

## **HAGFISH NEEDS THE NEW PARADIGM OF JAPAN'S DOMESTIC FISHERIES MANAGEMENT**

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### **ABSTRACT**

The new fishery order of Japan, China and the Republic of Korea (Korea) has changed their supply-and-demand structure (SDS) of marine products. This study observes the hagfish fishing which started in the Japanese coast/offshore, and the change of the international SDS. The present condition will be arranged as a framework subject of a new domestic fisheries management policy in Japan. The background takes following points. In Japan, hagfish has not been important until now. It hardly becomes edible. In Korea, It is very popular to be edible and is also the materials for leather craft. The demand is not declined. New Japan-Korea Fisheries Agreement has the Korean hagfish boats lost their fishing grounds near Japan. Imported frozen/fresh hagfish supports the consumption market. In Japan, the hagfish fishing started with the intermediation of Korean brokers. Between the hagfish fishing and existing fishings, problems have occurred. Although the local government started to arrange/mediate them, few regulation basis of fishing ground distribution or use adjustment was found. There is also the local government who considers a hagfish fishing to be introduction of a new fishing method. The concept of Exporter-materialization is hardly observed. Furthermore, illegal operation was found as violation-of-territorial-waters. In Japan, arrangement of the fishing ground use for foreign demand has not occurred in the coastal. The worthless fish resources as hagfish shows that Japan domestic fisheries management policy that takes traditional practice very seriously cannot be coped with a new paradigm as the international SDS.

**Keywords:** FISHERIES MANAGEMENT; HAGFISH; KOREA; JAPAN

### **1. The viewpoints and the problems**

#### **1-1 hagfish fishing and its situation in Japan**

The inshore hagfish (*Eptatretus burgeri*) lives in the sea near Republic of Korea (Korea) and Japan. It doesn't have scales. Because its viscous liquid covers its body, when the fishermen catch the hagfish, the processing by them should be such as time-consuming. Hagfish belongs to the cyclostomes. Another offshore hagfish (*Eptatretus okinoseanus*), too, belongs to the same. Hagfish is not the main fishing object originally. It is quite difficult to know the amount of the hagfish catch in Japan; therefore, the governmental statistics does not publish its figure<sup>1)</sup>. But, we can imagine the trend of the hagfish fishing. That is, when the permission of the hagfish fishing is applied for, as the way of fishing called "the conger eel tubular trap". The word "hagfish" means the inshore hagfish in this paper.

#### **1-2 the viewpoints and the problems**

As for this paper, some attentions are paid to the hagfish fishing done in the coast/offshore around Japan. The reasons are as follows. (1) By the establishment of the Exclusive Economic Zone (so called line

drawing), the Korean fishing vessels lost valuable fishing grounds for their hagfish fishing. (2) Demand for hagfish in Korea is expanding. (3) There are illegal operations which can be imagined by Korean fishing vessels in the western part of the Sea of Japan. (4) There are very little habitudes to eat hagfish in Japan<sup>2)</sup>. (5) Traditionally, there is little hagfish fishing in Japan. (6) Recently, the hagfish fishing has begun by the fisherman in Japan to export them to Korea. (7) It causes some of problems newly against fishing ground management.

We study the use of hagfish after establishment of the new fisheries agreement of Japan and Korea in 1996. This paper has the following points for issue. (a) What is the flexible resource use relation? (b) The possibility of the fisheries management that can support the international relation of supply and demand. (c) The evaluation of the case that the foreign demand produces the domestic fishing ground competitions. This paper is going to clarify the concepts the international resource management in near future which will be necessary for the neighboring countries surrounding same sea area as Japan and Korea.

## 2. Movement concerning the hagfish use

### 2-1 newspaper reports

Table 1 arranged the articles related to the hagfish use in Japan by the time series<sup>3)</sup>.

