Northwest Pacific Ocean

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INTRODUCTION

The Northwest Pacific Ocean region produces the greatest portion of world fish and seafood. The region includes the seas (the western part of the Bering Sea, the Sea of Okhotsk, the Sea of Japan (or "East Sea" according to the Korean tradition) the Internal Japan Sea, the Yellow Sea (or "West Sea" according to the Korean tradition), the East China Sea and northern part of the South China Sea), along with the Pacific Ocean waters of the southeast Kamchatka Peninsula, the Kuril Islands and Japan. The countries involved in fisheries in the area are the Peoples' Republic of China and Taiwan Province of China, Japan, the Democratic People's Republic of Korea,[1] the Republic of Korea and the Russian Federation.[2]

POLICY FRAMEWORK

The policy framework for the fishery management in the Northwest Pacific is set by global agreements such as the United Nations Convention on the Law of the Sea (UNCLOS), which is ratified by all countries but the Democratic People's Republic of Korea, and national legislations. All of the countries including the Russian Federation since early 2005 have basic national laws for fisheries (Annex Table 1); in the Republic of Korea, two laws may be considered basic for fisheries. On the one hand, objectives for fisheries management are set in the basic fishery laws of China, Japan and the Republic of Korea, which characteristically include "protection" (China), "appropriate

TABLE 1
Landings of marine fish and seafood in 1990 and 2002 in the Northwest Pacific Ocean

Country	Marine landings (tonnes)	
	1990	2002
China	5 779 750	14 053 145
Japan	8 411 944	3 755 986
Democratic People's Republic of Korea	448 000	200 000
Republic of Korea	1 850 611	1 123 423
Russian Federation	4 499 628	1 688 908
Taiwan Province of China	688 570	363 235
Total	**21 678 503**	**14 053 145**
Total Western Indian Ocean marine landings(5)	**22 131 781**	**21 355 987**
Percentage of Western Indian Ocean landings	98%	99%
Percent of global marine landings	28%	27%

Note: excludes marine mammals, crocodiles, corals, pearls, sponges and aquatic plants.
Source: FAO Fisheries Statistics (FishStat+), 2005

[1] Only limited information concerning the Democratic People's Republic of Korea is included in this review.

[2] The main sources used here are ~~the~~ the country reviews included in this report ~~contained in this report~~, which include a formal review of fisheries frameworks and~~,~~ legal and management systems supported by a detailed questionnaire on the three main fisheries by sector in each country. The sources without ~~a~~ references are from respective country reviews.

conservation" (Japan), "priority of conservation and rational use of aquatic bio-resources over the use of bio-resources as property right objects", "priority of conservation of particularly valuable aquatic bio-resources" (Russian Federation), "establishing fishery protection zone" (the Republic of Korea). On the other hand, they include the securing of a "stable supply of fishery products, to realize the sound development of the fishing industry" (Japan), "boosting of fishery production" (China), "propagation of marine fisheries" and "effective utilization of fishing grounds" (the Republic of Korea), "taking into account the interests of population living in the coastal regions, including in particular the indigenous people of the North, Siberia and the Far East" and "charging for the use of aquatic bio-resources" (Russian Federation). The Fisheries Law of the Peoples' Republic of China also emphasizes as its objective social needs, ensuring "fishery workers' lawful rights". The basic fishery legislation has been largely amended or adopted relatively recently: in 1995 in the Republic of Korea; in 2000 in China; and in 2001 in Japan. Further, the Parliament of the Russian Federation adopted the basic law on fisheries in December 2004. These adoptions and amendments have direct relationships to ratifying the UNCLOS and the UN Stock Agreement by the above-mentioned countries.

In Japan, the focus of the objectives of the Basic Law on Fisheries Policy clearly indicates a shift from the previous laws that emphasized increasing production and economic growth to the present stress on the resource sustainability through more efficient use of resources.

In addition to the basic laws there are a variety of regulatory documents, some having the status of national laws while others are governmental statutes, orders or policy documents. Special laws on the offshore areas with different legal regimes in accordance to UNCLOS, such as the territorial sea, the exclusive economic zone (EEZ) and the continental shelf, are directly related to marine capture fishery management. These laws are adopted in China and the Russian Federation. In Japan and the Republic of Korea, there is a set of additional fishery laws (or acts, as in the Republic of Korea), some of which are listed in Annex Tables 1 and 2.

The role of environmental legislation in shaping fishery policy differs considerably between countries. Japan has a traditional emphasis on the quality of seafood, which has to be obtained from non-polluted waters. Therefore, the Basic Law for Environment (Law No. 91) enacted in 1993, the fundamental law concerning environmental and ecological preservation, has a strong impact on fisheries' policy. The Law defines the duties of the central government, local autonomous bodies (i.e. the prefecture government and the municipal office) and business operators to control pollution and stipulates basic preventive measures against water pollution. The purpose of the law is to protect the people's health and preserve their living environment through promoting pollution control measures.

In addition, there are several laws that regulate water pollution in order to achieve the above objectives: (i) the Water Pollution Control Law (Law No. 138) of 1970; (ii) the Law related to Treatment and Incineration of Waste (Law No. 138) of 1970; (iii) the Law on Special Measures for Environmental Conservation of the Seto Inland Sea (Law No. 110) of 1973; (iv) the Laws on Marine Pollution and Preventions of Maritime Disaster (Law No. 136) of 1970; and (v) the Environmental Assessment Law (1999). With these laws providing the main legal basis for environmental and ecological preservation, administrative and technological guidelines have been formulated by prefecture governments for preserving the environment of fishing grounds in each sea area (Annex Table 2).

Recently, the Republic of Korea has more frequently faced problems of harmful algal blooms apparently caused by eutrophication and pollution, which has severely impacted the national fisheries and aquaculture (King and Park, 2002). This has led to re-formulating the entire marine and fisheries policy and putting fisheries issues in

a more general policy framework. As a result, the Ministry for Maritime Affairs and Fisheries (MOMAF) was created in 1996 to ensure comprehensiveness and unity in the marine environmental policy. The Coastal Management Law adopted in 1999 together with other environmental and water legislation (Annex Table 2) set up the framework for balanced management of several activities in the coastal zone, including pollution prevention, aquaculture, fisheries, recreation and protected areas. The ongoing Five-Year Marine Pollution Control Plan includes three main components: expanding purification and treatment capacities for urban and industrial effluents; integrated coastal zone management and coastal clean-up projects, which include polluted sediment dredging, cleaning coastal seabed farms; and reorganizing aquaculture facilities (King & Park, 2002).

Traditionally, the importance of the regulation documents, which do not have the status of laws, is greater in socialist countries (the Democratic People's Republic of Korea) or in ex-socialist countries that had planned economies in the past (Russian Federation and China).

A characteristic feature of the basic fishery legislation in the countries of the region is that capture fisheries and aquaculture are often treated together. The Basic Law on Fishery Policy in Japan stresses that marine aquaculture must be strengthened in order to increase the harvest of existing and new species to offer significant prospects for higher production in order to secure a stable supply of fish. The environmental maintenance and rehabilitation of aquaculture farms are urgent matters to address through the proper enforcement of farm management measures.

Concluding the review of the policy framework it may be useful to refer to the general analysis by Prof. Vyacheslav K. Zilanov (2003), the former Deputy Minister of the USSR Ministry for Fisheries and the present Vice-Governor of the Murmansk Oblast (Box 1).

At the regional level, the objectives for fisheries management are either not explicitly expressed in regulatory documents or are similar to the national objectives, such as

BOX 1

Comparing the basic policy in fisheries of the leading fishing countries

Zilanov (2003) compares the actual fishery policy of the principal coastal states and classifies the approaches to marine fisheries. One approach is sustainable and careful use of traditional resources. "The precautionary principle taking into account uncertainty of the consequences of fishery, governmental control and monitoring of fishing vessels activity becomes the basis of the fishery policy. To the greatest extent this approach is followed by the United States, Canada, Iceland and Australia" (Zilanov, 2003, 13). Another approach is to give highest priority to the development of technologies in mariculture and to supply products to domestic markets and the world market. Norway and China are leaders in this direction. The third approach is as follows "the traditional approach in using marine living resources dating back to the 1940s-1950s: increasing stock sizes of particular harvested species leads to increasing catch while the stock decline causes decreasing of fishing intensity up to complete ceasing" (Zilanov, 2003, 13). The countries subscribing to this include Japan, Chile, Peru and the Russian Federation. This interpretation is also supported by the theories dominating in the Russian fishery science. Russian fishery scientists are very much focused on the natural variation in fishery stocks, often of a cyclical nature. At the same time there is little research analysing the various impacts of fisheries on the harvested stocks, habitats and ecosystems. This illustrates a deeply rooted attitude, which is difficult to adjust in a short time without having to reconsider the entire fishery policy and changes in teaching and training fishery specialists.

in China where each Province has adopted its Regulation on the Implementation of Fisheries Law of the People's Republic of China. In Japan, the involvement of prefecture and local authorities and fishers' organizations in the management of both coastal and distant water fisheries is traditionally strong (Schmidt, 2003).

LEGAL AND INSTITUTIONAL FRAMEWORK

The basis of management decision

Management decisions according to the current fishery regulations in China, the Republic of Korea and the Russian Federation are based on biological analysis and stock assessment. In China, the legislation also requires taking into account the monitoring and enforcement options, while in the Republic of Korea, it implies that the fishery management should be based on the economic and social impact analysis (Annex Table 3).

There are, however, important differences between Japan, China and the Republic of Korea on one hand, and the Russian Federation, on the other hand. In the former group, the legislation is designed as a framework that shapes fisheries management and management plans, whereas until recently in the latter, there was a very complex set of non-fisheries laws, statutes and rules that did not work in this way but contained specific management measures for individual fisheries (Annex Table 4). This system apparently had to be changed after the adoption of the new fishery law in December 2004. However, the new law contains only a few provisions for direct regulation and requires 42 various additional regulatory documents (governmental statutes, ministerial orders and circulars, regional laws).

Responsibility for fisheries management

In all countries of the Northwest Pacific region there are special agencies responsible for fisheries management at the national level: the Bureau of Fisheries in China, the Fisheries Agency in Japan, the Ministry for Fisheries in the Democratic People's Republic of Korea, the Fisheries Administration Bureau and Fisheries Resource Bureau of the Ministry of Maritime Affairs and Fisheries (MOMAF) in the Republic of Korea, the Ministry of Agriculture and Fishery, the Federal Agency for Fisheries and the Fishery Directorate of the Federal Veterinary Service in the Russian Federation (Annex Table 5). The details of their activities at different jurisdictional levels are described below. These examples show that stock assessment and strategy are mainly carried out at the national level while management decisions are delegated to the regional level to varying degrees.

The Russian Federation

The most centralistic approach inherited from the Soviet Union is practised in the Russian Federation. Here, the Ministry of Natural Resources is a general governmental institution for the protection, control and regulation of the use of all organisms belonging to the animal kingdom (Government of Russian Federation Statute 726 of 25 September 2000). The general issues of control are generally mandated to the newly established (April 2004) Federal Service for Environmental Control which head reports to the Minister for Natural Resources. This service carries out activities that were generally performed by the Ministry of Natural Resources prior to its reorganization (i.e., formulating the State Ecological Expert Panel on Annual Total Allowable Catch (TAC) proposal to control fishing within the strictly protected natural areas and fishery-related pollution). However, the overall management of fisheries (including governance, inter-agency coordination of "rational use", monitoring and research, protection of stocks and their environment, and stocks replenishment) is a specific responsibility of another federal institution, the Ministry of Agriculture and Fisheries.

The Department for Fisheries of the Ministry develops the policy and prepares the regulation documents. Within this Ministry, there is the Federal Agency for Fisheries, which is responsible for conducting the governmental policy with regard to fisheries, regulation of access to resources, monitoring and research.

The Federal Agency for Fisheries was organized in April 2004 on the basis of the State Committee for Fisheries. At the regional level, the then State Committee for Fisheries was represented by the basin directorates for aquatic bio-resources protection and replenishment (or "reproduction" in some translations), called *rybvods* in Russian. The responsibility of each directorate covered the area of one or several administrative regions – parts of the Russian Federation and the adjacent marine waters. The *rybvods* drafted updates of regional fishing rules, issued fishing permits, controlled daily reporting of vessels, collected fishery statistics for all kinds of fisheries including recreational, performed the operative management of important fisheries and the marine mammal populations management, controlled the impact of industrial, agricultural and communal activities on fishery resources and directly managed or coordinated salmon or sturgeon hatcheries and other, if any, replenishment facilities. In total there were 26 directorates, five of which, Sevvostrybvod, Okhotskrybvod, Amurrybvod, Sakhalinrybvod and Primorrybvod, covered the Northwest Pacific. In the new administrative system, which has been in force since the spring of 2004, the *rybvods* were reorganized in the fishery control divisions of the Federal Service of the Veterinary Control within the same Ministry of Agriculture and Fisheries. They will most probably retain many functions of the former *rybvods*. According to the administrative reforms, the primary functions are those related to issuing permits, controlling reporting and enforcement in internal waters, partly including internal marine waters, such as estuaries. However, it is not currently clear how functions not related to control will be performed at the regional level, whether there will be regional divisions of the Federal Agency for Fisheries or whether the successor of the *rybvods* will implement the full range of former responsibilities.

