



SOCIO-ECONOMIC ANALYSIS ON THE ROLE OF LOCAL GOVERNMENT IN DEVELOPING THE ABALONE INDUSTRY IN KOREA

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ABSTRACT

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Many Koreans regard abalone (*Haliotis discus hannai*) as a desirable luxury food because of its limited availability and high price. Abalone aquaculture was developed during the late 2000s, and production has greatly increased in Korea, reaching 9,147 tons in 2014. Policy experts said this trend means many fishers who cultivate abalone could increase their income. However, their incomes had not increased since fishers started cultivating abalone, because a conventional "addition" was applied to abalone transactions. The distribution structure for abalone products relies almost entirely on wholesalers instead of fisheries cooperatives, which are commonly used for other types of seafood products. Therefore, a new distribution structure was required in the Korean abalone industry. The objective of this study was to document how the establishment of an abalone cooperative by the local government has affected fishers' income and production since 2009. This research was conducted in Wando District in South Jeolla Province, which accounts for over 90% of the domestic abalone production. Wholesalers, fishers, and a public officer were interviewed. A shift from a wholesaler-controlled distribution structure to a cooperative run by the local government helped to reduce the "addition" and increase fishers' incomes overall.

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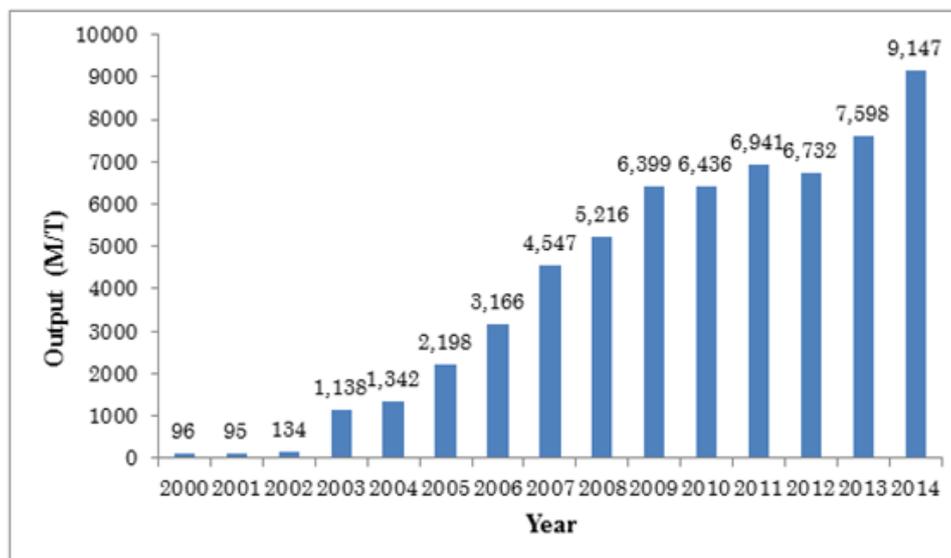
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INTRODUCTION

Abalone (*Haliotis discus hannai*) has traditionally been considered a valuable present for special days, such as Korean Thanksgiving or Lunar New Year. Cultivation of abalone in sea cages was developed in the 2000s, and production has greatly increased in Korea. By 2014, Korea had nearly 400 times the production of 2000 (KOSIS, 2014, Figure 1). Korean abalones are known for their great flavor, and large volumes are exported overseas, especially to Japan (Lee and Baek, 2010). Consequently, abalone has become the emblematic seafood of Korea.

