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Current status and Challenges of Agricultural
Diversification Efforts by Fisherperson
-A case study of Koshiki Island, Kagoshima Prefecture-

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Current status and Challenges of Agricultural Diversification Efforts by Fisherperson -A case study of Koshiki Island, Kagoshima Prefecture-

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漁業者による六次産業化の取り組みの効果と課題
～鹿児島県甑島を事例に～

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Abstract

Efforts by fisherperson to process and sell their own catches have long been widespread. However, in recent years, those efforts have been refocused as agricultural diversification. The purpose of this paper is to clarify the effects and challenges of agricultural diversification efforts by fisherperson. This paper considers the businesses “Kaiseimaru” and “Higasayama Fisheries” in the Koshiki area (Satsumasendai City, Kagoshima Prefecture) as a case study.

Kaiseimaru diversified its business by utilizing the subsidy project of Satsumasendai City. In addition to Banded blue sprat gillnets, rock oyster farming, restaurant management, and marine tourism business have improved income. Higasayama Fisheries also established a new processing plant utilizing the subsidization from the project of Satsumasendai City.

As a result of the analysis, the following matters became clear. Financial support from local government has certainly lowered the hurdles for fisherperson to undertake agricultural diversification efforts. However, it is not easy for a fishery management entity, which lacks management resources such as funds and labor, to expand the scope of management. The labor force of the family is insufficient to expand the scale of the business, and an employed labor force is needed. However, in remote island areas where the population is declining and aging is notable, they must rely on external technical intern trainees. Furthermore, it is difficult for fisherperson to perform the entire process from production to sale by themselves in terms of time and ability. They are professionals in fishery operation, but often lack experience and knowledge in sales and product development, so support from outside experts is required.

Keywords: Agricultural Diversification, Koshiki Island, Financial Support

1. Research background and objectives

Efforts by fisherperson to process and sell their own catches have long been widespread. However, in recent years, those efforts have been refocused as agricultural diversification.

The Ministry of Agriculture, Forestry and Fisheries defines the “sixth industrialization” as “efforts to encourage growth in the agriculture, forestry and fisheries as the primary industry, manufacturing as the secondary industry, and retailing as the tertiary industry in a comprehensive

and integrated manner, thereby exploiting local resources to generate new additional value,” and based on these efforts, aims to raise the income levels and secure employment in rural areas. In 2010, the Act on the Creation of New Businesses in Agriculture, Forestry and Fisheries using Local Resources and the Promotion of Use of Local Agricultural, Forestry and Fishery Products (Sixth Industrialization Act) was established, based on which policies relating to the “sixth industrialization,” such as agricultural, forestry and fishery workers expanding their business to processing and sales, have been implemented with the aim of stimulating business operation in agriculture, forestry and fisheries. Specific examples of the sixth industrialization include seafood processing, direct selling of fisheries products, fisherperson’s restaurants, fisherperson’s guest houses, orientation/tourist fishing, recreational fishing, and diving. It is not new for fisherperson to engage in these businesses. Running businesses such as fishery processing and recreational fishing and setting up fisherperson’s markets have been traditional secondary businesses in fisheries. However, with the establishment of the Sixth Industrialization Act in 2010, these businesses are now encouraged as government policy. Some of the outcomes of these efforts are summarized in the Collection of Cases of Sixth Industrialization Efforts, in which increases in sales are highlighted.

However, the sales scale of agricultural diversification by fisherperson has been almost flat since 2015 (Table 1). Despite various policy supports, the scale of the industry has not expanded. What are the challenges of the sixth industrialization efforts, which are expected to bring income growth to fisherperson?

The purpose of this paper is to clarify the effects and challenges of agricultural diversification efforts by fisherperson. This paper considers the businesses “Kaiseimaru” and “Higasayama Fisheries” in the Koshiki area (Satsumasendai City, Kagoshima Prefecture) as a case study. Kaiseimaru is a management entity that operates Banded blue sprat gillnets, shellfish farming, restaurants, and marine tourism businesses by fisherperson. Higasayama Fisheries is a management body that operates Banded blue sprat gillnets and a processing industry and consists of one fisherperson, his son, and an employed labor force. Both companies are developing their activities with support from the budget for promoting agricultural diversification from the local government, and are good examples to clarify the purpose of this research.

