



**UNDP/GEF PROJECT ENTITLED “REDUCING ENVIRONMENTAL STRESS IN THE
YELLOW SEA LARGE MARINE ECOSYSTEM”**

UNDP/GEF/YS/RWG-F.3/11
Date: 26 September 2006
English only

**Third Meeting of the Regional Working Group
for the Fisheries Component**
Weihai, China, 25-28 October 2006

**REPORT ON A DETAILED EXISTING NATIONAL LAWS, REGULATIONS, REGIONAL
AND INTERNATIONAL CONVENTIONS AND
A DRAFT PLAN FOR A REGIONAL AGREEMENT FOR SUSTAINABLE USE OF
FISHERIES RESOURCES IN THE YSLME**
- Preliminary report -

The results from the review of existing national laws, regulations, regional and international conventions applied to the YSLME were compiled to prepare a “Plan for a Regional Agreement on Sustainable Use of YSLME Fisheries Resources”. This plan will include measures for overcoming the legislative issues, measures for strengthening laws and regulations, suggestions of ways to improve and strengthen enforcement and the feasibility and mechanism of implementing the “FAO Code of Conduct for Responsible Fisheries” in a regional management plan for fisheries resources in the Yellow Sea.

This work was carried out from May to September 2006. The results from this activity aim to contribute to the Fisheries Chapter of the Transboundary Diagnostic Analysis (TDA) and to the Strategic Action Programme (SAP).

A Consulting Firm, Marine Resources Assessment Group Ltd. (MRAG) from the UK was contracted, based on the open bidding process, to assess information on existing national laws, regulations, regional and international conventions applied to the YSLME, highlighting the legislative issues and including a study of the feasibility of a regional agreement on sustainable use of fisheries resources and, with this information, prepare a draft document of “Plan for a Regional Agreement on Sustainable Use of YSLME Fisheries Resources” for the consideration of the YSLME member countries. This plan will include measures for overcoming the legislative issues, measures for strengthening laws and regulations, suggestions of ways to improve and strengthen enforcement and the feasibility and mechanism of implementing the “FAO Code of Conduct for Responsible Fisheries” in a regional management plan for fisheries resources in the Yellow Sea. The preliminary version of the report is attached hereafter.

After reviewing the report and presentation, participants will discuss the information presented, and suggest on how to improve the proposed draft Plan for review at next session of the RWG-F.



**UNDP/GEF PROJECT ENTITLED “REDUCING ENVIRONMENTAL STRESS IN THE
YELLOW SEA LARGE MARINE ECOSYSTEM”**

Development of a Regional Agreement for Sustainable Use of Fisheries Resources in the
Yellow Sea Large Marine Ecosystem

Report 1:

**Summary of relevant existing national laws, regulations,
regional and international conventions applicable to the
Yellow Sea**

&

**Draft plan for a regional agreement on sustainable use of
fisheries resources**

Marine Resources Assessment Group Ltd



08 October 2006

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1 INTRODUCTION

This is the first report in a series of reports that constitute the outputs of a contract between the Yellow Sea Large Marine Ecosystem Project and the Marine Resources Assessment Group Ltd (MRAG). The reports are discrete steps to facilitate and support the process of the development of a regional agreement for sustainable use of fisheries resources in the Yellow Sea Large Marine Ecosystem.

Political agreement often is pre-empted by technical issues and dependent on mutual understanding of terms, which is never facilitated by language barriers. A sound common understanding and accord on the technical matters that lie at the basis of the regional agreement is a critical first step. This implies among other consensus on the physical status and presence of the resource, and on the methods that will be employed to assess these stocks, to monitor their status and trends, as well as the levels of exploitation and possible emerging threats.

This initial approach to the task will depend and build on many other elements and historic experience, some of which are still to be achieved as part of the Project. This offers an excellent opportunity for interaction between the development of the Regional Agreement and the development of some of the tools that will be required to implement the Regional Agreement. Their simultaneous development provides the opportunity for close, mutually reinforcing interaction.

This initial report deals with the existing legal framework applicable to the Yellow Sea and presents a roadmap to a regional agreement.

2 REPUBLIC OF KOREA

2.1 International conventions and agreements

Korea is a party in international treaties, conventions and agreements pertaining to environment, fisheries and navigation as listed in Table 1. The table also presents the year in which the Korean government ratified the conventions and agreements.

Table 1. Relevant international treaties, conventions and agreements in which the Republic of Korea is a party

Conventions/Agreements	Date of ratification / accession
1982 United Nations Convention on the Law of the Sea	1996
1993 FAO Compliance Agreement	1993
1995 UN Fish Stocks Agreement (on straddling and highly migratory fish stocks)	1995
1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1993
1992 Convention on Biological Diversity	1993
1973 International Convention for the Prevention of Pollution	1984

Conventions/Agreements	Date of ratification / accession
from Ships (MARPOL)	
1974 International Convention for the Safety of Life at Sea (SOLAS)	Ratified but date not identified
1990 International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC)	Ratified but date not identified
1992 United Nations Framework Convention on Climate Change	1993
International Convention for the Regulation of Whaling (ICRW)	1978
1954 International Convention for the prevention of Pollution of the Sea by Oil	1978
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)	1993
International Convention on Civil Liability for Oil Pollution Damage (CLC)	1978
1969 Protocol to the International Convention on Civil Liability for Oil Pollution Damage	1992
1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention)	1992
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention).	1994
Cartagena Protocol on Biosafety	1994
Kyoto Protocol	2002

Korea is a member of following RFMOs covering the Yellow Sea: Asia-Pacific Fishery Commission (APFIC); North Pacific Marine Science Organization (PICES) and Korea is also a member of following regional programmes covering the Yellow Sea: Partnerships in Environmental Management for the Seas of East Asia (PEMSEA); Coordinating Body on the Seas of East Asia (COBSEA); Northwest Pacific Action Plan (NOWPAP).

2.2 Maritime zones

Korea established a 12-mile territorial sea in April 1978, except in the Korean Strait where it was limited to three miles in order to leave a high seas corridor through it. However, in accordance with a provision (Article 4) of the UN Convention, Korea adopted new “Laws on the Territorial Sea and Contiguous Zone” replacing the “Laws on the Territorial Sea” in August 1996, establishing the breadth of its territorial seas as up to 12 miles and contiguous zones as up to 24 miles, measured from the baselines.

The “Law on the EEZ” in Korea was promulgated in August 1996 and entered into force in September 1996 (it is composed of 5 Articles and an Annex). The Law provides that the EEZ of Korea shall be the waters up to 200 miles from the baseline from which the territorial sea is measured (Article 2, Para 1). The boundary of the EEZ with opposite or adjacent coastal countries shall be delimited by agreement between countries concerned

on the basis of international law (Article 2, Para 2). The law provides that in the EEZ, Korea has sovereign rights for exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil.

When foreigners exercise their rights and perform their duties in the EEZ of Korea, they shall have due regard to the rights and duties of Korea and shall comply with the laws and regulations adopted by Korea (Article 4, Para 2). When the competent authorities of Korea have good reason to believe that the ship has violated the laws and regulations of Korea, they can take necessary measures, including the pursuit of a foreign ship beyond the limits of the Korean EEZ, ordering it to stop, boarding, searching, arrest, and judicial procedures in accordance with provisions of Article 111 of the UN Convention (Article 5, Para 3).

With regard to the conservation and use of living resources in the EEZ, the UN convention states that proper conservation measures should be ensured and that other states fishing in the EEZ should comply with them. In case of Korea, the “Law on exercising Sovereign Rights on Foreign Fishing in the EEZ” was promulgated in August 1996, and entered into force in August 1997. The law consists of 26 Articles and an Annex. The objective is, in accordance with the relevant provisions of the UN Convention, to provide for appropriate conservation, management and utilization of marine living resources by providing necessary details on the exercise of sovereign rights over foreign fishing activities (Article 1). The law is applied to foreign fishing activities within the EEZ of Korea, except in cases where there are agreements with foreign countries, in which case that agreement is applied (Article 3, Para 1 and 2). Therefore, fishery relations between Korea and China are regulated through the Korea-China Fishery Agreement. For the conservation of fishery resources and for fishing adjustment, fishing activities in the “Special Prohibition Zone” in the EEZ are prohibited.

Foreigners wishing to fish in the EEZ need a fishing licence issued by the Ministry of Maritime Affairs & Fisheries (MOMAF) (Article 5). The fishing licence regulates the type of fishing technique, the size of fishing vessels, the number of attached vessels, the type of fishery animals and plants that may be caught, and the amount of fish that may be caught (Article 3 of the enforcement ordinance). More specifically, the following criteria need to be fulfilled in order to obtain a licence: the proposed fishing activity should not undermine the implementation of international conventions or agreements between countries and other relevant matters; the catch should not exceed the amount determined by MOMAF on the basis of an ordinance from the MOMAF; and the fishing activity should be compatible with the criteria for permissible fishing for the size of vessels determined by ordinance of the MOMAF.

Table 2. The status of acceptance of the Ocean-related international laws

	Korea	China
• UN convention	Ratification: Jan 1996 (Signature: Mar 1983)	Ratification: Jun 1996 (Signature: Dec 1983)
- Territorial Sea	12 mile (Aug 1996)	12 mile (Feb 1992)
- Contiguous Zone	24 mile (Aug 1996)	24 mile (Feb 1992)
- EEZ	Effectuation: Sep 1996 (Promulgation: Aug 1996)	Effectuation: Jun 1998 (Promulgation: Jun 1998)

-Effectuation of Straight baseline	April 1978	May 1996
• Seabed Agreement	Ratification: Jan 1996 (Signature: Nov 1994)	Ratification: Jun 1996 (Signature: Jul 1994)
• Compliance Agreement	Ratification: Not yet	Ratification: Not yet
• UNIA	Signature: Nov 1996	Signature: Nov 1996

In determining the catch limitation, Korea shall take into account all comprehensive factors including the trend of fishery resources, the actual catches of Korean fishermen, state of foreign fishing, and the state of Korean fishing on the basis of the TAC (Article 6, Para 2). This relates to Article 62, Para 3 of the UN Convention which states that in giving access to its EEZ, coastal states should take into account all relevant factors.

When receiving a fishing licence (Article 7) and applying for approval to catch and gather fishery animals and plants, foreigners should pay fees and are prohibited to transfer or land the catch directly (Article 12). In addition, for the conservation and management of anadromous stocks spawning in inland waters, in accordance with Article 66, Para 1 of the UN Convention, Korea has provisions discussed above show that Korea has reflected the general provisions of the UN Convention in its domestic law.

Korea, China, and Japan declared 200-mile EEZs in 1996. However, they have yet to reach a compromise on their delimitation. Delimitation problems in the region are especially difficult because they simultaneously involve boundaries with both adjacent and opposite states. Claims to the full 200-mile EEZ will create overlap, and may result in potential controversies. This is mainly because the region has semi-enclosed seas less than 400 miles wide. Especially, the Yellow/East China Sea has been the focus of continental shelf boundary disputes since 1969. The essential cause of the disputes stems from the differences between the parties concerned as to the principle of international law to be employed in delimitation, as well as the geophysical nature of the seabed at issue.

For instance, Korea adheres to the median line in the continental shelf of the Yellow Sea and part of the East China Sea, but relies on the doctrine of natural prolongation in the north-eastern part of the East China Sea because it extends beyond 200 miles from the baseline of its territorial sea. On the other hand, in the Yellow Sea/East China Sea, China adheres to the doctrine of natural prolongation. Its claim is derived from the overlay of sediments in the seabed of the Yellow Sea and the proportionality of the lengths of the coastline. China claims that its continental shelf extends beyond the median line drawn by Korea in the East China Sea up to subzone 7 of Korean continental shelf.

2.3 The Fishery Relationship between Korea and China

Although diplomatic relations between Korea and China were established in August 1992, there was no fishery agreement between Korea and China. While Korean fishermen have not fished heavily in Chinese waters, Chinese fishermen have expanded their fishing activities in Korean waters. They target the same fish as Korean fishermen: jack mackerel, hairtail, anchovy, Japanese flying squid, pilchard. Gazami, crab, Japanese spanish mackerel, yellow croaker etc.

