a chairperson of the Fishery subcommittee on the Fishery Policy Council and was awarded the Fishery Contributor's Prize in 2019.

## Chenxing Yang



Dr. Chenxing Yang is working as a lecturer in the College of Economics and Management, Shanghai Ocean University, China. She obtained her PhD in Tokyo University of Marine Science and Technology, Japan (2016). Chenxing has worked in Chinese small-scale fisheries. Her previous research field also includes an evaluation of Japanese Pacific saury fishery production efficiency. Most recently, she has been devoting to the economic analysis of Chinese s pelagic fisheries, especially the squid fishery and Pacific saury fishery, and is interested in the international distribution channel of the aquatic products caught by Chinese pelagic fishing fleet.

## Mai Yoshimura



Mai Yoshimura is an assistant professor at Mie University with a master's degree in sociology. Her current research interest is the heritagization of traditional subsistence activities and its various influences on local communities, with a focus on Ama fishing and fishing villages in Japan, and what impact the recognition of cultural heritage and tourism resources has on the lives of Ama divers and the sociocultural structure of fishing villages.

## Afterword

In Northeast Asian culture, there is a word that is understood as “goen” in Japanese, “inyon” in Korean, and “yuanfen” in Chinese. It is often loosely translated into English as “meeting,” “encounter,” “chance,” or “relationship,” but I feel that these expressions do not adequately encapsulate the word’s meaning. This is because goen’s meaning not only has to do with encounters and opportunities in and of themselves, but also the mysterious circumstances which lead to their occurrence. In recognizing this, the meaning of goen also conveys a sense of gratitude for the situations we find ourselves in. When I think of the Too Big To Ignore (TBTI) project, the concept of goen comes to mind. Until a little while ago, I felt that it presented itself when I started working as a member of the Human Dimensions Working Group of the Integrated Marine Biosphere Research (IMBeR) project back in 2014. Through that project, I met Professor Ratana Chuenpagdee, TBTI’s director, who was also a working member of the group at the time. I remember being deeply intrigued by TBTI’s name upon hearing it for the first time.

However, due to a small event that occurred while writing and editing this book at home, I now realize that goen may have been at work longer than I had previously thought. The event was set in motion when I decided to straighten the bookshelf in my office, causing some documents from previously attended seminars to spill to the floor. As I gathered them together, I realized that these papers were from the time I was conducting my postgraduate studies and attending seminars that I organized together with friends. Looking over the pages with nostalgia, a paper titled “Step zero for fisheries co-management: What precedes implementation” (Marine Policy 31(6):657-668, 2007) caught my eye. As it turns out, the paper was written by Professor Chuenpagdee and Professor Svein Jentoft, who I know now as one of the founding members of

TBTI. Taking in this paper, I distinctly recalled the struggle of having to use a dictionary in order to read and understand the text, as a student who had not learned English in school. Still, I realized in that moment that this research and numerous TBTI-related books have undoubtedly inspired and led me to where I am now. Thinking back to my days as a student, that paper may very well have been goen's "step zero" for me and TBTI.

With the help of Prof. Chuenpagdee, who is also the TBTI Global Book Series editor, and my co-editor, Dr. Tamano Namikawa, as well as every contributor, we are now able to move on from "step zero" to "step one" in publishing this TBTI Japan e-book. Although there are many fisheries social scientists in Japan who play active roles in academic societies such as the Japanese Society of Fisheries Economics, the Japan Regional Fisheries Society, and the Japan International Fisheries Research Society, I am extremely happy to present this work in my position as a very ordinary and "small-scale" researcher. I have always thought that there is a certain role I should play in this line of work, and promoting the TBTI Japan Research Network may very well be part of it. With an immense sense of gratitude, I bring this e-book to a close, while reaffirming the critical mission and significance of small-scale fisheries research.

Yinji Li  
Shizuoka, Japan  
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