Table-1 Changes in annual sales of fishery-related businesses

	Processing business		Direct sales business		Guest house Restaurant (100 million yen)
	Total amount (100 million yen)	Per business (Ten thousand yen)	Total amount (100 million yen)	Per business (Ten thousand yen)	
2011	1,339	–	276	–	–
2012	1,543	9,920	311	5,084	–
2013	1,719	11,515	313	5,127	–
2014	1,724	11,546	332	5,229	–
2015	1,847	12,096	365	5,503	124
2016	1,783	11,591	373	5,512	144
2017	1,745	11,449	375	5,485	152
2018	1,769	11,572	399	4,813	175

Source: Ministry of Agriculture, Forestry and Fisheries

2. Efforts of agricultural diversification in Koshiki Island

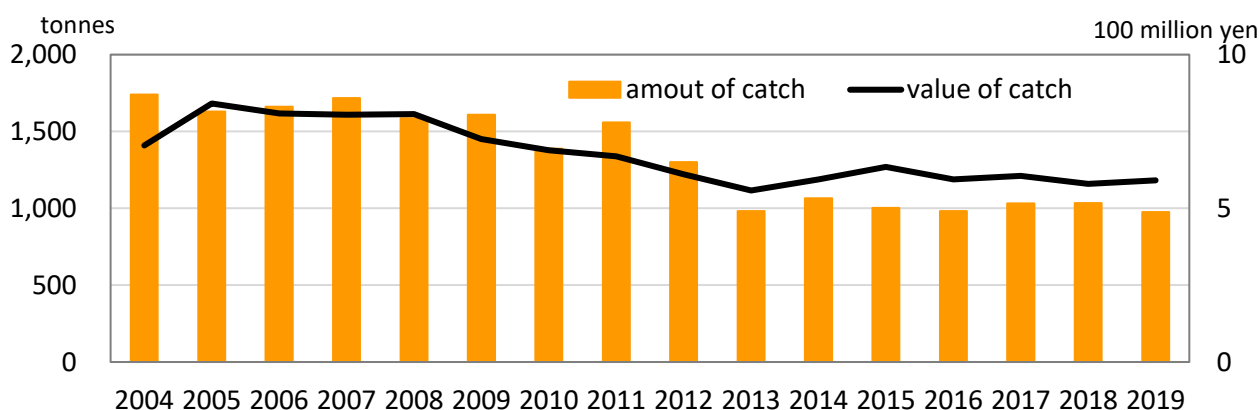
1) Overview of Koshiki Island Fisheries Cooperative Association

The Koshiki Island Fisheries Cooperative Association (FCA) was established in 2003 by the merger of four FCAs in the Koshiki Island area. As of March 2020, there were 189 regular members and 469 associate members of this FCA.

One of the best fishing grounds in Kagoshima Prefecture occurs in the waters around Koshiki Island, and shellfish and algae collection, fish farming, and fishing using set nets, gillnets, and hook and line have been practiced since ancient times. Among them, fishing for Banded blue sprat with gillnets is the core fishery, accounting for 56% of the catch quantity and 40% of the income.

