Sustainable Management of Pelagic Fisheries in the South China Sea Region

by

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Acronyms

APFIC	Asia-Pacific Fishery Commission
AQD	Aquaculture Department
ASEAN	Association of Southeast Asian Nations
COFI	FAO Committee on Fisheries
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization
GIWA	Global International Waters Assessment
IPOA	International Plan of Action
ITLOS	International Tribunal for the Law of the Sea
IUU	Illegal Unreported and Unregulated
LME	Large Marine Ecosystem
LOSC	Law of the Sea Convention
MCS	Monitoring, Control and Surveillance
MFRD	Marine Fisheries Research Department
MFRDMD	Marine Fishery Resources Development and Management Department
MSY	Maximum Sustainable Yield
PRC	The People's Republic of China
RFMOs	Regional Fisheries Management Organizations
SAR	Stock Assessment Report
SCS	South China Sea
SEAFDEC	Southeast Asian Fisheries Development Center
TACs	Total Allowable Catches
TD	Training Department
UN	United Nations
UNCED	United Nations Conference on Environmental and Development
UNCLOS III	Third United Nations Conference on the Law of the Sea
UNEP	United Nations Environment Programme

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Abstract

The South China Sea (SCS) is one of the most important and abundant commercial fisheries areas in the world. Fisheries play a critical role in the food security and the economies of the States in the SCS region. Many of the pelagic fish stocks in this area are straddling fish stocks. In principle, no single State owns these common pool resources, which renders fisheries management in the region very difficult. The fishing capacity in the SCS is in excess, and the fishery resources are in a severe state of overexploitation. Thus, it is imperative for the pelagic fish stocks in the SCS to be managed at a regional level. However, disputes over fisheries resources in the region have made it more difficult to jointly manage such resources in a sustainable manner. The paper examines the geo-political situation in the SCS region, analyses the pelagic fisheries profile and sustainable management of pelagic fisheries in the area, as well as proposes solutions to achieve the sustainable management of such fisheries in the SCS region. It is maintained that fisheries management in the SCS region must focus on both the dynamics of the fisheries resources and address issues relating to other aspects of fisheries management including the resolution of delimitation problems. The conservation and management approaches under the Law of the Sea Convention, and other related international instruments, also play a significant role towards the sustainable management of pelagic fisheries in the SCS region.

Introduction

Fisheries resources, if properly managed, can produce long-term sustainable yields ensuring continuous economic activities and employment. However, research in fisheries management has usually focused on the dynamics of the fish resource while issues relating to other aspects of management have often played lesser roles. This is also the case for the South China Sea (SCS) region which is rich in both renewal fisheries resources and hydrocarbon resources. Fisheries resources, particularly pelagic resources, are very important not only as food supply for people but also as valuable export products of the States in this region. However, due to the open-access nature of fisheries, the fishing capacity in the SCS is in excess.[1] Furthermore, the destructive fishing practices have made it worse. The fisheries are in a severe state of overexploitation.[2] Many of the coastal pelagic and demersal fish stocks are fully exploited or overfished. This is evident in the increasing proportion of low-value species and juveniles of high-value species being caught.[3] Furthermore, some of the large pelagic in the area are considered as migratory fish stocks which need to be managed at the regional level. However, territorial disputes, such as the Spratlys disputes[4], as well as various conflicts in the SCS region have also made it more difficult to manage the fisheries in a regional and sustainable manner. Moreover, there is increased Illegal, Unreported and Unregulated (IUU) fishing because of the absence of maritime boundaries as well as fisheries monitoring, control and surveillance (MCS). Therefore, in absence of regional agreements, the Law of the Sea

[1] Peter Manning, *Control and Reduction of Fishing Capacity* (1998 [cited 1 May 2006]); available from http://www.oceansatlas.com/world_fisheries_and_aquaculture/html/issues/govern/overcap/control.htm#topof document.

[2] GIWA, "Preliminary Results for the Scoping and Assessment of the South China Sea and Sulu-Celebes Seas," (Global International Waters Assessment, 2001).

[3] Manning, op cit, note 1.

[4] Jonathan I. Charney, "Central East Asian Maritime Boundaries and the Law of the Sea," *The American Journal International Law* 89 (1995); Liselotte Odgaard, "Deterrence and Co-Operation in the South China Sea," *Contemporary Southeast Asia* 23, no. 2 (2001); Shicum Wu and Huaifeng Ren, "More Than a Declaration: A Commentary on the Background and the Significance of the Declaration on the Conduct of the Parties in the South China Sea," *Chinese Journal of International Law* 2 (2003).

Convention (LOSC)[5] and other related international instruments are left to play a significant role in sustainable fisheries management in the SCS region.

This paper examines the geo-political situation in the SCS region, analyzes the pelagic fisheries profile of the SCS region, and proposes solutions to achieve sustainable management of the pelagic fishery resources in the SCS region - in particular management approaches stipulated within the LOSC and other related international instruments.

[5] United Nations, *The Law of the Sea. United Nations Convention on the Law of the Sea* (New York: United Nations, 1982).

Part I The Geo-political Situation in the South China Sea Region

A. Geography of the South China Sea region

The SCS region comprises the marine, coastal and hinterland river catchments of nine States: Brunei, Cambodia, China, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, which have the highest coastal zone population growth of the world (Figure 1).

