

Effort and Prospects for a Sustainable Coastal Fishery in Japan: A Case Study of a Small Trawl Fishery in Boze Prefecture

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ABSTRACT

Currently, the Japanese fishery is in a declining state. However, the number of fishery establishments among coastal fisheries is decreasing more slowly than any other fisheries. Therefore it is expected that it will play an important role in coastal fisheries in Japan fisheries in the future.

In this paper, a small trawl fishery which is one of the most important coastal fisheries is examined. Aspects of a sustainable small trawl fishery, resource management, transactions, and the present state of the operating licenses are investigated, and the prospects are clarified.

The role of fishermen's cooperatives has become more important than ever in order to lead fisheries into sustainable production. It is important to determine whether the fishermen's cooperatives can function positively through administering license operations and other matters.

Key words: small trawl fishery, five-day workweek, license.

INTRODUCTION

Currently, fisheries in Japan as a whole are experiencing reductions through restructuring. The number of fishery establishments among coastal fisheries is decreasing at a much slower pace than are those of open sea and offshore fisheries. Trawl fishery is one aspect of coastal fisheries.

According to the 10th fishery census (MAFF, 2000), there were about 12,102 small trawl fishery establishments in Japan, and those with vessel capacities of less than 5 tons exceeded 74% of the whole. As 77% of these small base tugboats of less than 5 tons are from Japan, the district of the Seto Inland Sea was used for a case study.

The Seto Inland Sea district consists of 11 prefectures (Osaka, Wakayama, Hyogo, Okayama,

Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Oita, and Fukuoka), and there are 425 districts. Trawl fishing boats which operate in this district are less than 5 tons and 15 horsepower. In short, it is impossible to operate large fishing boats or those with greater horsepower in this district.

PRESENT STATUS OF THE SMALL TRAWL FISHERY

The number of small trawl fishery establishments was 12,102, according to the 10th fishery census (MAFF, 2000). This was a 16.5% decrease in comparison with that of the 6th census (MAFF, 1980). Although there is a tendency for a decline in fisheries of the Seto Inland Sea of Japan, the small trawl fishery is still one of the most important fishery types in all of the prefectures here (Fig. 1).

Big differences exist among the prefectures. The number of ships in Hyogo Prefecture was 1326,

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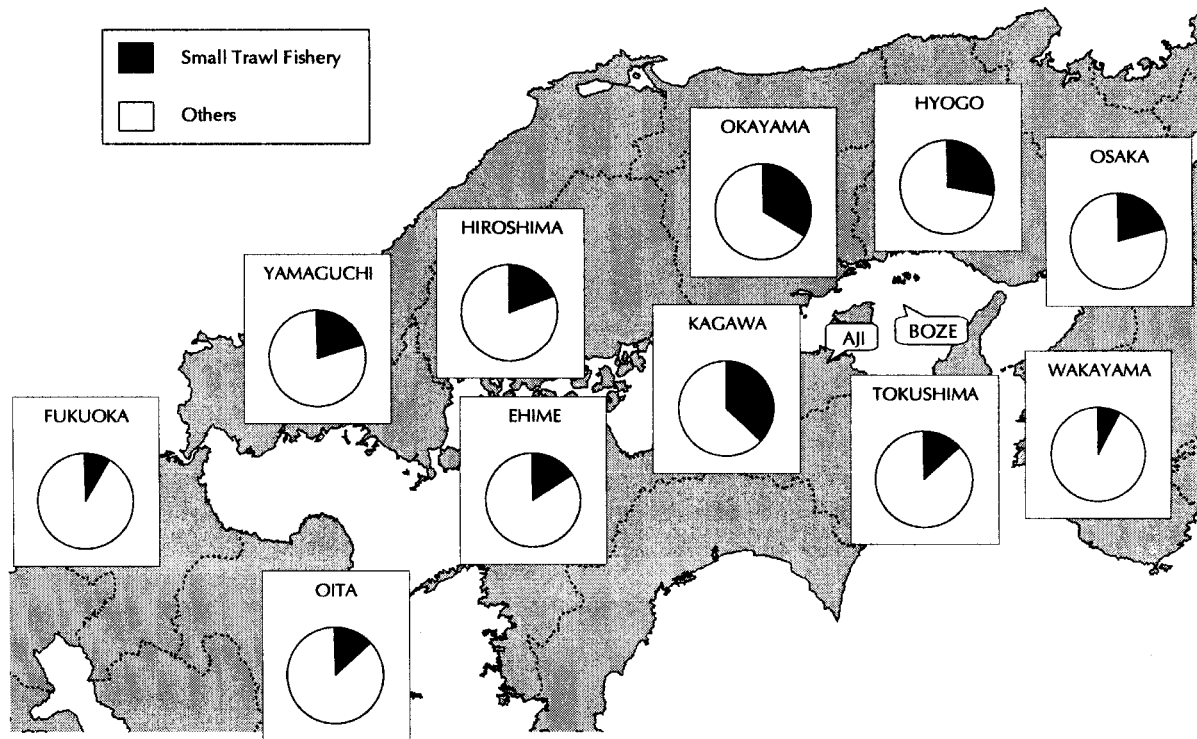


