



A New Departure on Remote Island : A Case of Abalone Farming in Ehime, Japan

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Abstract

Japanese fish production is currently affected by two major currents: population ageing and lack of young leaders. I found a solution to resolve this problem which is the closed circulatory culture system on land. There is actual abalone farm that conducting these system in OH Island, Yahatahama City, Ehime Prefecture, Japan. Although there are many benefits of using this system, competitive price could be a problem. Abalone imports rapidly increased over decade and has encroached upon the abalone market in Japan. Therefore cost reduction is the most important task.

Keywords: Remote Island, Abalone Farming, Grants-in-Aid Program

1. INTRODUCTION

Japan is one of the greatest fisheries production nations in the world. Japan consists of four main islands and around 6000 large and small islands, and each individual island plays a significant role in marine products production, environment conservation, salvage, and borderline surveillance. However, Japan's fishery market is suffering due to the lack of new generation of fishery operators, decreasing the number for old generation fishermen because of retirement, consumers choosing western diet, and decreasing of marine products consumption, and this phenomenon stands out more in remote islands. Experts are predicting this phenomenon will affect negatively to the economy since there is not enough labors – new generation – and the cost of shipment from remote island to capital cities are too expensive. Therefore, Japanese government's action is extremely critical to promote fishery production in remote islands. This study focused on 「The closed circulatory culture system on land」 which was started via 「Grants-in-Aid Program to Vitalize Fishing Industry of Remote Island」 in OH Island, Yahatahama City, Ehime Prefecture, Japan and review outcome of this program. In addition, this study also investigates economic effects

about abalone that is cultivated by the closed circulatory culture system.

2. New challenge in Japan and OH Island

2.1 Outline of Ehime Prefecture and OH Island

Japan consists of four main islands and around 6000 large and small islands. Shikoku is the smallest and least populous of the four main islands of Japan. Ehime Prefecture is a prefecture in northwestern Shikoku, Japan. The capital is Matsuyama. The fishery industry in Ehime is blessed with abundant marine resources and has been developing a coastal fishery and aquaculture. Red sea bream production is the highest in Japan at more than 50% of production nationwide. Yellowtail production is second highest in Japan. OH Island consists of five islands and located about 12 kilometers away from southwest of Yawatahama city. According to the government report, 64 percent of OH Island's total population is 65 or older which indicates that the rate is higher compare to other remote islands (33 percent).

Due to the fact that the aging population is constantly increasing and younger generation is not flowing in, elementary school and the middle school were not needed and shut down eventually in 2008. Fishing is OH Island's

main industry since its ocean is pollution-free and marine resources are well preserved.

However, OH Island's fishing industry is expected to gradually decline because the average income from fisheries is around USD4,500 which is below than Japan`s fishery average earnings - USD16,000.

Table 1. Population structure of OH Island

	Population	Over 65years	Ratio of Over 65years
2008	343	202	58.89
2009	324	200	61.73
2010	310	195	62.90
2011	303	190	62.71
2012	296	186	62.84
2013	288	188	65.28
2014	275	177	64.36

Source : Fishery Division in Yawatahama City

2.2 Grants-in-Aid Program to Vitalize Fishing Industry of Remote Island

Lack of transportation and infrastructure give a serious disadvantage of producing fisheries items and selling products to Remote Island (Takashi.T, 2012). In addition, the lack of new generation and graying cause reducing the roles of remote islands: marine products production, environment conservation, salvage, and borderline surveillance (Kudo T, 2012; Sasaki T, 2012). Therefore, Japanese government established a new 「Grants-in-Aid Program to Vitalize Fishing Industry of Remote Island」 to increase productivity and rise income in remote island from 2005 (Takashi F, 2015). Grant in aid were paid around USD95,000,000 from 2005 to 2009 (the first period), around USD85,000,000 from 2010 to 2014 (the second period). OH Island was also subsidized around USD400,000 for the first period and started cultivation of abalone. However, around 40% abalones have died from the high water temperature, red tide, and typhoon and shipments were falling behind 10%. The cultivation of abalone was failed and make a new strategy was required for OH Island.

