

COMPARISON OF JAPANESE AND KOREAN TAC SYSTEM FOR FUTURE EXPANSION

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ABSTRACT

As fisheries resources in the East China Sea, the Yellow Sea and the Japan Sea have the tendency to decrease, the purpose of this study is to identify the problems of the co-management by comparing the Total Allowable Catch (TAC) system between Japan and the Republic of Korea (Korea) in the executed sea areas. Japan, Korea, and China ratified the United Nations Convention on the Law of the Sea in 1996. The TAC system has been implemented by Japan from 1997 and Korea from 1999. While China is still examining the TAC system, Japan is allocated TAC for each administrative division as a fisheries management policy. The TAC of Korea is allocated for only the main fisheries that catch a lot of fish stocks. Common mackerel, sardine and snow crab are agitation for the fish stock targets of Japan and Korea. The target sea areas are EEZ and the provisional sea in both Japan and Korea. In general, the catch from EEZ and provisional sea areas are parts of the TAC. But in reality, the haul of one country in the other country's EEZ and the provisional sea areas is excluded from its own TAC. Therefore, it is necessary to establish the co-management system for the effective use of resource, for example, the one that can control the catch of migratory fish species.

Keywords: TAC System, Co-management, Japan, Korea, East China Sea, Yellow Sea, Sea of Japan

1 The introduction of the Korean TAC system

1-1 The backgrounds

Korea and Japan ratified the U.N. Convention on the Law of the Sea (UNCLOS) in 1996. By the ratification, the both countries take on a responsibility herself as the following sentences.

(1) The coastal State shall determine the allowable catch of the living resources in its exclusive economic zone and ensure through proper conservation and management measures (Article 61).

(2) The coastal State shall determine its capacity to harvest the living resources of the exclusive economic zone and give other States access to the surplus of the allowable catch (Article 62).

And also, Korea and Japan have fisheries agreement between Korea-Japan, Korea-China and Japan-China. It is necessary that these agreements decide a fishery allowance for the mutual fishing in restricted waters.

The license system of both countries faced a limit of managing traditional fisheries about such items as the fishing effort control, prohibiting season/zone setting and regulations. That is, the quantity of the surplus fishing effort increased because an over-investment was expanded. With it, the fisheries management became difficult. Because the license system which could not restrain illegal fisheries is maintained, the resource excessive fishing and the decreasing catch amount expand. TAC system was concluded, because it was emphasizing when the fisheries management system with such new actual condition was necessary. Now, because it supported Northeastern Asia's Fisheries Order Reorganization in addition to the traditional way which is an indirect resource management tool, by the TAC system, the both countries entered the step which manages a catch directly.

1-2. The basis service

1) Korea

To introduce the TAC system, a law was revised first (1995). This revision "Law of the fisheries industry " specifies the following;

- (1) The Minister Of Marine Maritime affairs and Fisheries (MOMAF) the Governor of the Provinces decide TAC applied species and applied sea area.
- (2) The natural, social, economic conditions are considered to decide TAC.
- (3) The types of fisheries and the scale which TAC is applied to are decided by Presidential Order.

In December, 1996, Aquatic Resource Protection Order (APRO) was revised. The APRO has following important points.

- (1) A master plan for the management of TAC is made.
- (2) The Minister of MOMAF or the Provincial Governor makes an enforcement plan for the TAC management by each species.
- (3) The Minister announces the TAC applied fisheries and fish species by considerations for fishery condition, the number of the employees, resource status and so on.
- (4) The TAC deliberative council for the selection of the applied-able resources, the TAC setting, the management and the evaluation of objected resources by the Minister's settlement.
- (5) The Minister or the Provincial Governor announces TAC exceeding officially.
- (6) The Minister or the Provincial Governor allocates TAC to each fisherman.
- (7) The fisherman whom TAC was allocated to reports a catch to the Minister or the Provincial Governor.

Moreover, in April, 1998, regulate about the TAC management, however, it was specified. The contents are as follows;

- (1) The following are published with the publication and the newspaper and so on.
 - When the catch reaches 50 % of the distribution quantity.
 - And more mentioned above, when the catch reaches 80 % of the distribution quantity.
 - At the case which increase rapidly the catch quantity in short days.
 - Species, name of fishing method, name of fisherman, amount of catch, ratio to the allocation, when the catch exceed the allocated quantity, and so on.
- (2) Instruction and control by the observers.
- (3) The Minister or the Governor of the Province or city distribute the cease and desist order book of the capture and the gathering to the fishermen who have the possibility of exceeding the quota.
- (4) The grant of the distribution quantity quota certificate when distribution quantity is limited according to the fishermen and it is allocated and the procedure about the redelivery.
- (5) The capture and the result are reported to the Minister or the Provincial/city Governor via the representative of the fisheries cooperative or the chief of the common market for the agriculture and forestry marine products.
- (6) To handle the violation fishermen by the observer.