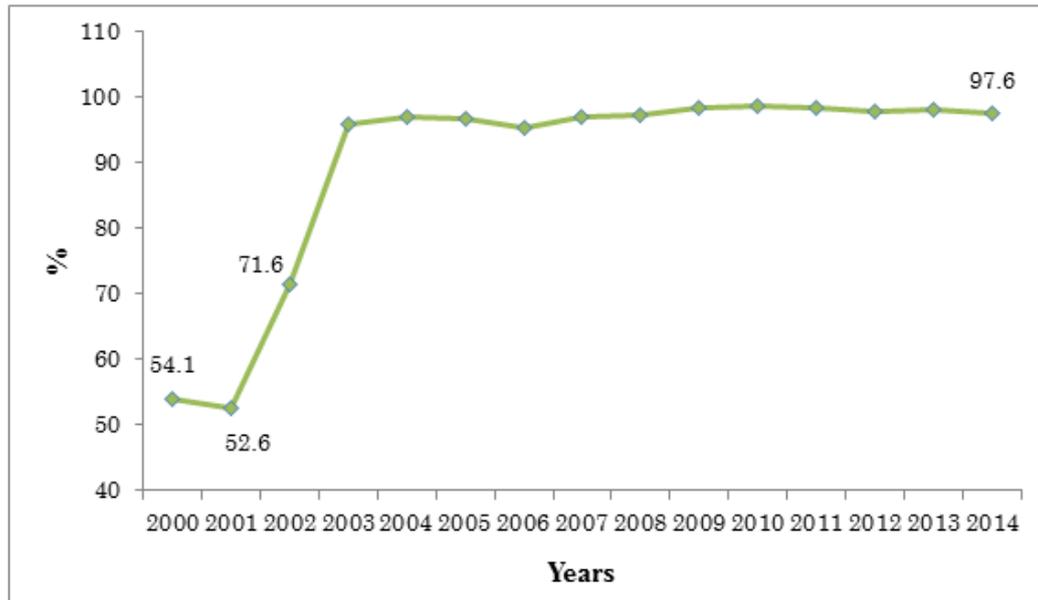
An abalone-producing area in Wando District in South Jeolla Province accounts for over 90% of all Korean abalone production (Kim and Song, 2012). South Jeolla Province is located in the southeastern part of the Korean Peninsula, a region that leads the country in the cultivation and production of seaweed, abalone, and small octopus. The province includes 5 cities and 17 districts, including Wando. Wando District's fishery is the most advanced in the province, with local specialties of seaweed and abalone.

Wando is also well known for its laver (*Porphyra tenera*), which accounts for 80% of total production in Korea (KOSIS, 2014). The sea around Wando is relatively unpolluted and contains many nutrients (Ock, 2013). The abalones in Wando are of high quality because they feed on the Wando seaweeds (Ock, 2013). Given its quality, Wando abalone is increasingly recognized domestically and internationally, but problems in the distribution structure in production areas have also arisen (Song and Kim, 2013). This distribution structure is divided into two routes: "systematized forwarding" and "unsystematized forwarding" (Ock, 2013). Under systematized forwarding, marine products are distributed by the National Federation of Fisheries Cooperatives (NFFC). Fishers prefer to deal with NFFC because their transaction system is stable (Ock, 2013). However, unsystematized forwarding, which includes all distribution structures other than the NFFC, accounts for 97% of the Korean abalone market share (Figure 2). The NFFC is divided into an "economic business" and a "credit business" (Ryu and Yang, 2010). The latter involves loans, and because the profit margin from loans is more lucrative, the former, which includes the distribution chain of products from fishers to large supermarkets, is neglected (Ryu and Yang, 2010).



Source: Korean Statistical Information Service

Figure 1. Outputs of Korean abalone by year in (ton)



Source: Korean Statistical Information Service

Figure 2. Korean abalone distribution market share of "unsystematized forwarding"

Approximately 2,500 fishers cultivate abalone in Wando, whereas there are a few wholesalers and only a single NFFC branch office. In other words, the Korean abalone-producing district is a consumer- (wholesaler) oriented market, and wholesalers have the bargaining power. Petty fishers have few resources because prices are fixed (Lee and Yoo, 2014). Under this power structure, the amount of the "addition" has been increasing. Fishers are required to pay the wholesaler for losses when abalone perish during the distribution process. Product mortality is estimated around 10% from the production district to retail markets, and this amount is considered a reasonable addition between wholesalers and fishers (Lee and Baek, 2010). However, wholesalers ask for an "addition" of approximately 15–20% and earn a disproportionate profit (Lee and Baek, 2010). This unfair trading practice has led to financial difficulties for fishers, and the local government of Wando District recognized the need for a new distribution structure. The Wando District government finally implemented a new distribution structure for small abalone farmers in 2009. The purpose of this study is to investigate how the new distribution structure has affected incomes and reduced the "addition."