The extension of Chinese fishing activity to the Korean coast has resulted in many problems including the depletion of fish stocks, marine pollution, and accidents at sea. However, since Korea did not have a fishery agreement with China and neither country claims a unilateral fishery jurisdiction zone, each country was technically free to fish. Therefore, it was difficult to regulate illegal fishing activities in areas of the Yellow Sea and the East China Sea beyond the limit of Korean territorial sea.

The Korean government proposed fishery talks to solve the problems and as a result, a first inter-governmental meeting was held in December 1993 to deal with the establishment of a fishery agreement, and with issues relating to illegal fishing by China and the maintenance of fishing order. Korea and China held fishery working-level talks 19 times from that point onward.

In these negotiations, while China tried to extend the joint fishing zone in order to maintain and protect Chinese vessels fishing in Korean waters, Korea tried to reduce the joint fishing zone to prevent Chinese fishing activities in Korean waters. Finally, both countries concluded their 5-year negotiations and signed an agreement on 11 November 1998 with the adoption of the concept of Transitional Waters that reflects the China position to some extent. The agreement entered into force on 30 June 2001.

The agreement consists of a preamble, 16 Articles and two Annexes. The main objectives of the agreement are to seek the conservation and desirable utilization of marine living resources; to maintain normal fishing order at sea; and to strengthen and promote mutual cooperation in the fishery sector. The contracting waters are the EEZs of Korea and China. These waters are divided into four distinct areas: EEZs, Transitional Waters, Provisional Waters, and waters for maintaining current fishing activity.

First, each contracting party can exercise its sovereign rights over marine living resources within an area extending to about 50 to 60 nautical miles from the baselines. Fishing vessels from the other party are not allowed to operate in this area. In these waters, coastal states have exclusive rights for the exploitation, conservation and utilization of marine living resources. Each party makes, on an annual basis, a detailed decision on conditions allowing the other party's fishermen and fishing vessels to operate in its waters, taking into account the results of consultations with the Joint Fishery Committee and the status of the marine living resources, fishing capacity, traditional fishing activity, and the reciprocal fishing situation in the EEZ.

These conditions included the fish species, the amount of catch allocation, and the fishing area. The decision is notified in writing. Foreign fishing vessels need a fishing licence issued from the coastal country to fish in the EEZ and must obey the relevant laws or regulations on marine living resource of the coastal state (Article 4 and 5). Seized or detained fishing vessels or crews should be released rapidly after paying a security or a guarantee.

Transitional Waters are located between the EEZ and Provisional Waters and are around 20-30 miles wide. Transitional Waters are similar to provisional waters in that both countries' fishing vessels conduct fishing activities together, the governments jointly manage the fishery resources, and the flag State principle is applied (Article 8). However, four years after the agreement comes into force, the Transitional Waters will revert to the coastal country's jurisdiction. Before that time, in the waters, both countries can incrementally control or reduce fishing activities so that the fishing activities of both countries are maintained in balance. Both governments can observe and manage marine living resources based on the decision made by the Korea-China Joint Fishery committee. In order to identify whether the fishing conditions decided by the Committee

are obeyed, joint monitoring or supervision is conducted. To be effective, a list of fishing vessels is exchanged.

Provisional Waters cover the overlapping areas caused by the establishment of the 200-mile EEZ between Korea and China, if a 200-mile EEZ is applied by both two countries. In this area, both countries' fishing vessels conduct fishing activities together and both governments jointly manage fishery resources. The governments jointly determine management conditions, including catch volumes and the number of fishing vessels, in order to conserve marine living resources. The details are decided by the Korea-China Joint Fishery Committee (Article 7).

The so-called flag State principle is applied to this area, where each country controls its own fishing vessels and does not have the right to control the other party's fishing vessels. If one party detects that the other party's fishing vessels are violating regulations decided by the Joint Fishery Committee, the flag state is informed of the nature of the violation. The flag state should take necessary measures and inform the other party of the result of the measures.

Finally, in the waters around the China's Yangtze River (latitude 37 degree North) and the south of Korea's Jeju Island (latitude 31.5 degree South), Korea and China fishing vessels can freely conduct fishing activities as they did in the past (Article 9). In other words, Korean fishing vessels can conduct fishing activity around the Yangtze River in the China's EEZ, and Chinese fishing vessels can operate around the south of Jeju Island in the EEZ of Korea. However, Chinese fishing vessels should obey conservation measures in fishing regulation zones such as the special prohibition zones and special waters established in the northern part of the Yellow Sea by the Korean Domestic Law. In return, Korean fishing vessels should obey conservation measures in the fishing suspension zone and in the fishery resource conservation zone along the Chinese Yangtze coast.

To implement the agreement effectively, the Korea-China Joint Fishery Committee was established. The Committee consists of one representative and several commissioners from each country and, if necessary, a sub-committee of experts could be established. The Committee recommends mainly the followings: the species that it is possible to fish, the amount of quota allocation and other detailed fishing conditions for allowing the operation of another party's fishermen and fishing vessels; matters related to maintaining a fishing area; matters related to the state and conservation of marine living resources; and matters related to fishery cooperation between two countries (Article 13). The Committee discusses and decides the issues on joint conservation measures for fishery resources in Transitional Waters and Provisional Waters.

2.4 Fisheries legal framework

In Korea, the "Fisheries Law" and the "Fishery Resource Protection Law" provide the legal framework for the management of the fisheries sector and the protection of fishery resources. Based on the Fisheries Law, the central government (MOMAF) and local governments (provincial, city and district) are responsible for fishery resource management.

MOMAF is largely in charge of managing fishery resources in the offshore, distant water, and foreign flagged vessels fishing areas within Korean EEZ, while local governments are mainly in charge of fishery management in the coastal areas. Monitoring and enforcement are conducted by MOMAF, the Maritime Police and local governments, which mobilized 84 patrol vessels, 220 guard-ships, 10 helicopters, and 3,950 staff in

2001. It was, for example, reported that 1,532 national vessels and 95 foreign-flagged vessels violated Korean laws and regulations in 2001 within the EEZ of Korea.

2.5 Conservation and management measures

The Korean government has traditionally managed the fishing industry and fish stock through technical measures such as closed season, closed area, mesh size regulation, etc. as well as input control based on the licensing system of fishing boats and fisheries. In addition to the former technical regulations and the control of fishing efforts, the vessel buyback programme has been promoted since 1994, and the output control is also utilized by adopting the Total Allowable Catch (TAC) policy since 1999.

Korea has restricted the number of participants by setting the limited number of licences by fishery. This has been implemented by fishery types in offshore and coastal fisheries in order to control the conflicts between different areas or between fishery types and to strive for balanced development of fisheries. In the case of offshore fisheries, the limited licensing system was implemented for large otter trawl fisheries and diving fisheries in 1953 and for other fisheries in 1976 (See Table 3).

For coastal fisheries, it has been allowed to set the limited number of licences since 1975, but in practice, among coastal purse seine fisheries, the limited number was set for sukjo net fisheries and yangjo net fisheries, and it was expanded to other coastal fisheries after the 1990s. As of 2004, the limited number of licences for coastal fisheries are 19,273 for coastal grill net fisheries, 850 for coastal improvement stow net fisheries, 426 for coastal yangjo net fisheries, 10,672 for coastal trap fisheries, 781 for coastal lift net fisheries, 1,475 for coastal shrimp net fisheries, 17 for coastal boat seine fisheries, and 30, 753 for coastal combined fisheries.

Table 3. Number of licence by type of offshore fisheries in Korea (source: Ministry of Maritime Affairs and Fisheries (MOMAF), *Fisheries Yearbook*, 2005)

	1953	1976	1978	1982	1998
Large Otter Trawls	185			Danish Seine (80) Pair Trawl (180)	
Diving	295	283	273		249
Middle Otter Trawls		125	Eastern (42) West Southern (65)		
Eastern Sea Trawl		25		43	
Offshore Stow Nets		1,100		850	
Offshore Drift Gill Nets		2,200			
Offshore Dredged Nets		540			

Anchovy Drag Nets		200		150	
Offshore Trawl				60	
Large Powered Purse Seine				35	
Offshore Traps				300	

Beside the restriction on the number of fishing vessels by fishery, the Korean government has employed other conservation measures. The “Fishery Resource Protection Decree (FRPD)” provides specified technical measures. As shown in Table 4, technical measures are categorized into restrictions of fishing activity, fishing gear, and others. Regulating fishing activity includes measures such as the restriction of specific fisheries, closed areas and seasons, restrictions on specific fish species, catch restrictions on fish eggs and juvenile fish, and restrictions of fishing areas. Regulating fishing gear includes restrictions on fishing gear size and type and mesh size. Other measures include restrictions on catch landing and transshipment, restrictions on place of sale, water quality conservation measures, and the prohibition of sales of illegal catches.

Table 4. Technical measures implemented in Korea

Types	Specific technical measures	Legal basis (FRPD)
Regulating fishing activity	Restriction of specific fisheries	Article 4
	Closed areas and seasons	Article 4,7,8,9,17
	Restriction of specific fish species	Article 11
	Catch restrictions on fish eggs and juvenile fish	Article 11-12
	Catch restriction of non fishermen	Article 14
	Restrictions on fishing area	Article 17
	Prohibition of fish road inspection	Article 12
Regulating fishing gear	Fishing gear types	Article 5,6,23
	Mesh size	Article 6
	Fishing gear size	Article 6
Others	Restrictions on catch landings and transshipments	Article 19,20
	Restrictions on fish selling place	Article 21
	Water quality conservation for fishery resources	Article 16
	Prohibition of sales of illegal catches	Article 29

The Korean government has been operating the Fishery Resources Protected Area (FRPA) to protect fish habitats and spawning grounds. Currently, 10 FRPAs are designated across the coastal areas. In those areas and neighbouring areas, any reclamation of coastal waters is restricted, the purifying facilities to mitigate marine pollution are expanded, and any discarding of pollutants is prohibited.

As basic provisions were prepared in the revision of Fisheries Law on December 30, 1995; the Fishery Resources Protectorate was revised on December 31, 1995; and the "Regulations on the Management of Total Allowable Catch" was implemented on April 25, 1998, a Korean TAC measure was enforced on a full scale.

The background for the introduction of this management measure include the accommodation of new maritime order with the effectuation of the UN Law of the Sea, the compliment of the traditional fisheries management policy, Korea-China-Japan Fishery Agreements, and the necessity of the rational management system of fishery resources in the waters surrounding Korea.

The current operation of the Korean TAC policy is divided into two phases of the determination of the annual TAC and their individual allocation. More specifically, based on the basic state of fish stock estimated by the National Fisheries Research & Development Institute (NFRDI), the TAC Council evaluates the annual TAC, and the Central Fisheries Coordination Committee makes a final decision on the annual TAC and the provisions on its management. Then, the Ministry of Maritime Affairs & Fisheries (MOMAF) allocates an annual TAC to cities and provinces, and each city or province assign 70% of the allocation to individual fisherman with consideration of the tonnage of fishing vessels and the catch in the last three years. When more than 80% of individual quota is spent, additional allocation or total distribution can be done from the remaining 30%.

In 1999 when this policy was first implemented and enforced, the species of fish subject to the TAC policy were those with large catch and heavy industrial weight as well as sedentary fish that need protection due to the drastic decrease of fish stock, and they were four species of fish - mackerel, jack mackerel, sardine, and red snow crab. As of 2005, the number of the target species of fish has been increased to 9 by adding snow crab, purplish clam, pen shell, spiny top shell, and blue crab (See Table 5); moreover, the number is expected to go up to 20 by 2010 with additional species including groundfish.

Table 5. TACs by species; 1999-2004 (unit: metric tons) (source: Ministry of Maritime Affairs and Fisheries (MOMAF), *Fisheries Yearbook, 2005*)

	TAC Target Fisheries									
	Large Powered Purse Seine			Offshore Traps		Diving		Cooperative	Gillnets	Total
	Mackerel	Jack Mackerel	Sardine	Red Snow Crab	Snow Crab	Purplish clam	Pen shell	Spiny Top Shell	Blue Crab	
1999	133,000	13,800	22,660	39,000	-	-	-	-	-	208,460
2000	170,000	13,800	22,660	39,000	-	-	-	-	-	245,400
2001	165,000	10,600	19,000	28,000	-	9,500	4,500	2,150	-	238,750
2002	160,000	10,600	17,000	28,000	1,220	9,000	2,500	2,058	-	230,378
2003	158,000	11,000	13,000	22,000	1,000	9,000	2,500	2,150	13,000	231,650
2004	160,000	10,600	17,000	28,000	1,220	9,000	2,500	2,058	13,000	230,378

In Korea, the vessel buyback programme has been operated since 1994 and the purpose of this policy was to rebuild fish stock through reducing fishing capacity and to promote the growth of fishing income for residual fishermen. With the buyback programme, vessels have been bought back from the types of coastal and offshore fisheries that abuse fish stock by excessive fishing or those are not competitive.