**Table 1 Chronological Table of the Newspaper Articles**

1987, Jul.	In Korea, the hagfish skin is tanned. It is flexible and is strong in water, too, being used as the basic materials for the handbag, the high-heels and the belt and so on. Therefore, the hagfish is remarkable as the article for export to Korea. To export hagfish, a fishery company at Onahama (Japan) joint-ventured in Busan, Korea. This company makes purse and bag with hagfish skin in Korea. ( <i>The Asahi Shimbun, Tokyo</i> )
1990, Jan.	The department store in Fukuoka sold the egg of the hagfish. ( <i>The Nishinippon Shimbun</i> )
1993, Jun.	In the offshore of Ishikawa Pref., a Korean eel fishing vessel was found out. The captain was arrested. The ship had about 100 kg hagfish. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )
1994, Dec.	In offshore Ishikawa Pref. (means the Japanese territorial waters) Korean conger eel fishing vessel was found out. The captain was arrested. He had caught about 300 kg hagfish. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )
1997, Sept.	Why do the Korean fishing vessels do their impossible operations as their braving danger of capture? We see an opinion that they are classified into two kinds of the fishing vessels which escape from the watch to the Japanese sea area by the operation which violated a Korean law, and the fishing vessels that face the decreased resources in the Korean coastal area. ( <i>The Chugoku Shimbun</i> )
1999, Feb.	In the offshore of Kasasa, Kagoshima Pref., the hagfish has increased in these several years and they very often bit/eat the fish hung on the gill net. ( <i>Minami-Nippon Shimbun</i> )
2001, Jun.	As a challenge for the hagfish fishing in Suruga-Bay, Shizuoka Pref., a fishing vessel sailed from the Yaizu harbor supported/cooperated with a Korean trade company. The special implement is like a pipe/tube with about 50 cm of length, 12 cm of bottom diameter. This is called "the tubular trap for conger eel." 230 tubular traps were prepared to the ocean floor with 250- 300m water depth. While the two-nights-stay operation, the hagfish of about 300 kg was caught. ( <i>The Shizuoka Shimbun</i> )

2001. Aug.	The president of the Korean hagfish processing company said the following. As the new fisheries agreement between Japan and Korea made not put Korean fishing vessels in the sea close to Japan, the raw materials lack runs in Korea. Now, my company imports deep-frozen hagfish from the U.S. This has poor-quality more than the live caught in Japan. ( <i>The Shizuoka Shimbun</i> )
2002, Aug.	A Korean fishery company in Busan searches for the hagfish. Korean hagfish catch was too much and it is lacking now. The company made a contract with a Japanese fisherman whose fishing vessel belongs to the Yaizu harbor and keeps buying the hagfish caught in Suruga-Bay in Japan since 2001. The goal for the fisherman is to have 2 ton monthly production. ( <i>The Shizuoka Shimbun</i> )
2002, Oct.	A master of grill house in the Jagalchi market in Busan says as follows. The peculiar fragrance of fried hagfish makes a Korean have a good appetite. It was inexpensive food for the students, now however; it is a very food of quality. The large-scale processing company in Busan imports 2-3 tons hagfish from the Japanese fishermen a month. By over-fishing in recent years, Korean domestic landing volume is decreased. ( <i>The Shizuoka Shimbun</i> )
2003, Feb.	The fishing gears for hagfish which was illegally prepared on the bottom of sea (this means Japanese territorial waters) at about 10 km offshore from the area between Wajima City and Monzen-machi was found out. By the reason that insisting the Wajima City Fisheries Cooperative (WCFC), the disturbance of the bottom-trawling net fishing should happen, they all were collected. Korean letters were written on the fishing gears. WCFC made two groups for the collection work of the implement. This work was done for 2 days for 4-5 hours a day and gathered the fishing gears with 15 trucks of 4 tons loading capacity. Some of the gathered gears had caught hagfish. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )
2003, May.	In the near sea around Noto Peninsula in Japan, the large-scale poaching of crab was detected. Also, poaching hagfish by the Korean ship is a problem for many years. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )
2003, Oct.	Japanese Fisheries Agency (JFA: Dept. Of Fisheries, Ministry of Agriculture, Forestry and Fisheries) seized about 10,200 tubular traps for conger eel which a Korean fishing vessel settled in the offshore of Shimane Pref. ( in Japanese territorial waters). The seized quantity is maximum after the line drawing in 1996 between Japan and Korea. JFA protested against Korea through the diplomatic channel. The gears had caught about 2.5 ton conger eel and hagfish. ( <i>Kyodo News</i> )
2003. Dec.	The Japanese Maritime Safety Agency arrested a captain of the Korean nationality fishing vessel for the reason of the fishing law violation. This fishing vessel which cruised in Japanese territorial waters ignored the order to stop, ran away for 1 hour, after that, was caught. The fishing vessel had hagfish in the pool. ( <i>The Asahi Simbun, Osaka</i> )
2004. Apr.	At about 10 km western offshore of Wajima, hagfish fishing gears were found out. The JFA's control ship gathered them. Because the gears had Korean letters, JFA have consideration that Korean boats prepared them. As for local fishermen, inconvenience happened against the bottom-trawling fishing. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )
2004. Apr.	According to the JFA's release, the fishery control ships chased Korean three fishing vessels to the provisionary sea area on fishery because that they had found to appear in the offshore in Shimane Pref.. ( <i>THE HOKKOKU SHIMBUN, Toyama</i> )

Source: Database service for Newspaper Articles Search. The authors composed/arranged the contents; the exact original sentences of the article are not introduced.