The SCS is recognized as a Large Marine Ecosystem (LME)[6] with specific characteristics of oceanography, biography and ecology. Much of the southern half of the SCS lies on the Sunda Shelf, and its coastal waters are shallow (< 200 meters deep) and influenced by both marine and river/terrestrial inputs. Further north, the SCS Basin and the Palawan Trough are much deeper (> 1,000 meters) and are bounded by the shallower continental margins and shelves of China, Vietnam, Cambodia, Thailand, Malaysia, Indonesia and the Philippines. The major gulfs and bays of the region are the Gulf of Thailand, Gulf of Tonkin, Lingayen Gulf and Manila Bay.[7] The SCS is considered a semi-enclosed sea under the LOSC[8], which describes such seas as:

> enclosed or semi-enclosed sea means a gulf, basin or sea surrounded by two or more States and connected to another sea or

[6] LMEs are regions of ocean and coastal space that encompass river basins and estuaries and extend out to the seaward boundary of continental shelves and the seaward margins of coastal current systems. LMEs are relatively large regions that have been delineated according to continuities in their physical and biological characteristics, including *inter alia*: bathymetry, hydrography, productivity and trophically dependent populations. United Nations Atlas of the Oceans, *Large Marine Ecosystems (LMEs)* (2006 [cited 10 October 2006]); available from http://www.oceansatlas.org/servlet/CDSServlet?status=ND0xMjcyNyZjdG5faW5mb192aWV3X3NpemU9Y3RuX2luZm9fdmlld19mdWxsJjY9ZW4mMzM9KiYzNz1rb3M~

[7] Wilkinson C. et al., *Global International Waters Assessment. South China Sea, GIWA Regional Assessment 54* (University of Kalmar on behalf of United Nations Environment Programme, 2005).

[8] United Nations, op cit, note 5, Article 122.

> the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States.

The SCS covers an area of around 3,500,000 square kilometers of the Pacific Ocean. Within this sea, there are over 200 identified islands and reefs. It is, however, generally agreed that most of these features are not suitable for human habitation but may be of vital economic, strategic, political and legal importance to the States of the region and beyond.

Figure 1: The South China Sea region.

Source: *South China Sea-Reference Map-Us CIA* ([cited 31 July 2006]); available from http://community.middlebury.edu/~scs/maps/South%20China%20Sea-reference%20map-US%20CIA.jpg.

These islands are grouped into four mid-ocean groups of islands, namely: (i) the Pratas Islands, (ii) the Paracel Islands; (iii) the Spratly Islands, and (iv) Macclesfield bank.[9] Most of the islands are within the Spratly Islands group which spreads over an 810 by 900 square kilometer area covering some 175 identified insular features. The largest one is Taiping Island (Itu Aba) at just over 1.3 kilometers long and with its highest elevation at 3.8 meters.[10]

B. The importance of the South China Sea region

a) Strategic points

The SCS contains some of the world's busiest international sea lanes[11] which link Northeast Asia and the Western Pacific to the Indian Ocean and the Middle East (Figure 2). More than 41,000 ships a year pass through the SCS.[12] Over half of the world's annual merchant-fleet tonnage passes through the region's waters. Tanker traffic through the Strait of Malacca at the Southwestern end of the SCS is more than three times greater than the Suez Canal traffic, and well over five times more than the traffic of the Panama Canal.[13] More than 80 percent of the oil imported by Japan, South Korea, and Taiwan transits through this area[14] and oil consumption among developing States is expected to rise annually on average. Almost all of this additional Asian oil demand, as well as Japan's oil needs, will need to be imported from the Middle East and Africa, most of which will pass through the strategic Strait of

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[9] Christopher C. Joyner, *Toward a Spratly Resource Development Authority: Procursor Agreements and Confidence Building Measures*, ed. Myron H. Norquist and John Norton Moroe, *Security Flashpoints: Oil, Islands, Sea Access and Military Confrontation* (1997).

[10] Stein Tonnesson, "Locating the South China Sea," in *Locating Southeast Asia: Geographies of Knowledge and Politics of Space*, ed. Paul Kratoska, Henk Schulte Nordholt, and Remco Raben (Ohio University Press, March 2005).

[11] David Rosenberg, "Environmental Pollution around the South China Sea: Developing a Regional Response," *Contemporary Southeast Asia* 21, no. 1 (1999).

[12] Ji Guoxing, "Rough Waters in the South China Sea: Navigation Issues and Confidence-Building Measures," (East-West Center, 2001).

[13] Erik Kreil, *South China Sea* (March 2006 [cited 24 April 2006]); available from http://www.eia.doe.gov/emeu/cabs/South_China_Sea/pdf.pdf.

[14] Scott Snyder, Brad Glosserman, and Ralph A. Cossa, "Confidence Building Measures in the SCS," *Issue and Insights* 2 (2001).