The Republic of Korea

In the Republic of Korea, the Ministry of Maritime Affairs and Fisheries (MOMAF), an executive branch of Marine Affairs, is in charge of planning and implementing fisheries policy. It was founded in August 1996, incorporating the National Fisheries Administration, the National Port Administration and other marine-related government branches.

The main functions of MOMAF are to develop and restructure the fishing industry, ensure safe navigation of fishing vessels, construct and manage the port facilities, and assist conservation/exploration of the marine resources. MOMAF has five branches concerned with the management of fisheries resources (research, management and monitoring/enforcement services).

- the National Fisheries Research and Development Institute (NFRDI), which provides research services;
- the Fisheries Administration Bureau and Fisheries Resource Bureau, which provide management services;
- the Fisheries Resource Bureau, the Fishing Vessels Management Office and the National Marine Police Agency (NMPA), which provide monitoring and enforcement services.

The Fisheries Resource Bureau is committed to the general affairs of fisheries resources management, performing all of the main duties involving the management and enforcement of fisheries policies except for research and development issues. The Bureau works with provincial and local authorities to administer fisheries, enforcing the law at the regional level.

According to the Fishery Act, MOMAF is largely responsible for the licensing of fishing vessels in offshore and distant waters and foreign-flagged vessels fishing within

the EEZ; while local governments at the province, city and district levels are mainly responsible for vessels in the coastal areas.

China

In China, the Bureau of Fisheries of the Ministry of Agriculture is in charge of the development and implementation of management measures. Except for the "zero growth" and "minus growth" policy put forward directly by the Bureau of Fisheries, management measures are usually suggested by the local fisheries authorities, scientists as well as fishers. After receiving suggestions, the Bureau of Fisheries conducts field investigations and obtains more views from stakeholders. Based on the views obtained from the investigation and reports from other resources, the Bureau organizes a working group consisting of experts and government staff to formulate the draft management measures. This draft is then distributed to the local fisheries authorities for comments within a definite time frame. In some cases, this draft is published in the *China Fishery News* – a weekly newspaper for public comments sponsored by the Ministry of Agriculture. After a set time, the management measures must be submitted with the necessary revisions based on the comments received to the Ministry of Agriculture or the State Council for approval. The Bureau of Fisheries and local governments (through its fisheries authorities) are then responsible for implementing such measures. The new management measure should be published in the newspaper (*The People's Daily* or *China Fishery News*) and on the Ministry of Agriculture's website (www.agri.gov.cn.), as illustrated in Box 2.

Japan

The overall responsibility for fisheries resources management is vested in the Fisheries Agency of the Ministry of Agriculture, Fishery and Forestry (MAFF). Within the Fisheries Agency there are three departments concerned with management services – the Management Department, the Coastal and Offshore Department, and the Distant Water Department. The major functions of these departments include vessel registration, licensing, resources conservation and management, and associated disciplines.

The Fisheries Research Agency (FRA) was created in 2001, consolidating nine national fisheries research institutes. Subsequently in 2003, the Agency merged with the Japan Marine Fishery Resource Research Center (JARMAC) and the Japan Sea-Farming Association (JASFA). With this reorganization, the government aimed at enhancing levels of required interaction or cooperation in planning, implementation and monitoring of research activities, in addition to the reduction of administrative costs and duplication of efforts. Its main functions are to carry out research on the population dynamics of commercially important species including tuna and tuna-like species, environmental protection, resource conservation and management, stock enhancement, aquatic ecosystems, fish safety, fishing grounds rehabilitation, and revitalization of fishing communities, among others.

The Prefecture Fisheries Departments (PFDs) formulate detailed regulations to control fishing operations in order to ensure the conservation and rational exploitation of living aquatic resources. These fisheries operate offshore beyond the boundary of coastal areas that are secured by fisheries that hold fishery rights. While coastal territories are precisely defined as the seaward limit of a village's territory, offshore fishing grounds are not accurately defined throughout the nation and the criteria for establishing these limits varies.

Shortcomings of the prefecture licensing system originate from the difficulties in the implementation of resource surveys in the waters outside the prefecture. In particular, there were problems in assessing straddling and migratory fish stocks in several prefectures because their research institutes were not flexible enough to release their research results. This led to the failure of generating the stakeholders' awareness

BOX 2
Notification for introducing a moratorium in the South China Sea

In March 1999, the Ministry of Agriculture published its decision for a new management measure – starting from 1999, the area north to 12 degrees North latitude in the South China Sea would prohibit fishing from June 1 to 31 July each year. During this period, fishing operations by all trawlers and purse seines in the area are prohibited.

The notification mentioned that in recent years the fishing activities surpassed the renewability of fisheries resources in the Chinese jurisdiction in the South China Sea and the fish stocks declined continuously. The catch of major economic fish species decreased sharply and the income of fishermen also decreased. Such problems had become negative factors for local economic development and social stability. In order to ensure the sustainable development of fisheries in the South China Sea, an effective measure must be taken to conserve and rationally use the fishery resources. The notification described the new management measure was based on:

- the relevant provision of the Fisheries Law;
- suggestions made by relevant local fisheries authorities, experts and fishermen;
- investigations and studies carried out by the Bureau of Fisheries Management and Fishing Port Superintendence of the South China Sea;
- comments received from relevant local fisheries authorities;
- successful experiences obtained in conducting a moratorium in the East China Sea and the Yellow Sea.

on the current status of fish stocks, in addition to difficulties in acquiring the accurate status of migratory fish stocks.

A new strategy aims at involving multiple prefectures in resource surveys to cover a wider sea area under joint responsibilities. New management initiatives for prefecture fisheries licensing are envisioned in order to have a comprehensive system covering the following:

Responsibility for fishery enforcement

In general, in most countries, the same agencies also participate in fishery enforcement (Annex Table 5). In China, enforcement is coordinated by the Fisheries Law Enforcement Command, which is a subsidiary body to the Ministry of Agriculture, which presides over the Bureau of Fisheries. In the Republic of Korea, enforcement duty is complemented by the National Maritime Police within MOMAF.

In Japan, fisheries surveillance and enforcement is carried out by two agencies at the national level, the Japan Coast Guard (JCG) and the Fisheries Agency of the MAFF. Both agencies own airplanes and patrol boats to fulfill their duties, and geographic coverage is nationwide within the EEZ. Prefecture governments are also equipped with patrol boats and cooperate with the national agencies. Violation is mainly concerned with the encroachment of offshore vessels on coastal waters and the lack of discipline in observing established rules and regulations (e.g. closed areas).

In coastal waters, major efforts have been made to detect and arrest poachers whose number has increased in recent years. They target high-value species such as *abalone* and *lobster*, but detailed data are not available. In order to cope with these issues, the entire nation was divided into six blocks, and regular meetings were held between coastal and offshore fishers in each block to prevent illegal fishing and realize a proper and rational utilization of fishery resources.

As regards enforcement on the high seas, the Fisheries Agency undertakes responsibilities to maintain discipline and order of Japanese distant-water vessels to

comply with international rules and regulations through a variety of activities including the vessel monitoring system (VMS) for tuna longliners, routine inspection at landing sites for tuna vessels, and at-sea boarding and inspection for trawlers.

In the Russian Federation, the enforcement of the marine capture fisheries is largely performed by the Border Service of the Federal Security Service, but again, the Federal Agency for Fisheries is responsible for the development of the satellite monitoring of fishing vessels (*otraslevoi monitoring*), while the *rybvods* or their successor organizations retain the mandate for enforcement in estuaries and in the internal marine waters (Annex Table 5).

Such a complex system as in the Russian Federation requires good coordination of different bodies in management and enforcement. In fact, coordination is limited even though it is required by the legislation. In some seasonal fisheries experiencing considerable impact from poaching, regional coordination committees are organized during *putina*, the high fishing season. In most cases, however, coordination refers to enforcement *per se,* and even in this case, it is usually relegated to joint patrolling and involvement of other governmental agencies such as the Ministry of the Interior and the State Customs Committee, which are responsible for the enforcement of fisheries-related activities, such as trade in fish and seafood.

STATUS OF FISHERIES IN THE COUNTRIES

Total catch

The catch volume of marine capture fisheries broadly varies between countries from around 300 000 tonnes in the Democratic People's Republic of Korea to over 11 million tonnes in China (Annex Table 6). A separate estimate of the contribution of marine capture fisheries to the GDP was unavailable for almost all countries. The total contribution of fishery and aquaculture is highest in China, at around 3 percent, and lowest in the Russian Federation, at around. 0.8 percent (Annex Table 6). It should be taken into account, however, that in all countries but the Russian Federation, aquaculture provides a considerable contribution to the production of fish and seafood. Therefore, the role of marine capture fisheries in contributing to the GDP in China, Japan, the Republic of Korea and the Russian Federation appears to be comparable. The general trend of marine catches in all countries but the Democratic People's Republic of Korea at the turn of the 21st century is either zero growth or a steady annual decrease by 0.5 to 4 percent. A general explanation is the decrease of the main fishery resources.

In the Democratic People's Republic of Korea, the catch of marine capture fisheries underwent a considerable decline since 1987; dropping from 2.7 million tonnes (FAO, 1998). This is likely explained by the shortage of fuel and lack of spare parts due to the prevailing economic difficulties, which may have limited substantially fishing activities of these boats in both the EEZ and the High Seas (FAO, 1998).

Classifications of fisheries

In all countries, fisheries may be broadly divided into several groups according to the correlation between geographical location and the fishing capacity. For example, the marine capture fisheries of Japan are divided into coastal, offshore and distant water components, although they are not legally defined. The distant-water fishery operates on the high seas beyond the Japanese EEZ and in those of other nations (Annex Table 7); the offshore fishery, which usually employs boats above 10 gross tonnes (GT), operates seawards of the coastal fishery but still within the Japanese EEZ and the coastal fishery, for the most part, uses boats of less than 10 GT and includes marine aquaculture, operating landwards of the offshore fishery. The coastal fishery is not equivalent to artisanal fishery. Even though it is based on community rights, traditional practices and gears, it extensively involves modern technologies and re-stocking. The

salmon fishery is by far the most important fishery in terms of the scale of stocking operations. In 2002 some 1.8 billion fingerlings were released and 221 000 tonnes of salmons were harvested in the same year. The number of seed released has been kept quite constant during the last several years. As regards shellfish, scallop is the dominating species in re-stocking programmes, releasing over 3 billion spats in 2002 producing a harvest of 236 000 tonnes. Seabream, flounder, prawn, crab, abalone, top shell, sea urchin and red shellfish have gained popularity in re-stocking programmes during the last three decades and in 2002 a total of 5.3 billion fry/fingerlings of these species were set free into the sea. Mass production of seed is undertaken by prefecture research centers. At present there are 49 of these centers throughout the country. Seed produced by the centers are sold at subsidized prices to fisheries cooperatives, which assume the responsibility for releasing [distributing?] and managing the seed. At the central level, the Fisheries Research Center (FRC) is responsible for the coordination and monitoring of re-stocking programmes.

There are similar although less explicit types of fisheries in the Republic of Korea. In 2001, about 47 percent of total fishery production came from offshore and coastal waters; only 0.2 percent came from inland waters. Landings from distant-water fishing operations also steadily expanded, accounted for more than one-quarter (27.7 percent) of the total fishery production in 2001.

The available information from China and the Republic of Korea implies that in these countries, there is a clear distinction between the industrial and the artisanal fishery. Accordingly, the trawl fishery and driftnet fishery in China are classified as industrial fisheries, while part of set-net fishery, angling and invertebrate collecting has a greater artisanal component.

In the Russian Federation, the following kinds of fisheries are distinguished in Article 16 of the Federal Law on Fishery and Conservation of Aquatic Biological Resources (2004):

- industrial fishery, which includes in particular coastal fishery;
- scientific and control fishery;
- fishery for the purposes of re-stocking and introduction of aquatic bioresources;
- fishery for educational purposes;
- amateur and recreational fishery;
- subsistence fishery of indigenous people.

The Law requires the development of special regulations for each kind of fishery, which have not yet been prepared at the time of completion of the present review. A general comment regarding the scientific fishery and the fishery for re-stocking and introducing aquatic bio-resources is that they do not differ from the industrial fishery in terms of gears and methods, but rather in terms of regulation of resource access. Coastal fishery is not explicitly defined in the Law on Fishery and Conservation of Aquatic Biological Resources. Nevertheless, Article 20 states that the coastal fishery may use a "fishing parcel" (*rybopromyslovyi uchastok*), which consists of the onshore and the coastal waters component, while the regulatory documents for types of vessels and gears permitted for coastal fishery must be compiled and issued by the federal authority responsible for policy and issuing regulatory documents for fisheries (currently, the Department of Fisheries Policy of the Ministry of Agriculture and Fishery). Another kind of industrial fisheries may be called offshore fisheries, although this term is not used in the legislation. Industrial fishery in the EEZ of other coastal states and in the High Seas is analogous to distant-water fishery as it has been identified in Japan.

Fishing fleet

Over 80 percent of the large fishing fleet, totalling more than 600 000 powered vessels, are small vessels of less than 20 tonnes water displacement, which are fishing in the

inshore waters in China, Japan and the Republic of Korea. In the Russian Federation, small vessels are not registered with the State Marine Register, but controlled by the State Inspection of Small-Size Fleet (today under the Ministry of Natural Resources), for which information is difficult to obtain.