1) Japan

In Japan, to introduce TAC system, "Law for the save and management of marine creature resources (the TAC law)" in June, 1996 was established.

The articles:

- (1) Purpose and definition (Article 1~2).
- (2) Master plan (Article 3): Minister of Agriculture, Forestry and Fisheries (MAFF) works out a master plan. Contents of the plan are the basic policy, the fishery possible quantity, the distribution quantity of the minister management fishery or local governor fishery, the policy for allocation to the minister management fisheries and so on.

(3) The local plan (Article 4): The local Governor works out a master plan (the distribution quantity, the policy about the distribution to the governor supervision fishery and so on), it faces to that and receives the approval of Minister of Agriculture, Forestry and Fisheries (Minister of AFF).

(4) The save and the management of specified marine creature resources (Article 5): The local governor sets specification marine creature resources and takes actions for save and management.

(5) The management of the allowable catch (Article 6 - article 12): Minister of AFF and the local governor can take actions such as the publication of the catch, the guide and the recommendation, the stop direction, the limitation on the allocation and the limitation in the operational period so as not for catch quantity to exceed TAC.

(6) The TAC agreement (Article 13 - article 16): The popular agreement can be concluded under the authorization of Minister of AFF or the local governor for the save and the management of marine creature resources about the minister supervision fisheries and the governor supervision fishery. The authorized participants for the agreement can demand an action by the participation mediation between the agreement of the non- participant, the fishing law and so on.

(7) The report of catch quantity (Article 17 - article 25): The fishermen report their catch to the minister or the governor according to the rules. Minister of AFF and the local governor can have the inspection on-site as occasion demands. The marine policy council can collect a report on the matters needed. As for the one which violated article 10 - article 12, and article 17 - article 18, a penalty regulation is imposed.

Additional Rules:

(1) The definition of the date of enforcement, the objected sea area (Article 1): The law enforces itself since the day when the United Nations law of the sea came into force. "Exclusive Economic Zone of Japan" which is an objected sea area is based on "the law of the exclusive economic zone and the continental shelf".

(2) The special case of the application (Article 2): The article 17- 25 are not possible to be applied for by regulations.

(3) The interim measures which affect a master plan and a prefecture plan (Article 3): the master plan and the prefecture plan specify the possible catch quantity since 1997.

2 The outline of the TAC system

2-1 The standards (Refer to the Table1)

1) The management method

The management method of TAC is as the Olympic Games system, the Individual Quota (IQ) system, the Individual Transferable Quota (ITQ) system and so on. In Korea, the IQ system is taken, and Japan chooses the Olympic Games system. The IQ in Korea is described in other section. The Olympic game method in Japan is similar as Korean allocation system until the flow-stage that the quota is allocated to the fishermen's organization and to the prefectures by MAFF. However, after the flow-stage, the Japanese system is that each fishing vessels could compete their catch until reaching the catch quantity to the limitation of TAC. But, TAC is divided to each fishermen's organizations and fishermen actually, the control to prevent the anticipation competition as the fault of this method is accomplished.

2) The applied area

The TAC applied area is in the own EEZ and the common use area for both countries according to the fisheries agreement. The catch in foreign EEZ is not included. The common use area is provided for the reason that the overlapped each EEZ and the territorial problems can not fix up the boundary. In the common use area, the diplomatic deliberations provide the cooperation management, but it does not progress. Specifically, the management of the common use area takes effect under the Flag State Prince, and the fishing vessels which were shut out from foreign EEZ is concentrated in.

3) The fishing within the EEZ by foreign fishing vessels

Both countries admit their fishing within their own EEZ by foreign fishing vessels. This is by the mutual fishing in restricted waters action which was laid down in each fisheries agreement. Within the Korean EEZ, the fishing vessels from Japan and China continue their operations. Also within the Japanese EEZ, the fishing vessels from Korea, China and Russia continue their operations. The foreign fishing vessels have the obligation to report their catch to the government of the EEZ where they fish in, this quantity reported by them are calculated, however, it is not considered to TAC management actually. Also, in these agreements, the sea area where the boundary can not be demarcated by overlap of each EEZ and the territorial problems is determined as a common use area (Free access zone). The catch quantity in there is hardly placed under TAC management.