According to the records of the vessel buyback programme carried out until recently, total 2,562 vessels were bought back between 1994 and 2003, including 575 coastal fishing vessels and 1,987 offshore fishing vessels. Despite the operation of the buyback programme, the number of coastal fishing vessels is in fact increasing, so MOMAF has planned to annual buyback about 6,300 vessels, 10% of the current number of vessels, targeting coastal fisheries with relatively large catch from 2004.

Besides these conservation and management measures, the Wetland Conservation Act enforced as of August 1999 makes it possible for the Korean government to designate a wetland sanctuary which restricts human activities such as fishing, building, dredging, etc.

In addition, the Korean government also started a fishermen-oriented co-management system for more effective implementation of responsible fisheries in 2001. Under this system, an organization of fishermen such as a fishery corporation or a group of fishermen in fishing villages set up self-regulations in accordance with the fishery-related laws and regulations with the endorsement of local government; thereby a fishery is controlled. The fishermen-oriented co-management system is designed to enhance the sense of responsibility of the fishermen and to prevent illegal fishing.

Furthermore, the Fisheries Law provides for the enhancement of fishery resources. The Korean government has implemented fishery-resource-fostering efforts, including installing artificial reefs, production and release of fry, release of salmon and cod, and sea farming projects for coastal fishing grounds.

3 PEOPLE'S REPUBLIC OF CHINA

3.1 International conventions and agreements

China has ratified the following conventions and agreements (Table 6).

Table 6. International conventions and agreements ratified by China

Conventions/Agreements	Date of ratification / accession
1982 UN Convention on the Law of the Sea	7 June 1996 (R)
1992 Convention on Biological Diversity	5 January 1993 (R)
Cartagena Protocol on Biosafety	6 September 2005 (approval)
1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	8 January 1981 (R)
1992 United Nations Framework Convention on Climate Change	5 January 1993
Kyoto Protocol	30 August 2002

Conventions/Agreements	Date of ratification / accession
1974 International Convention for the Safety of Life at Sea (SOLAS) ¹	Ratified but date not identified
1973 International Convention for the Prevention of Pollution from Ships (MARPOL) ²	Ratified but date not identified
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) ³	Ratified but date not identified
1990 International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC)	Ratified but date not identified

3.2 Maritime zones

3.2.1 Territorial Sea

On 25 February 1992, China adopted the Law on the Territorial Sea and the Contiguous Zone.

The extent of the China's territorial sea measures 12 nautical miles from the baseline of the territorial sea. The China's baseline of the territorial sea is established by applying the method of straight baselines, formed by joining the various base points with straight lines. The outer limit of the China's territorial sea refers to the line, every point of which is at a distance of 12 nautical miles from the nearest point of the baseline of the territorial sea (article 4).

China exercises sovereignty over its territorial sea and the airspace over the territorial sea, as well as its seabed and subsoil (article 5).

Non-military foreign ships enjoy the right of innocent passage through China's territorial sea according to law (article 6).

Any international foreign organization, or individual who intends to conduct activities connected with scientific research or marine survey in Chinese territorial sea is required to first seek the consent of Chinese competent authorities and abide by the laws and regulations of China. Whoever is found illegally entering the Chinese territorial sea to conduct activities connected with scientific research or marine survey in violation of the preceding provisions is to be dealt with by the relevant organs of the People's Republic of China according to law (article 11).

When the competent Chinese authorities have good reasons to believe that a foreign ship has violated the laws and regulations of the People's Republic of China, they may exercise the right of hot pursuit. The hot pursuit commences when the foreign ship, or one of its small boats, or other craft working as a team and using the ship pursued as a mother ship is within the limits of the internal waters, territorial sea or contiguous zone of the People's Republic of China. As

¹ China ratified the SOLAS Convention 1974, the SOLAS Protocol 1978 and the SOLAS Protocol 1988.

² China ratified MARPOL 73/78 (Annex I/II), MARPOL 73/78 (Annex III) and MARPOL Protocol 97 (annex VI).

³ China ratified the London Convention 72 but not the London Convention Protocol 96.

long as the hot pursuit is not interrupted, it may continue outside the territorial sea of the People's Republic of China or the contiguous zone. The hot pursuit ceases as soon as the ship pursued enters the territorial sea of its own country or of a third country (article 14).

3.2.2 Exclusive Economic Zone and Continental Shelf

China adopted the Exclusive Economic Zone and Continental Shelf Act on 28 June 1998. It provides that, in the EEZ, China exercises sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources of the waters superjacent to the seabed and of the seabed and its subsoil (article 3). China also exercises sovereign rights over the continental shelf for the purpose of exploring it and exploiting its natural resources, including living organisms belonging to sedentary species (article 4). No foreign vessel is allowed to engage in fishing operation in the Chinese EEZ without an authorization from the competent authorities. These authorities have the duty to take all conservation and management measures necessary to prevent overexploitation (article 5). They may also adopt measures for the conservation and management of straddling and highly migratory fish stocks, marine mammals and anadromous stocks originating in the rivers of the People's Republic of China and catadromous species that spend the greater part of their life cycle in Chinese waters (article 6). Chinese competent authorities are also required to prescribe all measures necessary to prevent, reduce and control pollution of the marine environment (article 10). In exercising its sovereign rights over the living resources of the EEZ, China may take any measure necessary to ensure compliance with applicable domestic laws and regulations, including boarding, inspection, arrest, detention and judicial proceedings. It may also exercise the right of hot pursuit in accordance with international law (article 12). Table 2 provides an overview of the status of acceptance of the Ocean and fisheries-related international conventions and agreements by China.

Korea, China, and Japan declared 200-mile EEZs in 1996. However, they have yet to reach a compromise on their delimitation. Delimitation problems in the region are especially difficult because they simultaneously involve boundaries with both adjacent and opposite states. Claims to the full 200-mile EEZ will create overlap, and may result in potential controversies. This is mainly because the region has semi-enclosed seas less than 400 miles wide. Especially, the Yellow/East China Sea has been the focus of continental shelf boundary disputes since 1969. The essential cause of the disputes stems from the differences between the parties concerned as to the principle of international law to be employed in delimitation, as well as the geophysical nature of the seabed at issue.

For instance, Korea adheres to the median line in the continental shelf of the Yellow Sea and part of the East China Sea, but relies on the doctrine of natural prolongation in the north-eastern part of the East China Sea because it extends beyond 200 miles from the baseline of its territorial sea. On the other hand, in the Yellow Sea/East China Sea, China adheres to the doctrine of natural prolongation. Its claim is derived from the overlay of sediments in the seabed of the Yellow Sea and the proportionality of the lengths of the coastline. China claims that its continental shelf extends beyond the median line drawn by Korea in the East China Sea up to subzone 7 of Korean continental shelf.

3.3 Fisheries law and regulations

The principal fisheries law is the Fisheries Act 1986 promulgated by Order No. 34 of the President of the People's Republic of China on 20 January 1986⁴. It designates the Fisheries Department under the State Council as the Chinese authority responsible for the administration of fisheries throughout the country. At the local level, administration of fisheries is carried out by the decentralized services of the Fisheries Department in their area of jurisdiction. These services are authorized to set up so-called "fishery superintendency agencies"⁵ in important fishing areas and fishing ports (article 6).

No foreign fishing vessels may fish within the Chinese maritime zones except under the authority of a licence and in accordance with the conditions set forth in the access agreement concluded by the People's Republic of China and the flag State (where applicable) (article 8).

The Fisheries Act encourages the development of offshore and deep sea fishing⁶. To this end, it provides incentives to any individual who wants to undertake such activities in the form of funds, gear and technology, and tax breaks (article 15). Deep sea fishing operations and any fishing activity by means of large trawl or purse seine nets are subject to a licence issued by the Fisheries Department under the State Council, whereas other fishing activities are subject to a licence issued by local people's governments at or above county level (article 16).

It is prohibited to fish or catch:

- (a) by means of any explosives or poison;
- (b) in prohibited fishing areas;
- (c) during closed seasons;
- (d) with prohibited or non-compliant gears;
- (e) fry (articles 20 and 21).

Fishing in Chinese maritime zones without a licence or in contravention with the conditions of the licence is a serious offence. Any person convicted of such an offence is liable to a fine. In addition, the catch and any revenue that he may have derived from such unlawful activity must be confiscated. In serious cases, the fisheries administration may also confiscate the fishing gear and revoke the fishing licence (where applicable) (articles 30 and 31). Administrative sanctions imposed by the fisheries administration may be challenged in a court of law within 30 days from notification of the decision (article 33).

The Fisheries Regulations 1987, which are the principal fisheries regulations, were adopted in 1987 to implement the Fisheries Act 1986. They comprise 42 articles divided into 7 chapters dealing with: general provisions Fishery Superintendence; aquaculture fishing; development and protection of fisheries resources; offences and penalties; and supplementary provisions⁷.

⁴ As far as could be established the Fisheries Act 1986 was modified by Presidential Order No. 38 adopted on 31 October 2000. Twenty-five amendments were introduced dealing with fishing licence, fishing methods, fishing areas, fishing vessels and offences and penalties (No English translation was available).

⁵ This is the language used in the English translation.

⁶ The Fisheries Act was adopted in the mid-80s at a time where the principal objective was to increase production but developing national fleets.

⁷ No English translation was available.

China adopted regulations on fishing licence management in May 1989. It establishes three types of licences: (a) commercial fishing licences (including licences for coastal, high seas⁸ and inland fisheries); (b) special fishing licences; and (c) temporary fishing licences. It sets forth the application procedure for each type of fishing licence. The authority competent to issue licences varies in relation to the engine power of the vessel. For vessels using trawl or purse seine net whose engine power exceeds 600 HP, the licence must be issued by the Sea Area Management Agencies subject to approval by the competent authorities at the provincial and national levels. Licences for artisanal fishing vessels whose engine power is less than 399 HP are issued by the competent authority at the provincial level (article 8).

It makes provisions to reduce the number of vessels involved in coastal fisheries by requiring that vessels without licence be issued temporary licences prior to being removed from coastal fisheries (article 11).

Commercial fishing licences for coastal and high seas fishing are valid for a 5-year period subject to annual renewal. Temporary fishing licences are valid for one year and cannot be renewed more than twice (article 13).

Fishing licences are not transferable (article 18).

In 2003, China enacted Ministerial Order No 27 regulating pelagic fishing by Chinese flagged vessels on the high seas or in the maritime zones of a third country. This order does not apply to fishing operations carried out in the Yellow Sea, the East China Sea and the South China Sea.

Regulations on fishing vessel inspection were adopted on 1 August 2003 by Order No. 383 of the State Council of the People's Republic of China. The purpose of these regulations is twofold: (a) ensuring that China flagged fishing vessels meet safety requirements to safeguard the safety of both the vessel and crew; and (b) preventing pollution of the marine environment (article 1). Inspection of fishing vessels is a mandatory requirement. Inspection is a three-step process divided into preliminary, operation, and temporary inspections (article 4). The preliminary inspection is the all-around inspection of the vessel carried out by the competent agency before the vessel is put in operation (article 6). The operation inspection refers to the regular inspection carried out by the competent agency once the vessel is in operation (article 13). A temporary inspection is required:

- (a) where the vessel is unable to return to the port of registry prior to the expiry of the inspection certificate;
- (b) to control its compliance with safety requirements;
- (c) under any specific circumstances provided by the Fisheries Department under the State council (article 19).

⁸ In 1989, China had not declared an EEZ.

3.4 China's main efforts in capacity management⁹

China is facing a serious problem of overcapacity in its marine capture fisheries. In order to balance exerted fishing pressures on available fish stocks, China has taken a range of measures in order to bring its fishing capacity under control. Some of these measures are designed to control fishing capacity. Others are initiated to limit capacity utilization. Still others are employed to reduce fishing capacity directly.