MATERIALS AND METHODS

This study was conducted in Wando District in South Jeolla Province, Korea. The data for this study were collected in 2013 and 2014 in Wando from face-to-face interviews and a structured questionnaire. A representative sample of 118 fishers who had been attending the Wando Abalone Development Meeting (WADM) since 2010 were interviewed for this study. Data regarding output, abalone export volume, average earnings of abalone aquaculturists, and changes in the distribution structure were collected from the Wando government's reports and audits.

RESULTS AND DISCUSSION

New distribution structure eliminated “addition”

In Korea, a system of local autonomy was started in 1994. Each local government head is elected every four years by the local residents. Therefore, these representatives should be responsive to residents' demands (Lim and Tang, 2002). In Wando, fishers had requested that the new distribution structure be operated by the local government because it has an important role in aquaculture management and could eliminate the “addition.” Fishers were confident that the local government had the power to solve the problem of the “addition,” and Wando's local government finally responded to their repeated demands. Wando's local government injected KRW 4 billion (1 USD ≈ 1100 KRW) of public funds into the new distribution structure. This structure was christened the Wando Abalone Corporation (WAC), with abalone produced by fishers and oversight provided by a supervisor from the local government. The most popular feature of the WAC is its source of capital. Company ownership is divided into 616 shares, with one owned by the local government and 615 owned by fishers, portioned equally in partial shares among all members. The company has not sold stock to other entities, and hence, fishers hold the majority of shares and can influence corporate operations. As the major stockholders in the company, fishers focus their efforts on producing abalone, while the company staff delivers abalone to major cities. Fishers no longer have to pay an “addition,” and the company has seen considerable growth. In Wando, there were 1,212 fishers who shipped abalone to retail markets through the new distribution structure in 2014. Table 1 shows that the number of fishers using this structure has increased nearly two-fold since 2010. Abalone production was 1,060 tons over the first two years, in 2010 and 2011, but increased to 889 tons in 2014 (Table 2). In addition, the company adopted a new strategy that focuses on domestic demand as well as export to Japan because exports are highly influenced by economic factors such as exchange rates. In 2014, the company sold 702 tons of abalone to the domestic market after the Wando local government began actively promoting abalone. The Wando local government has developed a brand for WAC to identify its abalone as a specialty product within the country. With this differentiation strategy, increasing the name recognition of WAC increases abalone consumption.