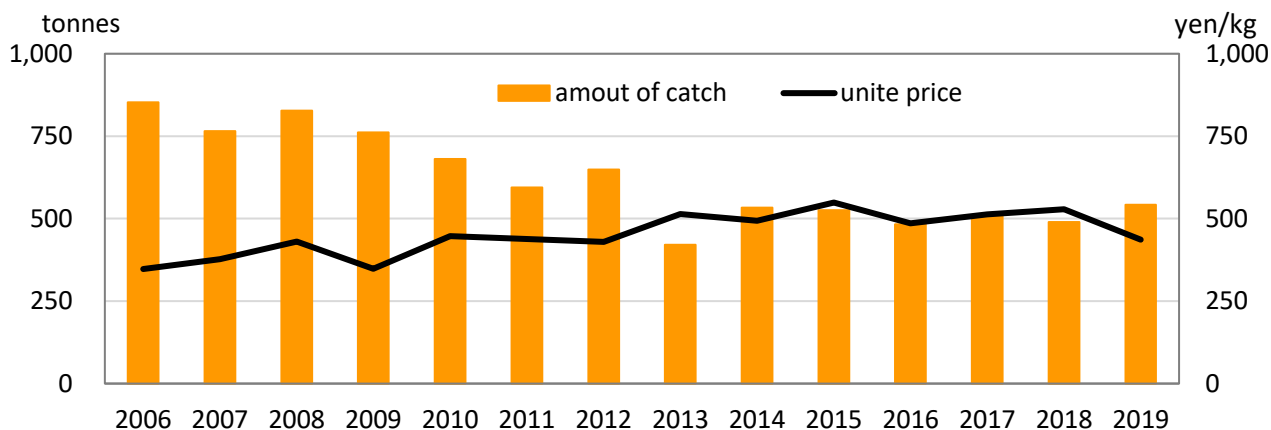
Although the catch from fishing boat fishery is declining, it has remained almost flat since 2013, reaching about 976 tonnes and about 590 million yen in 2019 (Fig. 1). Looking at the trends in the Banded blue sprat fishery, as with other fisheries, the catch is on a downward trend. The unit price of Banded blue sprat shows a slight upward trend, and has risen from 450 to 550 yen/kg in recent years (Fig. 2).

Figure-1 Changes in Amount and Value of Catch for Fishing Boat Fishery



Source: Koshiki FCA (2004-2019), Business Report

Figure-2 Changes in the Catch and Unit Price of Banded blue sprat



Source: Koshiki FCA (2004-2019), Business Report

2) Efforts for agricultural diversification of Kaiseimaru

Mr. A, the representative of Kaiseimaru, is aged in his mid-40s and runs a fishing boat fishery mainly on Banded blue sprat gillnets on Kamikoshiki Island. Since 2014, Kaiseimaru has been working on diversifying its business for the purpose of stabilizing management. In 2016, a restaurant was opened utilizing the “Agricultural Diversification Support Project” of Satsumasendai City.

(1) Fishing boat fishery

Mr. A’s main business is fishing boat fishing, which combines Banded blue sprat gillnets, small fish baskets, and skin diving according to the season. Among them, the Banded blue sprat gillnet fishing was the main pillar supporting Kaiseimaru; however, in recent years, due to the decrease in catch and increased production costs such as fuel oil, the profit margin has fallen. Mr. A felt a sense of crisis in management, so he decided to expand his activities into businesses other than fishing boat fishing.

(2) Rock oyster farming

In 2014, Kagoshima Prefecture was looking for a fisherman to carry out trial aquaculture of rock oysters, so Mr. A started trial aquaculture with the prefecture. In October 2014, Mr. A received 300 rock oyster juvenile from the Fisheries Experiment Station and started aquaculture testing. Although Mr. A had experience in fish farming, he was new to oyster farming, so he tried to acquire aquaculture techniques under the guidance of the Fisheries Experiment Station. As a result of repeated trial and error over about three years, Mr. A acquired a specified demarcated fishing right in 2016 and started full-scale aquaculture of rock oysters after he had mastered the technique.

Annual production is 2,000 to 3,000 pieces. The busy season is from July to August, which is the shipping time. The main sales destination is the restaurant run by Mr. A, and the surplus is sold at events such as at a roadside station. Although sales are strong, there is no prospect of further scale expansion because Mr. A is training and shipping by himself. Since 2017, Mr. A has been conducting trial aquaculture of Japanese oyster, which has a different shipping time to rock oyster; however, he is still at an early stage in this process.