Fig. 1 Proportion of small trawl fishery occupied in Zeto Inland Sea District.

which was the largest, followed by Yamaguchi, Ehime, and Kagawa Prefectures. From 1980 to 2000, only Oita Prefecture experienced a slight increase in the number of ships. Okayama Prefecture showed the largest decline of 41.6%, followed by Fukuoka, Yamaguchi, and Hiroshima Prefectures, which all showed declines exceeding 30%.

1. Challenge for Resource Management

Resource management here includes two different types: management of fishing grounds and management of resources, both of which need to be considered simultaneously and on the same level.

A 5-d workweek for the small trawl fishery was begun in the Aji Fishermen's Cooperative of Kagawa Prefecture. After an accidental oil spill in the Mizushima Industrial Complex in November 1974, the Aji Fishermen's Cooperative was forced to take days off, in order to remove the crude oil which lasted for half a year. Then, the cooperative restarted its operation with time limits and with every Saturday off. Later in 1986, the cooperative was forced to introduce

a 5-d workweek due to a decrease in fuel allocation.

Resource-controlling management such as restrictions in mesh size and seedling restocking has been promoted since 1985. In Hyogo Prefecture, at least 1 d of suspended fishing per week has been implemented since 1993. Saturday is the day on which fishing is suspended for all, and the other suspended day depends on the group the fishermen belong to. The establishments are divided into two groups and take turns. One has Tuesdays off, and the other has Wednesdays off. This reverses in January-June and July-December. Furthermore, for weeks with a national holiday, all member fishermen have 2 d off, the national holiday and Saturday.

If rules are violated, the offender will receive severe punishments. First, any fish caught by the offender on that day is confiscated. Second, the offender is banned from fishing for a few days. Third, all members of the group the offender belongs to are also banned from fishing for 1 d.

Although the 5-d workweek rule in the Aji Fishermen's Cooperative has not been adopted by

Table 1 Number and proportion of members by age-class in Boze in March 2000

Age composition	Number	Proportion (%)	Proportion (%)
~19	10	1.7	
20~24	46	7.7	
25~29	43	7.2	(Age under 40)
30~34	68	11.4	40.2
35~39	73	12.2	
40~44	53	8.9	
45~49	71	11.9	
50~54	55	9.2	(Age between 40 and 64)
55~59	52	8.7	46.7
60~64	48	8.0	
65~69	44	7.4	
70~74	26	4.4	(Age over 65)
75~	8	1.3	13.1
Total	597	100.0	100.0

other cooperatives within Kagawa Prefecture, it was implemented by Hyogo Prefecture in 1993. The government of Hyogo Prefecture rather than the fishermen's cooperative has played an important role in implementing the 5-d workweek. All fishermen cooperatives of the Seto Inland Sea in Hyogo Prefecture agreed to follow the 5-d workweek rule in 1998.

2. The Case of the Small Trawl Fishery on Boze Island

Boze Island of Hyogo Prefecture is a remote island in the Seto Inland Sea. The key industry of the island revolves around fisheries and is mainly composed of the small trawl fishery. The number of members of the Boze Fishermen's Cooperative has consistently increased since the latter half of the 1960s (BFC, 2001). Regarding the age composition of the members, those under 40 years old comprise 40.2% of the whole, and those under 65 years 86.9% (Table 1). According to the Marine Product White Paper (MAFF, 2003), those under 40 years old comprise 14.6% of all the fishery employees, and those under 65 years make up 66.4%. In comparison with other cooperatives, members belonging to the Boze Fishermen's Cooperative are relatively young.