Table1. The standards of the TAC in Korea and Japan

	Japan	Korea
Starting Year	1997	1999
No. of TAC Species	7	9
Management Method	Olympic Games system	Individual Quota System
Applied Area	Japanese EEZ including the part of open access zone	Korean EEZ and the open access zone
Foreign Boats within EEZ	China, Russia, Korea	China, Japane

Source: Korean MOMAF, Japanese F.A.

2-2 The enforcement of TAC (Refer to the Table-2 and Table-3)

1) The target fish species

(1) Korea

The selection standard of the TAC applied species is by the following.

- (i) The species that catch quantity and their economical value of them are big. The species for common using by the fishing boats of the neighbor countries.
- (ii) Save and management is necessary, according with the resource decrease and the adjustment for cut-off is necessary.
- (iii) For the fishing rate by the single fishery to be big, to implement the fishery, and can be comparatively easily managed.

The points of these standards stand on the economic viewpoint as the fishery profit expansion with biological resource management, the announcement to neighboring countries as a diplomatic duty performance by the UNCLOS. The TAC attempt project started in 1999. The fish species which was chosen as that case were 5; Mackerel, Horse Mackerel, Sardine, Red Snow Crab, and Spanish Mackerel. But, Spanish Mackerel was excluded because a lot of fishing styles catch with a lot of other fishes. After that, Purple Washington Clam, pen shell, Jeju-Do turban shell since 2001 are added for management. In 2002, the Snow Crab and in 2003, Blue Crab are added. As for the added species, the specification is that they except Red Snow Crab are coast-distributed species.

(2) Japan

The TAC species in Japan are as followed;

- (i) These are the species that caught too much and the species that have a big influence on the national life or the fisheries industry if we have no management.

(ii) These are the species that their resource condition is bad and that save or management is necessary.

(iii) The species that the fishing boats from neighboring countries continue their operations to catch.

TAC in Japan considers much of the above (iii), specifically. It has the evidence clearly that all of the objected species at present correspond to (iii). As a result, the total abolition of allocation the abolition of the mutual access fishing into the restricted waters succeeds by the reason in TAC. The species chosen in 1997 with the TAC enforcement at first according to the TAC selection standard were 6 species as of Mackerel, Horse Mackerel, Sardine, Pacific Saury, Alaska Pollack, Snow Crab. Additionally in 1998, the Japanese Common Squid was objected, and totally became 7 species.

2) The applied fishery

(1) Korea

As for the fishing styles dealt with for TAC catch the TAC fish species, the offshore fishing results is primary section to catch big amount. As for the coastal fishing, only the fishery which the local governor authorizes to need of the resource management is dealt with for TAC. Oppositely, the fishery which fills above the constant ratio does not apply for the TAC. However, in the long run, even if the share with the catch of TAC objected fish-species is low to the total output of the category of the fishing style, that it is put in TAC is reviewed.

(2) Japan

As for the objected fisheries in Japan, the fisheries which catch mainly the object species would able to be selected. The difference of the objected fisheries depends on the minister management fishery and the governor management fishery. The minister management fishery is the one which Minister of AFF permitted under the fisheries law, and it is selected within the offshore fishing. On the other hand, the local governor management fishery is the one which the local governor permitted based on the fishing law and it is selected within the coastal fishing. As for the minister management fisheries, the Large Purse Seine fisheries mainly catch the Mackerel, the Horse Mackerel, and Sardine. Pacific Saury is by the Pacific Saury fisheries, the offshore trawl fisheries catch Alaska Pollack, and Snow Crab is mainly caught by the offshore trawl fisheries and the Snow Crab fishery. As for the Japanese Common Squid, because many fishing styles catch it, the object are these fisheries of Large Purse Seine fisheries, the offshore trawl fisheries, the middle-scale squid angling and the small-scale squid angling. On the other hand, as for the governor management fisheries, the applied fisheries are the Medium Squid Angling fisheries that catch Mackerel, Horse Mackerel, Sardine, the Pacific Saury fishery for Pacific Saury, the Fixed Gill Net for Alaska Pollack, and the Small Trawl for Snow Crab.

3) The period of the execution

(1) Korea

TAC is implemented every fiscal year but the executional period differs on each species. On the Jeju-Do turban shell the period is held from October to June in next year, and on the snow crab is since November to May. On other species, the period is held since January to December. But, as for the Blue Crab, its closed season is settled during July to August. The TAC plan for the Jeju-Do turban shell and the snow crab is determined at the TAC deliberative council held in November.