(3) Restaurant management

In July 2016, Mr. A opened the fisherman restaurant “Kaiseimaru”. Koshiki Island has a thriving fishing industry, but most of the fish caught are shipped outside the island, and there are few places where visiting tourists can taste local marine products. Mr. A thought that if he could provide tourists with Koshiki Island’s marine products, tourists’ satisfaction would increase and fisherperson would also be able to earn income, so he began to plan restaurant management. Because Satsumasendai City was conducting their “Agricultural Diversification Support Project,” Mr. A aimed to open a restaurant with a subsidy.

In March 2016, financial support from the government was decided, and the restaurant was

opened in July 2016. The restaurant is located a 10-minute walk from the main port, the departure and arrival point for high-speed boats and ferries. Business hours are from 11:00 to 15:00, and night business is open only for reservations and is closed irregularly. The marine products of Koshiki Island are provided, centering on Banded blue sprat and rock oyster caught by Mr. A himself. In preparation for poor fishing and bad weather, Mr. A has set up a farm cage near the rock oyster farm and has a system in place to supply marine products at any time. Mr. A's wife is in charge of store management (e.g. reservation, cooking, provision, customer service, and accounting). When the shop is busy, she temporarily hires 2 to 3 people.

The most popular are barbecue-style set meals (1,980 yen) that customers themselves bake and eat, as well as seafood bowls (1,500 yen), small shrimp bowls (1,000 yen), and Banded blue sprat pickled bowls (700 yen). The menu is structured according to the catch of the day, and the fact that the menu contents differ depending on the day is also a popular point. The busy season is from October to November, when the number of tourists increases, including the consecutive holidays in May, summer vacation, and autumn holidays. However, attracting tourists in winter, when the number of tourists to Koshiki Island is decreasing, is an issue.

(4) Marine tourism business

As Mr. A interacted with tourists at the Kaiseimaru, he began to feel that Koshiki Island lacked a hands-on tourist program, which was an obstacle to attracting families. He suggested to a tourist company on Koshiki Island that they incorporate playing on the beach into their package tours. Currently, he offers an "uninhabited island shore play tour" (10,800 yen per person) that includes beach play and a barbecue on an uninhabited island, and a "boat fishing experience" (6,500 yen per person) for beginners. The annual number of users is about 50 to 80.

(5) Achievements and issues of efforts

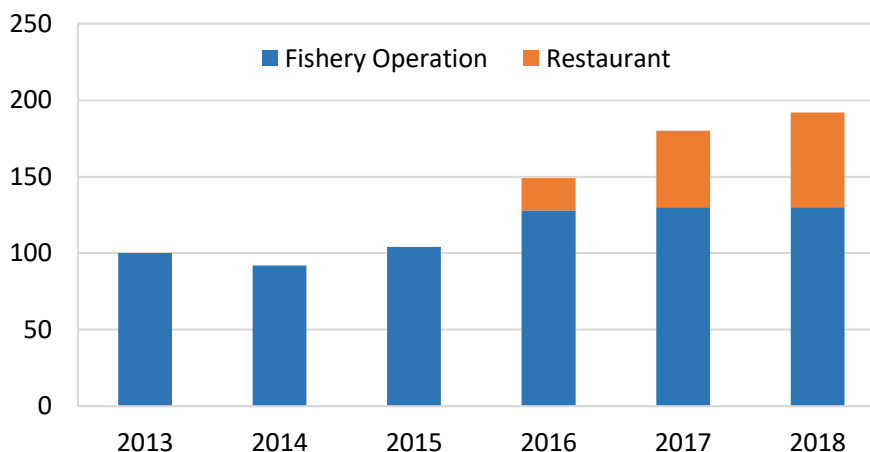
One of the effects of agricultural diversification is that income from non-fisheries is gradually increasing (Fig. 3). It has become possible to alleviate the instability of income from fishing boats by rock oyster farming and managing restaurants. Mr. A used to ship all of his catch to markets outside the island, but now it can be used at the restaurant he manages, and the unit shipping price has risen. In addition, seeing tourists at the restaurant happily eating the marine products that he caught helped improve his motivation for work.