China had previously made a moderate effort in controlling fishing capacity by a fishing permit system initiated in 1979 but intervened seriously with capacity utilization, especially after the late 1980s. Only recently, however, China began to take steps aimed to reduce fishing capacity directly. In the following sections, we will first discuss the options for capacity management in general and then examine China's recent efforts in capacity management in particular.

3.4.1 Options for capacity management

Measures for capacity management may be categorized differently, either in terms of the incentive effects they are likely to produce on users or in terms of the targets they are to control. The former is often termed as the incentive-based measures that may be subdivided into two broad groups. One is to establish a system that provides economic incentives for fishermen to control capacity of their own accord, without the need for the government to intervene directly (incentive-adjusting). The other is a system through which the government attempts to manage capacity levels directly (incentive-blocking).

The latter may be classified into three groups, i.e. input-based methods, output-based methods, and user charges. Input-based capacity management generally aims to contain or reduce the level of harvesting capacity. They achieve this by limiting or reducing the level of inputs deployed to the fishery. Input controls can take a variety of forms, including license limitations, utilization schemes, gear controls, and restrictions on the level of fishing activity. Output controls generally limit the quantity of fish that the fishery may land, either at the aggregate, trip or individual level. Output-based management is not capacity management measures per se. They affect the level of capacity utilization rather than capacity itself, although some output controls (e.g. ITQs) create incentives that can lead to fleet rationalization and the reduction of excess capacity (i.e. creating an incentive-adjusting effect as opposed to an incentive-blocking effect). User charges can be imposed by the government, on behalf of society, for allowing fishermen the use of fish resources. The imposition of a charge alters the costs or benefits of fishing (depending on how it is levied) and helps to control capacity by forcing the least efficient participants out of the fishery.

We will group China's measures for capacity management under three headings: (1) measures to control capacity; (2) measures to limit capacity utilization, and (2) measures to reduce capacity directly.

3.4.2 Measures to control capacity

Measures under this umbrella include a fishing permit system and a "single control" system aimed at capping the aggregate horsepower in the country's

⁹ This section is based on Mu Yong-Tong, Yu Hui-Guo, Chen Jing-Na & Zhu Yu-Gui (2006). *A qualitative appraisal of China's efforts in fishing capacity management*. J. Ocean Univ. of China, in press.

marine fishing fleets. The latter subsequently evolved to a “dual control” system, with which China attempts to bring both the number of vessels and the aggregate horsepower under control.

(i) The fishing permit system

China first introduced a license system in 1979 when the fish stock in its coastal and inshore waters were perceived as over-fished. By implementing this system, China moved its marine capture fisheries from a condition of open access to what might be characterized as a regulated open access. This is certainly imperative for controlling the country’s fishing capacity though it is only an initial step and came a little late. Since then, the system has become, and it is likely to continue to be, the cornerstone of the country’s fisheries management.

Under such a scheme, however, only a few elements of the country’s marine capture fisheries is constrained, e.g. the number of fishing vessels, the types of fishing gear and methods, or the season or area allowed fishing, but access remains free within the constraint. This system generally made the overcapacity problem worse as fishermen (and local governments) respond to the constraint, e.g. by input substitution, since it did not provide any incentives for fishermen (and local governments) to avoid overcapacity.

Since its inception, the fishing permit system has been revised several times, though without a fundamental change in essence. It is noteworthy to mention that, after the 1986 fisheries Law was amended in 2000, the MOA formulated a new regulation for the fishing permit system, namely Regulations on the Management of Fishing Licences, which was issued on August 23, 2002. While retaining the basic management measures as specified by its previous versions, the Regulations did introduce some new management approaches, notably including a fishing quota system. This is the country’s first-ever output-based measure, though it is yet to be put into effect.

(ii) From “Single Control” to “Dual Control”

With regard to the problem of overfishing, China came to realize that management efforts had to target fishing capacity rather than to focus on resource conservation only. This led China to take steps to control fishing capacity in the early 1980s, especially in its coastal and inshore waters.

In 1979, a government report on the state of the country’s fisheries pointed out that the expansion of bottom trawling and stake nets had depleted the resources, and induced the collapse of several commercially important species. That same report called for a stabilization of overall fishing effort at current levels, the replacement of trawling by gillnetting, and other fixed gear, etc. The measures proposed , however, were not implemented.

In 1981, another government report on ‘outstanding fishery problems’ identified overcapacity as the overriding issue, and called for suppression of capacity growth through measures such as diverting the larger motorized boats to offshore fishing, lowering inshore catch target levels, and transferring surplus fishing vessel crew to fish processing and aquaculture sectors, etc. In 1983, the government issued another statement calling for strict control over the increase in fishing boat numbers.

These various reports, however, led to little effect but a continuing expansion of its marine fishing fleets. In 1981, for example, there was a ceiling on the total number of vessels, but the provincial and local governments ignored its existence, with no willingness to comply with it. The ceiling is periodically revised and observed mainly in its violation. There is even a thriving market for old vessels between the provincial government and the collective fishing units.

In 1987, a first serious attempt to control fishing effort was initiated by the central government. This measure aimed only at limiting aggregate horsepower by fishing zone, thus referred to as 'single control'. By implementing this policy, China intended to limit the number of licenses issued within the national quota as predetermined. The national quota served as a ceiling for permitted vessels fishing in the trawler-free and offshore zones. This quota was then subdivided into provincial or metropolitan quotas that were further divided into county quotas and it was not allowed for fisheries agencies at provincial and lower levels to exceed the quota as assigned to them. Again, this policy had achieved little positive results and the control targets were never met by the mid-1990s.

This failure led China to replace it with a 'double control' policy in 1997, which aimed at limiting not only the country's boat numbers but also the aggregate power and served as part of the country's Ninth Five-Year Plan (1996-2000). To support this policy, the MOA also had fishing permits reissued in all coastal provinces and cities. Again, this policy failed to constrain the country's fishing capacity at what was perceived as a desired level. As a result, China's fishing capacity continued to grow.

Fundamentally, this failure was mainly because the resources were under the state ownership. Individual provinces (and individual users) tended to behave as competitors in order to maximize their local interests from the utilization of these resources. This phenomenon, known in China as "local protectionism", was in essence a typical version of Hardin's "tragedy of the commons".

Technically speaking, the failure was caused by what is known as technological "capacity creep" and input "substitution". Technological capacity creep means that, even if management regulations freeze the fleet size and/or engine power, the ability of vessels to catch more fish can still improve as a result of technological advancement, particularly in fish-finding equipment and in fishing gear and methods. Input substitution means that fishermen can almost always find ways to use unconstrained for constrained inputs.

Returning to the Chinese case, by the centrally defined aggregate capacity level, the "single control" and "dual control" systems, in essence, are both a kind of "command and control" regulation. At first glance, such regulations seem to be attractive due especially to being easy in implementation. In practice, however, there are several conditions that make an effective control of the fishing capacity difficult. First, the "command and control" regulation does not provide the economic incentives for the removal of excess capacity. Secondly, fishing capacity is not a one-dimensional concept. The controlling of a few selected inputs encourages the fishermen to bypass the regulation through increasing the use of unregulated inputs. Thirdly, overcapacity arises not only from more advanced fishing technology or bigger, faster boats. It may also occur simply from a growing number of participants. This point is of particular relevance to China where a large amount of surplus labour exists. As a result, overcapacity often results from large numbers of poor people coming from inland to coastal areas and going fishing for their livelihoods. This implies that overcapacity in

China's marine fishing fleet can occur even without technological capacity creep and input substitution.

3.4.3 Measures to limit capacity utilization

Measures fall into this category include, inter alia, the mid-summer fishing moratorium (fuji xiuyu) system and an output control policy recently implemented.

(i) The mid-summer fishing moratorium

This system is essentially a mix of area/season closures which have been in place in China since the 1950s and have become the most significant management measures in the country's management toolbox since then.

Beginning in 1995, an annual fishing ban in summer was imposed on boats operating in the Yellow Sea and the East China Sea. In 1998 and each subsequent year, the summer moratorium was extended both in time and space, including a large area of the South China Sea (north of 12°N), while trawling is wholly banned in the Bohai Sea all year around. By implementing this system, fishing is closed for three months a year (June 1 – September 16) in the Yellow Sea and the East China Sea, and for two months a year (June 1 – August 1) in the South China Sea (from the Taiwan Strait down to 20°N).

During the moratoria, it is illegal to even have your fishing gear either in the water or onboard a vessel, irrespective of whether you are fishing or not. As a result of the implementation of the 2- or 3-month moratoria systems, more than 117,000 fishing vessels nationwide have to stay in port, leaving about 1.2 million fishermen idle in 2003.

Although some Chinese officials and scholars consider the measure to be the most effective fishing capacity management tool for the moment, it does not really take care of the overcapacity problem because it reduces neither the number of fishing vessels nor the aggregate fishing capacity. After the summer moratoria, fishing becomes more intense as fishermen try to catch as much fish as they can in the shortened period of time in an attempt to compensate for "time lost fishing" during the closed season. This explains why restrictions on fishing time frequently lead to overcapacity: fishermen simply replace the restricted input (the time banned fishing in this case) with unrestricted ones (the time allowed fishing).

(ii) Efforts to control marine catches

Since the early 1950s to the late 1990s, the annual output increase had become a major indicator for measuring the country's success of fisheries development and an important criterion for determining the performance of officials in charge of fisheries matters. One of the objectives of the country's 1986 Fisheries Law, for instance, was to strongly promote fishery development and increasing output had remained the priority objective up to the late 1990s. This, together with China's assessment and promotion system for officials, overemphasized the increase in landings and, in effect, provided a strong incentive for officials to over-report catches.

China established a 'zero-growth' policy in 1999, explicitly stating that marine catches were not allowed to exceed the level at the end of 1998. The shift in policy was caused by two main reasons. One was a realization that, from a long-term perspective, increasing benefits from fishery resources must come either from increasing the value and value-added of a given output, or from reducing the costs of production, or from some combination of the two. The other was that the central government came to wake up to there being a need to remove all reasons for local officials to over-report catches. This, on the other hand (and this is an explicit goal of the zero-growth policy), should encourage or force them to report on qualitative changes in the fishery, including, *inter alia*, on success in phasing out illegal and excess inshore vessels, shifting deck crew into non-fishing businesses, and recreational fishing. Besides, the policy was intended to pave the way for provincial leaders willing to break with the old 'tonnage/GDP' ideology.

The zero-growth policy continued to the year 2000, with the expected result that the reported annual catches for 1999 and 2000 were almost exactly equal to that for 1998.

3.4.4 Measures to reduce capacity directly

Historically, as occurred in the other parts of the world, the Chinese government at different levels has played an important role in fuelling the expansion of excessive fishing capacity and overexploitation by providing lucrative policies including financial assistance (or alternatively termed as "subsidies") of nearly all kinds. Most recently, however, China has taken two actions that represent an evident shift in policy orientation. They are a nationwide campaign against illegal, unreported and unregulated (IUU) fishing and a buyback programme, both of which have a distinctive effect on fishing capacity reduction. The driving force underlying the two actions came at least from two aspects, one being to make China's fisheries management compatible with international requirements, and the other to bring its marine fishing capacity in balance with the available resource in its waters.

(i) Combating illegal fishing

One major problem associated with overcapacity in China's marine (and inland) fishing fleets is the prevalence of IUU fishing. According to a 2000 report, since 1985, the number of fishery workers in China had increased by six million, of which about 2 million were engaged in fishing itself. As a result, IUU fishing in China during that period was increasing in both intensity and scope, and was seriously undermining the country's efforts to manage fisheries in a sustainable way.

In China, three official kinds of certificates are presently required for engaging in marine capture fisheries. They are (1) a fishing vessel inspection document; (2) a fishing vessel registration document; and (3) a fishing license. Vessels without or with an incomplete set of those certificates are generally referred to as "3-no's vessels". According to the BOF, the IUU fishing most commonly observed in China involves the use of illegal gear, fishing in closed areas and seasons, catches of illegal or undersized species, and most notably fishing with vessels labelled as "3-no's".