In addition, when the age-class interval composition of new members in every fiscal year after 1995 was examined, there were on the average over 10 new members every year between 1995 and 1999. Sixty-one people have joined in the past 5 years, and most new members are younger (Table 2).

In the small trawl fishery, there are 322 operating licenses, among which 315 fishing boats are truly seaworthy, and the main mode of operation is pulling the nets from on board. Boats work from 04:00 to 18:00, and the length of seining at any one time has been shortened to about 1 h to help ensure the freshness of the fish.

Although there used to be two people on board, in recent years, the operation style has changed to a single person with some exceptions. Factors affecting this change included the introduction of mechanization such as fish finders and radar, and these devices have succeeded in reducing manpower needs (BFC, 2001).

With regard to the amount of money for landed fish, the average of the small trawl fishery in the fiscal year of 2000 was about ¥7 million; there has been a decline in the amount of money per capita over the past few years. This is not because of a decrease in the catch, but due to a fall in the unit price (BFC, 2001).

Table 2 Age-class composition of the new members between 1995 and 1999 in Boze

Year/Age	≤ 19	20~29	30~39	40~49	50~59	≥ 60	Total
1995	7	4	1	1	0	0	13
1996	9	2	1	0	0	0	12
1997	9	1	0	2	0	0	12
1998	7	5	1	0	1	1	15
1999	5	3	0	1	0	0	9
Total	37	15	3	4	1	1	61

When the amount of money for landed fish per capita is reviewed by age classification, the class under 50 years old including middle-aged fishermen and young fishermen shows good performance. There are several reasons for this. First, the introduction of mechanization like fish finders has drastically reduced the difference between experienced and inexperienced fishermen. Although differences in experience used to have a great influence on the size of the catch, in fact, differences in catch efficiency due to experience is now less important due to development of fishery mechanization. As a result, young fishermen, who are physically fit and are good at handling the machines, have an advantage and land more fish. The second point is the segregation of the fishing grounds. The one near Boze Island is for elderly people, and the other one further away from the island is for younger people. But in fact, there is trouble between the younger fishermen of Boze Island and those belonging to another fishermen's cooperative, when their operations are conducted outside the licensed operation zone. The third point is related to the first point, young fishermen are in excellent physical condition. Even though they have to depart early in the morning for the fishing ground which is far from the island, gains in fish caught correspond to how much effort they expend.

Although there is a nationwide tendency toward a decrease in the number of fishermen with the aging of fishermen, new members of the Boze Fishermen's Cooperative are actually increasing. One factor is the

method of membership qualification. Generally, membership in fishermen's cooperatives is given to a family rather than to each member of the family, whereas this is not the case in the Boze Fishermen's Cooperative. When a father and his son own and operate their boats individually, a membership is given to each person. When a fishing boat is built by a new member, the customs of people on the island seem to have a positive effect. The custom still exists where the parent constructs a fishing boat for his son, when he has U-turned to become a successor of his father, as a fisherman. The financing system of the fishermen's cooperative for this also functions well. In addition, although the amount of money being earned has recently decreased, it is still possible to earn more than ¥10 million in a year if people make sufficient efforts. These points have attracted many people in their late teens and twenties.

Most of the new members were born on the island and belong to fishing families. While rare, there have been queries from the outside of the island. Indeed, applications for entry are not accepted, because those from the island continually apply for entry.

CHALLENGE TO THE SUSTAINABLE PRODUCTION

Here, the challenges to sustainable production, resource management, transactions, and operating licenses are reviewed.

1. Resource Management

In addition to the introduction of the 5-d workweek, a movement of throwing back fish is being carried out in the Boze Fishermen's Cooperative. The movement to throw back fish means that at least three small fish are released from every catch.