However, labor intensity has increased. During the busy restaurant season, sleep time is decreasing because he helps in the restaurant in addition to fishery operation. Since Mr. A is in his mid-40s, increasing labor intensity may not be a problem. However, in the future, if he physically overextends himself, this may lead to an accident during fishery operation.

Attracting customers in winter is also an issue. Because the sea is rough and the cancellation rate of shipping routes is high, winter is a quiet season for tourism on Koshiki Island. Since most of the restaurant users are tourists from outside the island, it is necessary not only to try to attract customers through PR activities, but also to search for businesses that can earn money during this

period. However, although employment labor may be required to expand the scale of the business, it is not easy due to the significant shortage of human resources on Koshiki Island.

Figure-3 Changes in Sales Amount



Source: Kaiseimaru

3) Higasayama Fisheries' efforts for agricultural diversification

Mr. B, the representative of Higasayama Fisheries, is engaged in amberjack aquaculture and marine product processing, centering on Banded blue sprat gillnets. In 2018, a new processing plant was established by utilizing the “Agricultural Diversification Support Project” of Satsumasendai City. There are two vessels and four people working on the sea, including Mr. B, and seven people working on land (six of them are technical intern trainees).

(1) Overview of Banded blue sprat fishery and amberjack aquaculture

Mr. B runs a Banded blue sprat gillnet with his son, two employed workers, a total of two ships and four people. The Banded blue sprat gillnet is operated almost every year, except for closed days (Sundays and holidays) and the closed season during the spawning season in some sea areas. Mr. B aims to value the quality of the Banded blue sprat caught by (1) catching only large fish by using a gillnet with a large mesh; (2) catching the Banded blue sprat at midnight when the stomach is empty, which helps maintain freshness after catching; and (3) avoiding bending of the fish body by devising a storage method after catching. The annual production is about 30 tonnes, and depending on the price and demand, this goes to the market outside the island or to the Higasayama Fisheries processing plant.

In addition, Mr. B has been amberjack farming since 1996. By using juvenile collected around Koshiki Island, and using inferior-quality Banded blue sprat and processing residues as bait, he aims to make effective use of resources and reduce production costs. The annual production is about 1.6 tonnes, and the main shipping destinations are restaurants and mass retailers on the island.

(2) Processing business

Mr. B previously shipped the caught Banded blue sprat and farmed amberjack to markets outside the island. However, shipping to the outside of the island is expensive and disadvantageous to price competition with other production areas, so the processing business was started in the early 2000s. Banded blue sprat are not only caught using his own boat, but are also purchased from other fisherperson on Koshiki Island for processing. In 2018, he built a new processing plant, purchased processing-related equipment, and created pamphlets with the financial support of Satsumasendai City. He also focused on hygiene management and responded to HACCP (Hazard Analysis Critical Control Point). The main products are Banded blue sprat salt-dried, fried, individual quick frozen (IQF), and sashimi.

For example, Banded blue sprat sashimi is brought into the processing plant after the boat returns to port, sorted, washed with sterilized cold seawater, and processed mechanically or manually. After checking the quality, it is quickly frozen at minus 35°C and vacuum packed. After passing through a metal detector, it is packed in a box and shipped.

The main shipping destinations are major conveyor-belt sushi restaurants and Japanese gastropubs outside the island. In particular, IQF shipments to conveyor-belt sushi restaurants amount to 20 tonnes per year. At the sushi restaurants, it is cooked in tempura and offered for 110 yen for five fish. Because conveyor-belt sushi restaurants demand hygiene management higher than HACCP, Mr. B recommended improvement of the processing plant. This experience has further improved hygiene management at the processing plant and has reached a level where it can be dealt with by any trader.

Higayama Fisheries also sells to general consumers via the Internet, and sales of processed products as a set are strong. In addition, they are focusing on developing sales channels, such as school meals, delivery to university cafeterias, and consideration of product development in collaboration with the Faculty of Fisheries, Kagoshima University.