Table 1. Increase of capital and stockholders in the Wando Abalone Corporation

	2010	2014
Corporation capital	KRW 4 billion	KRW 9 billion
Stockholders	615	1212

Table 2. Abalone production of the Wando Abalone Company, 2009–2014

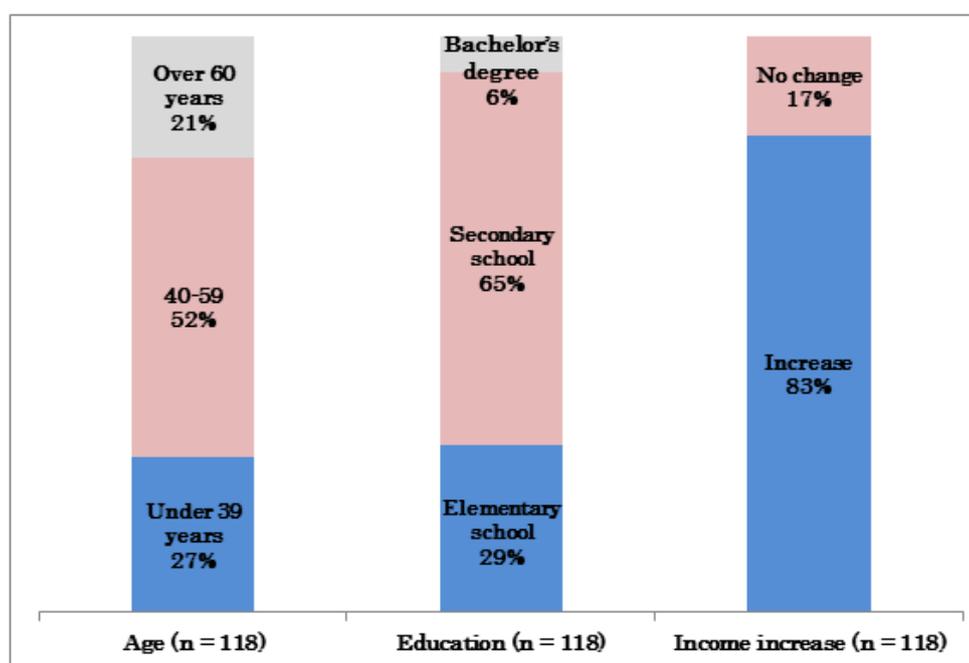
Year	Domestic		Export		Total production	
	Quantity in tons	Sum in million KRW	Quantity in tons	Sum in million KRW	Quantity in tons	Sum in million KRW
2009–2011	811 (76.5%)	29415 (70.7%)	249 (23.5%)	12137 (29.3%)	1060	41589
2012	376 (59.8%)	13815 (54.2%)	253 (40.2%)	11679 (45.8%)	629	25494
2013	431 (60.4%)	14875 (56.9%)	282 (39.6%)	11278 (43.1%)	713	26153
2014	702 (79.0%)	25535 (77.9%)	187 (21.0%)	7230 (22.1%)	889	32765
Total	2320 (70.5%)	83640 (66.4%)	971 (29.5%)	42324 (33.6%)	3291	126001

Table 3. Comparison of WAC's production and farmers to those in the traditional distribution structure

	WAC	Others	Total in Wando
Abalone production	889 tons	~7100 tons	~8000 tons
Abalone farmers	1191	~1300	~2500
Output/farmer	0.7 ton/farmer	~5.5 tons/farmer	~3.2 tons/farmer

Fishers' income increased

Fishers were surveyed in the Wando area in late 2013 and early 2014; 118 WADM members were randomly selected to participate. Figure 3 shows a socio-demographic breakdown of the survey sample. More than half of the survey respondents were between 40 and 59 years of age, while those under the age of 40 accounted for 27%. Among those surveyed, 65% had completed secondary school and 6% had a bachelor's degree. The remaining 29% only attended elementary school. No respondents were illiterate. Most (83%) of the members increased their annual income after joining the WAC, while 17% did not see a change. Considering the members whose incomes increased, in 2013–2014, the annual income of 56% increased by KRW 3 million compared with that of 2009, while that of 23% increased by KRW 5 million and that of 21%, by more than KRW 10 million.