To combat illegal fishing, China conducted a first-ever nationwide fishing vessel census in 2000. The result of the census showed that of China's all fishing vessels, 28% were identified as without the three mandate certificates, another 21% lacking at least one certificate. Of these problematic vessels, 72% were small boats less than 12 meters in length, including 156,000 light boats or rafts, of which many operated in inshore nurseries and were reported to utilize destructive fishing techniques, including poison, explosives, electric shock gear.

The BOF regarded the elimination of IUU fishing as a major goal second to the fishing capacity reduction. One tactic China adopted in 2002 was to require bilingual (thus harder to counterfeit and easier to enforce) fishing licenses to be onboard fishing boats at all times. A second tactic was to require that fishing boats be licensed before being allowed to leave the shipyard.

(ii) The fishing buyback programme

The number of small boats operating in China's coastal and inshore waters has increased substantially since 1985, arising from the combined effects of the following factors. The first one is the country's relaxation of price controls over its fishery products starting in 1985 as previously mentioned, which made many forms of fishing profitable that earlier had not been, and thus tempted many to try their luck in fishing.

The second one, occurring in the same period, is the enormous mass migration of farmers to coastal areas, combined with an inability of the country's fisheries management team to enforce legislation and regulations on the ground, which suggests that a serious "implementation gap" yet to be bridged. The local fishery law enforcement authorities are chronically short of funds, and generally lack the means to perform their mandate responsibilities. Not only are the enforcement vessels slower than the fishing boats they are supposed to supervise, but also they lack the operating funds required to sustain their normal operations.

The third one is the so-called 'local protectionism' that has also played a role in creating the present uncontrolled situation. In many areas, local officials have granted fishing or boat construction permits to applicants who, had the regulations been implemented, would have been found not qualified, in order to collect fees to supplement their own incomes, and/or finance the institutions they work for. In other cases, local officials have intentionally overlooked the status of vessels lacking licenses, as their own political careers benefit from reports of high local "production".

To address the problem of explosive growth in the number of small-sized fishing boats, the MOA has launched an 8-year buyback programme (2003-2010) funded at RMB 270 million yuan on an annual basis from 2002 to 2004. The programme aims at delicensing and scrapping a total of 30,000 fishing boats from 222,390 vessels at the end of 2002 to 192,390 vessels by 2010, or 3750 vessels each year. In terms of engine power, the programme's objective is a reduction of 1,269,663 kW, from 12,696,631 kW at the end of 2002 to 11,426,968 kW by 2010, or a reduction of 158,708 kW each year. During 2002, the year before the programme was launched, China scrapped and withdrew the licenses of 5000 ships. A related regulation mandates that a new fishing vessel cannot be built unless the new unit will replace an existing vessel and inherit its license.

Details on the size and nature of the boats that have actually been scrapped are not yet available. As a general practice, however, the central government funds

are passed to local governments, which then add some local funds and recruit fishermen to participate in the programme voluntarily. Table 7 lists the amount of subsidy paid for scrapped vessels from the central government.

The programme also plans to move 200,000 fishermen (4% of the total) to other jobs by 2010. To accomplish this goal, policy tools such as subsidizing the infrastructure of fish farming and offering some training programmes are employed.

Table 7. Payment criteria for each vessel scrapped

Vessel's specification (kW)	Subsidy paid for each vessel scrapped (Yuan)
20 to 40	15 000
40 to 60	20 000
60 to 80	25 000
80 to 100	30 000
100 to 150	50 000
150 to 200	60 000
200 to 300	80 000
300 to 500	100 000

In order to make the programme more practical, cooperation between the central and local governments was needed. For this reason, the reduction target was divided into provincial targets which were then assigned to each province for implementation (Table 8).

Table 8. Targets assigned to individual provinces bordering the sea: 2003-2010

Province/City	Fleet size at the end of 2002		Target Fleet size in 2010	
	Vessel number	Engine Power (kW)	Vessel number	Engine Power (kW)
Liaoning	28, 441	1,086, 054	24, 604	972, 534
Tianjin	1, 237	46, 587	1, 070	41, 717
Hebei	8, 406	378, 335	7, 272	338, 789
Shandong	35, 363	1, 472, 874	30, 593	1, 318, 921
Jiangsu	15, 089	730, 370	13, 054	654, 028
Shanghai	725	85, 416	627	76, 488
Zhejiang	34, 543	3, 835, 696	29, 883	3, 434, 769
Fujian	22, 924	1, 560, 285	19, 832	1, 397, 196

Guangdong	49, 659	2, 218, 997	42, 960	1, 987, 056
Guangxi	14, 321	732, 325	12, 389	655, 778
Hainan	11, 682	549, 692	10, 106	549, 692
Total	222, 390	12, 696, 631	192, 390	11, 426, 968

Plans for evaluating the results of buybacks should also be considered when these programmes are being designed. Measuring and evaluating the results can identify important lessons that can improve the effectiveness of future buybacks.

4 Draft Plan for a Regional Agreement on Sustainable Use of Fisheries Resources

4.1 Measures for overcoming the legislative issues: legal basis for regional cooperation

There are more than 500 maritime boundaries in the world between adjacent EEZs, and significant proportions of the world's fish stocks lie across these boundaries and are fished by two or more nations. Taking into account this circumstance, the 1982 UN Convention and other instruments such as the Compliance Agreement, UNIA (1995 United Nations Agreement for the Implementation of the Provisions of the United Nations Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks), and the FAO Code of Conduct for Responsible Fisheries emphasize that regional fisheries organizations (RFOs) should play a role in managing and conserving world marine capture fisheries. The international instruments encourage states to establish RFOs where appropriate, and to strengthen existing RFOs in order to improve their effectiveness in establishing and implementing conservation and management measures.

Also, International Plan of Action for the Management of Fishing Capacity adopted by the FAO in 1999 urges states to take immediate steps to address the management of fishing capacity through regional and global cooperation for international fisheries requiring urgent attention, with priority being given to transboundary, straddling, highly migratory and high seas stocks that are significantly overfished.

More specifically, the 1982 UN Convention emphasizes the role of RFOs for management of fish stocks straddling national jurisdictions, or beyond them, that cannot be managed by a single state. Under these circumstances concerned states should take steps to implement cooperative conservation and management measures through RFOs. Article 63 of the UN Convention provides that the states concerned should seek, through appropriate RFOs, to agree upon the measures necessary to coordinate and ensure the conservation and development of fish stocks. If the stock is exploited in the EEZ of any of the states involved, that states has a duty to cooperate through an appropriate RFO with the other states through whose EEZ the stock migrates. Article 118 refers to the need to establish RFOs, as a means of cooperation between states, for the conservation and management of high seas living resources.

Agenda 21 stresses the importance of RFOs in securing the long-term sustainable use of living marine resources. Chapter 17 refers to the need for, and the role of, RFOs in the

process of achieving sustainable fisheries development. Further, Chapter 17 addresses the need for effective and multilateral cooperation, within the framework of RFOs, in the programme areas relating to the sustainable use and conservation of high seas and EEZ fisheries. The necessity for coordination and cooperation between RFOs is also highlighted.

The Compliance Agreement urges countries to take effective action to deter the reflagging of vessels for fishing activities on the high seas. It also emphasizes regional cooperation among states for the implementation of the agreement. The preamble of the Compliance Agreement calls upon states that do not participate in RFOs to do so, with a view to achieving compliance with international conservation and management measures. Article V(3) provides that the parties should, when and as appropriate, enter into cooperative arrangements of mutual assistance, on a global or regional level, in order to promote the objectives of the agreement. Article VI provides for exchanges of information to RFOs.

The FAO Code of Conduct for Responsible Fisheries urges RFOs to participate in the implementation of all aspects of the Code in relation to fisheries management and fishing operations. Article 7 of the Code of Conduct stipulates that where transboundary and straddling fish stocks are exploited by two or more states, the states concerned should cooperate to ensure effective conservation and management of the resources through the establishment of a RFO. The Code also emphasizes the role of RFOs in establishing a responsible international fisheries regime. Article 6.5 requires RFOs to apply a precautionary approach to the conservation, management, and exploitation of marine living resources. Article 7 describes the role of RFOs in fisheries management, including such roles as attaining management objectives, providing a management framework and procedures, data gathering and subsequent management advice, application of the precautionary approach, describing management measures and the implementation of the Code. Article 8 requires states within the framework of RFOs to establish effective monitoring, control and surveillance (MCS) system and enforcement.

The UNIA provides an important role to RFOs in the compliance and enforcement system of the agreement. Part III of the agreement, relating to mechanisms for international cooperation concerning straddling fish stocks and highly migratory fish stocks, specifies the scope and role of RFOs in facilitating management. Article 8(1) urges coastal states and fishing states to pursue cooperation in relation to straddling fish stocks and highly migratory fish stocks through appropriate RFOs to ensure effective conservation and management of such stocks. Article 8(3) provides that where a competent RFO exists, states should either become members of the organization, or they should agree to apply the conservation and management measures established by such organizations. Article 8(4) provides that only those states which are members of such RFOs should have access to the fishery resources to which these measures apply. Article 8(5) notes that where there is no RFO, relevant states in the region should cooperate to establish such an organization to ensure conservation and management of the fish stocks. Article 9 and 10 provide for the establishment and functions of RFOs. Article 11 provides for new members or participants and Article 12 requires transparency in the activities of RFOs. Article 13 promotes the strengthening of existing organizations. Article 18-23 refer to the subjects of monitoring, control and surveillance by flag states providing for international, regional cooperation in enforcement.

Article 122 of the 1982 UN Convention defines “enclosed or semi-enclosed seas” as “a gulf, basin or sea, surrounded by two or more states and connected with another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and EEZs of two or more coastal states.” Based on this definition, the Yellow Sea is a semi-enclosed sea. In particular, the Yellow Sea comprises the territorial seas and EEZs of

Korea, China, and North Korea. Semi-enclosed seas tend to have unique marine living ecosystem with relatively little interchange of fish species beyond their borders and generally with fish stocks shared among coastal states. Therefore, close cooperation among states is required for the conservation and management of fish stocks in the region.

In this regard, the UN Convention emphasizes the importance of enclosed or semi-enclosed seas in the management of marine living resources. It calls for the states bordering enclosed or semi-enclosed seas to cooperate in fisheries directly or through appropriate RFOs (Article 123): (1) to coordinate the management, conservation, exploration and exploitation of the living resources of the sea; (2) to coordinate the implementation of their rights and duties with respect to the protection and preservation or the marine environment; (3) to coordinate their scientific research policies and undertake, where appropriate, joint programmes of scientific research in the area. Therefore, if Korea, China, and other related countries cooperate through RFO in the Yellow Sea region, it will contribute to avoiding overexploitation and increasing fish production over the long-term through effective management as well as lowering the costs of scientific studies, controlling the fishing activities of other countries, and easing tension and fishery disputes facing the region.

It is in this context that the Yellow Sea agreement must operate, recognizing both the national control over some areas of the sea and the joint management and control required in the Provisional Waters (Yong-Tong et al, 2006).

4.2 Measures for strengthening fisheries laws and regulations (fisheries management)

Article 5 of the UNIA provides that coastal and fishing countries should adopt measures to ensure the long-term sustainability of straddling fish stocks and promote the objective of their optimum utilization. And such measures should be based on the best scientific evidence available. Article 61 of the UN Convention provides that the coastal states should determine the allowable catch of the living resources and obliges states to use scientific evidence to allocate shares of stocks. Article 10(b) of the UNIA states that in fulfilling their obligation to co-operate through RFOs, states shall "agree, as appropriate, on participatory rights such as allocations of allowable catch or levels of fishing effort." The UNIA invokes the precautionary approach when scientific data do not clearly indicate that it is prudent to establish a fishery. Article 6 of the UNIA requires that the precautionary approach be "widely applied to conservation, management and exploitation of straddling fish stocks in order to protect the marine living resources and preserve the marine environment."

The Code of Conduct also notes that "States should apply the precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures"(Article 7.5.1). In applying the precautionary approach, the UNIA also provides guideline for the application of precautionary reference points to straddling fish stocks.