Malacca into the SCS. Supertankers going to Japan will pass through the wider Lombok Straight east of Bali. This adds to the strategic importance of the SCS which also contains oil

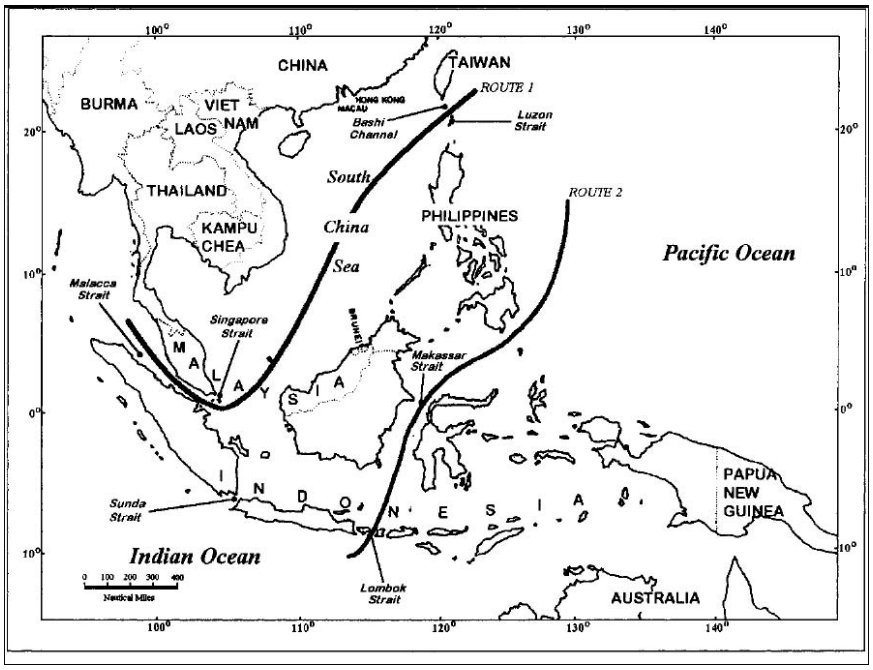

Figure 2: The two main traffic routes in the SCS region linking Europe and the Middle East to Asia.

Source: Joseph Morgan and Mark Valencia, eds., *Atlas for Marine Policy in Southeast Asian Seas* (Berkeley, CA: University of California Press, 1983).

and gas resources located near large energy-consuming States.[15] Therefore, exercising sovereign control over some of the islands in the area creates the opportunity for gaining a central and commanding position in the region. For this reason, the Pratas Islands, the Paracel Islands and the Spratly Islands are the most strategically important island groups in the SCS.[16]

In addition to the importance of the SCS for international trade and commerce, the sea lanes of communication in the SCS are also utilized for military purposes. The United States has always recognized and defended the traditional freedoms of navigation and over flight on

[15] David Rosenberg, *Environmental Pollution around the South China Sea: Developing a Regional Response to a Regional Problem*, ed. Anne Casson, vol. 20, *Resource Management in Asia-Pacific Working Paper* (Canberra: Resource Management in Asia-Pacific Project, Division of Pacific and Asian History, Research School for Pacific and Asian Studies, The Australian National University, 1999).

[16] Kuan-Hsiung Wang, "Bridge over Troubled Waters: Fisheries Cooperation as a Resolution to the South China Sea Conflicts," *The Pacific Review* 14, no. 4 (2001).

and over the world's oceans for military and commercial purposes.[17] For more than 20 years, the U.S. Freedom of Navigation Program has ensured that excessive coastal State claims over the world's oceans and airspace are repeatedly challenged.[18] For the United States, freedom and safety of navigation and over flight in the SCS region are critical strategic interests because the SCS can be used as a transit point and operating area for the United States Navy and Air Force between military bases in Asia and the Indian Ocean as well as the Persian Gulf areas.[19]

b) Hydrocarbon resources

Hydrocarbon resources are the most important non-living resources in the SCS. It is widely known for its rich oil and gas reservoirs which have been discovered in most parts of the SCS[20] (Figure 3). The discovery in the region has made Indonesia one of the world's leading oil exporting States, and the combination of onshore and offshore petroleum has given Brunei the highest per capita gross national production in the region.[21] For the other States, the revenue from oil and gas activities has also contributed considerably to the continuous increase in their national economic growth. Accordingly, these high rates of economic growth naturally lead to a corresponding increase in resource consumption.[22] However, the extent of hydrocarbon resource deposits remains unclear. This is primarily due to the absence of a full assessment, particularly in the Spratly Islands area, the biggest group of islands. Nevertheless, a 1995 study by Russia's Research Institute of Geology of Foreign Countries estimates that an equivalent of 6 billion barrels of oil might be located in the Spratly Islands area, of which 70 percent would be natural gas. On the other hand, Chinese media have referred to the SCS as

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[17] National Oceanic and Atmospheric Administration, *Freedom of Navigation* (16 August 2006 [cited 17 November 2006]); available from http://www.publicaffairs.noaa.gov/oceanreport/freedomnav.html

[18] William S. Cohen, "Annual Report to the President and the Congress," (Washington D.C., 2000).

[19] Dong Manh Nguyen, "Settlement of Disputes under the 1982 United Nations Convention on the Law of the Sea: The Case of the South China Sea Dispute," (New York: UN-Nippon Foundation Fellowship on the Law of the Sea, 2005).

[20] Robert Catley and Makmur Keliat, *Spratlys: The Dispute in the South China Sea* (Brookfield: Ashgate, 1997).

[21] Mark Valencia and Douglas M. Johnston, *Pacific Ocean Boundary Problems: Status and Solutions* (Martinus Nijhoff, April 1991).