(2) Japan

Japanese TAC had adopted a calendar year as the period of the TAC enforcement, but the period was changed to the fishing season method since 2002. The fishing season is different for each other, so it is not desirable to standardize all the period of execution. However, at the beginning of the enforcement, they are standardized to avoid the complexity of TAC operation. At the 5th year past since the beginning of the enforcement, this change was done to solve the problem as mentioned above. The period for the Alaska Pollack was held since April to March, and for the snow crab is since July to June in next year, and for other 5 species is held since January to December in next year.

Table2. TAC application in Korea

Fish Species	Fishery	Area	Boats or Association	Period	Prohibition Period
Mackerel	Large Purse Seine	Whole country	28 units, 140 boats (35 units, 220 boats)	Jan. ~ Dec.	-
Horse Mackerel					-
Sardine					-
Red Snow Crab	Offshore Trap	Gangwon, Gyeongbuk	50 boats (295 boats)		25.Jul. ~ 24.Aug.
Snow Crab	Offshore Trap, Offshore Gill net	Gyeongbuk, Ulsan	53 boats (1,021 boats)	Nov. ~ May	Jun. ~ Oct.
Purple Washington Clam	Diving Fishery	Busan, Jeonnam, Gyeongnam	181 boats (213 boats)	Jan. ~ Dec.	-
Pen Shell		Whole country	37 boats (213 boats)		Jul. ~ Aug.
Blue Crab	Offshore Trap, Offshore Gill net etc.	Jeonnam, Chungnam	178 boats (1,021 boats)		
Turban Shell	Village fishery	Jejudo	6 F.coop 10 F.vill	Oct. ~ June.	Jul. ~ Sep.

Source: MOMAF

Table3. TAC application in Japan

Fish Species	Minister management	Local Governor management	Area	Period
Mackerel	Large Purse Seine	Tokyo, Shizuoka, Mie, Wakayama, Shimane, Kochi, Nagasaki, Miyazaki, Kagoshima	-	Jan. ~ Dec.
Horse Mackerel		Chiba, Mie, Wakayama, Shimane, Yamaguchi, Ehime, Nagasaki, Oita, Miyazaki, Kagoshima	-	
Sardine		-	-	
Pacific Saury	Pacific Saury Fishery	Hokkaido, Iwate	-	
Alaska Pollack	Offshore trawl	Hokkaido	the Sea of Japan, the Sea of Okhotsk, the Pacific Ocean	Apr. ~ Mar.
Snow Crab	Offshore trawl, Snow Crab Fishery	Hokkaido, Akita, Yamagata, Niigata, Toyama, Ishikawa, Fukui, Kyoto	The Sea of Japan, the Sea of Okhotsk, the northern Pacific Ocean	Jul. ~ Jun.
Japanese Common Squid	Offshore trawl, Large Purse Seine, Medium and Small Squid Angling	-	-	Jan. ~ Dec.

Source: Fishery Agency

4) The enforcement area

(1) Korea

The enforcement area of Korean TAC is different for each species. The EEZ whole area in Korea is enforced for Mackerel, Horse Mackerel, Sardine and Pen Shell. The Red Snow Crab is allocated for the fishing vessels that belong to Gang-won and Gyeong-buk where faces the Sea of Japan which is the main

fishing ground. The fishing vessels belong to Gyeong-buk and Ulsan which face the Sea of Japan that is the main fishing ground, are allocated for the Snow Crab. On the other hand, the fishing vessels belong to Busan, Jeon-nam, Gyeong-nam facing the Korean southern coast that is the main fishing ground is allocated for the Purple Washington Clam. The Blue Crab is allocated to the fishing boats belong to Jeon-nam and Chung-nam which face its main fishing ground.

(2) Japan

The implemented sea area by Japanese TAC is different for each species, moreover defers depending to the minister management fishery or the local governor management one. As for the mackerel, the horse mackerel and the sardine, in case of the minister management fisheries, they are all allocated the whole sea area. But as for the same species, in the local governor super visionary fisheries case, they are allocated to each prefectures western of Kanto District. None of the sea area is specified in the case of the minister management fisheries as for the Saury, but in case of the local governor management fisheries, it is allocated to Hokkaido and Iwate. The Alaska Pollack is allocated for the minister management fisheries, dividing by the subpopulation of each species and by sea-area as the Sea of Japan, the Sea of Okhotsk and the Northern Pacific Ocean. In case of the local governor management fisheries, it is allocated to Hokkaido. The snow crab is allocated to the minister supervision fishery, dividing by the subpopulation of each species and by sea-area as the Sea of Japan, the Sea of Okhotsk and the Northern Pacific Ocean. In case of the local governor management fisheries, it is allocated to the prefectures facing Northern Sea of Japan, the Sea of Okhotsk and the Northern Pacific Ocean. As for the Japanese common squid, specifically no sea area is provided.