(3) Achievements and issues of efforts

The first effect of agricultural diversification is the stabilization of management. When market conditions are good, the catch can be shipped to markets outside the island, and when it is cheap, it can be processed at their own processing plant, making it possible to avoid shipping at low prices.

Second, the creditworthiness of Higayama Fisheries has increased through transactions with major conveyor-belt sushi restaurants. The trading partner sushi restaurants are known to be strict about hygiene management standards, and Mr. B raised his knowledge and awareness of hygiene management in the process of closing the deal. It is thought that this experience will contribute to development of future school lunches and marketing to restaurants.

The third is to secure successors to the fishery. After seeing Mr. B's aggressive management response, his son decided to return to the island and started Banded blue sprat gillnet fishing with Mr. B. He became independent a few years ago and plans to build a new boat by the end of 2021.

Of course, there are still some challenges. First, there is a need to expand sales channels.

Higasayama Fisheries also purchases Banded blue sprat from other fisherperson on the island, and there is still plenty of production capacity. Although the sales channel to conveyor-belt sushi restaurants has been opened, it is necessary to secure more sales channels. However, Mr. B and his son, who are busy with daily fishing operations, cannot afford to be in charge of sales. Therefore, from 2020, Mr. B utilized the support project of the Kagoshima Chamber of Commerce and Industry, and started market development and product development with the support of a person familiar with marketing. However, the sales channels are not expanding, and the utilization rate of the processing plant is sluggish.

Second, the weaknesses of Banded blue sprat (i.e. fish species name) and Koshiki Island (i.e. region name) are also issues. Banded blue sprat is one of the representative fish of Kagoshima Prefecture, and Koshiki Island is well known as a region where fisheries are thriving. However, outside of Kyushu, the name recognition of Banded blue sprat drops significantly.

In some cases, although the product was evaluated favorably during negotiations, Banded blue sprat was rejected because of its poor name. Even if Banded blue sprat from Koshiki Island is emphasized, there is also Banded blue sprat of inferior quality from Koshiki Island in circulation. It is not easy for Higayama Fisheries alone to improve the image and name of Banded blue sprat from Koshiki Island and it is necessary for fisherperson to work together to improve quality, but such momentum is weak.

3. Effects and challenges of agricultural diversification efforts by fisherperson

The Ministry of Agriculture, Forestry and Fisheries has promoted agricultural diversification as one of the management promotion measures for the agriculture, forestry and fisheries industry. However, the annual sales amount of fishery production-related businesses is sluggish, and this paper analyzed two cases of Koshiki Island in order to determine the cause.

Kaiseimaru diversified its business by utilizing the subsidy project of Satsumasendai City. In addition to Banded blue sprat gillnets, rock oyster farming, Japanese oyster farming, restaurant management, and marine tourism business have improved income. However, it became clear that further scale expansion would not be easy due to increased labor intensity and labor shortage.

Higasayama Fisheries also established a new processing plant utilizing the subsidization from the project of Satsumasendai City. The level of hygiene management has risen dramatically, and it has become possible to do business with major conveyor-belt sushi restaurants. In addition, with the support of the Chamber of Commerce and Industry, Higayama Fisheries has started efforts to develop products and expand sales channels. However, there are challenges with the development of new sales channels and the name recognition of products, and the utilization rate of the processing plant remains low.

Thus, financial support from local government has certainly lowered the hurdles for fisherperson to undertake agricultural diversification efforts. However, it is not easy for a fishery management entity, which lacks management resources such as funds and labor, to expand the scope of management. The labor force of the family is insufficient to expand the scale of the business, and

an employed labor force is needed. However, in remote island areas where the population is declining and aging is notable, they must rely on external technical intern trainees.

Furthermore, it is difficult for fisherperson to perform the entire process from production to sale by themselves in terms of time and ability. They are professionals in fishery operation, but often lack experience and knowledge in sales and product development, so support from outside experts is required.

In order to link the efforts of agricultural diversification by fisherperson to the improvement of management, not only assistance to facilities but also support for product development, market development, and securing a labor force, are required.

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