[22] Nguyen, op cit, note 19.

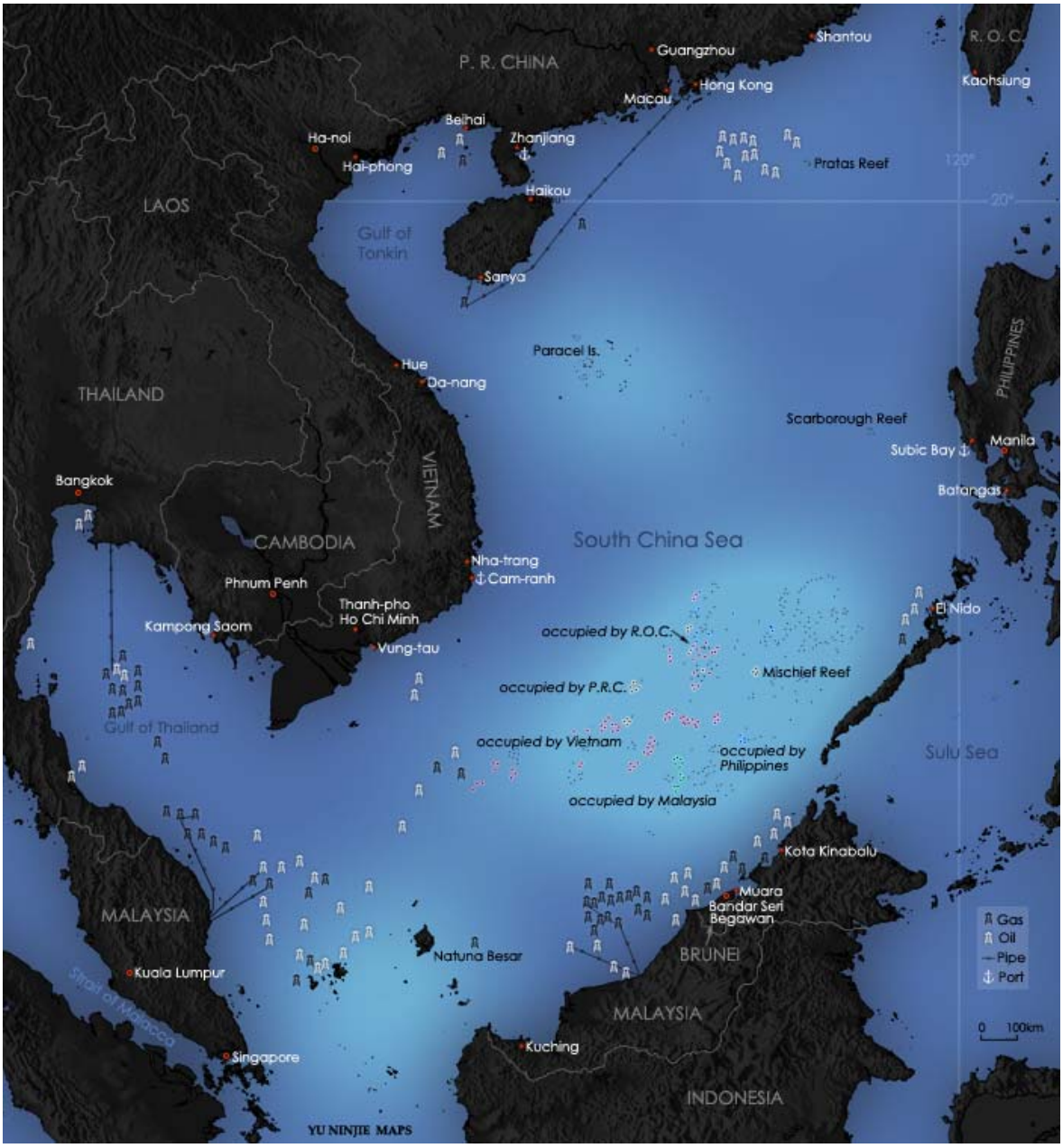

Figure 3: Drilling sites in the SCS region.

Source: Yu Ninjie, "South China Sea," (National Geographic, 1998).

"the second Persian Gulf," and some Chinese specialists have asserted that the SCS could contain as much as 130 billion barrels of oil and natural gas.[23]

[23] Scott Snyder, *The South China Sea Dispute. Prospects for Preventive Diplomacy* (August 1996 [cited 13 March 2006]); available from http://www.usip.org/pubs/specialreports/early/snyder/South_China_Sea1.html.

It is for these reasons that many littoral States have tried to occupy islands in the area in order to claim rights for future negotiations to these hydrocarbon resources. Competition for them could conceivably trigger war.[24]

c) Fisheries resources

Because of the extensive continental shelves, relatively shallow depths, and the influx of numerous large continental rivers, the SCS is a highly productive body of water in terms of fisheries and other marine living resources.[25] In addition to this, habitats in the SCS include mangrove forests, seagrass beds, coral reefs and soft-bottom communities, all of which may host highly productive ecosystems. The SCS is considered a Class II, moderately high productivity (150-300 gC/m^2-yr) ecosystem based on Sea-viewing Wide Field-of-view Sensor (SeaWiFS[26]) global primary productivity estimates.[27] High productivity levels are found in gulfs, along the coast, and in reef and seagrass areas, commonly in the Philippines portion of the LME.[28]