## 2-2 Behavior for hagfish fishing development in Japan

In some Pref.s where hagfish fishing is held, the local governments often has their industry support policy and oppositely, the exposure of the illegal operation by the foreign fishing vessels often continues. Here, some cases will show the characteristics of the fishing ground use in Japan.

### a) in case of Kagoshima Pref.

The Kagoshima Pref.'s fishery promotion policy has developed hagfish fishing actively in recent years<sup>4)</sup>. We overviewed it in Table 2. In the Kasasa-cho Fisheries Cooperative area which is in

southernmost tip of Satsuma-Peninsula, fishermen were so anxious for that hagfish eat a lot of fish they caught. Therefore, Kagoshima Pref. had the plan which promotes hagfish use in 1999<sup>5)</sup>. There were a few fishermen who have an interest in the hagfish fishing at the time in Kasasa. Kagoshima Pref. examined the status/condition of the resource distribution and gave the information related with the exportation to Korea to the fishermen. And, the Prefecture Fisheries Center introduced a fishing gear to the fishermen<sup>6)</sup>. By these supporting behaviors, until June, 2003, the fishermen caught the hagfish of about 5.5 tons and 2,500,000 yen since late 2000<sup>7)</sup>. Also, the negotiation held between them and the brokers who have connection with the Korean importers showed the following conditions. (1) The hagfish should be shipped and exported as it lived. (2) The minimum shipment lot is 1 ton<sup>8)</sup>. (3) The water tank which can swim by shipment is indispensable<sup>9)</sup>. In the fiscal year 2001, in the neighboring fisheries villages such as Nomaiki and Eguchi and so on, the fishermen became to have their interest in the hagfish fishing. Kagoshima Pref. asked some pioneers/fishermen of KFC to support/show operational guide for to expect that the hagfish catch technology would become popular and easy to operate. After 1999, Kagoshima Pref. takes such evaluations as follows. (1) Hagfish was proved to be used as economic resource. (2) The number of the hagfish fishermen increased steady but the catch will not expand. Being certain, the reality showed that this fishing did not continue for a long time.

**Table 2 Main News/Remarkables on Hagfish Fishing in Kagoshima Pref. Japan**

Year	Contents
1999	In western offshore of Satsuma Peninsula, Kagoshima Pref. set about the inhabiting situation study of the hagfish and the possibility of the economic utilization was shown.
2000	2 fishermen who live in southern Satsuma-Peninsula started fishing hagfish at the same time as inhabiting status investigation began. Always there are not the many catches. Kagoshima Pref. provided them the circulation information actively. Therefore, they could pioneer a new market.
2001	In western Satsuma district, a fisherman gets a desire to begin the hagfish catch. In Satsuma Peninsula area, at the total, 4 fishermen in each 3 town began hagfish fishing.
2002	The distribution of hagfish over the coast of the mainland of the Kagoshima Pref. was known by Kagoshima Pref. government. They are distributed over 5 coastal/offshore areas. The local gov't. thought of stable family fishermen's administration by hagfish exported to Korea.

*Source:* Interview and information/articles collected by authors

The ocean floor of the range with 20-100m water depth where the hagfish lives is as muddy sand. Even if it supposes that the number of the hagfish fishermen increases, it does not admit that the present Japanese coastal fisheries control system joins freely from other fisheries cooperative area. Under the system, Kagoshima Pref.'s fisheries policy made the resource development and the industrial useful guidance. The results were as follows. The hagfish fishing could continue for about 3 years. It could not have a sufficient. The existence was confirmed and the fishing was begun but there was little amount.

The case in Kagoshima Pref. has three characteristics. (1) The local gov't. analyzed resource distribution actively and dispatched efforts for circulation (effect of the public administration support). (2)

A type of conger eel fishing is applied for the hagfish fishing (The barrier of the fishing method acquirement is low but a new entry is limited). (3) An outlet is for exportation to Korea without being turned to the domestic demand (profitable commodity production for the demand in foreign country).