Principal resources

All seas in the region are highly productive, each with an annual production exceeding 1 million t. The largest harvest taken is in the East China Sea (Annex Table 8). China's catch alone is approximately as high as the gross catch of Japan and exceeds the gross national catches of the Russian Federation, the Republic of Korea, and obviously, the Democratic People's Republic of Korea.

The main resources fished in the Northwest Pacific vary with the sea, area and country. In the northern seas of the region (the Bering Sea, the Sea of Okhotsk, the Northern Sea of Japan and the Pacific Ocean waters east of the Kuril Islands and Hokkaido), the main fishing stocks are Alaska pollock, Pacific salmon, Pacific herring, Pacific cod, plaice, halibut, navaga, saury, rockfish, king and snow crab, and pandalid shrimp. In the southern part of the region (the Southern Sea of Japan, the Yellow Sea and Bohai Bay, East China Sea, Pacific waters southeast of Hokkaido), the fisheries are diverse with essentially multi-species, without a clear dominance of particular stocks and with an increasing contribution of invertebrate target species. This multi-species characteristic increases towards the South China Sea. The principal commercial species and stocks in the south include anchovies, hairtail, yellowtail, chub mackerel, Pacific herring, Spanish mackerel, Chinese herring, horse mackerel, hickory shad, sea eels, large yellow croaker, small yellow croaker, porgy, silvery pomfret, mullets, flounders, cuttlefish, squid, octopuses, abalone, penaeid shrimps, swimming crabs, sea cucumbers and jellyfish. In all countries but Japan, trawl fishery provides most of the catch followed by gillnets and set nets, jiggering and tuna seine nets.

Distant-water fisheries in the Pacific waters of the countries of the region are targeted mainly to tuna species, in particular yellowfin, skipjack and bigeye tunas. Of particular importance are Japanese tuna fisheries. In 2000 world production of tuna and tuna-like species (i.e. bluefin, southern bluefin, yellowfin, albacore, bigeye, other tunas) amounted to some 1.7 million tonnes, of which 290 000 tonnes, or 17.1 percent, were captured by Japan, followed by Taiwan (14 percent), Spain (7 percent), Mexico (6.1 percent), France (5.5 percent) and the Philippines (5.5 percent) (FAO Fishery Statistics, 2000).

The most important fisheries: industrial

Generally, only the data of catch volume are available for identifying the most important marine capture fisheries within a country. In China and Japan, there may be difficulty in ranking by importance fisheries targeted at definite stocks. Instead, in China the trawl fishery is considered the most important. It provides around 51 percent of the total catch. The second ranked fishery is small-scale gillnet and driftnet fisheries (16.4 percent of the total catch), while the third place belongs to the set-net fishery (14.6 percent of the catch). In Japan, trawl fishery ranks third (about 13 percent), the second rank held by longlining (with roughly the same contribution), while the purse seine fisheries, contributing about 21 percent of marine capture fisheries catch, occupy first place (Annex Table 9).

In the Democratic People's Republic of Korea, the most important fisheries are bivalve harvesting and distant-water Alaska pollock fisheries, each sharing around 22 percent of the total catch, followed by squid fisheries.

In the Republic of Korea, the most important fisheries are anchovy, mackerel and squid fisheries.

In the Russian Federation, the largest fisheries by volume and value are Alaska pollock and those in the Western Bering Sea and the Eastern Sea of Okhotsk. The

second in importance by volume may be either the Pacific salmon fishery in Kamchatka or, depending on the year, the Pacific herring fishery in the Northern Sea of Okhotsk (Annex Table 10). In some years this may be taken over by salmon fishery in Sakhalin. Taken together, the salmon fisheries in both Kamchatka and Sakhalin apparently overcome the Pacific herring fishery in importance. Moreover, the salmon fishery apparently exceeds the herring fishery by value. Being highly seasonal and based on spawning stocks, these fisheries have much in common with regard to management. However, since salmon fishery is essentially shore-based, partly conducted in the estuaries and often by indigenous people, it is classified in the category of small-scale/artisanal fishery/lifestyle/subsistence/indigenous fishery. The third most important fishery is the crab fishery in the West Kamchatka Shelf, which is not outstanding in terms of the volume but remarkable in terms of value. Since 1999 this fishery has undergone a considerable decline, thus indicating that under the strong Asian market pressure, illegal catch undermines even a well-developed management system.

The most important fisheries: small-scale, artisanal, lifestyle, subsistence, indigenous, customary and recreational fisheries

The above data refer to industrial fisheries. The situation for other categories, i.e. artisanal fisheries and recreational fisheries, are unclear. In the Republic of Korea and China, small-scale fisheries are apparently not clearly separated from large-scale industrial fisheries in catch statistics. In 2001 in Japan, the small-scale set-net fishery provided as much as 509 522 tonnes of catch, while the small-scale trawling and gillnet yielded 341 793 tonnes and driftnet, stick-held dipnet fisheries yielded 229 023.

The Russian coastal fishery for Pacific salmon is by far the most important fishery for anadromous, semi-anadromous and coastal fishes. It is followed by those for navaga and smelt during winter and spring according to traditional practices (Annex Table 10).

The data for marine amateur and recreational fishery are available for Japan and the Russian Federation.

In Japan, recreational fishing can be classified into: (i) angling (rod and line, handline) on board a boat; (ii) angling from the shore; (iii) collecting shellfish; and (iv) others (diving, etc.). Angling on board can be further sub-divided into angling using a boat of Tenth Fishery Census conducted in November 1998; 33 million person-days were spent marine recreational fishing. According to the survey conducted in 2002, recreational fishers spent 4.5 million person-days using fish-guide boats. The total amount of fish taken by them was 29 300 tonnes, compared with 29 500 tonnes taken by 5.8 million person-days fishers in 1997. Jack mackerel represented 17 percent, followed by isaki (8 percent), yellow tail (8 percent), seabream (6 percent), squid (5 percent), together accounting for 44 percent of the total catch. It was estimated that the total output derived from marine recreational fishers using recreational fish-guide boats was around 30 000 tonnes per annum. Looking at the declining trend of catches by the coastal fisheries sector, it is evident that recreation fishing has exerted a certain impact on coastal resources. In fact, in 1997 the total amount of catches taken by recreational fishers using a fishing guide boat was estimated at around 29 500 tonnes, which corresponded to 1.5 percent of the total output of coastal fisheries, while the ratio rose to 2.7 percent in 2002. It was pointed out that, in some areas, the catch of recreational fishers exceeded that of professional fishers (e.g. seabream in the central Japan on the Pacific Ocean side).

The most popular and widespread amateur and recreational fishing– but often in fact for subsistence – is winter fishing for navaga and smelt from the fast ice in northern Sakhalin. In total there are more than 100 000 non-industrial fishers in the Sakhalin Oblast. Smelt fishing is widespread in the Russian Far East, but the total amount of smelt caught by non-industrial fishers is difficult to assess.

FISHERIES MANAGEMENT ACTIVITIES

Introductory notes

In all countries of the region there is a special governmental body responsible for the management of fisheries. This body may be called or translated as "an agency", for instance, in the Russian Federation or "a bureau" in China and the Republic of Korea. In the Democratic People's Republic of Korea only, this body is a ministry, which also governs the fisheries sector in a centralized process. This type of organizational structure was also typical for the Soviet Union in the past and remains a nostalgic dream of some old-style fishery administrators in the country. The details of their formal organization are given in the Policy Framework section; while this section focuses mostly on the practices.

The practice of fishery management is probably most complex and diverse in Japan where it includes various legislations and regulations, management plans and forms of stakeholder involvement often lacking in other countries (Annex Table 11).

How many fisheries are managed?

To answer this, it is important to note different perceptions and aspects of the term "management" (Annex Table 11). In China, for instance, all fisheries are managed by the overall control of fishing activities, which include fishing vessel and power control quotas and through an approval and inspection system on fishing vessel replacement and fishing permits. For certain fisheries, particular regulations also applied, for instance, for shrimp trawling fishery and the set net fishery. However, the available material indicates a scarcity of stock-specific fisheries management based on the stock assessment, TAC, quotas and restocking.

In the Republic of Korea, the management of all coastal and onshore fisheries includes regulations on the maximum number of fishing vessels to be licensed, minimum mesh size of fishing nets, engine power by fisheries, fishing grounds, fishing seasons and size of fish. In 2001, a special TAC programme was introduced for seven important, mostly commercially species such as the common mackerel, Pacific sardine, Jack mackerel, red snow crab, purple Washington clam, pen shell and spiny top shell.

Officially in the Russian Federation, all fisheries for stocks on the TAC list are considered managed. Their inclusion in the list means that stock assessment is conducted to some extent, the allowable catch is determined to some degree and when issuing catch permits, the *rybvods* determine the fishing season, the gear and whether a particular species is a target species or a by-catch. Many of these "stocks" have little biological meaning and furthermore several of them are not fished in practice. In total, there are currently 133 formally listed commercial stocks of fish and 71 stocks of marine invertebrates. Some fishing stocks are not harvested on a regular basis, being either subject to experimental fishing or a by-catch. Extraction of such stocks results in a more conservative estimate of the stocks providing a basis for the industrial fisheries, i.e. 116 stocks of fish and 59 stocks of invertebrates, some of which are in fact multi-species assemblages.

In Japan, the fisheries legislation sets out a process of management, which may include the following steps:

- assessment of some of the major stocks;
- formulation of a master plan;
- formulation, if necessary, of a resource recovery plan;
- establishment of necessary regulatory measures (e.g. vessel reduction, gear control, closed seasons and areas);
- management implementation and surveillance;
- monitoring of fish catches and fishing activities;
- inspection of fish catches (e.g. size limits in landing sites).

In China and the Republic of Korea, the number of fisheries managed increased during the past ten years, particularly in the past five years due to the introduction

BOX 3
The advantages and disadvantages of a moratorium in China

China introduced a moratorium system in the Yellow Sea and the East China Sea, starting from 1995 and 1999, respectively, as well as in some parts of South China Sea. At present, all Chinese marine waters are subject to this system for two to three months. Each year, about 118 000 fishing vessels (trawlers and set-net vessels including vessels of the Hong Kong and Macao Special Administration Zone) should stay in fishing ports and more than one million fishers should stay on land during the period. The system has been carried out for several years, resulting in experience acquired and lessons learned:

- *The advantages*. Spawning stocks and juvenile stocks of major economic species had time and space for spawning and growing during a two- to three-month period. It was reported that after a two- to three-month moratorium, the catch of some species increased compared with the same period in the previous year. This shows that the moratorium had a positive impact on stock rebuilding. Consequently, stockholder involvement was enhanced. After the implementation of the moratorium, fishers realized that they increased their catch in less time on the sea and with less direct costs. The situation was changed. At the first stage, fishers were forced to implement the moratorium. At later stage, the fishers tried to push the implementation of moratorium. They made suggestions on how to carry out the moratorium and reported violations to the government and requested further investigation.
- *The disadvantages*. Due to the high level of fishing capacity, the stocks recovered during the moratorium would be exhausted about one month after the moratorium. The fishery stocks would continue to decline.

of various limitations such as the moratorium in the South China Sea, and regulatory measures (see Box 3). In the Russian Federation, the number of formally managed fisheries generally increased due to new fisheries starting up. This formal increase in the fished stocks (by nearly 30 percent since 1991) was especially observed in invertebrates harvesting in the Russian Far East. The reason for this was a high demand for seafood in the Asian Pacific market and the break-up of the state monopoly of seafood export. Since 1991, for almost ten years, the harvesting of sea urchins in Primorye, Sakhalin, South Kurils and Kamchatka, hairy crabs off South Sakhalin, Kuril Islands and the mainland coast, deep-water stony king crabs (*Lithodes aequispina*) in the Sea of Okhotsk, and clams in the Sea of Japan developed virtually from zero. All of them are formally managed, but generally poorly.

Capacity reduction programmes

Capacity reduction is the most general measure to manage marine capture fisheries. It is highly important for China with its diversity of fishery targets to which it is difficult to apply individual regulations. In order to achieve the goal of minus growth of its marine fishery catch, China started a five-year buy-back programme in 2002. According to this programme, China will reduce 30 000 fishing vessels and arrange 300 000 fishers to be transferred to other jobs within the five years. The central government will contribute US$33 million each year and local government will contribute a counterpart fund of approximately one-to-one in support of the programme.

Since 1994, the chronic overexploitation of marine fishery resources by overcapacity in coastal and offshore waters of the Republic of Korea has been addressed by imposing a fleet reduction programme, the General Buy-back Program. About 113 fishing vessels were scrapped under this programme in 2001. Moreover, another buy-back scheme, the Buyback Program by the International Agreements, was also implemented

after the Special Act for Supporting Fishermen Affected by the International Fishery Agreements entered into force on 7 December 1999; this Special Act of agreements aimed at compensating fishers for losses resulting from the international fishery agreements, including fishing cooperation agreements with Japan and China. In 2001, the Government of the Republic of Korea scrapped 551 vessels in accordance with this Special Act. In 2001, financial transfers by the Government of the Republic of Korea for implementing these buy-back programmes totalled KRW 550 billion, or US$385 million, showing an increase from KRW 367.3 billion, or US$330 million, in 2000.