The SCS has also the world's highest level of bio-diversity.[29] According to a Chinese study, species abundance in the SCS region includes: 1,027 fish, 91 shrimp and 73 cephalopod species in the Northern continental shelf; approximately 205 fish and 96 shrimp species in the continental slope, and more than 520 fish species around the islands and reefs of the Southern

[24] Wang, op cit, note 16.
[25] Stephen W. Ritterbush, "Marine Resources and the Potential for Conflict in the South China Sea," *The Fletcher Forum* 2 (1978).
[26] SeaWiFS Project is to provide quantitative data on global ocean bio-optical properties to the Earth Science Community by deriving the concentration of phytoplankton which is primary producer from satellite observation and quantification of ocean color, i.e. the more phytoplankton present, the greater the concentration of plant pigments and the greener the water which also means the higher productivity. NASA, *Background of the SeaWiFS Project* (2006 [16 October 2006]); available from http://oceancolor.gsfc.nasa.gov/SeaWiFS/BACKGROUND/SEAWIFS_BACKGROUND.html
[27] LME, *LME 36: South China Sea. Large Marine Ecosystems of the World* (2 March 2004 [cited 28 April 2006]); available from http://na.nefsc.noaa.gov/lme/text/lme36.htm.
[28] Ibid.
[29] Talaue-McManus L., *Transboundary Diagnostic Analysis for the South China Sea*, vol. 14, *EAS/RCU Technical Report Series* (Bangkok, Thailand: UNEP, 2000).

waters.[30] The fisheries resources of the SCS are of great local, national and international importance as well as being a major contributor to both food and income.[31] In total, the SCS produces around 5 million tones of catch each year, some 10% of the total global catch.[32]

According to Food and Agriculture Organization (FAO) fishery statistics, the SCS is grouped in Area 71 which is dominated by a large continental shelf area (Figure 4). Area 71 is bordered in the North by Southeast Asian States and in the Southeast by Indonesia and Australia. The majority of this shelf area lies within the EEZ's of Southeast Asian States, reflected in the major contribution these States make to the total production of the area.[33] The total fishery production from Area 71 States in the SCS region during the period 1994-2003 is summarized in Figure 5 and Annex 1. It is obvious that the production has continuously increased over the years, which manifests its importance as an economic sector in the region.

[30] Jin Xianshi, "Marine Fishery Resources and Management in China" (paper presented at the ICFO Seminar, Qingdao, China, 25-29 October 2000).
[31] Wilkinson C. et al., *Global International Waters Assessment. South China Sea, GIWA Regional Assessment 54*.
[32] LME, op cit, note 27.
[33] Fishery Resources Division FAO Marine Resources Service, *Review of the State of World Fishery Resources: Marine Fisheries*, vol. 920, *FAO Fisheries Circular* (Rome: FAO, 1997).