*b) in case of Nagasaki Pref.*

In the second half of the 1980s, a fisherman in Takashima Is. caught hagfish with the conger eel tubular trap<sup>10)</sup>. It is said that this is the first case of hagfish fishing in the prefecture. We do not know whether or not this case had been started naturally/suddenly or supported by such policy of the local government. However, we do not think that it is started by the political induction. In 2001-2002, as the permitted fishing by local governor in the northern Nagasaki Pref.'s sea, a lot of permissions for hagfish fishing were applied for with the name of "the conger eel trap fishing". This permission license application was mainly accomplished by the fishermen in Ukujima. Also, the fishermen in Ikitsuki, too, did same fishing. The fishermen in Ukujima landed their hagfish to the Shishigi Fisheries Cooperative (in Hirado). Their hagfish was forwarded to Fukuoka from there. The case in Wakamatsu (in Goto Is.) attracts attention<sup>11)</sup>. This resembles the case of Kagoshima Pref. well. Nagasaki Pref.'s policy made begin hagfish fishing newly in Wakamatsu<sup>12)</sup>. The remarkable points are as follows. (1) In Wakamatsu five fishermen began tubular trap fishing to catch hagfish. (2) They make an effort for the fishing ground development. (3) Nagasaki Pref. authorizes them as the directed fishermen's group should be assisted politically.

The existence of the brokers who buy hagfish like the case in Kagoshima Pref. is a precondition for hagfish fishing to start. Obviously this condition exists. But, the new entry for the hagfish fishing, too, is not increased and does not have an expanding tendency in the local area such as shown here.

*c) Shimane and Ishikawa Pref.s*

The structural characteristics of hagfish use in both are to poach by the foreign fishing vessels. Yet, Japanese fishermen hardly catch hagfish. Poaching in there resembles to be treated in the next section. The sea in both Pref.s shows the following. The foreign fishing vessel puts the conger eel tubular traps in the Japanese territorial waters (to catch hagfish). Actually, an illegal fishing is done (by foreign fishing vessels). The Prepared fishing gears are discovered/found out. The Ishikawa Pref.'s policy does not think of making hagfish resource. The most important thought is foreign ship exclusion. Oppositely, Shimane Pref. thinks that the hagfish could be resource<sup>13)</sup>. To think of the possibility of its resources use, Shimane Pref.'s fisheries experiment station surveyed resources in the near coast/offshore<sup>14)</sup>.

The contents of such investigation are as follows<sup>15)</sup>. (1) They are placed with the purpose of this investigation on the actual state of catch, the profitability, and the possibility for resource management. (2) In 1987, the hagfish fishing began in the Masuda City Fisheries Cooperative area. This is first in Shimane Pref. (3) In the early stages, hagfish caught was handled as the fresh fish (ice and together, but dead) for leather crafts materials. But recently, as for it, live hagfish are shipped/distributed/exported for

consumption to eat. (4) The price is about 600 yen per kg. (5) All of hagfish caught is exported to Korea. (6) The annual catch is 20-50 tons and fishing amount/tendency is/are influenced by the demand in Korea<sup>16)</sup>. (7) In recent years, a resource condition is estimated to have become 50-60 % of 1983's stage because of increased amount of catch.

*d) Shizuoka Pref.*

In Suruga-Bay, Shizuoka Pref., a shark fisherman in deep sea has an experience to have been asked to capture the hagfish from the medical researcher who studies hagfish<sup>17)</sup>. He received another new offer to wish to catch it actively from a marine products trading company in Busan, Korea<sup>18)</sup>. Shizuoka Pref. emphasizes that the Korean trading company talks its evaluation with the best quality of hagfish meat which is caught in Suruga-Bay to the mass-media.

According to our study, however, in other production areas in Japan, each evaluations resembles such as the Korean company's evaluation above mentioned. Wherever the production area in Japan is, we could hear such estimation as that here is not a substitute in the high quality, because the live hagfish is both used to process leather crafts and to be food consumption. Incidentally, it was not possible to confirm that Shizuoka Pref. govt. proceeded with the development of the hagfish fishing ground as its policy.