In Japan, vessel reduction programmes may be broadly divided into those primarily intended for domestic fisheries and those for distant-water fisheries. Withdrawal from domestic fisheries is voluntary. Voluntary withdrawal from fishing takes place mainly in offshore fisheries where the fishing enterprise is managed as a corporation. Generally, fishers or crew employed by such companies can find alternative job opportunities and other types of fishing. Procedures taken by voluntary vessel reduction programmes are as follows:

- Fisheries cooperatives operating according to different types of fisheries (e.g. purse seine fisheries cooperatives) initiate action by soliciting volunteers who agree to the withdrawal of vessels.
- The proposed number of vessels to be withdrawn is brought to the attention of the prefectural federation of fisheries cooperative for on-forwarding to the Japan Fisheries Association (JFA) at the national level.
- The central government provides subsidies to fishers through JFA, which represents 44 percent of the total cost. The prefectural government and the fishers who remain in the fisheries contribute 56 percent of the programme costs.

In the case of small-scale coastal fisheries, fishing is carried out on a family scale and withdrawal from fishing would mean the suspension of income. Vessel reduction is therefore rarely seen in coastal operations.

The main types of fisheries that have participated in vessel reduction programmes during the last decade include: offshore bottom trawling, large- to medium-scale purse seine, small-scale trawling, shrimp traps, bottom trawling operated in East China Sea and sail trawling. Of these, sail trawling and small-scale bottom trawling belong to coastal fisheries, while the rest are classified as offshore fisheries. The geographic coverage of this programme is nationwide. The maximum withdrawal rate was observed in 2000-2001 when a total 1 of 68 vessels were decommissioned and about 9 billion yen (US$74.7 million) subsidized.

In the case of high sea fisheries, there are two types of vessel reductions, voluntary and compulsory. The latter occurs as a result of restrictions or banning of fishing by international regulations, leading to the redeployment of distant-water vessels. As the remaining fishers may not enjoy increased rents from the programme, they are not required to shoulder any financial burdens for compensating vessel owners leaving the sector; the entire compensation is made by the government. Major vessel reduction programmes implemented during the last decade are as follows:

1990-1992: Withdrawal of salmon fishing from the high seas in the North Pacific due to the driftnet moratorium. The government subsidized 40 billion yen (US$272 million) in order to stabilize incomes.

1992-1994: Withdrawal from driftnet fishing from the northern Pacific. A total of 20 billion yen (US$160 million) was provided for the destruction of vessels and nullifying licences.

1998: Reduction of tuna vessels by 20 percent, from 650 to 518 vessels; 20 billion yen (US$150 million) was allocated for this scheme.

2001: The quota for cod fishing in the EEZ of the Russian Federation was reduced by 83 percent compared with the previous year; a subsidy of 300 million yen (US$2.7 million) was granted as compensation.

There is no indication that capacity reduction programmes exist or have been ever seriously discussed in the Russian Federation.

The presence of management plans

The available material does not provide an explicit definition for "management plans" in all countries of the region but Japan. In 2002 in Japan, the Fisheries Basic Plan (FBP) was formulated on the basis of the Basic Law on Fishery Policy (BLFP) and was approved by the Cabinet. The FBP is a master plan for the fisheries sector in which the major elements of the BLFP are used to help fisheries' administrators and managers design and implement sectoral strategies and programmes. The FBP consists of four components: (i) a basic policy; (ii) goals for the self-sufficiency rate of fish; (iii) major strategic initiatives; and (iv) requirements for its implementation.

It is envisaged that the FBP will be evaluated every five years according to effectiveness and validity, and if necessary, it will be revised to respond to the changes that have occurred during the period under review.

The Japanese Government has been rigorously implementing area-specific or fishery- specific resource recovery plans at a wide range of operational levels throughout Japan. As of March 2003, there were seven ongoing plans targeting 13 fish stocks (Annex Table 12).

Stakeholders involvement

In the Democratic People's Republic of Korea, China, the Russian Federation and the Republic of Korea, stakeholders are not formally involved in the process of fishery management. The real situation is different, however, and ranges from a totally centralized type of management in the Democratic People's Republic of Korea, to various levels of stakeholder involvement (i.e. municipal and regional administrations and legislators, fishing enterprises and their associations) in public discussion and consultative processes in China[3] and the Russian Federation, to sharing management responsibility in the Republic of Korea (Annex Table 13).

The Government of the Republic of Korea started a fishers-oriented co-management system for more effective implementation of responsible fisheries. Under this system, an organization of fishers such as a fishery corporation or a group of fishers in fishing villages set up self-regulation according to the fishery-related laws and regulations with the endorsement of local government, thereby controlling fishery. The fishers-oriented co-management system is designed to enhance fishers' sense of responsibility and to prevent illegal fishing.

In Japan, fishers' voluntary management initiatives have been well integrated into the official management system, and in general, have been effectively carried out (see Box 4). Currently, the TAC system forms the core of the official management measures within the EEZ and calls for fishers' strong participation in the planning and implementation of the TAC regulations that impose a limit on catches of major species. In this respect, harmonization between management authorities and fishers' voluntary management schemes is indispensable for achieving effective resource rehabilitation. There is also a need to involve recreational fishers (activities estimated at around 39 million fisher-days per year) in management schemes from the early stages of planning, such as stock assessment. Resource users' participation in formulating management plans is essential for raising their awareness on the importance of managing fish stocks.

The Fisheries Basic Plan (FBP), or the Master Plan, for the fisheries sector, stresses that resource users should have considerable responsibility in the conservation

[3] Note: In the Country Questionnaire, the answer to the question concerning whether there was involvement of stakeholders in the consultation process was "no". However, the country review clearly indicates that there is indeed a consultation process (see above).

BOX 4

Outcomes of the Japanese community-based fisheries (Schmidt, 2003)

The first observation on Japanese community-based fisheries is that there may be important efficiency gains by management decisions taken at the local rather than central levels. This is achieved through a reduction in transaction costs related to both production and management. Co-managed fisheries allow more flexibility, which makes the fishery more profitable. Similarly, management objectives may be satisfied more accurately and can be geared to local conditions.

Another important observation is that co-management promotes voluntary compliance through peer group pressure. This is also likely to reduce transaction costs in particular as central enforcement may be minimized. The fishers collectively have an interest in securing the long-term sustainability of the resource and enforcement costs can thus be reduced. The study observes that the vast majority of compliant behavior is the result of social behaviour rather than enforcement per se, suggesting that the fishing community structure, through social control, works as an important lever for the fulfillment of management objectives. Furthermore, as fishers closely participate in the management process, they are more likely to be motivated in protecting fishing and fishing grounds. In other words, what in many other fisheries situations would be perceived as unpopular decisions (e.g. quota reductions, scrapping of fishing vessels), in community based fisheries management settings, there will be a better chance of success.

The second set of observations relates to local knowledge of stocks, fish biology and environment in general, which for obvious reasons is more advanced at the local level. Such knowledge can be utilized through local community-based management approaches. While also reducing transaction costs related to stock assessments, local knowledge can provide valuable additional information that can complement biological data from central research programmes. Further, this knowledge has developed over time and is likely to be more recognized by fishers than formal research.

The third set of observations relates to the broader social function of fishing communities. In Japan, many coastal fishing communities consist of homogenous social units or families that share a cultural heritage and work together towards shared fishery management objectives. Various methods are used in Japan by the local Fishermens' Cooperatives Associations (FCAs) for the allocation of catch possibilities to individual fisher, varying according to the social structure of the fishing community, among other things. This may, for example, entail a first right for elderly fishers to harvest easily accessible species. In addition to having the role of management, the FCAs also provide additional services that may include credit facilities supplies of inputs (e.g. fuel, nets and ice) and other social functions such as schooling. In general, Japanese fishing communities develop additional activities in support of the harvesting sector including processing handling and marketing.

Finally, it should be mentioned that the support provided by the central government to the FCAs is of high significance. The support includes legal, technical and financial assistance and may be an additional reason for the longevity of the community-based fisheries management system in Japan. The support to the FCAs and the financial transfers to port infrastructure in Japan are the principal Government financial transfers to the fishing industry which in 2001 totaled JPY313 billion (US$2.35 million).

and management of fishery resources in the light of the basic concept of resources management. The FBP will identify the scope of the appropriately delegated responsibilities, provide the necessary guidelines for effective management and design monitoring schemes that will enable the national and prefectural fisheries authority to remain in control.

Regularity of the stock assessment

Regularity and practices of stock assessment varies from country to country. In China, stocks have only been assessed occasionally depending on available financial resources. However, Article 22 of the revised Fisheries Law states:

> *Following the principle of keeping the allowable catch lower than the increase of the fishery resources, the State determines the total allowable catch of the fishery resources and applies a catch limit system for fishing. The administrative department for fisheries under the State Council is responsible for arranging surveys and assessment of the fishery resources to provide a scientific basis for the implementation of the catch limit system for fishing.*

As a first step, according to these provisions there are plans to conduct surveys and assessments for two stocks, namely, hairtail fish in East China Sea and anchovy in Yellow Sea.

In the Republic of Korea, the implementation of the TAC programme for the seven most important fisheries implies that the corresponding stocks are assessed on a regular basis (see Box 5).

In Japan, the Fisheries Research Agency (FRA) is mandated to provide information on the status of fish stocks every year. It aims at increasing scientific knowledge of fish stocks and further expanding their coverage. There is a strong demand for developing models to predict the likely changes in the magnitude of fish stocks in the future through improved accuracy and increased sophistication of analytical methodologies. Reliable stock assessment of major species and marine living resources including whales, marine environment and ecosystems are other important research items.

In the Russian Federation the most commercially important stocks, i.e. Alaska pollock, Arcto-Norwegian cod, herring, salmon, and red and blue king crabs are assessed annually using variously designed surveys by fishery institutes subordinated to the Federal Agency for Fisheries. Currently, the responsibility for stock assessment in the Northwest Pacific is mandated to the Pacific Centre for Marine Fisheries and Oceanography (TINRO – Centre), which has branches in Khabarovsk, on Sakhalin, in Kamchatka, in Magadan and in Chukotka. In many other cases, catch and effort data are collected and used.

Implementation of TAC and TAE regulatory measures

Neither the Democratic People's Republic of Korea nor China are implementing TAC measures.

In 2001, in the Republic of Korea, the TAC system – following its successful testing in 1999-2000 (see Box 5) – became an alternative to the current fishing licence system and has been implemented for seven commercial species – the common mackerel, Pacific sardine, Jack mackerel, red snow crab, purple Washington clam, pen shell and spiny topshell.

Japan and the Russian Federation have been broadly using the TAC approach to fishery management. However, even in Japan the application of TAC measures are limited to the seven commercially important stocks, i.e. sardine, mackerel, jack mackerel, saury, Alaska pollock, common squid (*Todarodes pacificus*) and snow crab. These species were chosen on the basis of the following criteria:

- The fish are abundant nationwide and of high commercial value.
- The status of fish stocks is extremely poor and urgent measures are required for resource management and rehabilitation.
- The fish are sought with great interest by foreign fishers.

In Japan, the TAC system plays an important role in fisheries management within the EEZ. However, since the enforcement of the TAC Law in 1996, a number of shortcomings have been identified in the regulations, including the absence of provisions to implement rigorous regulatory measures. It has been pointed out, for example, that under the current TAC Law the management authority cannot impose

the application of rigid management methods (e.g. cancellation of licences), and it is legally difficult to expand the list of fish species determined by the TAC.

The difficulties with the TAC system are partly solved in Japan by the introduction of the total allowable effort (TAE) measures, which were introduced to manage fish stocks whose abundance is difficult to assess due to the inherent fluctuations. The TAE system gives an upper limit on the number of fishing days as well as vessels in a specific area within the EEZ. Unlike the case of the TAC system, this management method is implemented more flexibly without scientific data. The TAE system can thus be applied when the abundance of fish stocks is on a downward trend or highly fluctuates as a result of changes in oceanic conditions. The competent minister is authorized to determine the ceiling of catches of the fish species designated by TAC and to control fishing activities through the application of TAE. The differences between the TAC and TAE systems are presented in Annex Table 15.

In the Russian Federation, the TAC for all species and stocks exploited by the industrial fishery is required by law (Article 28 of the Law on Fishery and Conservation of Aquatic Biological Resources). Fishery institutes provide assessment of exploited and exploitable stocks and yearly estimates of allowable catches for particular commercial stock. These estimates are approved by the Federal Agency for Fisheries and are subject to panel review conducted by the division of the State Ecological Expert Review of the Federal Service of Environmental Control. Once reviewed, the TAC proposal has to be approved by the Ministry of Agriculture and Fishery and becomes the basis for quota setting. The effectiveness of TAC measures is different. While in some stocks TAC limits have never even been approached, seafood species valued in the Asia Pacific market are regularly overfished and the illegal catch undermines management effort (Boxes 6 and 9).

The present system of quota setting was introduced in 2003 and recently has been official under the Law on Fishery and Conservation of Aquatic Biological Resources (Article 31). It is analogous to the system of Individual Transferable Quotas in the United States and some other countries.