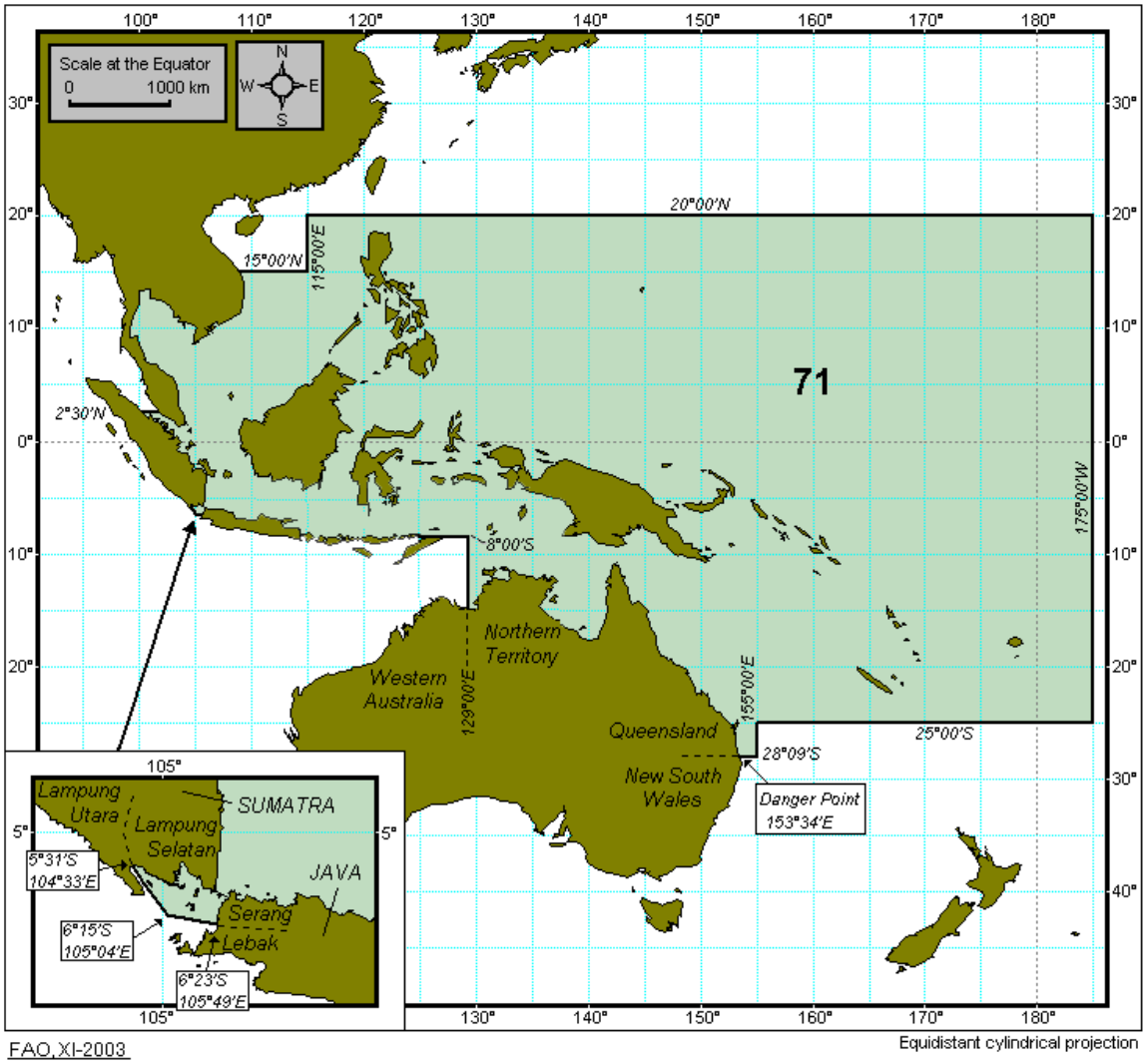

Figure 4: Western Central Pacific, Area 71, of FAO fishery statistic.

Source: FAO, *Area 71: Pacific Western Central* (2003 [cited 25 June 2006]); available from http://www.oceansatlas.com/servlet/CDSServlet?status=ND0zMTIyLjMxNDAmNj1lbiYzMz13ZWItc2l0ZXMmMzc9aW5mbw~~.

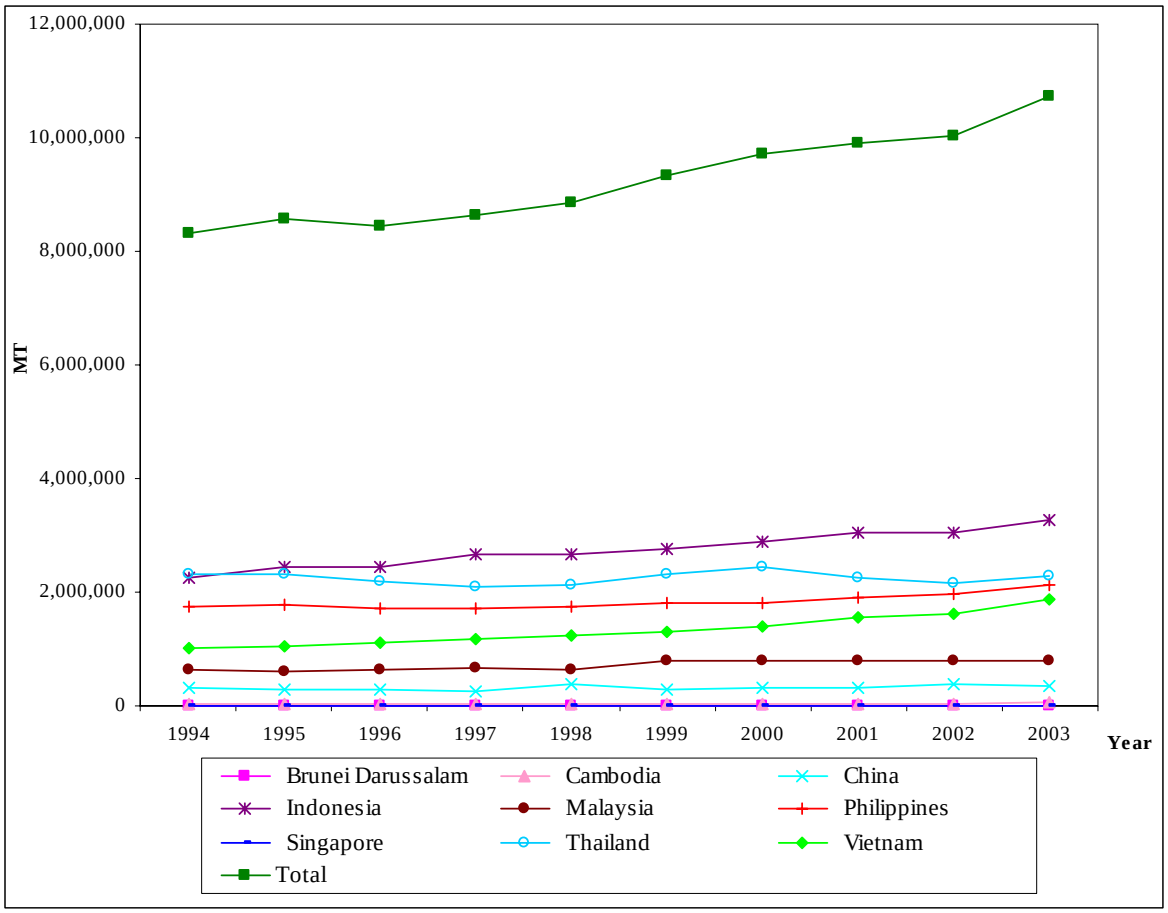

Figure 5: Total fishery production (Metric tones) obtained from the Western Central Pacific by States in the SCS region.