Also, there is a rule that fishermen need to bring back the trash which is caught in the trawl net. The cooperative then pays them at the commissioned rate of ¥300 per trash bag. Fishermen who only collect a small amount of trash are warned. The Boze Fishermen's Cooperative began to implement this rule in 1990. In the beginning, five to six bags were collected by each person a day, and about 10,000 bags were collected in half a year. This drastically decreased to 1 bag per person by March 2001, indicating that the garbage pollution in fishing area is largely improved.

2. Fish Transaction

As the catch has been declining, stagnation of fish prices has long continued. A new method of selling in the case of the Boze Fishermen's Cooperative was developed in an effort to find better prices. Traditionally, fish were sold on consignment through the cooperative to local traders who then shipped them to markets in Himeji, Okayama, and Kyoto. Thus, direct shipments to outside markets would produce better prices than could be obtained in local markets. Young fishermen return to the harbor in the evening and preserve fish for the next morning. They then ship the fish to markets in Hyogo and Okayama Prefectures. After the sale, the young fishermen head out to the fishing grounds.

The price from direct sales to outside markets is about 1.5 times as high as that obtained from the traditional way. However, it requires greater efforts. Young fishermen need to leave port at 03:30 in the very early morning. In recent years, a "grouping" of direct shipments has developed. The group shipment consists of one fisherman who represents several fishermen's ships and who brings the landed fish together from them to the market. In comparison with the case in which fish are shipped by an

individual, the merit of the group shipment is that about 30% more money is obtained in proportion to the increase in the length of their operation.

3. Operation License

Small trawl fishing fishery licenses are given out by the governor for a 3-year period. When a fisherman wants to obtain an operating license, he will first notify the local fishermen's cooperative. If all conditions are satisfied, the cooperative applies to the prefecture (governor), and receives a license from the governor. There has been a small increase in the number of small trawl fishery licenses in the Boze Fishermen's Cooperative since 1985. There were 322 in April 2001 (BFC, 2001). It is said that the number of the operating licenses was about 80 to 100 in the 1960s (personal communication, 2001).

The number of operating licenses for the small trawl fishery in Hyogo Prefecture was 1851 as of April 2001, and the number of establishments which are actually in operation is 1476. This indicates that 375 licenses are unused. However, the number of licenses is on the increase in some fishermen's cooperatives like Boze and Akashiura. In short, the number of unused licenses tends to increase at the prefecture level, whereas in terms of fishermen's cooperatives, there are some cooperatives like the Boze Fishermen's Cooperative which has an insufficient number.

What has become a problem here is the management of licenses. Until now, the fishermen's cooperative or a small trawl subcommittee in the fishermen's cooperative has controlled operating licenses. When there is a vacancy (when a fisherman retires), the fishermen's cooperative or the small trawl subcommittee maintains control over the vacant license. When there is a new applicant for entry, it is accepted with the approval of the fishermen's cooperative at its general meeting. With the aging of fishermen and a decrease in the number of new people applying for new licenses, there is greater opportunity for fishermen's cooperatives or small trawl subcommittees to control vacant licenses. However, as mentioned above, in spite of there being applicants,

the Boze Fishermen's Cooperative cannot accept them, because there are no vacant licenses, resulting in obstruction of the participation of new applicants. On one hand, fishermen's cooperatives are searching for U-turn and I-turn people, and on the other hand, it prevents new applicants from participating.

Under these circumstances, in Hyogo Prefecture, they forbade fishermen's cooperatives from transferring licenses among themselves in April 2001, and decided to recover dead licenses and approve new licenses. In short, the prefecture recovers the licenses which are not actually being used, and those who wish to obtain licenses apply to the prefecture through the fishermen's cooperative. As a result, it has become possible to prevent the trade of licenses at high prices. There is a rumor that the trade is ruled by the black market. In addition, this does not prevent applicants with intent from entering, since the number of licenses is not limited by the fishermen's cooperative unit.

In the Aji Fishermen's Cooperative, which first introduced the 5-d workweek, in the conventional way, the fishermen's cooperative (the small trawl subcommittee) maintains control over the licenses. Strictly speaking, the license is regarded as the right which the governor grants to an individual fisherman to fish in an area. Therefore, it should be returned to the prefecture when the fisherman quits the fishery.