Quotas for industrial fishery are determined separately for coastal and non-coastal fisheries. Each participant of a fishery may hold a share in the allowable catch for particular stocks, which are calculated as average shares from the previous five years. This share remains constant for the next five years unless the holder buys additional shares (e.g. for newly introduced stocks for industrial fishery or shares refused by previous holders) via auctions or sells his share. A yearly individual quota is set by multiplying allowable catch for a particular stock to the share of particular holder.

Licensing

The concept of licensing as a fishery management tool is setting the maximum permissible number of fishing licences issued to fishery enterprises or individual fishers in order to protect the fishery resources. Licensing is conducted in various forms in all countries but the Democratic People's Republic of Korea, where the existing practices are difficult to attribute to licensing. In the Russian Federation with its rigid TAC system, licensing merely consists in the approval of the right to conduct fishery by the state authority. In the industrial fishery, licensing per se, without a quota, does not play a distinctive role in the management process for the country's EEZ and the territorial sea.

In countries such as China and the Republic of Korea where application of the TAC and quota systems are limited, licences play an important role. Of particular importance are licences issued in the Russian Federation, the Republic of Korea and China for fishing in the High Seas. For example, Article 23 of China's Fisheries Law stipulates that fishing licences for fishing on the High Seas shall be granted upon approval by the administrative department for fisheries under the State Council. Article 19 of the

BOX 5

Topshell resource management under a TAC programme in Korea

Topshell (*Batilus cornufus*), which is fished mainly around Cheju Island, has been exported to Japanese markets since the 1970s, and has been one of major fishery resources for Cheju islanders. Its economic significance has led to strong incentives to exploit this particular shellfish. Cheju fishers have been increasing topshell fishing activities over time and exports have made a substantial contribution to enhancing their income.

Until the 1970s its production was maintained at around 1 500-2 700 tonnes, but reached a record high of 3 163-3 649 tonnes in 1982-1985. In 1986-1988, an unusual phenomenon hit the topshell species that had a significant direct impact on the Cheju economy. During this period, the demise of topshell fishery throughout the coastal area of Cheju Island resulted in dramatic socio-economic problems. This situation continued until 1989 when fishers experienced the lowest level of annual production, 440 tonnes.

This disastrous predicament fostered the consensus among research institutes, administrations, guidance institutes and fishers on stopping further fishing efforts, without recovery of topshell resources. The South Branch of the National Fisheries Research and Development Institute proposed that it would develop a total allowable catch (TAC) system in order to allow the topshell resources to recover.

Topshell fishers initially failed to understand the benefits of the TAC system and disregarded it until proven by the Institute. However, positive efforts for developing and implementing a TAC system were initiated among the interest groups to decide on seasonal closure during the spawning period (between June and September) and on changes in the catch size limit from 6 to 7 cm.

In spite of the recovery policy of the topshell resources, however, the downward production trend continued until 1989. All the public administrations were certain that topshell resource recovery would be futile without a more active management policy. They therefore agreed to launch the TAC system in the late 1990s.

The annual topshell TAC for recovering the resources was set at 900 M/T in 1991, 1 200 M/T in 1992 and 1 500 M/T between 1993 and 1994.

As topshell resources started to dramatically recover three years after implementing the TAC scheme, fishers stressed that there was no longer a need for the TAC policy on the topshell resources and ultimately demanded its dissolution. Consequently, the TAC system was suspended between October 1994 and December 1996. However, as the resources began to decline, the local fisheries administrations began to actively intervene by reinstating the TAC scheme with a TAC level of 2 000 M/T.

As a decline in topshell resources was apparent, fishers began to fully recognize the need of a TAC and the TAC system was officially adopted in October 1997 reflecting of various opinions from all levels of society. In this regard, the TAC was set to 2 531 M/T in 1998, 2 107 M/T in 1999, 2 045 M/T in 2000 and 2 185 M/T in 2001.

The reasons for the drastic decline of topshell resources were due mainly to unusual deaths of topshell fish. Research showed that the main causes were:

- a decline spawning biomass due to overfishing;
- a decrease of reproductive capacity due to the decline of spawning biomass;
- a decrease of recruitment due to fishing below the size limit;
- habitat degradation;
- a decrease of food organisms.

Since the inception of the TAC in the early 1990s, the most difficult problem that has arisen has been how illegal diving-fishing-boats should be eliminated. The Cheju Provincial Government managed to successfully introduce a buy-back/scrapping programme, which is expected to make a significant contribution to the sustainability of Cheju topshell fishery and resources. This case of topshell fishery management may provide other Korean fisheries with a good model.

Source: contribution to the study on economic and social stability indicators for fisheries (OECD, 2001).

Regulation on Distant-Water Fisheries Management stipulates that the fishing vessels conducted fishing operation on the high seas shall comply with fishing area, fishing type and fishing duration as set out in the Fishing Permit of High Seas Fishery, and observe the international treaties and agreements that China ratified or accessed.

The most complex licensing system exists in Japan where it complements the fishery rights system. A national fishery licence is required for those who carry out fishing on a nationwide scale or on the high seas. A licence is issued by the Minister of Forestry and Fisheries to individual fishers, a group of fishers or a juridical person, such as a corporation.

The national government is in a position to limit the number of licences and monitor the changes in fishing practices by category of fishing. The licence specifies detailed terms and conditions of fishing, including restrictions on gear, fishing areas and seasons, fishing bases, etc. In case the number of applicants for a licence exceeds the pre-announced number, priority is given to those who are presently involved in the fishery.

Fisheries that come under the administration of the Prefecture Fisheries Departments include: (i) medium-scale purse seining using a vessel of 5-40 GT; (ii) small-scale trawling using a vessel under 15 GT; (iii) small-scale salmon driftnetting using a vessel under 30 GT; and (iv) trawling using a vessel over 5 GT in the Seto Inland Sea.

These fisheries are operated in offshore waters beyond the areas secured for coastal fisheries. The licence is issued to individual fisheries operators by the Prefectural Governor, which describes the terms and conditions, such as the kinds of gear and methods, the minimum exploitable sizes of particular marine animals, closed areas and seasons, and sets various associated rules. At the national level, the Fisheries Agency of the Ministry of Forestry and Fisheries determines the overall limit on the number of licences to be issued by the prefectural governors for each category of fisheries. A notable feature of the fishing licence is that, unlike a fishery right, it is not treated as a property right; hence the fishing operation of a licensed vessel is not protected by the law.

Fisheries rights system

The fishery rights system is not explicitly expressed in the fishery management of China and the Republic of Korea. It is most developed in Japan where it largely aims to protect the coastal fisheries from the deterioration from other fisheries. Fishery

BOX 6

Comparison of the Russian export of commercial crustaceans (crabs and shrimps) to Japan and total allowable catch (TAC) of crustaceans in the Russian Far East (Arai, 2004)

Year	Import to Japan, tonnes	Total allowable catch in the Russian Far East, tonnes
1998	75 325	...
1999	80 570	85 140
2000	86 130	85 140
2001	84 684	73 814

The analysis of the Japanese import statistics shows that in 1999 and 2000 the catch of crustaceans landed in Japanese ports exceeded TAC in the entire region of the waters of the Russian Federation in the Northwest Pacific. Considering extensive landing in the Republic of Korea, China, and other countries, it can be concluded that TAC is regularly exceeded and illegal catch and trade in seafood seriously threaten the stocks.

rights are exclusive rights to fish in a specified water area with permitted fishing gear; encroachment by a third party is completely excluded. There are three types of rights: common fishery rights, set-net fishery rights and demarcated fishery rights. The significance of the fisheries rights system is that it legally recognizes the traditional systems of sea tenure. This allows fishers to utilize their detailed knowledge of the local marine ecosystem, their traditional rules for allocating access to grounds and resources, and their traditional conservation practices as the basis for resource management.

A common fishery right is granted only to fishery cooperatives by prefectural governors, who in turn distribute it among the membership. This type of right is further divided into three sub-types: Type 1 for the harvest of littoral immobile species (e.g. seaweeds, shellfish and other benthos); Type 2 for the use of small stationary gear at depths of less than 27m; and Type 3 for the use of beach seines. The allocation of resources and fishing grounds for each sub-type of operation and the selection of fishers for engagement in each type are determined in accordance with principles of equity and through a consensus of all members of a particular cooperative. Type 1 rights are confined to stocks of bottom dwellers, and mobile species are thus made available for exploitation by means of other, more effective fishing gear. The validity of the common fishery right lasts for ten years.

The set net referred to in this category of rights is defined as a net set at depths of more than 27 m. Priority in the granting of set-net fishery rights is given to individual fishers and fisheries' cooperatives that have sufficient capital for the investment involved and experience in set net operations. At present, such rights are mainly granted to fisheries' cooperatives that are financially capable of handling the investment and operation. This right is valid for five years. A demarcated fishery right is one established for marine aquaculture in a specific sea area.

In the Russian Federation, the property right system is in the process of being established due to the legal development of the notion of "fishing parcel" (*rybopromyslovyi uchastok*). These parcels existed far before the adoption of the Law on Fishery and Conservation of Aquatic Biological Resources in 2004. They were mostly granted to fishing cooperatives (*kolkhozes*). Since some *kolkhozes* were successors of much older fishing communes, the custom or rights to fish in particular coastal areas may have historical roots (Box 7). In the post-Soviet period, different regions adopted their own rules for allocating fishing parcels while some *kolkhozes* collapsed. However, the new holders of fishing parcels were mostly interested in salmon fishing, and in some areas such as south of the Russian Far East, in aquaculture.

The present law requires a new inventory of all fishing parcels and re-arrangements of the contracts upon application, on a competitive basis. The communes of indigenous people have a right to hold their fishing parcels on a priority basis, without competition. The rules and procedures for allocating fishing parcels are subject to regional regulation: regional administrations or legislators should adopt specific rules for each region.

Monitoring of fishing vessels and enforcement

The practices of monitoring and enforcement are essentially different in the countries of the region. With the important development of the Chinese fisheries, the task to monitor numerous and mostly small vessels becomes difficult. However, once the relatively simple operational management system – based on licensing, capacity reduction programme and temporal restrictions – was developed, China enhanced cruise inspection in its EEZ in order increase its monitory and control system. The penalty imposed on violations of the fishery law and regulations have also become more serious.

In the Republic of Korea, the MOMAF, the Maritime Police and local governments are mandated to jointly carry out the monitoring and enforcement of the fisheries regulations and programmes. Accordingly, in 2001 the agencies mobilized 84 patrol

BOX 7

Sakhalin lagoons: the rise, the fall and the property right of fisheries

The village of Morskoi Piltun on the northeastern Sakhalin coast existed for many years and was most probably located on the site of the ancient Nivkh (the indigenous people of the lower Amur and North Sakhalin) settlement on the coast of the Piltun Lagoon. From 1950 to 1960, there was a fishing *kolkhoz* specialized in industrial herring fishing using a 300-metre *zakidnye nevoda.* Herring was salted in a large processing factory and the production transported to the nearest railway station. In the late 1960s, herring catches decreased, which coincided with the general policy of the Soviet administration to reduce the number of villages in remote areas and moving their inhabitants to fewer but larger settlements. In 1968, Morskoi Piltun was therefore abandoned and the *kolkhoz* joined two other *kolkhozes* located in the shores of other lagoons of North-eastern Sakhalin. The new *kolkhoz* had been based in the town of Nogliki, around 150 km to the south of Morskoi Piltun. This *kolkhoz* retained the fishing ground in the Piltun Lagoon and used the remaining facilities in Morskoi Piltun. In the post-Soviet period a small enterprise separated itself from the *kolkhoz* and continued fishing in the area. However, the specialization of this fishing has changed dramatically. Today, the enterprise regularly receives a quota for navaga in the winter fishing season for this particular area. Production of frozen navaga goes to the local and the regional market. Navaga fishing is carried out by a team of ten to 12 fishers, while in the summer, one member of the team watches the base and conducts subsistence fishing with seine nets. The right to fish in this particular site is based on a combination of legal documents (ownership of the fishing base, rights to perform economic activity on this particular segment of the shore, allocation of the quotas) and tradition.

vessels, 220 patrol boats, 10 helicopters, and 3 950 staff and found that 1 532 national vessels and 95 foreign-flagged vessels violated Korean laws and regulations.

Up to now there is no information on whether China or the Republic of Korea has developed a vessel monitoring system based on satellite technologies.

In Japan, specific enforcement measures are normally components of the general management plan for the recovery plans of particular fisheries. Considerable enforcement effort has focused on the foreign vessels fishing in Japan's EEZs. Special measures are undertaken for the Japanese vessels fishing in the High Seas. The Fisheries Agency assume responsibilities to maintain discipline and order of Japanese distance-water vessels in order to comply with international rules and regulations through a variety of activities. These include a vessel monitoring system for tuna longliners, routine inspection at landing sites for tuna vessels, and at-sea boarding and inspection for trawlers.

In the Russian Federation, enforcement measures normally include patrolling at sea, on-board inspection at sea, on-board observation (mostly for foreign vessels working in the EEZ of the Russian Federation) and inspection of coastal bases, in particular for salmon fisheries. A comprehensive satellite vessel monitoring system was established in 1999.