3. The way of implementing TAC

3-1. The calculation method of TAC

(1) Korea

TAC is calculated based on a wide range of TAC quantity decision materials. One of the decision bases is a scientific basis. The National Fisheries Research and Development Institute investigates fisheries resources scientifically and it gathers the result every year by June. Also, the 2nd basis is TAC fishery results in the preceding fiscal year. As for it, the TAC species quota and the result by every fishing method are reported to the Minister of MOMAF via the governors of the city/Province after reported to the fisheries cooperatives and fisheries organizations. The 3rd point is the catch average in the past. The 4th point is the C.P.U.E. The 5th point is the amount of fishermen's requirement. It is adopted to incorporate a business economy condition. Because the TAC system tries to avoid itself becoming a fantastic system, the calculation process of TAC has the possibility to think too much only of the scientific data. So finally after the TAC deliberative council has a discussion based on the data with the social and economic condition and so on, the central marine coordination committee fixes TAC.

(2) Japan

Next, the decision of TAC in Japan is done based on the master plan. First, for the resource situation grasp, ABC is calculated in the marine institute. It takes account of fishery results and fishery management status in the resource status, Condition of the sea, the past and it fixes TAC plan. After that, TAC is fixed via the deliberation of The Fishery Policy council. As for TAC that the case is distributed to the governor supervision fishery, an opinion at the prefecture, too, is heard.

3-2. The TAC distribution and it allocation

(1) Korea

By the master plan for TAC setting and the management, the Ministry of MFA allocates the TAC for the fishermen's associations according to the city or the Province by species. As for the fishermen that their associations do not organized or that do not belong to their associations, the city and the Province

allocate it for them. As for the fisheries that organized their organizations or cooperatives, TAC is distributed to each organization and cooperative. As for the fishermen individual quota, the city and the Province which received a quota of TAC distribute the 70 % with all TAC quantity to the fishermen equally according with cooperating of fisheries cooperatives and fishermen's organizations. The representative of the fishermen's organizations like the local cooperative that the fishermen belong to by district present their quota plan documents to the Minister or the Governor. Also, if the distribution completes, that they allocate for the Minister and to present approval are sought. 30 % of the remainder is called a distribution reserving quantity. Possible about that the distribution of the addition is allocated by considering operational results about this quantity and that all of this quantity is allocated by the dull fishermen that the catch does not fill 80 % of the allowance, too. The standard of the distribution is set recently based on the average fishing results and the fishing vessel weight according to the 3-years-of-fishing and so on. According to the standard, TAC is individually allocated.

See the examples of the specific TAC distribution. As for the Snow Crab, the fleet is called the TAC participation fishing vessels which 50 vessels get their catch by the offshore gill net and trap-fishing such as two main fishing styles. TAC is distributed to them (50 vessels). As for the Jeju-Do turban shell, an implementation target area is limited within Jeju-Do. The Jeju-Do governor considers fishery results in the past and so on; he allocates it for each fisheries cooperative (6 cooperatives in Jeju-Do). Moreover, each fisheries cooperative allocates their allocated TAC to the fishing communities (100 in total as called "KEI" in Korean).

(2) Japan

The distribution of TAC in Japan is roughly divided into the minister supervision fishery and the governor supervision fishery. Minister supervision fishery is allocated for each fishery group. Governor supervision fishery is allocated for the prefecture. The TAC agreement is provided every fishery kind and distributes distribution to the minister supervision fishery to the fishery person based on the agreement. The governor supervision fishery fixes distribution to each fishery kind based on the prefecture plan in TAC which was distributed by the local governor. The opinion of the marine zone fishery coordination committee of the case is heard. When the distribution for fisheries decides, TAC is distributed to the fishermen or the fishery cooperatives.