**Figure 3.** Socio-demographic breakdown of the survey sample

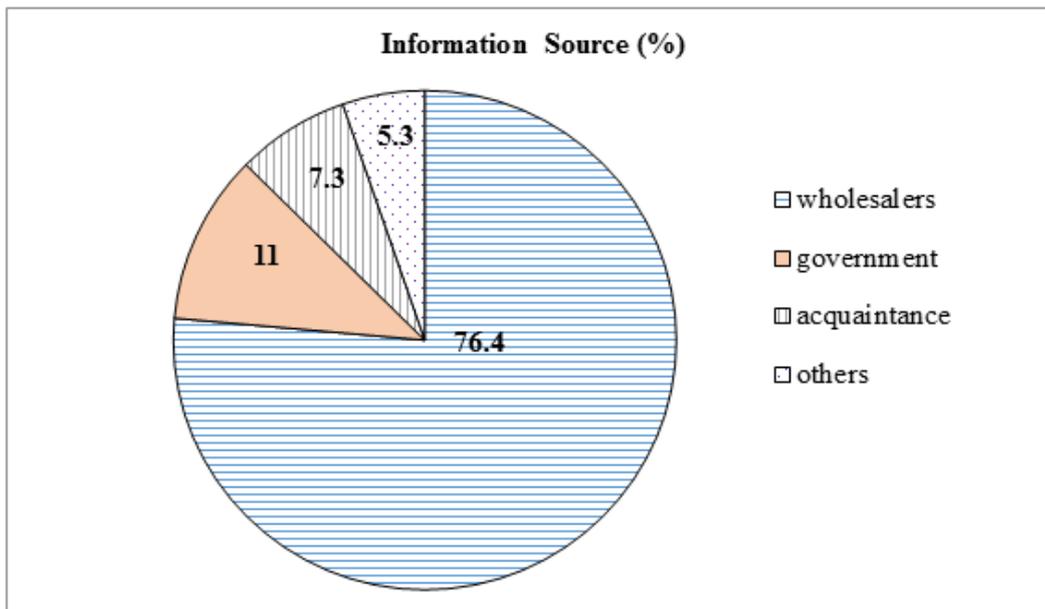
Incremental equity to shareholders

As the increased incomes of the fishers became apparent to other fishers, more joined the company, and membership increased from 615 in 2010 to 1,191 in 2014. During the same period, the capital assets of the company increased from KRW 4 billion to KRW 9 billion. Furthermore, the company's per capita investment increased from KRW 3 million in 2010 to KRW 5 million in 2014, and company sales have steadily increased in the past five years (2010–2014).

Wando Abalone Corporation production

Abalone production was approximately 8,000 tons in Wando in 2014 (Table 3). WAC handled 889 tons through its 1,191 abalone farmers, out of the approximately 2,500 who were cultivating abalone in Wando.

The wholesale distribution enterprise handled approximately 7,100 tons produced by 1,300 abalone farmers during the same period. There is a very large disparity in production between WAC members and nonmembers. While WAC members have a great advantage because they receive more income for less production, WAC cannot handle the same volume of abalone production as the wholesalers because its finances are limited. The fiscal self-reliance of Wando's local government was only 7.3%, and Wando was ranked 227th out of 244 local governments (Statistics Korea, 2015). Therefore, Wando local government has been recruiting more fishers to join the WAC and become stockholders. However, many are ambivalent about joining WAC because most of the abalone farmers learn about wholesale prices, retail prices, consumer preferences, and overseas markets through the distribution enterprise (Figure 4). The wholesale price is very important because it changes by season. Thus, abalone farmers and the distribution enterprise still have an important relationship, and fishers are reluctant to sever ties. In 2014 in Wando, average abalone production per farmer was 3.2 tons, but WAC's sales volume during the season was far below average (Table 3). Therefore, the long-term effect of WAC on the abalone industry in Wando is uncertain. However, WAC has grown substantially in recent years, and it is now recognized as a reputable company by abalone farmers.



Source: Korea Maritime Institute

Figure 4. Sources for information about abalone market factors

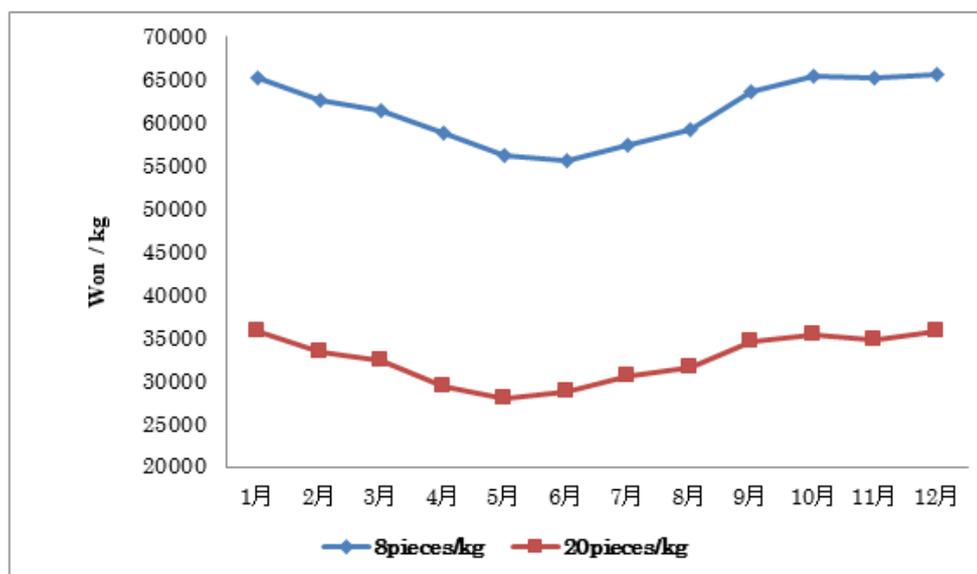
Variation of monthly addition ratio of Wando Abalone Corporation and wholesalers