Management measures of most important fisheries

Large-scale industrial fisheries

The management of the most important fisheries shows a transition from using relatively few instruments to implementing various measures (Annex Table 14). The most important industrial fisheries in China oriented towards a diversity of stocks are managed using rather simple tools allowing effective control such as licensing, closures

of particular areas and gear restriction. The Republic of Korea does not apply area closures but controls catches and size of commercial organisms. It also applies fiscal instruments such as taxes and royalties for fisheries management. Japan also uses some simple regulation measures such as licensing, temporal restrictions, gear restrictions and catch restrictions. The Russian Federation applies most of the tools, at least formally. In particular, fiscal tools include fees whose amount depends on particular stocks. Holders of quotas must pay these fees when receiving an annual permit to fish. Neither fishery rights systems nor performance standards are used in the management of the industrial fisheries (Annex Table 14).

Coastal, artisanal and small-scale fisheries.
Available material makes it possible to distinguish the management of the coastal, artisanal and small-scale fisheries from the management of industrial fisheries in Japan and, in some particular cases, also in the Russian Federation.

In Japan, small-scale set-net fishing, trawling and gillnet, driftnet, stick-held dipnet fisheries are managed using, in general, a broader set of tools than in the large-scale fisheries, including marine protected areas, nursery areas closure, temporal closures (defined fishing seasons, defined days fishing), several kinds of gear restrictions, catch restrictions and community rights system. However, neither fiscal tools (taxes and royalties) nor performance standards are used. On the other hand, the enforcement of these fisheries is not as strict as that of large-scale fisheries.

Management of marine subsistence and recreational fisheries

In Japan, the management of recreational fisheries has focused first on the operations of the recreational fishing boats. Due to conflicts between coastal fisheries and recreational fishers over fishing grounds as well as mooring quays, the Recreational Fisheries Law (Law No. 99) was enacted in 1988 and integrated into Fisheries Law (1949) in order to regulate recreational fishing and to avoid disputes between two groups of fishers. In practice, prefectural governors issues regulations concerning recreational fishing within the framework of the Recreational Fisheries Law, taking into account local conditions that greatly differ from one prefecture to another. The aim of the law is therefore concerned with how to ensure safe navigation, proper utilization of fishing grounds and safety at sea for recreational fishers. Awareness-building on resources conservation, fisheries management and environment conservation also constitute some of the important activities to be undertaken by management authorities under this law.

While recreational boat operators have to be licensed, marine recreational fishers are not required to obtain a licence or pay any fees directly to boat operators. There are some regulations to be observed by guide boat operators in regard to fishing areas, use of gear (e.g. use of nets is not permitted) and fish species (e.g. harvest of seeds of eel and yellowtail is prohibited).

Nursery areas closures were introduced as specific measurement regulations for two of the three most important recreational fisheries (rod and line on board, hand-line on board), whereas the third most important fisheries (rod and line on the beach, jetties and breakwaters) are not subject to such regulations.

The Fisheries Basic Plan (FBP) emphasizes that sound development of recreational fishing is an important part of tourism development, contributing to growth of the local economy through the increase of employment opportunities.

In the Republic of Korea, the recreational fisheries subsector is managed through the enactment of the Fisheries Act of 1908 (replaced by the Chosum Fishery Act of 1929) and the Recreational Fishing Boats Operation Act (RFBOA). The Chosum Fishery Act regulates the seasonal and area enclosures and minimum size limits, *inter alia*, of the fishery, while RFBOA controls the operational aspects of recreational fishing boats

including regulating the recreational fishers' safety, prohibiting the discarding of wastes by anglers, inspecting recreational boats for safety and waste-treating equipment on boats (OECD, 2002). Accordingly, recreational boats must be inspected for safety every five years and waste-treating equipment on boats is required.

Special rules for amateur and recreational fishing have been adopted in each region of the Russian Far East. These rules determine the permitted gears and allowable catch per day per person. For example, in the Sakhalin Oblast (which includes Sakhalin Island and the Kuril Islands), a single fisher is allowed to catch up to 300 specimens of smelt, 100 specimens of navaga, up to 20 kg in total of other fish species, 127 kg of king crabs, 200 hokkai shrimps, 50 sea urchins, 50 clams or whelks, and up to 50 kg of seaweed. Salmon species are prohibited for amateur fishing except fishing at sea with set nets on the basis of daily licences.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

The major costs of fisheries management are covered by the governments in all countries of the region but Japan. The budget for fishery management and enforcement at the national level in China shows a rapid increase in the last 15 years. (The local government budgets have not been available for the present study.) In 1990, the budget was only US$600 000. The budget directly linked with fisheries management in 1999 was US$7 million (for fisheries law enforcement). There was also a continuous increase after 1999. For example, US$27.3 million were used for enhancing fisheries management ability in 2001, of which US$8.3 million was used for constructing new fisheries law enforcement vessels. The increased budget ensured the smooth implementation of the moratorium and deterred domestic illegal, unreported and unregulated (IUU) fishing activities.

Costs for fisheries management in the Republic of Korea primarily involve: (i) research and education; (ii) fisheries infrastructure and environment enhancement; (iii) fisheries resources enhancement; (iv) aquaculture development; (v) renewal and modernization of vessels; (vi) support for crew insurance; (vii) payment for fishing fleet reduction; and (viii) other cost-reducing transfers. Total government financial transfers in 2001 amounted to KRW 550 billion (US$ 440 million); most of the transfers were used for fishing fleet reduction (KRW 260.2 billion, 47.3 percent), infrastructure and environment enhancement (KRW 177.2 billion, 32 percent), and resource enhancement (KRW 31.0 billion, 5.6 percent). The government financial transfers constituted around 12.2 percent of the total revenue from fisheries landings (KRW 4 511.9 billion, or US$3.6 billion) in 2001.

In the Russian Federation, the current budget for the fishery management consists of the costs of the stock assessment carried out by the fisheries institutes, the operating costs of the relevant services of *rybvods* or their successors following the administrative reform of 2004, the cost of enforcement at sea conducted by the Border Service and the operating costs of the relevant services of the Ministry for Natural Resources involved in the fisheries management process.

The full cost of the marine stocks assessment was recently estimated at around 8 billion roubles (the Russian Federal Institute for Marine Fisheries and Oceanography estimate), or around US$260 million (as of Spring 2003). This may be considered the maximum estimate. The total cost of assessment was probably close to this value in the early to mid-1990s when large "scientific quotas" were allocated for research and monitoring work and the process of their allocation was under less public control. Since then, the annual funds channeled to the stock assessment apparently decreased.

The funds for the management in the strict sense performed by the *rybvods* or their successors after 2004 also come from various sources. Basic salaries and supply are provided via the federal budget. Other sources of funding were and still are fees for issuing fishing permits and part of the fines imposed for violation of the fishing rules

in the inland (including estuaries and lagoons) waters. The *rybvods* also received part of the revenues from selling quotas according to the international agreements and the fines for the estimated loss of fisheries resources resulted from the industrial activity (offshore and harbour construction, accidental pollution, seismo-acoustic surveys, etc.). These funds, however, are mostly allocated to the development and modernization of salmon and sturgeon hatcheries. The exact distribution of these compensation fees between the central and the regional directorates is difficult to estimate.

The budget of the Border Service (performing enforcement at sea) is approved at the federal level and it is strictly controlled by the central directorate. It is unclear which part of the service's budget is allocated to the enforcement at sea since this information was never publicly accessible. There has been a general increase of the Federal Border Service budget since 1997, but the mechanisms of using fines for the development of the enforcement system are essentially lacking. The cost of the on-board observers currently recruited mainly from the employees of the Federal Border service is still covered by the fishing companies.

In Japan, a considerable part of the budget, especially for the coastal fisheries, is covered by prefectural governments, municipal offices, fisheries cooperatives and the private sector. However, it is not possible at present to obtain relevant figures.

In the three largest industrial fisheries and the largest coastal fisheries in Japan, the costs of research and development, monitoring and enforcement and daily management are covered by the government. No recovery from any type of licensing is provided by the legislation. In real terms, the management budget for these three largest fisheries increased in Japan in the last ten years. Governmental funding is allocated to the Fisheries Research Agency (FRA) and to the Ministry for Agriculture, Fishery and Forestry (MAFF). The budget for research (26 million yen, or US$247 000 in 2004) is greater than those for management services and enforcement services (19.44 million yen, or US$182 000, and 9.88 million yen, or US$94 000, respectively). Within MAFF the budget is divided between the Management Department, which receives the bulk of the funds, the Coastal and Offshore Department and the Distant Waters Department.

Events driving changes in the management actions

China is the only country in the region that has increased its catch in the last ten years. This is likely explained by a general economic growth, high demand for seafood and growth of technical abilities of Chinese fishers. Although a regular assessment was not carried out, it is known that since the overall fishing capacity is higher than the resources can sustain, marine resources are increasingly depleted. The main driving factors for fishery management are therefore the depletion of the resources and the growing fishing capacity, which has to be regulated.

Among several problems and constraints identified in the course of the sectoral review and assessment conducted during 1997 to 2000 in Japan by the Fisheries Policy Council, an advisory body to the Minister of Agriculture, Forestry and Fisheries (MAFF), there were three important issues that required government attention: (i) compliance with the principles of the United Nations Convention on the Law of the Sea (UNCLOS); (ii) the declining trend of domestic fish production, and as a consequence, the decrease in the self-sufficiency rate; and (iii) the declining trend in the number of fishers as well as the ageing of the fishers population.

Similarly, in the Republic of Korea during the last few decades, overcapacity, marine environmental degradation and international fishery regulations have severely constrained all of the country's fisheries. Since 1994 the chronic over-exploitation of marine fishery resources by overcapacity in coastal and offshore waters has been addressed by imposing a fleet-reduction programme, the General Buy-Back Program, and the introduction of special management measures such as the TAC system.

BOX 8

Major policy initiatives of Japan to prevent illegal catch of tunas

- Since large quantities of tuna caught by flags of convenience vessels were imported by traders despite the recommendations made by regional fisheries management bodies, the Japanese Government took action in 1999 to force tuna importers to report the name and origin of fishing vessels pursuant to the *Law concerning Special Measures to Strengthen Conservation and Management of Tuna Resources* (Law No. 101, 1996). The government further requested fish traders to refrain from importing fish caught by flags of convenience fishing vessels.
- Japan prohibited the importation of Atlantic bluefin tuna from Belize in 1999 following ICCAT recommendations, but lifted the ban in January 2004. Similarly, the ban of importing big-eye tuna from St. Vincent was lifted in January 2004.
- Japan has been prohibiting the import of Atlantic bluefin tuna from Equatorial Guinea since 2000.
- The import of big-eye tuna from Bolivia, Cambodia and Georgia has been banned. The import of bluefin, big-eye tuna and swordfish from Sierra Leone has also been banned.
- In order to monitor the trade of fish caught by IUU vessels, a number of initiatives have been taken by Japan including the collection of catch statistics on various tuna species and tooth fish. The above law stipulates that any person who imports bluefin tuna, southern blue-fin tuna, big-eye tuna, swordfish, Patagonian tooth fish, and Antarctic tooth-fish must submit catch data and other statistical reports to the management authority in accordance with the rules set by the relevant international fisheries management organizations.
- In 1999, a work plan was formulated under the joint effort of the Japanese and Taiwanese Governments to eliminate IUU vessels. The work plan included scrapping IUU vessels and changing to Taiwanese registration. Despite these efforts, it is estimated that there still remain around 100 IUU vessels. In April 2003 the industries of Japan and the Chinese Province of Taiwan agreed that new initiatives would be taken to eliminate the remaining IUU vessels.
- Japan has had a series of talks with China over the issue of IUU vessels, requesting to halt their entry and restrict the increase in number of tuna vessels. Subsequently, China also agreed to halt the entry of IUU vessels and to ban the import of used large tuna vessels. Nonetheless, China still holds the right to build tuna vessels as part of the rights owned by developing countries.

The current changes in the fishery legislation and administration in the Russian Federation include attempts to increase governmental control over resources and to demarcate the competence of the federal and regional authorities over the fishing grounds and aquatic bio-resources. This resulted in the demarcation, although not yet complete, of the coastal and non-coastal industrial fisheries.

The other driving force toward change in management actions and/ or mechanisms is usually the transboundary nature of particular exploited stocks. Currently, the stock and of the Barents Sea and its environmental assessments are presented to the International Council for the Exploration of the Sea (ICES) for discussion and consideration by both ICES and other advisory bodies. The Russian-Norwegian Commission on Fisheries sets TAC and quotas for both the Russian Federation and Norway, and adopts management regulations for most of the stocks except those that spend their entire life cycle in waters under the jurisdiction of the Russian Federation. Alaska pollock fishery in the Bering Sea, which is currently covered by a special convention on the stock protection is another example of management development driven by a transboundary regime.

Loosening governmental control over catch and export is a driving force for the introduction of new general measures such as the control over daily reporting and satellite monitoring of vessels positions, which became mandatory since 1999.

The economic role and dependence of the domestic economy on particular fisheries are also factors driving change in the management approach at the regional level. This is especially seen in the development of the Pacific salmon fisheries management, in particular, fisheries in Sakhalin, which include an almost regular assessment of smolts, the setting of a definite number of fishing sites at sea and in estuaries, assessment of the number of fish reaching spawning grounds, a flexible system of regulatory measures during the fishing season, and enforcement practices.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

All of the countries of the region ratified UNCLOS. Under the new maritime order created by UNCLOS, Korea, Japan and China have proclaimed their EEZs. These states have overlapping EEZ claims to the East China Sea, the East Sea and the Yellow Sea. Due to the complexity of these overlapping claims, the Korean Government concluded a fisheries agreement with Japan in January 1999 and with China in August 2000. From December 2001, Korea has had four rounds of maritime boundary delimitation talks with Japan and six rounds with China. Korea will endeavour to settle these matters in accordance with the international law and relevant practice.