Table 2. Grants-in-Aid Program to Vitalize Fishing Industry of Remote Islands (JPY1,000)

	Total	Ehime	OH Island
2005 - 2009	11,422,223	340,936	48,960
2010 - 2014	10,186,330	305,728	39,304
Total	21,608,553	646,664	88,264

Notes: Currency is Japanese Yen, 1USD=120 JPY

Source : Ministry of Agriculture, Forestry and Fisheries

2.3 「The closed circulatory culture system on land」

The closed circulatory culture system on land has many advantages to control the underwater temperature which is more efficient for farming and reduces some obstacles related to predation, unlawfully hunt, temperature of water and weather conditions. However, this system needs a large area of land which is often difficult to find in a country like Japan (Rahman 2012) and high initial introduction cost like the equipment purchase will be a disadvantage of this system. OH Island got the grant and started abalone farming using that 「The closed circulatory culture system on land」 from October 2012 and utilized a close-down school for the purpose of reducing manufacturing costs.

Table 3. Production effect of OH Island

	2014	2015
Sales of volume(kg)	58.24	12.32
Sales figures(JPY)	336,950	66,900
JPY/kg	5,785.5	5,430

Source : Fishery Division in Yawatahama City

3. The effect of the Land-Based Abalone Farming in OH Island

3.1 Unsuccessful of branding

Many primary industry farmers are concerned about the crisis of agricultural markets owing to the opening of domestic markets through Free Trade, but the openness and globalization is inevitable. Individual farmers are trying to maximize revenue through branding in order to prepare them. Besides, Local governments make a strategy for brand development systems. In Ehime Prefecture, there are many branding products including Bochan abalone. Botchan is a novel written by Natsume Sōseki in 1906. It is one of the most popular novels in Japan, read by many Japanese during their school years. The story is based on the author's personal experience as a teacher dispatched to Matsuyama on the island of Shikoku. Finally Botchan became the representative character in Ehime. Botchan abalone is bigger than Oh island abalone and be farmed a better environment. Therefore Botchan abalone is getting recognize and popular in Ehime for the taste and freshness. However, Oh Islands abalone's sales will be decreased compare to last year.

3.2 Uncompetitive price

Japan imported abalone 1500 ton in 2013. And most of it was from Korea. Oh Island abalone has to compete with Korea abalone and other Japan abalone.

Table 4. Average wholesale price of abalone in Japan (JPY/kg)

Size per piece	Korea Abalone (farmed)	Japan Abalone (natural)	Oh Island Abalone
Over 100g	9,720	10,800	
50~100g	5,264	5,480	5,430
Under 50g	3,240	2,700	

Source : The Statistics of Ministry of Agriculture, Forestry and Fisheries in Japan

3.3 Rise of cost

「The closed circulatory culture system on land」' s biggest problem is high costs of electricity, water and food for abalone. The original cost estimate around JPY626.9/piece in OH Island 2014. However Land-Based Abalone Farming breakeven point is estimated JPY600/piece in Japan. Moreover, the cost of Korea abalone is estimated JPY337.4/piece.

Table 5. The cost of abalone farming in OH Island(JPY)

	2013	2014
Electric charge	1,210,985 (19.1)	1,232,374 (19.7)
Water charges	64,320 (1.0)	64,760 (1.0)
Feed cost	139,584 (2.2)	158,623 (2.5)
Labor costs	4,206,000 (66.3)	3,658,800 (58.4)
Shellfish fry	634,250 (10.1)	1,097,250 (17.5)
The others	85,592 (1.3)	57,947 (0.9)
Total	6,340,731 (100.0)	6,269,754 (100.0)

Source : Fishery Division in Yawatahama City

4. CONCLUSION

Oh Island's abalone industry is expected to have a low impact on local economy from an economic standpoint. However, Land-Based Abalone Farming will be continued and received Grant in Oh Island. Japan became an aging society in 1994, was swiftly passing through an aged society, and finally became a super-aged society in 2007. Especially people over the age of 65 account for 37.4 percent of total population in farming and fishing villages, the problem of a super-aged society is more serious than city. The Changes in Population Structure will raise complicated issues like decrease workforce and consumption, and finally undermine the country's growth potential and deteriorate the people's livelihood. Therefore, Using 「The closed circulatory culture system on land」 can shorter working hours and participate in production activity, so retirement will be extended. In Oh Island, economic activity has been increased like processing, packaging, transportation, and accounting apart from

abalone farming that using 「 The closed circulatory culture system on land 」 . Although OH Island abalone farming run a deficit, the Japanese government has to

support agribusinessmen who aged 65 years old or older since Japan has become A super-aged society and their primary industry is at risk of collapse.

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