This study was carried out through in-depth interviews with four farmers in March 2016 to review the variation of the monthly addition ratio. Farmers A and B are distributing abalone to Wando Abalone Corporation (WAC) and wholesalers, farmers C and D are distributing abalone only to wholesalers (Table 4).

Table 4. Outline of the farmers

Clauses	Farmer A	Farmer B	Farmer C	Farmer D	Average of Wando
Number of farms (2.2m x 2.2m)	233	625	353	880	495
Raising term	1 year–2 years	Over 3 years	1 year–2 years	Over 3 years	3 years
Annual production / farm (2.2m x 2.2m)	Around 22 kg	Around 15 kg	Around 18 kg	Around 17 kg	17.3 kg

Farmers A and C are small-scale farmers, and their outputs fall short of the Wando average production. Their raising term is 1 year to 2 and a half years. This means that they produce small abalone. The abalone weight grows by 30g–35g per annum. Therefore, the farmer can adjust the shipping date by size. The price range is wide by size and by season. However, farmers B and D are large-scale farmers, and they produce large abalone. They raise abalone for 2 and a half years and more (Figure 5).



Source: Korea Maritime Institute

Figure 5. Monthly price trends of abalone by size

Table 5. Production trends of farmer A

Periods	Accounts and volumes	Market price (won / kg)	Addition ratio (%)
Nov. 2014–	① WAC: 336 kg	① WAC: 35000	① WAC: 0
Feb. 2015	② Wholesalers: 120 kg	② Wholesalers: 35000	② Wholesalers: 8
Mar. 2015–	① WAC: 224 kg	① WAC: 30000	① WAC: 0
Jun. 2015	② Wholesalers: 212 kg	② Wholesalers: 28000	② Wholesalers: 13
Jul, 2015–	① WAC: 224 kg	① WAC: 33000	① WAC: 0
Oct. 2015	② Wholesalers: 210 kg	② Wholesalers: 30000	② Wholesalers: 13
Nov. 2015–	① WAC: 336 kg	① WAC: 35000	① WAC: 0
Feb. 2016	② Wholesalers: 123 kg	② Wholesalers: 35000	② Wholesalers: 11

Farmer A (Table 5) shipped a total of 1785 kg from November 2014 to February 2016. Of this, 1120kg was dealt to WAC and 665 kg was dealt to wholesalers. The market price with WAC was slightly higher compared with wholesalers, whereas the addition ratio showed a big difference. The addition ratio was 0% dealings with WAC; however, the wholesaler was 8–13%. In addition, there was a difference of market price from March to October because the volume of WAC was decreased. Furthermore, the addition ratio increased to 13%. Meanwhile, farmer B (Table 6), who has lots of product, shipped a total of 2242kg in the same period. Of this, 896kg was dealt to WAC and 1346kg was dealt to wholesalers. Farmer B has been farming abalone

for 3 years to produce large abalone. However, WAC avoids large abalone because large abalone is expensive, so incurs serious costs when the abalone perishes during transportation. In other words, WAC deals mostly in small abalone to avoid incurring further costs. Thus, the addition ratio occurs until 15% and minimum was 11%; both are higher than those of farmer A. In both cases, WAC has many merits, like a high market price and an addition ratio of zero. However, the volume of orders from WAC is not high, so the rest have no choice but to transact with wholesalers.