The Chinese, Japanese and the Korean Governments are all adopting the *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing*. These activities were specifically focused on tuna fisheries issues. China conducted investigations on the business relations between fishery owners and the fishers who were or are engaged in IUU fishing activities; according to information sources, they have been asked to terminate these relations. China submitted a progress report on the issue to the International Commission for the Conservation of Atlantic Tunas (ICCAT) Working Group on IUU Fishing in May 2002. By the end of June 2003, the goal to end these relations was obtained. Japan has been involved in the elimination of IUU vessels to comply with internationally agreed rules and regulations. Major policy initiatives taken by Japan in this respect are presented in Box 8.

There is a considerable amount of illegally caught fish and seafood traded from the Russian Federation to the Asia Pacific market (Box 9). Both the Russian and Japanese governmental institutions conducted negotiations, but up to now the problem remains largely unsolved (see Box 9).

PARTICIPATION IN REGIONAL FISHERY BODIES

Agreements in international fisheries can be grouped into: (i) bilateral fisheries agreements with neighboring countries; (ii) participation in the regional fishery organizations; (iii) high seas fisheries; (iv) environmental and conservation-related management; and (v) bilateral assistance to developing countries. All countries of the region but the Democratic People's Republic of Korea have reciprocal bilateral agreements on cooperation in fisheries, which regulate access to transboundary fishery resources.

There is no special fishery organization for the Northwest Pacific, but there are several for the North Pacific, including the Pacific International Commission for the Exploration of the Sea (PICES) and the North Pacific Anadromous Fish Commission (NPAFC). The Russian Federation and Japan actively participate in the work of both. These countries and the Republic of Korea also participate in numerous regional fishery bodies, including those for other regions, in particular, the Northwest Atlantic (the Northwest Atlantic Fisheries Organization [NAFO]) and Antarctica (the Convention for the Antarctic, the Conservation of Antarctic Marine Living Resource [CCMALR]) (Annex Table 16).

Because of the importance of tuna fisheries for Japan, the country is party to all regional commissions for tuna conservation including the International Commission for Conservation of Atlantic Tunas (ICCAT), the Inter-American Tropical Tuna Commission (IATTC), the Commission for the Conservation of Southern Bluefin Tuna

BOX 9

What drives Russian fishers to catch seafood illegally and sell it to the Asian market?

Concentration of the Russian fleet in the EEZ of the Russian Federation and strong competition for resources stimulated export-oriented fisheries for seafood highly valued at the Asia Pacific market. As a consequence of proximity, Japan became especially attractive for the fishers from the Russian Far East. As a result, competition in the Japanese market increased while prices for seafood exported from the Russian Federation decreased. This in turn forced Russian companies to deliver an increasingly greater amount of seafood to Japan. Increasing supply led to a further drop in prices. A vicious circle was gradually formed and serious depletion of particular stockshad, i.e. king crabs, took place. When seafood export to Japan started to grow, neither the Russian Federation nor Japan was prepared to tackle the problem. Although deep economical roots of the problem were apparent, the Russian government adopted the federal programme Ryba (fish), aimed at delivering seafood mainly at domestic market.

This programme failed to influence the behaviour of Russian exporters. Low solvency of most of the Russian people and the remoteness of Russian Far East made this target unachievable.

Japan also had no solution for the situation. The Ministry for Agriculture, Forestry and Fisheries (MAFF) was very interested in obtaining lasting quotas for fishing in the EEZ of the Russian Federation. Its attitude towards increasing import from the Russian Federation was rather negative. The Ministry was concerned that this would adversely impact the accessibility of the resources for Japanese fishers. On the other hand, customs cared little about the documents that Russian captains presented when landing seafood. Although negotiations between the State Committee for Fisheries of the Russian Federation and the Fishery Agency of MAFF had been conducted for years, no agreement on the regulation of trade in fish and seafood was reached until 2002. After hard negotiations Japan agreed to permit landing only from fishing vessels that had customs cargo declarations released by the Russian customs authorities. Japanese authorities referred to the Law on the Regulation of Fishing by Foreigners (1967), which prohibits fishing vessels from calling into Japanese ports with the purpose of catch landing.

One month after the declaration, cargo vessels not covered by this law began to bring Russian seafood to the ports of Japan. Captains of these vessels presented customs declarations but Japan's customs authorities did not get involved in negotiating with Russian authorities and were not responsible for checking the validity of these documents. At the same time, Japanese fishing authorities did not have a legal basis on which to regulate operations of cargo vessels. This unfortunate situation proved low effectiveness of administrative measures for controlling trade in marine resources.

(CCSBT) and the Indian Ocean Tuna Commission (IOTC). Japan took the initiative to launch the formation of the Organization for the Promotion of Responsible Tuna Fisheries (OPRT), whose functions include scrapping tuna longliners involved in IUU fishing, listing tuna vessels, collecting tuna landings data and eco-labeling in order to ensure responsible fisheries on the high seas. The government also enacted the *Law concerning Special Measures to Strengthen Conservation and Management of Tuna Resources* (1999) in order to call on cooperation from traders who should voluntarily terminate the import of fish and fishery products from flags of convenience vessels.

Russia participates in the greatest number of fishery organizations for the region. This is explained by the access of the country to both the Pacific and the Atlantic Oceans and the broad expansion of the Soviet Union fishing fleet from the 1960s to the 1980s. The current international marine fisheries strategy of the Russian Federation aims at the following targets (State Committee for Fisheries, 2003):

- restoring and strengthening the position of the Russian Federation in the world's oceans;

- attaining national economic goals within the framework of international fishery cooperation on the basis of restoring the position of the Russian Federation in the World Ocean;
- exploiting the possibility to apply national scientific results within the framework of aquatic resources development programmes; and
- providing access of the Russian fishing fleet to the productive conventional areas of the World Ocean.

SUMMARY AND CONCLUSIONS

The policy framework for the fishery management in the Northwest Pacific is set by global agreement, such as the United Nations Convention on the Law of the Sea (UNCLOS) ratified by all countries but the Democratic People's Republic of Korea and national legislations. All of the countries (including the Russian Federation since early 2005), have basic national laws for fisheries and numerous regulatory documents focused on particular aspects related to fisheries. In all countries but the Democratic People's Republic of Korea, the legislation has been relatively recently (from 1990) renewed and updated in order to tackle numerous problems with resource depletion, social issues and, in some countries (e.g. the Republic of Korea), environmental problems related to development of aquaculture and agriculture. All countries but the Russian Federation and the Democratic People's Republic of Korea have special programmes aimed at the reduction of fishing capacity. Typically, all countries have a governmental body or bodies that are responsible for fisheries management, and in China, Japan and the Republic of Korea, which also carry out enforcement. In addition, in Japan, enforcement at sea is carried out partly by the Coast Guard, while in the Russian Federation, it is mainly carried out by the Border Service.

The catch volume of marine capture fisheries broadly varies between countries from less than 200 000 tonnes in the Democratic People's Republic of Korea to over 11 million tonnes in China. The general trend of marine catches at the turn of the century in all countries but The Democratic People's Republic of Korea is a zero growth or a steady yearly decrease by 0.5-4 percent. A general explanation is a decrease of the main fishery resources.

In the countries of the region, fisheries are classified into various types for management purposes, although these classifications are not always explicitly defined in regulatory documents. In Japan, the Republic of Korea and the Russian Federation, management practices and regulatory documents distinguish between coastal, offshore and distant-water fisheries. However, a coastal fishery is not necessarily an artisanal fishery. Non-professional and recreational fisheries constitute a recognizable segment in all countries, but estimates of the catch of recreational fisheries are limited.

The principal resources fished in the Northwest Pacific vary with seas, areas and countries. In the northern seas of the region the main fishing stocks are Alaska pollock, Pacific salmon, Pacific herring, Pacific cod, plaice, halibut, navaga, saury, rockfish, king and snow crabs, and pandalid shrimp. In the southern part of the region (southern Sea of Japan, Yellow Sea and Bohai Bay, East China Sea, Pacific waters southeast of Hokkaido), the fisheries are diverse and essentially multi-species without a clear dominance of particular stocks and with an increasing contribution of invertebrate target species. This multi-species characteristic of fisheries increases towards South China Sea. The distant-water fisheries of Japan, Korea and China largely focus on tuna fishing.

The set of management tools applied by the countries of the region varies from mostly general measures with scarcity of stock-specific practices as in China, to formal coverage of all industrial fisheries by TAC in the Russian Federation. The Basic Fishery Management plan is adopted only in Japan.

In The Democratic People's Republic of Korea, China, the Russian Federation, and the Republic of Korea, stakeholders are formally not involved in the process of fishery

management. The reality is different, however, and ranges from a totally centralized type of management in the Democratic People's Republic of Korea, to various levels of stakeholder involvement (i.e. municipal and regional administrations and legislators, fishing enterprises and their associations) in public discussions and consultative processes in China and the Russian Federation, to sharing management responsibility in the Republic of Korea. In Japan, fishers' voluntary management initiatives have been well integrated into the official management system, and in general, effectively carried out. Currently, the TAC system forms the core of the official management measures within the EEZ and calls for fishers' strong participation in the planning and implementation of the TAC regulations, which impose limits on catches of major species. Licensing is broadly applied in all countries, and the fishery right system is well developed in Japan and is in the process of development in the Russian Federation with a new federal law entering into force, the Law on Fishery and Conservation of Aquatic Biological Resources.

In all countries of the region but Japan, the major costs of fisheries management are carried by the governments. In Japan, a considerable part of expenses, especially for the coastal fisheries, are carried by prefecture governments, municipal offices, fisheries cooperatives and the private sector.

There is no special fishery organization for the Northwest Pacific, but several organizations for the North Pacific, such as the Pacific International Commission for Exploration of the Sea (PICES) and the North Pacific Anadromous Fish Commission (NPAFC). The Russian Federation and Japan actively participate in the work of both. These countries and the Republic of Korea participate in several regional fishery bodies, including those for other regions, in particular the North Atlantic (NAFO) and the Antarctic (the Conservation of Antarctic [CCMALR]). Japan is involved in almost all international organizations regulating tuna fisheries in the High Seas. The negotiation process on fisheries issues between the countries of the Northwest Pacific has never been easy and these organizations are fishery science fora rather than international organizations with a mandate for agreed concrete management measures. However, the complexity of management issues and the progressive depletion of resources must lead to regional organizations with a stronger management authority, possibly similar to ICES and NEAFC in the Northeast Atlantic.

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ANNEX TABLES

Note: data presented in the following tables are from the respective country reviews included in this report.

ANNEX TABLE 1
National fisheries laws and objectives of fishery management as set in these basic documents

Country	Principal fisheries laws	Year	Objectives of fisheries management as stated in the law
China	Fisheries Law of the People's Republic of China.	1986, amended in 2000.	Enhance the protection and rational utilization of fishery resources; develop artificial cultivation and ensure fishery workers' lawful rights and interests; boost fishery production.
Japan	Basic Law on Fisheries; The Fisheries Law; The Living Aquatic Resources Protection Law; The Law Concerning Conservation of Marine Living Resources.	Basic Law – June 2001; others amended in 2001 in accordance with the concept of the Basic Law.	Secure a stable supply of fishery products. Secure sound development of the fisheries industry to promote appropriate conservation and management of marine living resources
The Democratic People's Republic of Korea (North Korea)	Fisheries Law of DPRK	January 1995.	Not specified.
The Republic of Korea (South Korea)	Fishery Act; Fisheries Promotion Act; Fishery Resources Protection Act (Act No. 298, 12 Dec., 1953); Act on the Exercise of Sovereign Rights on Foreigners Fishing within the EEZ (Act No. 5152, 1996); Fishery Resources Protected Area (FRPA) Act.	Fishery Act amended in December 1995.	"The Government shall continuously promote resource development by establishing a fisheries protection zone, ensuring appropriate utilisation and development of fisheries resources, propagation of marine fisheries, prevention of contamination, and effective utilisation of fishing grounds in order to protect the fisheries resources." (Article 6 of the Fisheries Promotion Act).
The Russian Federation	Federal Law on Fishery and Conservation of Aquatic Biological Resources (2004).		Management purposes are not specified. Instead, there is an extensive list of the principles of legislation (Article 2).