3-3 The TAC report and its controls

(1) Korea

The cooperation of the fisheries cooperatives or the fishermen's organizations lead the TAC participating fishermen to the merchandizing channel by their cooperatives/organizations and manages their catch by fishing vessels under TAC which was distributed to the city and the Province. In case of landing except their society, the fishermen must report fishing results independently/personally. If the catch according to the fishing vessels may exceed an allowance, the distribution of the additional quota or all the allowances is done. The city and the Province report the catch every month to the Ministry of MFA according to the fishing vessel by the 5th. The figure of TAC which was distributed to the fisheries cooperative will show how to be handled. The fishing status which is presented to the fisheries cooperative booth with sales commission is reported to the representatives of the fishing-method-classified cooperative or the district-classified cooperative twice a month. They calculate the result and also, when a quota is added, they report it immediately to the governor of the city and the Province. TAC which was distributed to each fisherman is observed here. The article 15 of the Rule for the TAC management has such sentences. "A fishery performance report book is presented to the Minister of the MOMAF or to the governor of the Province via the president of the fisheries cooperative or the representative of the common market place of the agriculture, forestry and fishery products." But, when not selling on commission through the fisheries cooperative, the fishermen report their catch

independently to the City Governor or the related fisheries cooperative. Also, when the catch exceeds an allowance, the fishermen can demand an additional quota to the City Governor. When the catch exceeds 80 % to the allowance for a fisherman, the fisherman reports a catch and an operational position immediately is obligated for.

TAC management and the ways of control are observed. For to know the correct achieved quantity about the TAC allowance, and to manage and collect the basic statistics and so on, the Ministry of MFA made the observer (the fishery manager official) system in March, 1999. Then, it began to operate a system since June, 2000. The observers watch over whether a violation for catch happens in the fishing ground or in landing place. To monitor to manage the catch properly, they take charge of the following works. It confirms a catch in the operational scene. It secures correct catch statistics. It does scientific material investigation. It confirms the results of commission sales for the fisheries cooperative according to the fishing vessels.

The administrative disposition against the TAC violation fisherman has the following types. In case of violation to the matters of TAC management, there is a stop of the fishery permission or a stop of the seamanship license (30~60 days). In case of violation of the duty of fish catch result protection, there is a stop of the fishery permission or a stop of the seamanship license (10~20 days). Actually, an administrative disposition is not realized. The reasons are as follows. Because the scientific materials for the TAC still lack, the reliability of TAC is small and it lacks the system performance. The status of the small-scale fishermen who has with a background of the resource decrease and the aggravation of the fisheries economy is considered. In the future, the expansion of the observer system will make the TAC project have compelling force and make it the one which has system performance. It is necessary that the routine study meeting to improve the specialty of selection the servers, the ex post fact supervision of landing, upbringing the human resources are strengthened. Moreover, the prevention of the intensive control and the protection against the illegal fisheries are to be promoted.

(2) Japan

Next is the report with catch to TAC in Japan. As for the minister supervision fishery, through the fishery organization, a catch is accumulated by the fishery information service center. As for the governor supervision fishery, it is Fishing Port. Through Fisheries Co-operative, it reports a catch to the prefecture. The data which was accumulated by each prefecture is reported to the fishery information service center. The catch of the minister supervision fishery and the governor supervision fishery which was accumulated by the fishery information service center is reported to Fisheries Agency, being final.

Next is control. As for the minister supervision fishery, as for the TAC agreement which was provided for each fishery kind, an agreement for the management is accomplished. In the fear which exceeds distribution quantity, the country does the publication, the guide of the fishery results, an advice and recommendation. Moreover, when exceeding distribution quantity, it is ordered that the fishery stops. As for the governor supervision fishery, the fishery kind of the part is concluding TAC agreement and does an agreement for the management based on the agreement. Also, when the fear that the distribution quantity exceeds comes out, the publication, the guide, the advising and the recommendation of the fishery results are accomplished by the local governor. When the distribution quantity exceeds, it is ordered that the fishery stops. However, as for these compulsion regulations, until 2001, application was excluded to all fish species. The reasons are Japan has no control over foreign fishing boats within its EEZ, Japanese fishing boats are also exempt from regulations. In 2001, a regulation for Pacific Saury and Alaska Pollack had applied. This is because the abolition of the Alaska pollack fishery by the foreign fishing vessel and the substantial reduction of the saury fishery were accomplished about the mutual fishing in restricted waters action. In spite of the Fishery Agreement, the regulation for other species has been shelved because foreign fishing boats are operating in the open access zone.

4. The present situation and the problem of the TAC system

4-1. The present situation of the TAC system

(1) Korea

Table 4 shows the change of the catch, and the catch rate per TAC (catch / allowance \times 100) according to each fishing methods and the fish species. In 1999, the TAC system started for the Mackerel, the Horse Mackerel, the Sardine, the red Snow Crab as the attempt. At present, TAC is applied to 9 fish-species. Incidentally, the fish species which TAC is formally applied to is only three kinds of the red Snow Crab, the house purple guys, Jeju-Do turban shells. As for these species, the TAC allowance decreases every year. As for the catch rate per TAC of Mackerel and Horse Mackerel are decreasing a little. The catch rate per TAC except them shows high percentages in 2001 and in 2002. The catch rate per TAC of the Mackerel in 1999 exceeded 100 %.