Table 6. Production trends of farmer B

Periods	Accounts and volumes	Market price (won / kg)	Addition ratio (%)
Nov. 2014–	①WAC: 336 kg	①WAC: 65000	①WAC: 0
Feb. 2015	②Wholesalers: 396 kg	②Wholesalers: 65000	②Wholesalers: 12
Mar. 2015–	①WAC: 112 kg	①WAC: 55000	①WAC: 0
Jun. 2015	②Wholesalers: 402 kg	②Wholesalers: 52000	②Wholesalers: 15
Jul. 2015–	①WAC: 112 kg	①WAC: 58000	①WAC: 0
Oct. 2015	②Wholesalers: 216 kg	②Wholesalers: 50000	②Wholesalers: 15
Nov. 2015–	①WAC: 336 kg	①WAC: 65000	①WAC: 0
Feb. 2016	②Wholesalers: 332 kg	②Wholesalers: 65000	②Wholesalers: 11

Meanwhile, in the cases of farmers C (Table 7) and D (Table 8), who ship only to wholesalers, there is also a difference of market price and addition ratio by size and by season. Farmer C, who produces small abalone, deals with 28000won–35000won from wholesalers, and the addition ratio is 11%–15%. Farmer D, who produces large abalone, deals with 55000won–62000won from wholesalers, and the addition ratio is 10–13%.

Table 7. Production trends of farmer C

Periods	Accounts and volumes	Market price (won / kg)	Addition ratio (%)
Nov. 2014 – Feb. 2015	Wholesalers: 570 kg	Wholesalers: 32000	Wholesalers: 12
Mar. 2015 – Jun. 2015	Wholesalers: 504 kg	Wholesalers: 28000	Wholesalers: 14
Jul. 2015– Oct. 2015	Wholesalers: 434 kg	Wholesalers: 30000	Wholesalers: 15
Nov. 2015– Feb. 2016	Wholesalers: 563 kg	Wholesalers: 35000	Wholesalers: 11

Table 8. Production trends of farmer D

Periods	Accounts and volumes	Market price (won / kg)	Addition ratio (%)
Nov. 2014– Feb. 2015	Wholesalers: 932 kg	Wholesalers: 62000	Wholesalers: 10
Mar. 2015– Jun. 2015	Wholesalers: 820 kg	Wholesalers: 58000	Wholesalers: 13
Jul. 2015– Oct. 2015	Wholesalers: 650 kg	Wholesalers: 60000	Wholesalers: 13
Nov. 2015– Feb. 2016	Wholesalers: 935 kg	Wholesalers: 55000	Wholesalers: 10

In this way, wholesalers still exert their influence on abalone farmers, and WAC cannot bring out their merits because of the limitations on capital and the invisible assets of wholesalers.

CONCLUSION

Starting in 1995, local democratic politics were fully revived in Korea, with elections for mayors, county chiefs, and governors. Residents now elect the administrative heads of their areas and expect local autonomy. Each local authority is responsible for providing services that meet the community's needs, and they are responsive to electorate demands (Song and Chuenpagdee, 2014). Recently, constituents have urged the agricultural industry to find better ways to increase the sales of homegrown products by relying on large-scale purchases instead of regional governments in Korea (Kim, 2012). This study clearly showed that the role of local government in the production management, distribution, and marketing of abalone resulted in increased income for most fishers who joined the WAC. Primary industries, especially fisheries, have been declining for a long time in Korea (Lee and Midani, 2015). However, a primary industry is necessary for a local economy to grow (Cho, 2006). Many agricultural jobs were lost following the 1997 financial crisis, and the era of free trade resulted in many losers in the market economy (Pak and Joo, 2002). Local government clearly has a vital role in retaining and reviving primary industries in a local area.

COMPETING INTERESTS

The authors declare no competing interests.

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