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from http://faostat.fao.org/faostat/form?collection=Fishes& Domain= FishCatch& servlet=1&hasbulk=0&version=ext&language=EN

C. The disputes in the South China Sea region

The SCS disputes fall in two categories: maritime boundary disputes and territorial disputes.[34] Because the LOSC allows for a State's Exclusive Economic Zone (EEZ) to extend 200 nautical miles from the territorial sea baseline (Figure 6), States surrounding the SCS wish to avail themselves of the largest possible area of jurisdiction. Competing maritime boundary and territorial claims over the SCS and its resources are numerous; especially for the People's Republic of China (PRC) which claims almost the entire SCS (Figure 7). Territorial issues in the SCS, especially in the Spratly Islands and Paracel Islands, can be summarized as follows:

Brunei: Brunei, the latest State to become involved with the SCS disputes, does not claim any of the islands, but does claim part of the SCS as its continental shelf and EEZ on the basis of the LOSC. In 1984, it declared an EEZ that includes Louisa Reef which is in the Southern part of the Spratly Islands.[35]

Cambodia: Cambodia does not claim any of the islands but claims part of the Gulf of Thailand as its continental shelf and EEZ, a claim which overlaps with Thailand's claim. As of September 2006, this dispute has not been settled.[36]

People's Republic of China: China refers to the Spratly Islands as the Nansha Islands and claims sovereignty over the islands and most of the SCS based on historical grounds, by referring to archaeological finds and ancient documents.[37] These include the naval expeditions to the Spratly Islands by the Han Dynasty in 111 AD and the Ming Dynasty from 1403-1433 AD. Chinese fishermen and merchants have worked in the region over time. In the 19th and early 20th century, China asserted claims to the Paracel Islands. During World War II, the islands were claimed by the Japanese. In 1947, China produced a map with 9 undefined dotted lines, and claimed all of the islands within these lines.

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[34] Nguyen, op cit, note 19.
[35] United States Energy Information Administration, "South China Sea Region," (1998).
[36] Tonnesson, op cit, note 10.
[37] Stein Tonnesson, "The History of the Dispute," in *War or Peace in the SCS*, ed. Timo Kivimaki (2002).

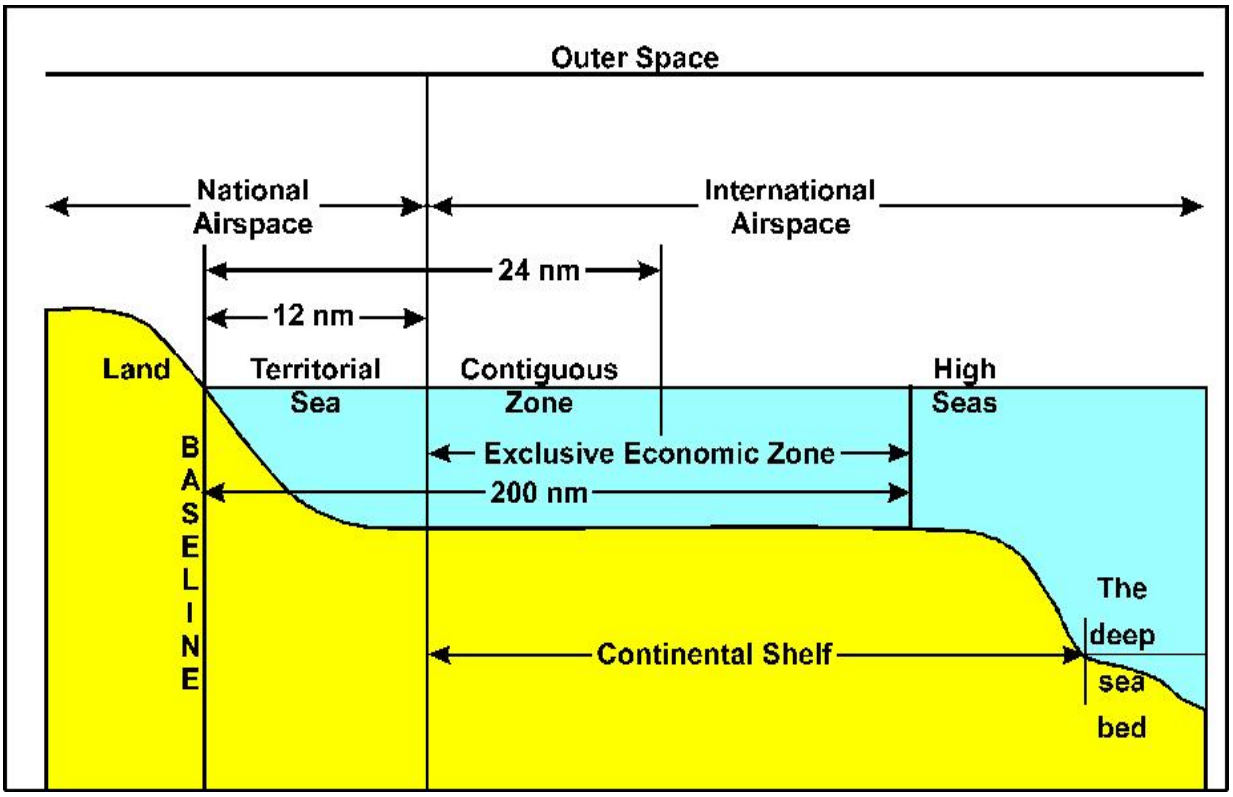

Figure 6: Zones delimitation according to the LOSC (Part V).