*e) Department Of Fisheries, Ministry Of Agriculture, Forestry and Fisheries*

JFA is in the clear situation and concerns hagfish fishing. That is, JFA controls to the operational violation by the foreign vessels, and oppositely, it does not develop hagfish fishing grounds. Especially, in the former case, JFA uses the right of control for the illegal operations in the Japanese territorial waters found out in offshore in Shimane Pref. and western offshore of Noto-Peninsula in Ishikawa Pref.. Because the Northern Provisional Zone of Japan and Korea is nearby, illegal invasion operations could happen in wide western Japanese coast/offshore. In Japanese EEZ, illegal fishing gears are seized. However, in some cases, the operation by the foreign vessels in the territorial waters, the on-site inspection and the illegal operational foreigners happen too.

Based on JFA materials, we can see the cases of the recent fishing gear seizure (Table 3). This table shows the cases the fishing gears seizure related to the illegal operations by Korean fishing vessels in the Northern Provisional Zone<sup>19)</sup>. In another word, we can know in turn as ivory shell, red queen crab and hagfish, the purpose of the crossing-border-operation have changed in these years. As for the fact, the illegal tubular traps are intensively seized in 2003-2004. This tubular trap is the one which is used for the hagfish fishing, not being used for conger eel fishing. Because this is settled on the ocean floor, it hangs inconvenience on Japanese bottom-trawling net fishing. The spots where settled are often in the territorial waters mainly or EEZ of Japan.

**Table 3 Results of The recent control (The fishing gear seizure quantity by Japan)**

fiscal year	NUM.	Bottom Gill Net (km)	Crab Trap ( Num. )	Ivory Shell Trap ( Num. )	Tubular Trap for congereel ( Num. )	Rope (km)
1999	2	44	0	17	0	18
2000	3	0	85	275	0	16
2001	6	39	335	0	0	29
2002	11	180	1,754	0	0	148
2003	13	126	132	2,045	253	71
Total	35	389	2,306	2,337	253	282

*Note:* The figures mean fishing gear seizure quantity at the offshore of San-in and Hokuriku district in Japan.

*Source:* JFA's data published in the home page in 2003

### 2-3 Types of the present situation

Introduced cases are classified into three types<sup>20)</sup>. The type-1 is that some hagfish fishing grounds were newly found out in the coast/offshore and have begun the fishing operation actually. The examples in Kagoshima and Nagasaki Pref.s lead this type. With a support policy aside, a few coastal fishermen join hagfish fishing. Only, because the hagfish has the small reproduction ability compared with the new entry (of fishing), it is difficult that a fishing ground is maintained during for long years.

The type-2 is to poach hagfish caught by the foreign vessels in territorial waters and/or the EEZ in Japan. This is clear illegal fishing. The seizure and the exposure of the illegal fishing gears which becomes evidence show the position of the hagfish fishing. Two reactions run in Japan at facing the type-2. In one case, like Ishikawa Pref., for the reason to be trouble for existing bottom-trawling net fishing, the local fishermen insist on the active foreign vessels exclusion to the local gov'ts. At another case, like Shimane Pref., the illegal operations show the future possibility of the hagfish fishing to the local fishermen. As for the former, the thoroughgoing exclusion is the purpose and the result of itself. However, when we see the latter, the local govt. began resource-searching. And the local fishermen have begun hagfish fishing at the same time, the same reaction as the former case will be seen.

The type-3 is the private development by existing fishermen. The example in Shizuoka Pref. corresponds this. In the case, the fishing point is in deep. Because the special technique is needed without most competition with the coastal fishing, the new entry does not move ahead.

### 3. Domestic fishing and trade with Korea

We can see present status of the hagfish fishing and the import in Korea. Oppositely, the Japanese

fisheries statistics and the foreign trade statistics don't have the figure of the hagfish (Table 4).

**Table 4 the fishing Amount and the Import of the Hagfish by Korea**

Unit: fishing quantity (volume: ton, value: 1,000 won, price averages: won/kg),  
import (volume: kg, value: US\$, price averaged: US\$/kg)

Year	1991	1996	1998	2000	2001	2002	2003
Won-U.S.\$ rate	760.8	844.2	1207.8	1259.7	1326.1	1200.4	1197.8
Total Supply Volume For Domestic Consumption			2,440	3,602	3,889	5,250	4,958
Domestic Catch volume							
value			12	1	3	0	63
price averaged			91,894	5,631	17,699	217	376,387
US\$			6.3	4.5	4.5		4.9
Won			7,658	5,631	5,900		5,974
Import ( Total Value )			3,862,701	8,269,256	8,716,129	12,280,541	11,171,098
"Live" volume	13,200	213,846	63,257	529,635	581,875	756,049	659,891
value	60,775		247,291	3,176,048	3,525,429	5,182,819	4,326,632
price averaged							
US\$	4.6		3.9	5.9	6.0	6.8	6.5
Won	3,500		4,710	7,432	7,957	8,163	7,786
"Deep-frozen" volume	-	3,324,943	2,364,870	3,071,014	3,303,814	4,494,077	4,235,220
value	-	5,446,559	3,615,410	5,093,208	5,190,700	7,097,722	6,844,466
price averaged							
US\$		1.6	1.5	1.6	1.5	1.5	1.6
Won		1,351	1,812	2,016	1,989	1,801	1,916