A variety of management tools have been used to address fishery management problems in the world. Such tools vary in their potential effectiveness for controlling fishing capacity. They generally fall into the categories of output control, input controls, and technical measures. Output controls constrain the catches that may be taken by the fishery. These tools include Total Allowable Catch (TAC) and Individual Quota (IQ) or Individual Transferable Quota (ITQ). Input controls constrain who may fish, and how

much they may catch. These tools include licence limitations, and gear and vessel restrictions. Technical measures constrain where, when, and how fish may be caught. These tools include size and sex selectivity, closed areas and seasons. While input controls are management mechanisms designed to control and limit the actual fishing effort applied in fisheries, output controls are mechanisms, such as quotas, to control the resulting catches. However, input and output controls and technical measures are usually used in combination, which may often result in a more practical and effective management system.

For output control, TAC sets a maximum on the total catch for specific species in a specific area for a given season or period. TAC is generally calculated just before the start of the fishing season on the basis of scientific advice on the state of exploited fish stocks. Catches are monitored and when the catch reaches the TAC the fishery is closed for the season. TAC does not prevent overexploitation effectively but generate a 'race for fish'. This is because the TAC forces fishers to fish as hard as possible to have a good share of the catch before the TAC is exhausted. The TAC shortens fishing seasons and results in excess capacity because the fishery is closed when the TAC is exhausted. When approaching the limits of a TAC it is difficult to obtain data in a sufficiently real-time basis to close the fishery, resulting in frequent over-runs of the TAC. TAC creates more employment as a result of the 'race for fish', but employment is less steady and for shorter periods. TAC tends to be set at higher levels than recommended by scientists due to political pressures. TAC is set separately for each for major species, and leads to by-catch problems in multi-species fisheries. Fishing for secondary target species continues even after the TAC for the main target species is exhausted, leading to wasteful discarding.

IQs are defined as quotas that give an individual producer, or fishing unit, the right to catch a specified quantity and species of fish in a specific location during a specific period of time. ITQs are IQs that are transferable between fishers through markets. IQs (ITQs) are widely advocated as ways to rationalize over-capitalized and over-exploited fisheries and to solve some of the problems associated with the TAC. This is because ITQs encourage vessel owners to reduce excess fishing capacity voluntarily by shifting the focus from increasing catches towards reducing costs as the means to improve income. They are best-known through their use in New Zealand, Australia, and Iceland beginning in the 1980s. There are many incentives for the use of IQs or ITQs. IQs (ITQs) are an effective means of mitigating the 'race for fish' that can occur under a TAC. As a result, the reduction of excess harvesting capacity is expected because of exclusive rights to a permanent share of the catch. Transferability of ITQs enables the most efficient operators and fishing gears to increase their shares via trading mechanisms, and allows the less efficient fishermen to leave the fishery. In the Canadian halibut fishery, the number of vessels was not reduced under IQs but was reduced from 435 to 353 under ITQs. IQs (ITQs) reduce employment and producer's profitability is improved because of the inherent incentive in an individual quota programme to reduce the number of vessels. IQs (ITQs) are also effective in limiting catches at or below the TAC determined by management authorities. However, in spite of the above-mentioned advantages, there are several disadvantages to IQs or ITQs. IQs (ITQs) normally create the incentive to misreport catches, and to discard lesser-valued fish to maximize return per unit of quota. This occurs especially with different types of catches, such as different sizes of fish. In addition, IQs (ITQs) can facilitate concentrations of capital and accumulation of quotas in the hands of a few, and leads to the breakdown of traditional fishing societies. IQs and ITQs also pose particular implementation problems in multi-species fisheries.

Licence limitation sets a maximum on the number or capacity of fishing units (vessel and gear) allowed participating in the fishery. This method is the simplest means of

controlling fishing effort by using a licence scheme that limits the number of vessels or fishers participating in a fishery. Licences are generally given to fishing units that have historically participated in the fishery or that have invested significantly in the fishery's development. In particular, licence limitations can be applied to the situation where effort is identified as increasing too rapidly, and are an easier method to collect or gather information on catch and capacity while not being costly to implement. With licence limitation, the fishing effort will temporarily decrease and then increase in the long-term without appropriate regulation because the remaining fishing units may seek to invest in more productive gear and vessels to gain higher profits. Employment is expected to decrease and some mitigation of the 'race for fish' is expected under limited licences.

Gear and vessel restrictions are designed to reduce or constrain the productivity of individual fishing units. Gear and vessel restrictions may be used to limit the power and size of vessels and gears, and their catchability and capacity. Vessel and gear restrictions prohibit producers from using gears and vessels they would otherwise find most profitable. By implementing gear and vessel restrictions, pressure on the resource stock is relieved to some degree and modest stock conservation is expected. Increased costs are expected, which has the effect of reducing the amount of fishing effort of each individual vessel and causing marginal vessels to exit the fishery. The number of vessels in a fishery will decrease and increased catch is expected under gear and vessel restrictions.

As one type of technical measure, size and sex selectivity measures are meant to control the size and sex of fish that are caught and landed. Size selective gear restrictions, such as maximum and minimum mesh size limits, affect the maximum and minimum size at which fish are caught. Minimum mesh size are used to prevent the capture of small fish, and maximum mesh size are applied to ensure that some fish are able to reach maturity and spawn before capture, or to increase the average size of fish landed in the fishery. Sex selective measures restrict the catch of mature, or egg-bearing, females. However, in practice, minimum and maximum mesh size measures may be used in different types of gear due to their different selectivity. For example, minimum mesh size measures may be used for trawlers, and maximum mesh size for gillnet. If appropriately set and complied with, measures regulating fish size selectivity are expected to strengthen conservation and improve the status of the resource stock. Stock size may increase through the use of size and sex selectivity measures. It is also expected that the number of vessels and employment will increase in a fishery managed with size and sex selective measures. However, size and sex selectivity measures may not mitigate the race-to-fish and result in increased enforcement costs and/or problems. Since fish caught that are not legal size cannot be sold, discards may increase with an increase in minimum fish size, resulting in a loss of the economic benefits associated with the discarded fish.

Closed seasons and areas are to prohibit fishing in an area during a specific time interval. Closed seasons are designed to protect vulnerable stocks in critical periods of their life cycles. Closed areas are the most appropriate for sedentary local stocks, and used to protect the grounds of juvenile and breeding fish. Closed areas can effectively set minimum size where juveniles and adults live in different areas in a fishery. A closure is expected to reduce fishing mortality, improve stock abundance and provide some stock conservation, resulting in increasing or stabilizing landings. Closed seasons also can contribute to improved quality or marketability, and reductions in vessels and employment. However, when an area is closed, producers formerly fishing in the closed area seem to have difficulty in covering all of their fixed costs, resulting in increased harvesting costs. Participants in a fishery may increase their investment in fishing vessels and technology to ensure good catches during the more limited open

season, thus leading to increased fishing pressure. The benefits of closed areas can be enhanced by the establishment of other controls on fishing effort outside the closed area.

According to Annex II of the UNIA, there are two types of reference points for conservation efforts; Limit reference points (LRPs) and target reference points (TRPs). LRPs define the conservation objective by setting a point beyond which fishing is considered dangerous for the long-term conservation of that stock. TRPs constrain the harvesting within safe biological limits within which the stocks can produce MSY. An LRP may therefore be viewed as a quantitative expression of the conservation objective. Whatever form the limit reference point takes for a stock, the fishery must then be managed in a way that minimizes the risk of that point being exceeded. Annex II of the UNIA suggests that "the fishing mortality rate which generates MSY should be regarded as a minimum standard for LRPs." TRPs differ from LRPs in that they usually correspond to a specific management objective and indicate a desirable level of fishing or status of the resource. Therefore, TRPs can be seen as a defined expression of the management objective. The establishment of TRPs will depend heavily on the objectives agreed for the arrangement. Specific management strategies, such as a TAC or level of fishing effort, may be designed to ensure that exploitation of the resources is consistent with the TRP.

A number of RFOs have introduced a variety of management measures including input and output control, and technical measure to avoid overfishing and keep fish stocks at sustainable levels. For example, determination of the TAC and allocation of quotas have been a principal measures of fishery management in many RFOs. The CCAMLR, CCSBT, CFP, IATTC, IBSFC, ICCAT, IPHC, NAFO, and NEAFC have adopted TAC system. TACs are normally established on the basis of scientific advice, taking into account a number of different factors, including biological, economic and social factors. When the TACs have been agreed to, as a next step, share for each member country is generally allocated. In determining the quota allocation, a variety of factors can be considered: catch history; size of EEZs; the geographical particularities of the region; socio-economic factors; and ability to monitor catch. In particular, catch history and size of EEZ are main elements to deciding quota allocations. More specifically, the CCSBT considers the following elements in deciding on allocations among the Parties: relevant scientific evidence; the need for orderly and sustainable development of stocks; the interest of Parties through which EEZ stocks migrate; the interests of Parties whose vessels engage in fishing for stocks including those which have historically engaged in such fishing and those which have stocks under development. In the CBSPC, the annual Individual National Quota (INQ) is divided equally among member states, regardless of the above-mentioned elements to decide on allocation.

In addition to the TAC system, many RFOs have also adopted a variety of management measures because TACs alone are not sufficient to control fishing. They include input control (licence limitation, gear and vessel restrictions, etc.) and technical measures (size and sex selectivity, closed seasons and areas, etc.). Also, the "precautionary approach" has been receiving considerable attention in fisheries because it provides technical guidelines for fishery management agreements. Most of the current RFOs were established before the precautionary approach was formulated in the Code of Conduct for Responsible Fisheries or the UNIA in 1995, but several of them have started to discuss the implementation of the principle.

Taking into account these situations, possible measures for implementation in the Yellow Sea region can be as follows; First, the setting of the TACs based on scientific data necessary in the region. Given that many commercial stocks are shared among coastal states and overexploited, the setting of TACs is required for species considered to be under threat from overfishing. There has been any international forum to discuss a TAC

system in the region. TAC systems were only introduced domestically in Japan and the ROK in 1997 and 1999 respectively. But China does not have domestically any experience with TACs, although he is a member of some RFOs dealing with TAC System. TACs should be set on the basis of exact scientific evidence on fish stocks and should not depend on political negotiations for higher TACs. Political complications can result in setting total quotas too high, undermining the success of conservation efforts.

Second, when TACs are set, appropriate allocations should be made between relevant countries. There are several possible options to be considered in determining the allocation between countries; allocation based on catch history and size of EEZ; equal allocation; and simultaneous fishing by all fishing vessels until the TAC is exhausted. Catch history and size of EEZ are generally major criteria to determine quota allocation in other RFOs, and they can provide guidance in the region. However, in practice, there are some difficulties in applying these elements to the region. The size of stocks within individual EEZs is generally considered based on spawning areas, distribution of regional larvae, the occurrence of juvenile fish, the occurrence and migrations of the fish stock, the rate and state of exploitation of the stock, degree of contribution for fishery conservation, and the distribution of the commercial fish species.

Third, TACs should be implemented in combination with other measures to increase their effectiveness. TACs tend to increase fishing capacity by encouraging a competitive "race to fish", and only contribute to indirectly limiting time available for fishing after the quota is exhausted. When TACs are applied alone without limited entry there is a possibility that newcomers will enter or that existing fishermen will expand capacity. Therefore, TACs must be accompanied by other measures to restrict capacity. TACs are generally accompanied by a licence system and technical measures to restrict capacity in the RFOs. A licence system may be a means of controlling fishing effort by limiting the number of vessels or fishers participating in a fishery. Licence limitation directly controls the numbers of fishing vessels, and may indirectly contribute to the limitation of vessels power, size and gear units. The direct and indirect contributions of licence limitation depend on what exactly is licensed. Depending on the size of the TAC, fishing effort can be regulated through the allocation of fishing permits stating the terms of access, the timing and the specific fisheries.

Technical measures can be considered as a useful tool in the region because many fish stocks have dispersed spawning grounds and seasonal movement. Closed areas may contribute to reducing the catchability of fishing effort, but may not limit the actual fishing effort applied, as vessels will be simply forced into waters outside such areas. The effectiveness of these measures can be ensured only if fish migration is sufficiently low to keep fish in the closed areas and if they cover waters with high fish densities used as a spawning ground. The benefits of closed areas can be enhanced by the establishment of other controls on fishing effort, outside the closed area. Closed seasons more directly limit the fishing effort of the vessels by controlling the time which vessels may spend fishing, but they may cause socio-economic difficulties if fishermen are unemployed for much of the year. Closed seasons and areas in the region may contribute to protecting the grounds of juvenile and breeding fish, and vulnerable fish stocks in critical period.