As for this reason, TAC of the Mackerel is that a closedown was not yet ordered because it was as the trial. Also, the catch rate of the Jeju-Do turban shell is very high. The turban shell is a sedentary species of shell. Also, a target area is limited. Moreover, because the management system is ready, the watch and the manager are simple and easy. Therefore, the result of TAC to the Jeju-Do turban shell succeeds. On the other hand, the catch rate per TAC of Red Snow Crab, Snow Crab, Purple Washington Clam, and Pen Shell are low comparatively. However, these species do not show extreme decreased catch. Because they are sedentary species, the continuous TAC management for the future is expected.

The catch rate per TAC of Sardine is the lowest. The large Purse Seine fisheries catch one mostly.

Table4. The TAC amount, result and the catch rate per TAC in Korea

		unit: ton, %					
		1999	2000	2001	2002	2003	
Large Purse Seine	Mackerel	TAC (A)	133,000	170,000	165,000	160,000	158,000
		catch (B)	152,640	83,629	156,081	126,502	116,226
		B/A	115	49	95	79	74
	Horse Mackerel	TAC (A)	13,800	13,800	10,600	10,600	11,000
		catch (B)	6,499	9,376	9,582	10,593	10,979
		B/A	47	68	90	100	100
	Sardine	TAC (A)	22,660	22,600	19,000	17,000	13,000
		catch (B)	9,533	661	125	0	2
		B/A	42	3	1	0	0
Offshore Trap	Red Snow Crab	TAC (A)	39,000	39,000	28,000	28,000	22,000
		catch (B)	25,249	30,362	19,319	17,996	20,328
		B/A	65	78	69	64	92
Offshore Trap, Offshore Gill Net	Snow Crab	TAC (A)	-	-	-	1,220	1,000
		catch (B)	-	-	-	947	611
		B/A	-	-	-	78	61
Diving Fishery	Purple Wasington Clam	TAC (A)	-	-	9,500	9,000	9,000
		catch (B)	-	-	6,051	5,319	4,667
		B/A	-	-	64	59	52
	Pen Shell	TAC (A)	-	-	4,500	2,500	2,500
		catch (B)	-	-	1,479	1,426	1,635
		B/A	-	-	33	57	65
Village Fishery	Turban Shell in Jeju-Do	TAC (A)	-	-	2,150	2,058	2,150
		catch (B)	-	-	1,938	1,965	1,951
		B/A	-	-	90	95	91
Offshore Trap, Offshore Gill Net etc.	Blue Crab	TAC (A)	-	-	-	-	13,000
		catch (B)	-	-	-	-	4,889
		B/A	-	-	-	-	38

source: Ministry Of Maritime Affairs & Fisheries (MOMAF)

The periodic Sardine resources change is intense. Now, it is evaluative when it is in the decline period. The problems for the future are to improve a resource managerial technique and the precision by the TAC system for an influence over the fishery management of the resource change to be restrained.

(2) Japan

Table 5 shows the TAC amount, the catch for each species, and the catch rate per TAC. As the TAC amount, the fish with highest reduction in TAC allocation is the Sardine. In 2004, the allocation to Sardine has been reduced to 10% of the amount allocated in the first year, because of the low resource level do to periodic resource fluctuation. The fish with second highest allocation cut is the Mackerel. In 2004, the allocation was reduced to 60% of the amount in 1997. The TAC amount for Pacific Saury, the Horse Mackerel, and the Japanese Common Squid in 2004 are reduced to 80~90%. On the other hand, the allocation for Alaska Pollack had been increased to 120% and Snow Crab to 150%.

On the result, the catch of Sardine in 2004 decreased to 20% of the amount of catch in 1997. The catch of Mackerel decrease to 60%. The catch of Pacific Saury, Alaska Pollack and Horse Mackerel decrease a little. On the other hand, the catch of Snow Crab increased to 115%, and the Japanese Common Squid increased to 145%. The Allocation of the TAC should be based on the amount of the resource of the species, but in reality, it is allocated according to the catch of the fish.