*Note:* The total weight is rounded. Live hagfish is imported from China and Japan. In value, the Japanese accounts for 96 % (2003). The deep-frozen is caught in the Pacific Ocean and the Atlantic Ocean and imported from 10 countries. The origin in U.S. and Canada accounts for 99 % (2003). The unit price is arranged arithmetically. No data in blank column. "Won" means the Korean currency.

*Source:* Authors made with the fisheries statistics, trade customs clearance statistics and materials of The Exchange Bank of Korea and arranged them.

The EEZ establishment did not make expand the Korean domestic hagfish catch. We would know the price level of the Korean domestic hagfish much lower than it in the 90s since 2000, if the Korean price range is compared with the imported from Japan, so comparing them by Korean currency Won base, the averaged unit price of the Korean domestic catch became lower since 2000. In 2003, the Korean domestic catch increases but the price level does not change roughly. Therefore, for the future and moreover even if it supposes that the domestic catch expands temporarily; there will not be a big change of price level relation. The relation shows us an interest. The price of the imported live hagfish had soared already in the 90s. In the second half of the 90s, it of the imported rose in price drastically and in 2003, the rise in price stops



barely. In this process, the price range of both reversed. Since 2000, the price of the imported live hagfish is more expensive than the live domestic. On the other hand, the price of the imported deep-frozen hagfish is inexpensive stabled. Table 5 shows only the status of the hagfish exportation to Korea from Japan. The foreign trade statistics of Japan did not have the figure of the hagfish commodity; we used the customs clearance statistics of Korea.

**Table 5 Live Hagfish Exportation to Korea from Japan**

Unit: kg, US\$, US\$/kg							
Year	1991	1996	1998	2000	2001	2002	2003
Volume	13,200 (100)	213,846 (1620)	141,652 (1073)	496,516 (3761)	581,875 (4408)	733,643 (5558)	635,886 (4817)
Value	60,775 (100)		247,291 (407)	3,154,502 (5190)	3,525,429 (5801)	5,040,821 (8294)	4,167,968 (6858)
Price Averaged	4.6		1.7	6.4	6.1	6.9	6.6

*Note:* Blank is by no-existing data. The customs clearance statistics of Japan doesn't have the figure of the hagfish.

*Source:* this table is arranged by authors with the Foreign Trade Statistics of Korea.

Because there is very little exportation of the deep-frozen from Japan, table 5 excludes it. We are able to think that all of the hagfish exportation from Japan is the living fish about us. When comparing the figure of 1991 and of 2003, as for the export volume expanded 48 times, the export value did 68 times, the average unit price so did about 1.4 times. Especially, the change since 1998 until 2000 is so big. In this period, they expanded suddenly. The averaged unit price of the imported live hagfish Japan got to be "expensive" on the average price range of the Korean domestic live hagfish. But as for the rate-of-climb with average unit price, the Korean is more rapid and bigger than the imported.

The reasons for the relation of both price levels are described next. Their distribution is commonly for the leather processing and food supply. It is said that the difference would be the fact that the handling of the domestic is more rough than of the imported. In Korea, the cheap special tubular traps (cylindrical shaped) catch the hagfish. When the traps are drawn up on to the ship deck, the fish body is handled for the tegument to be injured and moreover they are thrown into the water tank. Korean hagfish fishermen have their operations after purchasing cheap gears in quantities. Their investments scales are small. Therefore, whether or not each hagfish has the enough ability to cash (make money), even if it does not pay regard, it will think that the investments will be collected.

On the other hand, because the hagfish fishermen in Japan are not accustomed to treating them, they act very careful. Because they do not have much know-how in the same way about the safekeeping of the live fish after landing, too. In other words, the Japanese hagfish fishermen do not bruise the tegument and do not lower surviving percentage. The fact "bruising the tegument" to say here means that the commercial value becomes low for the raw materials for the leather processing. That is, if the tegument of the hagfish

is processed for the handbag, the purse, the jacket and so on, it has only the evaluation of very cheap and low if it is damaged.