Size and sex selectivity can be used to control catchability of fishing. Size limits are applied to ensure that some fish are able to reach maturity and spawn before capture, or to increase the average size of fish landed in the fishery. Size limits may be effective in limiting the catchability of fishing gear with respect to small fish, but may be difficult to enforce in highly dispersed fisheries. When introducing management measures, fishery characteristics in the region need to be recognized and taken into account. The region is a multi-species area where multiple fishing methods are in use. One or more of the key

fish stocks may be harvested by the same fishing operation, or different fleets may be operating to catch the same stocks.

As another possible alternative in the region, ITQs can be considered an effective means of mitigating the 'race for fish' that can occur under a TAC because of exclusive rights to a permanent share of the catch. An OECD study indicated that promising avenues to deal with fisheries problems include rights-based management approaches, and argued that if the TAC is divided into individual quotas, the race for fish would be mitigated. Under the ITQ system, fishery resources can be conserved and managed effectively by motivating fishers to assume more responsibility for the conservation of the resource. ITQs can directly control the numbers of fishing vessels. In addition, they indirectly provide the economic incentives for self-limitation of the other components of fishing effort. ITQs provide an incentive to behave economically and efficiently and discourage the competitive race for fish. They lead to the reduction of excess harvesting capacity because of exclusive rights to a share of the catch. ITQs also create incentives for participants in a fishery to behave co-operatively. However, ITQs should be based on exact TACs, and to be successful would need to derive from a well-organized and established fishery organization, and improved fishermen's attitudes regarding sustainable fishery. Therefore, it is likely to be difficult to adopt ITQs immediately after the RFO is established in the region. They may, however, be a possible option to be considered in the future, when a RFO is established and operating smoothly.

4.2.1 Ways to improve and strengthen monitoring and enforcement: Lessons from other areas and organizations

The purpose of monitoring and supervision of fishing is ensure that the member states apply the rules on resource conservation correctly, especially the rules on quota compliance, technical measures and specific arrangements. The UNIA states that the implementation and enforcement of conservation and management measures adopted by RFOs should occur through effective monitoring, control and surveillance (Article 10(h)). The UNIA calls for member countries to co-operate through RFOs to ensure compliance with and enforcement of regional conservation and management measures for straddling fish stocks (Article 20). Article 21 and 22 describe how States shall co-operate in enforcement in any high seas area covered by RFO. In particular, measures raised in the UNIA include *inspection programmes, observer programmes, catch and effort reporting, vessel marking systems, vessel monitoring systems, and registers of fishing vessel licences and vessel violations*.

(i) Observer programmes

For example, CBSPC (Convention on the Conservation and Management of Pollock Resources in Central Bering Sea) member vessels are requested to carry observers when commercial fishing is resumed in the Convention Area, in a accordance with the provision of the Convention that only one flag observer per vessel must be accepted by the flag state (Article 10 of the Convention). The records of the vessel master are the primary source of data for fishery management. However, if discrepancies are found between the observer's data and the master's data, such differences are to be investigated by the flag state. CCAMLR member vessels are requested to carry at least one observer appointed in accordance with the CCAMLR Scheme of scientific observation (Article XXIV of Convention). These observers are not from the flag state. Their responsibilities are to provide biological and fishery information, including records of the details of the vessel's operations, catch samples, and records of by-catches. IATTC has a compliance regime to limit per-boat dolphin mortality for

the relatively limited number of purse seiners operating in the East Pacific Ocean (EPO). This is monitored via an observer programme with 100 per cent coverage of the largest class of purse seine vessels in the EPO. IATTC staff members screen the observer data and report any possible breaches of rules to an International Review Panel composed of nine members, five of whom are governmental representatives, two of whom represent environmental organizations and two of whom represent the tuna fishing industry.

In the ICCAT, for yellowfin and bigeye tuna, 25 per cent of purse seine fishing vessels must carry an observer, while 5 per cent of the fishing vessels using other gears must carry an observer. These observers have samples from tropical tunas and obtain the sex ratio of swordfish and conduct a by-catch survey which includes sharks. In accordance with the NAFO "Pilot Projects for Observers and Satellite Tracking," all vessels fishing in the regulatory area are obliged to accept 100 per cent observer coverage of all vessels. Each contracting party should provide to the Executive Secretary a list of the observers they will be placing on vessels in the regulatory area. Observers should monitor a vessel's compliance with the relevant Conservation and Enforcement Measures, collect catch, samples and effort data on a set-by-set basis, and provide a report to the contracting party of the vessel and to the Executive Secretary.

(ii) Reporting

Under the CBSPC, the two coastal states, Russia and the United States, are required to submit reports on scientific data and on conservation and management measures in effect in their zones (Article x) because a moratorium was implemented in 1993 in the regulatory area, after which no commercial fishing has been allowed. All vessels fishing in the CCAMLR regulatory area are required to submit the following elements (170/XVIII of Conservation Measures): five-day, ten-day or monthly summary catch and effort reporting; monthly fine scale catch and effort reporting and monthly biological reporting, and seabird and marine mammal interaction reporting. The IATTC carries out extensive monitoring to provide comprehensive data for stock assessment. The Commission maintains field officers at or near unloading ports in the Americas. Local staffs copy the fishing logs of all tuna vessels that unload, take sample catches for length frequencies, and obtain details of unloading weights. In the IBSFC, Contracting Parties should provide the Commission with monthly catch statistics broken down by Fishery Zone and Management Area for fishing by their own vessels. Communication of these statistics should take place at the latest on the last day of each month for the preceding month (Rule 2.2 of Fishery Rule). The contracting parties are required to implement and abide by ICCAT recommendations on a national basis, and report catch and effort data to ICCAT's scientific forum, the Standing Committee on Research and Statistics.

(iii) Port inspection

In accordance with the CCAMLR "System of Inspection", each member is requested to designate inspectors referred to in Article XXIV of the Convention and the Commission maintains a register of certified inspectors designated by members. Inspectors designated by members should be entitled to board a fishing or fisheries research vessel in the area. Inspectors are required to complete an approved CCAMLR inspection report form not later than 15 days after their arrival in port. If there is evidence of violation of measures adopted by the Commission, the flag states shall take steps to prosecute and, if necessary, impose sanctions. Contracting Parties are required to carry out port inspections

to ensure compliance with CCAMLR Conservation measures with regard to their vessels. The ICCAT has Scheme of Port Inspection that is reviewed if necessary by the Contracting parties with a view to developing an effective enforcement scheme. As well, appropriate authorities of the Contracting parties are encouraged to board and collect information on pelagic fishing vessels of non-Contracting parties fishing in the Convention Areas. In NAFO, in accordance with the "Scheme of Joint International Inspection and Surveillance", boarding inspections are requested to enhance compliance with the NAFO recommendations. Contracting Parties are required to inspect the fishing vessels of the Contracting Parties during port calls to verify species and quantities caught. In accordance with "the Scheme to Promote Compliance by Non-Contracting Party Vessels with the Conservation and Enforcement Measures" established by NAFO, if Non-contracting Party vessel enters a Contracting Party port, it must be inspected. No landings or transshipments are permitted in Contracting Party ports unless such vessels establish that certain species on board were not caught in the NAFO Regulatory Area. Contracting Party must report the results of inspections to NAFO and to all other Contracting Parties.

(iv) VMS

All contracting parties in the CCAMLR are required to undertake licensing and inspection obligations with regard to their flag vessels operating in the Convention Area. CCAMLR Members are required to establish an automated satellite-linked vessel monitoring system (VMS) to monitor its flag vessels in accordance with conservation measures (148/XVII of Conservation Measures). Information collected with the VMS includes vessel identifier, location, date and time. Members submit the data collected to the Secretariat before the start of the annual meeting of the Commission. In the ICCAT, each Contracting Party with vessels greater than 24 meters and fishing for ICCAT species on the high seas should adopt a pilot programme for a satellite-based VMS for 10 per cent of such vessels. Each Party was to implement a three-year pilot programme effective 1 January 1999. Information collected includes the vessel identifier, location, date and time. Beginning in 1999, each Contracting Party should report annually on the progress and implementation of its pilot VMS programme. According to the NAFO "Scheme of Joint International Inspection and Surveillance," NAFO was also to have introduced satellite vessel monitoring systems on all such vessels fishing in the NAFO regulatory area no later than 1 January 2000. This system can automatically transmit satellite signals to a land-based receiving station, permitting a continuous tracking of the position of the vessel.

(v) Other measures (marking, register of fishing vessels)

All vessels from CAMLR members must be licensed to fish in the Convention area (119/XVII of Conservation Measures), and marked in accordance with internationally recognized standards (146/XVII of Conservation Measures). Each Contracting Party must provide the Commission a list of all its flag vessels intending to harvest marine living resources in the Convention Area every year by 1 May. The list should include the name of vessel, the call sign of the vessel registered by the flag states, the port of registration and nationality of the vessel, the owner or charter of the vessel, and the fishing area within the Convention Area. In the ICCAT, the use of registers of fishing vessel licences is not mandatory, and is regarded as a domestic matter relating to the contracting parties. An increasing number of RFOs establishes a list of authorized vessels (regional register on the basis of information provided by the flag states) and a black list of vessels (listing vessels that should not be allowed to fish in the area –

to avoid reflagging and change of vessels' names). Violations by national fishing vessels must be reported to the compliance committee by the contracting parties to which these vessels belong.

4.2.2 Ways to improve and strengthen monitoring and enforcement: Application to the Yellow Sea

Effective monitoring and enforcement in the Yellow Sea region are very important to ensure faithful implementation of adopted rules and management measures. In particular, the monitoring and enforcement scheme are likely to be effective and build the confidence of those involved in fishing if they are perceived as fair and equitably enforced. It will possible to think some options to be considered in the Yellow Sea region to ensure compliance with management measures.

First, flag states should be required to provide a strong punishment to their fishing vessels violating conservation measures adopted. This has implications for the fisheries laws as each party must ensure that its fisheries legislation provides adequate (i.e. sufficiently deterring) sanctions. For example, in the Korea-Japan Fishery Agreement, if one party informs the other of a violation on conservation measures, the government of the fishing vessel in question should impose punishment such as a licence suspension or revocation, depending upon the type or degree of violation, and notify the other party of the punishment. However, the most important element for effective monitoring is that all fishing vessels in the relevant waters should be licensed. A register of authorized fishing vessels should be established. Only licensed fishing vessels should be permitted to fish in the waters and they must observe conservation measures.

Second, VMS (vessel monitoring system) could be an important supplementary tool in surveillance. A VMS can make it easy to monitor fishing vessels licensed or permitted by detecting vessel identifier, location, data and time. The experience from the bilateral agreement between Korea and Japan may be a good example. All fishing vessels fishing in the regulatory area have been obliged to install special equipment such as Inmarsat to implement the VMS. If a fishing vessel violates conservation measures, it can be monitored immediately.

Third, another important supplementary tool in surveillance is to operate patrol boats carrying inspectors in relevant waters. There are a number of ways of doing this. Within waters under national control (EEZ and Transitional waters) the patrols should obviously be operated by the national authority of the waters in question. National laws need to be adjusted so that inspections and arrests can be carried out on all vessels in these national waters by the territorial state.

In Provisional waters (areas of overlapping jurisdiction) all claimant states should have both the right and responsibility to operate patrol vessels. However, the right to inspect and arrest needs to be the subject of an international or bilateral agreement. Clearly all IUU vessels may be inspected and arrested by patrol vessels of any claimant state, but there may be restrictions on the ability of claimant state vessels to be inspected and arrested by a patrol vessel of other claimant states. Thus the most elegant solution, and one that has been successfully applied in other areas of multiple jurisdiction such as European waters, is for all patrol vessels to carry an inspector from each claimant state on board. Inspections and arrests of all fishing vessels operating in Provisional waters is thus acceptable to fishermen and the inspection services, and possible under national law. Inspection of foreign vessels outside areas of national jurisdiction may be provided for under a multilateral or regional agreement. Note

that UNIA already provides such kind of provisions. Parties to UNIA (which is not yet the case of China and Korea) must take necessary measures to implement these provisions including the modification of their national fisheries law.