Next is the catch rate per the TAC. Overall, the catch of Mackerel has exceeded the TAC in first year. About the catch rate of each minister management fishery, every species except Horse Mackerel has exceeded the TAC. Especially, the catch of Snow Crab in western Sea of Japan is exceeding every year. But, the orders to stop the catch were never given. The reason is because, since Japan has no control over foreign fishing boats operating within its EEZ, Japanese fishing boats also exempted from forced regulations. However, a forced regulation for Pacific Saury and Alaska Pollack had been applied since 2001. In spite of the Fishery Agreement, the application of the forced regulation for other species has been shelved because foreign fishing boats are operating in the open access zone.

Table5. The TAC allocation and result in Japan

		unit : ton, %						
		1997	1998	1999	2000	2001	2002	2003
Pacific saury	TAC (A)	300,000	300,000	330,000	310,000	310,000	310,000	334,000
	catch (B)	285,052	141,030	139,440	206,345	264,327	200,137	263,197
	B/A	95	47	42	67	85	65	79
Alaska Pollack	TAC (A)	267,000	311,000	374,000	374,000	363,000	338,000	315,000
	catch (B)	247,913	258,599	259,115	245,228	192,795	156,881	198,044
	B/A	93	83	69	66	53	46	63
Horse Mackerel	TAC (A)	370,000	430,000	450,000	400,000	370,000	352,000	304,000
	catch (B)	294,894	280,676	172,213	210,540	180,198	159,175	207,103
	B/A	80	65	38	53	49	45	68
Sardine	TAC (A)	720,000	520,000	400,000	380,000	380,000	342,000	100,000
	catch (B)	267,855	153,572	327,588	137,014	161,606	45,496	44,280
	B/A	37	30	82	36	43	13	44
Mackerel	TAC (A)	700,000	700,000	780,000	780,000	770,000	693,000	512,000
	catch (B)	726,177	465,560	327,830	332,548	334,404	233,742	311,767
	B/A	104	67	42	43	43	34	61
Japanese Common Squid	TAC (A)		450,000	500,000	500,000	530,000	530,000	530,000
	catch (B)		150,644	185,479	300,895	281,294	218,711	218,689
	B/A		33	37	60	53	41	41
Snow Crab	TAC (A)	4,815	4,945	5,469	5,469	5,469	6,775	6,455
	catch (B)	4,333	4,307	4,276	5,030	4,900	5,001	
	B/A	90	87	78	92	90	74	

source: Fisheries Agency

4-2. The problems of TAC and its solutions

Here are the comparison of the present condition, problems and its evaluation of the TAC. As a supplementary measures, TAE (Total Allowable Effort) was introduced since 2002 in Japan. In Korea, the addition of the TAC species, Japanese anchovy, Japanese Common Squid and Cutlass fish is considered. As a watch system in Japan, there is self-management among fellow trader on the TAC regulation. In Korea, there are observer system and designation system of fish landing place. In Japan, the penalty of imprisonment or fine regulated, but not applied. In Korea, the proposal to advantage to the participant of TAC is inquiring. Problem unique to the Japanese TAC is over fishing beyond TAC because there in no penalty for over fishing and control of harmonization between minister management fishery and local governor management fishery. And problem seen only in the Korean TAC is over fishing effort and limitation of TAC applied area. International problems are no management in the open access zone, and high level of TAC with consideration of foreign boat's catch.

As a result of the TAC in both countries, the resource management system is near completion the TAC in both countries. However, it has not succeeded in the recovery of resources because the highest priority is placed on fishery economy. You can see that in the TAC exceeding the ABC, for example. These problems are weakening the confidence towards the TAC.

The issue for future is as follows; as the domestically issue, in Japan, it is necessary to strengthen penal-regulation. For example, one of effective measure is to establish the external auditor. In Korea, it is necessary to regulate the fishing effort adapted for the resource condition. As the international issue, TAC should enforce the catch by foreign boats. And we should investigate the international TAC in open access zone too. Conclusively, the exchange of the resource information is indispensable among Japan, Korea, and China.

Reference

Korean TAC

- 1) MOMAF, "The master plan and the enforcement plan for TAC system (2001、200、2004) "
- 2) MOMAF, "The regulation about the control of TAC"(Mar. 2002)
- 3) MOMAF, "The marine white paper" (2002~2003)

Japanese TAC

- 4) The sea law seminar, "Q&A The sea law treaty and the marine relevant law" (May.1997)
- 5) "The marine almanac"(2000~2004)
- 6) "The save of marine creature resources and the law about the management" (Jun.1998)
- 7) TAC Home Page (<http://www.jfa.go.jp>)
- 8) Japan Fisheries Information Service Center (<http://www.jafic.or.jp/index.html>)