#### **4. Impact of the EEZ establishment and the lessons of the resource management**

##### **4-1 The import-dependence occurred by line-drawing and resource for export commodity**

The common trigger to the described three types is that domestic demand in Korea was expanded. Not concerning with the decreasing amount of the hagfish fishing in Korea, the demand for hagfish has expansionary trend. This has been supported by the trade with Japan. To import their materials, the Korean processing companies of leather crafts and marine foods has searched/develops the hagfish fishing/fishermen in Japan. Observing the movement on Japanese side, we could say that the buyers and the brokers are searching for the negotiation partners. This negotiation is done with fishing method education and fishing gear offer. If any, therefore, this is the developmental import negotiation which is not accompanied by the direct equity investment rather than mere merchandise trade.

On and by this process, in Japan, fishing and exportation of live hagfish started. The shipment unit is 1 ton at anywhere. The live hagfish is kept in the water tank at the harbor. The brokers come to the harbor to take it back. They buy the live hagfish for cash on site. Living hagfish is carried by the special truck which has a water tank/pool. The international ferry carries the trucks from Japan to Busan, Korea. Then, the live hagfish from in Japan is sold to the Korean processing companies.

Living the hagfish so, they are exported expensively. Because they keep their lives, they are purchased for the leather processing and for cook. The offshore hagfish imported from U.S./Canada is deep-frozen. So, they are used only for the leather processing. We should be careful to observe the following. In Korea, the catch amount of the hagfish decreases. The figure in 2003 does not always show the big expansion for the future because of the next backgrounds<sup>21)</sup>. (1) Japan and Korea set the EEZ and do their each operations on new fisheries agreement since 1996 (Change of the international system). And by the fact, (2) the Korean fishing vessels lost offshore valid fishing grounds.

##### **4-2 Traditional management and the new international relations**

These entry words mean as below. If the only assumption such as the domestic sea food consumption is kept for the future, the new management would be difficult so much because the rapid change of the international supply-and-demand relation.

Japanese fisheries policy emphasizes that the resource management is to secure the marine foods. Because it sympathizes with the way of thinking of the resource management about the fishermen too, the management is applied to the coastal/offshore fishing grounds. At present, JFA makes efforts for the resource analysis in Japanese EEZ. However, only important marine food resources (edible in Japan) are analyzed. This must be studied. While tacit, the important resources are given a definition such as "the seafood for the domestic consumption in Japan". Oppositely, when a fish is exported much but it is not

edible in Japan, the resource conditions are not investigated. The management policy does not always search-for/care the commercial resources which have big exportation value. The purpose that the fisheries policy of Korea and Japan has common is as the following sentences. It is that a food in the sea for the people in own country is secured in the sea in own country. Countries account for the improvement of the self-sufficiency rate. Then, this concept is indispensable for all countries.

However, the line drawing of EEZ between Japan and Korea in 1996 made face the following interesting reality to both countries. That is, for Japan, (1) merchandising the hagfish has big evaluation which does not have domestic demand when exported to Korea. (2) The new fishing ground use for the merchandise/exportation use starts. (3) The exportation demand has an influence on the fisheries policy of the local governments. But, (4) the new management order does not solve the new facts such as competitions in same fishing ground against the existence fisheries and the sustainable-ness of resource. For Korea, (5) the line drawing of the EEZ threw away their influential fishing grounds of hagfish. As a result, (6) the import of live hagfish from Japan and of the deep-frozen from US/Canada make up for the short supply. (7) The price level of the imported live hagfish exceeds the domestic. (8) The demand for food and leathered commodities support developmental import from Japan by the Korean companies.

These are arranged now for our conclusion. As the outline, Japan and Korea had a new relation of supply and demand. This means the following question. That is, if one country thinks that only of the self-sufficiency is in the taking care, nothing of contributing is to the new international resource use relation. As the mutual country makes up the lack of the partner and among the neighboring countries the surplus foods are accommodated, so the food policy for the self-support is to be changed by the flexible relation. Then, the new resource management is suggested to have the concept as the resource use including is also the food trade must be expanded. As for the conclusion, the resource management by a international organization for the Far Eastern Asian sea area may be chosen. Also, the new international common rule may begin with bilateral or trilateral agreement. As for the resources which are used for the food trade, being compared with resources for the self-support, the low priority condition of the order must not be decided.