ANNEX TABLE 2

Documents other than the basic national laws on fisheries, which form the policy and legal framework for fisheries management

Country	Types of documents	Documents	Objectives for fishery policy as defined in the documents
The People's Republic of China	National laws	The Law on the Territorial Sea and the Contiguous Zone (1992) The Law on the Exclusive Economic Zone and the Continental Shelf (1998).	Not specified.
Japan	National laws	Water Pollution Control Law (Law NO. 138) of 1970; Law related to Treatment and Incineration of Waste (Law No. 138) of 1970; Law on Special Measures for Environmental Conservation of the Seto Inland Sea (Law No. 110) of 1973; Law on Marine Pollution and Preventions of Maritime Disaster (Law No. 136) of 1970; Environmental Assessment Law (1999).	Regulate the flow of water from factories and places of business; regulate ordinary waste (e.g. household and industrial waste); prevent eutrophication and restrain reclamation in closed waters; prevent ocean pollution including coastal waters; evaluate any adverse impact of construction projects that would prejudice the intended benefits.
	Basic plan	Fisheries Basic Plan (2002).	Ensure that resource utilization is anchored on sound management policy for sustained long-term benefits to maintain a stable supply of fish. Provide management reforms, which are imperative to recover the poor state of fish stocks in the waters surrounding Japan. Enforcment – through reforms to the licensing and regulatory system – the control and redirection of fishing activities away from overfished areas. Facilitate reforms through the strong participation of stakeholders.
The Democratic People's Republic of Korea – (North Korea)	Presidential Decrees Cabinet Statutes for the implementation of the Fisheries Law of 1995	Presidential Decree of October 1976 for the conservation of fishery resources; Presidential Order issued in 1989 to improve the protection and conservation of fishery resources	Modernize the fisheries industry through the application of science and technology so that the Korean people can have a healthy level of 200 grams of fish and fishery products per day. (According to the Statement of the Ministry of Fisheries of DPRK to the FAO Fisheries Development Programming Mission, 1998)
The Republic of Korea (South Korea)	Acts, laws	Marine Development Act (Act No. 3983, 1987); Marine Pollution Prevention Law (MPPL) (1977); Water Environment Protection Law (WEPL) (1990); Coastal Zone Management Law (CZML) (1999).	Establish national marine specific areas that have special significance for conservation and recreation (MPPL); restore and maintain the chemical, physical, biological integrity of the ocean and coastal waters (WEPL); provide management of the nation's coastline by balancing economic development with environmental preservation (CZML) (OECD, 2002).
	Decrees	Resources Protection Decree.	
	Programmes	Fishery Structural Adjustment Program; General "Buy-Back" and Total Allowable Catch (TAC) Programs.	
Russian Federation	Federal laws	Federal Laws on the Animal World, the Territorial Sea and the Internal Marine Waters, the Continental Shelf, and on the Exclusive Economic Zone.	"The aim of the development of the fishery sector of economy in the Russian Federation is sustainable functioning of the fishery industry on the basis of conservation, replenishment, and rational use of the aquatic biological resources, the development of aqua- and mariculture, which altogether should meet the domestic demand for fish products, the social and economic development in the regions whose economy depend on the fishery. In addition, the conditions should be developed to provide effectiveness of fish and seafood export, their competitiveness and optimization of the fishery sector management" (The Concept 2003).
	Fishing rules	Basin rules for conducting aquatic fisheries resources.	
	Officially published policy documents	The Concept for the Development of the Fishery Industry of the Russian Federation up to 2020.	

ANNEX TABLE 3

The basis of management decision according to existing regulation

Does the national legislation require that management decisions be based on information coming from	China	The Republic of Korea	Japan	The Russian Federation
biological analyses or stock assessments?	Yes	Yes	Yes	Yes
economic analyses?	No	Yes	Yes	Yes
social impact analyses?	No	Yes	Yes	No
monitoring and enforcement options?	Yes	Yes	Yes	No

ANNEX TABLE 4

Patterns of fishery regulation

	China	The Republic of Korea	The Russian Federation
Are the fisheries legislation and regulations designed as a framework that shapes fisheries management and management plans?	Yes	Yes	No
Do the fisheries legislation and regulations specifically include specific management measures and regulations for individual fisheries? (If "Yes", please list a few examples.)	No	No	Yes

ANNEX TABLE 5

Responsibility for fisheries management and enforcement

Country	Responsibility for fisheries management at the national level	Responsibility for fisheries enforcement at the national level	Responsibility for fishery management at the regional level	Responsibility for fisheries enforcement at the regional level
The People's Republic of China	Bureau of Fisheries, Ministry of Agriculture	Fisheries Law Enforcement Command (subsidiary body to the Ministry of Agriculture)	Bureau of Fisheries Management and Fishing Port Superintendence of Regional Seas; fisheries administrations of provinces, fishing towns and counties	Bureau of Fisheries Management and Fishing Port Superintendence of regional seas
Japan	Fisheries Agency	Fisheries Agency	Fisheries Coordination Offices; Prefecture governments; Fisheries management organizations	Fisheries Coordination Offices
The Democratic People's Republic of Korea (North Korea)	Ministry for Fisheries	Ministry for Fisheries	Regional branches of the Ministry for Fisheries	Not specified
The Republic of Korea (South Korea)	Fisheries Administration Bureau and Fisheries Resource Bureau of the Ministry of Maritime Affairs and Fisheries (MOMAF)	Fisheries Resource Bureau, the Fishing Vessels Management Office and the National Maritime Police Agency (NMPA)	MOMAF provincial branches; provincial and local authorities	MOMAF provincial branches, Maritime Police and local governments
Russian Federation	Federal Agency for Fisheries	Border Service of the Federal Security Service	Basin directorates for aquatic bioresources protection and replenishment (rybvods)	Marine inspections of the Border Service; inspections of rybvods in internal marine waters

ANNEX TABLE 6
General characteristics of marine capture fisheries

Country	Volume, million tonnes	Value	Portion (%) GDP	Year	Number of vessels
China	45.65*	US$37.56 billion	3.04	2002	279 013 powered;
	14.33**	n.a.			20 435 without engines
Japan	5.767*	1.614 billion yen	Not specified	2002	236 000 powered (95% smaller than 10 t)
	4.278**	1.135 billion yen			
The Democratic People's Republic of Korea	0.307	Not specified	Not specified	1997	1 553 powered
The Republic of Korea	1.991**	US$2 884 billion	Not specified	2001	89 347 powered (95% smaller than 25 t); 5 588 without engines
The Russian Federation	2.444**	US$1.85 billion	0.8	2000	2 500 in entire country (longer than 24 m length); 46 floating factories, 366 transport vessels; data for smaller vessels not available

Note: Monetary value and share in the GDP is given for the lump production of the fishery and aquaculture.
* all fisheries
** marine capture fisheries

ANNEX TABLE 7
Japanese distant-water capture fisheries production (1 000 tonnes)

	2000	2001	2002
EEZs of other nations			
The Russian Federation	18	15	14
China	71	70	63
Republic of Korea	7	16	20
Other nations (1)	n.a.	n.a.	n.a.
High seas (2)	759	648	589
Total	855	749	686

Notes: n.a. = not available
1) Data on catches from EEZs of nations other than those specified in the table are not available. As of 2001, access agreements with foreign countries excluding those mentioned in the table were as follows: Canada, Kiribati, Solomon Islands, Marshall Islands, Micronesia, Palau, Tuvalu, Nauru, France, South Africa, Australia, Morocco, Senegal, Gabon, Seychelles, Sierra Leone, Gambia, Mauritania, Guinea Bissau, Cape Verde, Madagascar, Mozambique, Mauritius and Fiji. It should be noted, however, that the existence of fishing permits does not necessarily mean that fishing is carried out every year.
2) Figures in high seas include catches from the EEZs of "other nations" and those from the High Seas.
Source. Prepared on the basis of the Annual Statistical Report of the Japanese Fisheries and Aquaculture, Ministry of Agriculture, Forestry and Fisheries, 2003.

ANNEX TABLE 8
China's catch from marine capture fisheries by area (2002)

Area	Catch (million tonnes)	Percentage (%) of total marine capture fisheries catch
East China Sea	5.14	35.0
South China Sea	3.59	25.0
Yellow Sea	3.15	22.9
Bohai Bay	1.33	9.3
Other areas	1.12	7.8

ANNEX TABLE 9

The most important gear-specific fisheries in China and Japan and their contribution to the total catch of marine capture fisheries

Country	Year	First ranked fishery		Second ranked fishery		Third ranked fishery	
		Type of fishery	Percent of total catch (%)	Type of fishery	Percent of total catch (%)	Type of fishery	Percent of total catch (%)
China	2002	Trawl fishery	51	Gillnet and driftnet fishery	16.4	Set nets	14.6
Japan	2001	Purse seine	About 21	Longlining including pole and line	About 14	Trawling	About 13

ANNEX TABLE 10

The most important stock-specific fisheries and their percentage (%) of total catch of marine capture fisheries

Country	Year	First ranked fishery		Second ranked fishery		Third ranked fishery	
		Stock	%	Stock	%	Stock	
The Democratic People's Republic of Korea	1997	Bivalves	21.7	Alaska pollock	21.7	Squids	4.6
The Republic of Korea	2001	Anchovy	13.7	Mackerel	10.2	Squids	11.3
The Russian Federation	1999	Alaska pollock	41.5	Pacific salmon	3	Red king crab	1

ANNEX TABLE 11

The aspects of management recognized in particular countries (question 90)

What does the idea fishery management include?	China	The Russian Federation	The Republic of Korea	Japan
Legislation on individual fisheries?	No	No	Yes	Yes
Management plans for specific fisheries?	Yes	No	Yes	Yes
Interventions/actions to support specific management objectives?	Yes	Yes	Yes	Yes
Published regulations or rules for specific fisheries?	Yes	Yes	No	Yes
Traditional rules or customs that affect the harvest of marine fisheries?	No	Yes	Yes	Yes
Rules established by fishing organizations?	No	No	No	Yes

ANNEX TABLE 12

Current resource recovery plans in Japan

Region	Target species	Gear types	Management tools
Northern part of the Japan Sea	Flat fish, sand fish	Offshore trawling, small bottom trawling, gillnetting, small set-net fishing	Withdrawal of fishing vessels; application of non-fishing days, closed areas; operation of newly devised gear; re-stocking programmes
Western Japan	Flat fish, demersal species	Offshore trawling, small trawling	Expansion of closed areas, operation of newly devised gear
Northern Pacific	Flat fish and other demersal species	Offshore trawling, small bottom trawling	Closed seasons
Pacific Ocean	Mackerel	Large and medium size purse seine	Withdrawal of vessels, setting up non-fishing days, reducing the number of fishing days
Ise Bay and Mikawa Bay	Puffer fish, sea mantis, conger eel	Small trawling	Size limits, closed seasons, restocking
Seto Inland Sea	Spanish mackerel	Driftnet, gillnet	Closed seasons; enlargement of mesh size; restocking
Buzen Sea in Oita Prefecture	Short-neck clam	Small trawling	Closed seasons; size limits, establishment of fry nursing grounds

ANNEX TABLE 13
Participatory processes in fishery management

Does the legislation enable particular participatory processes, such as:	China	The Russian Federation	The Republic of Korea	Japan
Consultative management, where fisheries management stakeholders are consulted but do not share management responsibility?	No	Yes	Yes	Yes
Co-management, where fisheries management stakeholders are consulted and share some management responsibility?	No	No	Yes	Yes
Co-management, where fisheries management stakeholders actively participate in the management process and share significant management responsibility?	No	No	Yes	Yes
Devolution of management, where local participants/ stakeholders have full management responsibility?	No	No	No	No

ANNEX TABLE 14
Management tools used for the three most important industrial fisheries in each country of the region

Management tools	China	The Republic of Korea	Japan	The Russian Federation
Spatial restrictions	Yes	No	No	Yes
Temporal restrictions	Yes	No	Yes	Yes
Gear restrictions	Yes	Yes	Yes	Yes
Size restrictions	No	Yes	No	Yes
Licence/ limited entry	Yes	Yes	Yes	Yes
Catch restrictions	No	Yes	Yes	Yes
Rights-based regulations	No	No	No	No
Taxes/royalties	No	Yes	No	Yes
Performance standards	No	No	No	No

ANNEX TABLE 15
TAC and TAE measures in Japan

System	Management measures	Target species
TAC	set the upper limit of catches (e.g. saury = 334 000 tonnes in 2003)	saury, Alaska pollock, jack mackerel, sardine, mackerel, common squid, snow crab
TAE	fishing seasons, areas, total number of days of fishing operations	flat fish, Spanish mackerel, puffer fish, other demersal species

Source: Fisheries Research Agency, 2004

ANNEX TABLE 16

International fishery organizations where the countries of the region are participating

Region	Fishery management or fishery science organization	China	Japan	The Republic of Korea	The Russian Federation
North Pacific	PICES		X		X
	NPAFC		X		X
Pacific	APEC			X	X
Tuna commissions	ICCAT	X	X		X
	IATCC		X		
	CCSBT		X		
	IOTC	X	X		
Atlantic, Mediterranean, Black Sea	ICES				X
	NAFO		X	X	X
	IBFSC				X
	SEAFO				X
	CECAF			X	
	WECAFC			X	X
Indian Ocean	IOFC			X	
Trans-Oceanic	CCAMLR		X		X
	IWC			X	X

CCAMLR – Commission for the Conservation of Antarctic Marine Living Resources
CECAF – Fishery Committee for the Eastern Central Atlantic
IBFSC – International Baltic Fisheries Commission
IOFC– Indian Ocean Fisheries Commission
IWC – International Whaling Commission
NAFO – Northwest Atlantic Fisheries Organization
NPAFC – North Pacific Anadromous Fish Commission
PICES – North Pacific Marine Science Organization
SEAFO – South East Atlantic Fisheries Organization