In many fishermen's cooperatives, it is true that there are sufficient licenses, considering the shortage of the number of fishermen and the aging of fishermen. However, as a few cooperatives, like the Boze Fishermen's Cooperative, have no vacant licenses, the cooperatives cannot accept those who want to participate in the cooperative and work in the small trawl fishery. In this case, the problem related to unused licenses arises.

As a case of a wider approach to license management, Oita and Hyogo Prefectures are mentioned. Oita Prefecture is divided into four regions, and the transfer of licenses is allowed inside a region. In short, the problem of operating licenses does not arise on the level of the fishermen's cooperative. In the case of Hyogo Prefecture, they regard the entire

prefecture as one fishing ground, which enables fishermen to transfer licenses within the prefecture.

PROBLEM AND PROSPECT

There are various problems that the small trawl fishery needs to tackle in order to be sustainable in the 21st century. In this section, three points are examined: resource management, fish transactions, and operating licenses. They are closely related to each other.

1. Resource Management

In Hyogo Prefecture, the 5-d workweek has already been accepted by all fishermen's cooperatives and has had an effect on the views of each fisherman as to the importance of resource management. On the contrary, in Kagawa Prefecture, few fishermen's cooperatives are interested in the 5-d workweek, although the prefecture was the first to have introduced it. In fact, it seems difficult to change the situation. In the prefecture, the major fishery type of fishermen's cooperative differs from each other. This is one explanation for the situation. After all, the problem is that the 5-d workweek does not work well for recruiting new people.

The introduction of the 5-d workweek needs to be managed at the same time and on the same level as restrictions of mesh size and seedling restocking. Furthermore, attention must be paid to the fact that there is no common policy among fishermen's cooperatives about the business of seedling restocking. Each cooperative takes the responsibility for only its own business. These problems, including the kinds of fish restocking, must be improved.

2. Fish Transaction

Almost every process is firmly in the hands of the fishermen's cooperatives from sale to collection of bills after fishermen land their fish at the fishermen's cooperative. This allows fishermen to concentrate on their fishing. However, it may be more important to increase prices than to increase production when increases in costs and stagnation of prices occur. Thus,

it is inevitable that individuals and groups will begin to develop their own sales policy. In the Boze Fishermen's Cooperative, there is a new movement in shipping by selling fish directly to outside markets rather than to local markets. Shipping may be carried out either by an individual or by a group.

3. Operation License

In general, operating licenses are managed by fishermen's cooperatives. Some cooperatives have many licenses which are not being used, and the number of such licenses is increasing. On the other hand, some cooperatives suffer from an insufficient number of licenses. Since there are inequalities in the distribution of license among cooperatives, the prefectural government should take over the management of licenses. This is what Hyogo Prefecture has begun, which has allowed more new people who want to be fisherman to formally enter the cooperative.

CONCLUSION

The role of fishermen's cooperatives is becoming more important. Regarding sales of fish catches, it is necessary that each fisherman has his own marketing

route. In addition, it is vital that fishermen's cooperatives make efforts to find new markets. As to the acquisition of new licenses, fishermen's cooperatives play an important part in applying to the prefecture for new licenses and in functioning well as a "coordinating section" when a license is transferred from one cooperative to another. After all, cooperatives can have a positive effect on the future development of the small trawl fishery.

Furthermore, it is also important that young fishermen who enter the fishery have hope. As reformed fishermen, they not only have ideas to catch and market fish, but also are fully conscious of the importance of the resources and the environment. Younger fishermen are expected to be the key to the success of small trawl fisheries.

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沿海漁業持續發展之配套措施與其未來展望 —以日本之小型底拖網漁業為例—

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摘 要

今日，日本的漁業正處於縮編之際。而其中又以沿海漁業所減少的戶數較低，因此，該漁業有可能成為今後日本漁業的重心。

本論文中將以在沿海漁業中屬於重要漁業種類之一的小型底拖網漁業為例，結果發現以小型底拖網漁業來進行可持續生產的配套方式，對於其資源管理、漁獲物販售、捕撈許可之現狀進行調查，將可使今後漁業的發展更趨明朗化。

為能更積極地進行可持續生產的配套措施，漁會所扮演之角色將比目前更為吃重。由漁會來執行捕撈許可調度的角色，其功能能否積極有效地展現將是相當重要的一環。

關鍵詞：小型底拖網漁業，週休二日制，捕撈許可

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