## REFERENCES

- 1) A local newspaper “The *Hokkaido Shimbun*” (2004. Feb.) say as follows. As for the lamprey, fishing is mainly done in Ishikari-river and Shiribetsu-river in Hokkaido. In Ishikari-river, over 100 ton lamprey were caught and landed in 1985 and in 19886. However, it decreased sharply to 3.5 tons in 2002. Specialty event “the Ebetsu lamprey festival” in Ebetsu City became that could not help resting from 2002. (Roughly arranged by the authors)
- 2) For example, in Shimabara and Kayagi, Nagasaki Pref. and in Oyashirazu, Niigata Pref. and so on, we can see the fishing. It is said that a food served in a pot is like in the former. Samely a relish taken with sake is like in the latter.
- 3) The authors used the newspaper articles crossing search provided by @Nifty. Just because the authors

gathered article contents about the overview which the table shows, all of the sentences of the article are not rewritten.

4) Mainly, the Kagoshima Pref. marine promotion section takes charge of it.

5) As for the information in Kagoshima Pref., due to the home page of the Kagoshima Pref. Kaseda agriculture, forestry and fisheries office, and by interview.

6) According to the fishing gear classification, it is called "the conger eel trap ". The brand name is "the anago-tohru" (means *the conger eel catcher* in Japanese).

7) The price which the fishery cooperatives wins in the example of the cross trading with the live fish buyer in Fukuoka is about 450 yen/Kg. The fisherman's income is a part of the fisheries cooperative handling charge's being deducted from this price.

8) According to the investigation by Kagoshima Pref., the weight-range hagfish is 20 - 420 g. If we think of the minimum lot for shipping, presupposing it, the fact that "the live hagfish to have put in the water tank with the constant size which contained seawater weight" is 1 ton is understood.

9) Kagoshima Pref. thought that it could maintain the shipment system which does not have a break by sharing these pool facilities by the hagfish fishermen. As for this point, no mistakes are there. However, in the pref., much example that the fishing effort exceeded the ability to reproduce hagfish occurred.

10) Interview. This part is hearsay. When thinking of that it became a chance and hagfish fishing's spreading, it seems that it is permitted to think that it was attractive like an income of the fishery.

11) According to the Internet version of "*White paper of Fisheries, Nagasaki Pref. 2003.*" It is introduced in "*section 2. Strategy for the added value and distribution*"

12) The policy is named as "*New Fisheries Creating Business, Nagasaki Style.*" It means that the new number of the active conducts of business becomes 20 in the period 1999-2010.

13) Dept. of Agriculture, Forestry and Fisheries, Shimane Pref., 2002, *the Shimane Prefecture's Promotional Concept For Agriculture, Forestry and Fisheries Experiment & Research . It has a plan which completes resources estimation by the hagfish by 2005.*

14) Yoshiki Yuuichi, Ishida Kenji and Aki Shigeru Shimane Prefecture fisheries experiment station, the 2000 business report, *the hagfish survey of natural resources, (Internet Edition).*

15) In this paragraph, the contents of "the hagfish survey of natural resources" of citing before were organized by the responsibility of the authors.

16) The fact that the exportation to Korea started is not expressed because the fishing according to the demand is done and the fish catching act which is always constant exists.

17) The case in Yaizu. The fishing vessel's weight is 9 tons. The captain is triumphant for fishing the milk crab and hagfish in addition to the shark fishing in the deep sea. As well as his home page, we can see the reports and the fan site to have treated him.

18) According to the newspaper reports, the first contact is that a buyer in Busan came to the scene visiting in 2000. Because they had a contract each other in 2001, the exportation started for the company. The company seems to import 2 - 3 tons monthly. The exportation of the fisherman in Yaizu shares it.

19) According to the situation which the source in table prescribes, we wrote it Korea.

20) Interview. In addition to the case which was introduced by the thesis, hagfish is caught by the fishery in Kochi and Ibaraki Pref.. Also, to change the fishing target from inshore hagfish to offshore hagfish, too, is thought of. Because the inhabiting condition becomes clarified, the new fishing ground reclamation may begin in the coast and offshore of Japan.

21) The hagfish which is exported from Japan is called 'Nuta-Unagi' in Japanese as "inshore hagfish." One which is exported from America and Canada is called 'Murasaki-Nuta-Unagi' as "offshore hagfish."