An alternative arrangement is to allow for inspections alone to be undertaken on any fishing vessel by any patrol vessel. Thus a Chinese patrol vessel carrying only Chinese inspectors would be able to inspect all vessels, but only arrest foreign and Chinese vessels. All fishing vessels of other parties could be inspected under joint inspection arrangements (similar to the CCAMLR situation) but under such arrangements the evidence of violations detected by patrol boats should be immediately delivered to the flag-state and only the flag state could act. It is also the experience of the bilateral agreement between Korea and Japan may be useful, as patrol boats in the regulatory area of this agreement have been effective.

Very often in such complex jurisdictional systems fishermen will avoid arrest by moving rapidly between jurisdiction – border hopping. This needs to be discouraged, and the only sensible way to do this is to have very close cooperation between the inspection services in the different states. This cooperation should take the form of joint patrols, the understanding that “hot pursuit” should be allowed across the various borders, and other cooperative mechanisms.

In any system such as that suggested above it is important that fishermen perceive that they are receiving equal treatment wherever they are fishing within their applicable permits. We would strongly recommend joint training programmes for all inspectors, joint/harmonized legislation and significant publicity among fishermen for the inspection programme, and especially its uniform application across the Yellow Sea. Scientific observers, whilst not an inspection tool, can also contribute to the general impression that laws, requirements and regulations are designed and applied uniformly for the whole of the Yellow Sea.

Finally, all vessels fishing should be required to submit catch and effort reports in order to control the fishing activity and identify catch levels. At least, they should include 10-day and monthly summary catch and effort reporting so that the catch does not exceed the level of the TAC if the amount of TAC is set up. As well, because of the migratory nature of many commercial fish stocks in the Yellow Sea region, each country should be encouraged to submit the size of catches in the non-contracting waters, including in their territorial seas. It would be necessary to develop a standardized format for these reports, in order for them to be effective. A standardized format makes it easy to access the data and to analyze them in a homogeneous way.

4.3 Implementing the provisions of the FAO Code of Conduct: a Regional Management Plan for the Yellow Sea

The FAO Code of Conduct specifies certain objectives and principles for good fisheries management. In the following box, the text of Article 6 of the Code of Conduct is presented.

Article 6 of the FAO Code of Conduct: GENERAL PRINCIPLES

6.1 States and users of living aquatic resources should conserve aquatic ecosystems. The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources.

6.2 Fisheries management should promote the maintenance of the quality, diversity and availability of fishery resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development. Management measures should not only ensure the conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species.

6.3 States should prevent overfishing and excess fishing capacity and should implement management measures to ensure that fishing effort is commensurate with the productive capacity of the fishery resources and their sustainable utilization. States should take measures to rehabilitate populations as far as possible and when appropriate.

6.4 Conservation and management decisions for fisheries should be based on the best scientific evidence available, also taking into account traditional knowledge of the resources and their habitat, as well as relevant environmental, economic and social factors. States should assign priority to undertake research and data collection in order to improve scientific and technical knowledge of fisheries including their interaction with the ecosystem. In recognizing the transboundary nature of many aquatic ecosystems, States should encourage bilateral and multilateral cooperation in research, as appropriate.

6.5 States and subregional and regional fisheries management organizations should apply a precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment, taking account of the best scientific evidence available. The absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species and non-target species and their environment.

6.6 Selective and environmentally safe fishing gear and practices should be further developed and applied, to the extent practicable, in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems and protect fish quality. Where proper selective and environmentally safe fishing gear and practices exist, they should be recognized and accorded a priority in establishing conservation and management measures for fisheries. States and users of aquatic ecosystems should minimize waste, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species.

6.7 The harvesting, handling, processing and distribution of fish and fishery products should be carried out in a manner which will maintain the nutritional value, quality and

safety of the products, reduce waste and minimize negative impacts on the environment.

6.8 All critical fisheries habitats in marine and fresh water ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary. Particular effort should be made to protect such habitats from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources.

6.9 States should ensure that their fisheries interests, including the need for conservation of the resources, are taken into account in the multiple uses of the coastal zone and are integrated into coastal area management, planning and development.

6.10 Within their respective competences and in accordance with international law, including within the framework of subregional or regional fisheries conservation and management organizations or arrangements, States should ensure compliance with and enforcement of conservation and management measures and establish effective mechanisms, as appropriate, to monitor and control the activities of fishing vessels and fishing support vessels.

6.11 States authorizing fishing and fishing support vessels to fly their flags should exercise effective control over those vessels so as to ensure the proper application of this Code. They should ensure that the activities of such vessels do not undermine the effectiveness of conservation and management measures taken in accordance with international law and adopted at the national, subregional, regional or global levels. States should also ensure that vessels flying their flags fulfil their obligations concerning the collection and provision of data relating to their fishing activities.

6.12 States should, within their respective competences and in accordance with international law, cooperate at subregional, regional and global levels through fisheries management organizations, other international agreements or other arrangements to promote conservation and management, ensure responsible fishing and ensure effective conservation and protection of living aquatic resources throughout their range of distribution, taking into account the need for compatible measures in areas within and beyond national jurisdiction.

6.13 States should, to the extent permitted by national laws and regulations, ensure that decision making processes are transparent and achieve timely solutions to urgent matters. States, in accordance with appropriate procedures, should facilitate consultation and the effective participation of industry, fishworkers, environmental and other interested organizations in decision making with respect to the development of laws and policies related to fisheries management, development, international lending and aid.

6.14 International trade in fish and fishery products should be conducted in accordance with the principles, rights and obligations established in the World Trade Organization (WTO) Agreement and other relevant international agreements. States should ensure that their policies, programmes and practices related to trade in fish and fishery products do not result in obstacles to this trade, environmental degradation or negative social, including nutritional, impacts.

6.15 States should cooperate in order to prevent disputes. All disputes relating to fishing activities and practices should be resolved in a timely, peaceful and

cooperative manner, in accordance with applicable international agreements or as may otherwise be agreed between the parties. Pending settlement of a dispute, the States concerned should make every effort to enter into provisional arrangements of a practical nature which should be without prejudice to the final outcome of any dispute settlement procedure.

6.16 States, recognising the paramount importance to fishers and fishfarmers of understanding the conservation and management of the fishery resources on which they depend, should promote awareness of responsible fisheries through education and training. They should ensure that fishers and fishfarmers are involved in the policy formulation and implementation process, also with a view to facilitating the implementation of the Code.

6.17 States should ensure that fishing facilities and equipment as well as all fisheries activities allow for safe, healthy and fair working and living conditions and meet internationally agreed standards adopted by relevant international organizations.

6.18 Recognizing the important contributions of artisanal and small- scale fisheries to employment, income and food security, States should appropriately protect the rights of fishers and fishworkers, particularly those engaged in subsistence, small-scale and artisanal fisheries, to a secure and just livelihood, as well as preferential access, where appropriate, to traditional fishing grounds and resources in the waters under their national jurisdiction.

6.19 States should consider aquaculture, including culture-based fisheries, as a means to promote diversification of income and diet. In so doing, States should ensure that resources are used responsibly and adverse impacts on the environment and on local communities are minimized.

The challenge for the Yellow Sea authority will be putting these principles into practice. We have already addressed some of the issues in the first three sections above. Here we outline a general management plan, into which these very specific considerations would fit.

4.3.1 Scope

In any management plan, it is necessary to define the scope of the agreement, which presumably will be “the fisheries resources of the Yellow Sea and the ecosystems that support them”. Clearly, decisions here need to focus on exactly what the remit of the Agreement will be, whether it will have concerns with general marine ecosystem health either in its own right or only in association with fisheries concerns. Another question is whether the Agreement will consider only shared, straddling and highly migratory stocks or all stocks, including those occurring exclusively in the waters of one Party.

This section also needs to deal with external relations, particularly with other regional agreements both bi- and multilateral such as the West and Central Pacific Fisheries Commission.

4.3.2 Objective

The objective of the Agreement must be spelt out clearly in a section of its own. We anticipate that the objectives will include features particularly of concern to

the Parties and a commitment to apply the voluntary Code of Conduct for Responsible Fisheries and its associated voluntary instruments¹⁰:

- Ensuring sustainable use of the fishery resources and large marine ecosystem of the Yellow Sea
- Advising Governments on actions to be taken to manage fish stocks
- Harmonising management actions between all Parties, including harmonization of legislation and management approaches for shared and migratory stocks such as technical regulations, closed areas and seasons.
- Application of a precautionary approach, and ecosystem based fisheries management
- Balancing fishing capacity with the productivity of fisheries
- Improving compliance with fisheries management regulations and eliminating IUU fishing including through joint actions between the parties, including sharing of information on non compliant vessels (to avoid re-flagging, change of names)
- Utilising the best scientific advice in decision-making
- Sharing of data and scientific information, including the conduct of joint research

The objectives may also make mention of any special issues, key problems or key species that are of concern to the parties. In particular the objectives should take into account the discussions above of the particular legislative issues, measures that all parties need to take to strengthen their laws so as to improve compliance, and how to strengthen enforcement.

4.3.3 Activities

Activities to achieve the objectives might include:

Compliance

- Monitoring of capacity, including the sharing of licensing, registration and other information between the Parties, and agreeing to control capacity
- Setting up Surveillance networks for the sharing of surveillance intelligence, conducting joint surveillance/compliance activities to stop border-hopping by fishing vessels, sharing real-time VMS data; may also include the establishment of a compliance committee;
- Setting up a fishery inspector training and exchange scheme so that all inspectors are aware of the relevant laws and standards adopted by the Parties, and apply common regulations with equal effectiveness in the waters of all the Parties. In this way fishermen perceive the penalty of their non-compliant actions to be equally severe over the whole of the Yellow Sea;
- Harmonising the penalties for non-compliance with fisheries regulations across all Parties. For instance, the administrative penalty for using an undersized net could be harmonized across all Parties.

¹⁰The Compliance Agreement and the IPOAs on Seabirds, Sharks, Capacity and IUU

Some of these issues have been examined in detail in the previous sections.

Science

Clearly, in this and the next section, it is important that the Yellow Sea be considered as a whole ecosystem. Scientific investigation, and management measures, must take the resource distribution into account. There are some migratory resources and resources that straddle the various jurisdictional zones – EEZ, transitional and provisional (overlapping) zones – that need to be considered not by individual states but as individual resources across the Yellow Sea. This can only be done through joint management. In the case of science this will involve:

- Setting up a science advisory body to advise Governments and other multilateral organizations on the management of fisheries in the Yellow Sea
- Conducting joint scientific research surveys across the whole of the distribution of relevant stocks, not limited by areas of national jurisdiction.
- Establishing a scientific observer programme, with common training of observers, common data collection protocols, and facility for exchanges of observers between Parties;
- Encouraging exchanges of data and personnel between scientific research establishments, and between different types of establishment (environmental research institutions, biological/ecosystem research institutions, fisheries research institutions and economic/social research institutions).
- Specifically developing an understanding of ecosystem functioning, ecosystem-based fishery models and other tools required to develop an ecosystem approach to fisheries management of the Yellow Sea, including particularly research into the management of multispecies fisheries.

Management

- Setting up a Yellow Sea fisheries management advisory body to advise governments on sustainable fisheries including
 - Catch and effort levels consistent with maintaining populations of exploited species at or above MSY;
 - Technical and other measures required for sustainable management of exploited populations, such as closed areas/seasons and gear regulations.
 - Management actions required to maintain sustainable fisheries and ecosystems across the range of fish stocks and ecosystems, such that management is harmonized in the waters of the Parties;
- Developing a precautionary approach to management, such that the lack of scientific certainty about a negative impact of fishing on the ecosystem or the status of a target stock should not be used as a reason to avoid agreeing precautionary management measures;
- Developing an ecosystem approach to fisheries

- firstly in relation to the minimization of incidental mortality of sensitive species, including sharks, seabirds, marine mammals, and minimizing bycatch and discards of non-target species and juveniles in all fishing operations through the development of management measures such as closed areas/seasons and selective gears; and
- secondly in relation to wider ecosystem concerns, such that fishing should not alter the trophic balance or biodiversity of the ecosystem
- Negotiating issues of allocation between the waters and fleets of the Parties such that overall management objectives for a stock and ecosystem (capacity, catches and effort) are maintained.
- Developing a particular strategy to combat IUU fishing, including the means to monitor the level of IUU fishing, the transgressors, and joint actions to deter and eliminate IUU.