Source: Martin Tsamenyi, "Zones delimitation according to the LOSC" (Slide presented on "The Law of the Sea" course at the University of Wollongong, Australia, 26-30 June 2006).

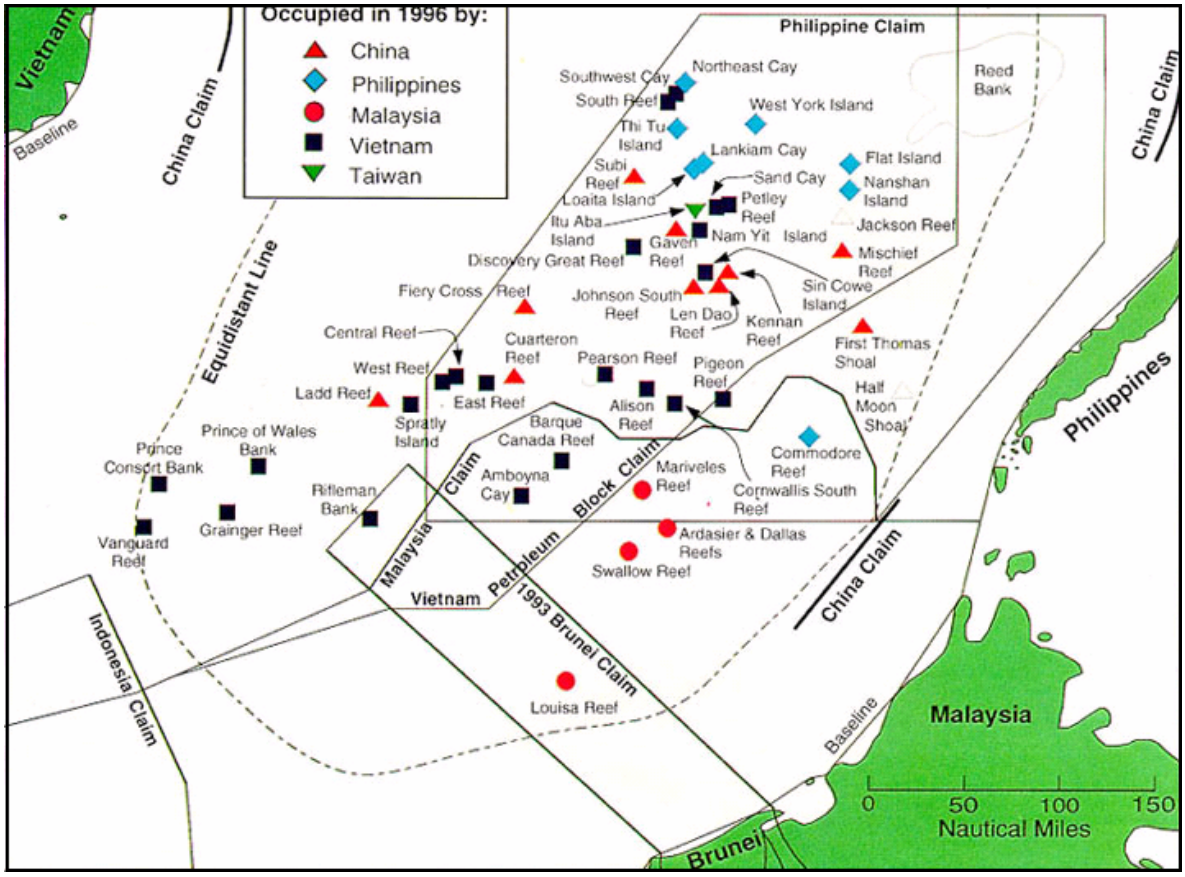

Figure 7: Claimants of Spratly Islands.

Source: Mark J. Valencia, Jon M. Van Dyke, and Noel A. Ludwig, *Sharing the Resources of the South China Sea* (The Hague; Boston: Cambridge, MA: M. Nijhoff Publishers; Sold and distributed in the U.S.A. and Canada by Kluwer Law International, c1997), p. 254.

A 1992 Chinese law restated its claims in the region. China refers to the Paracel Islands as the Xisha Islands, and includes them as part of its Hainan Island Province.[38] Its claims have been disputed with many States in the region.

Indonesia: Indonesia does not claim any of the Spratly Islands.[39] Its ownership of the natural gas-rich fields offshore of the Natuna Islands was undisputed until China released an official map with unclear maritime boundaries indicating that Chinese claimed waters in the SCS which may extend into Indonesia's EEZ and continental shelf, including the waters Northeast of the

[38] Greg Austin, *China's Ocean Frontier: International Law, Military Force, and National Development* (Allen & Unwin, 1998); United States Energy Information Administration, op cit, note 35.
[39] United States Energy Information Administration, op cit, note 35.

Natuna Islands.[40] In 1996, Indonesia responded by choosing the Natuna Islands region as the site of its largest military exercises to date. Since then, drilling in the natural gas fields has proceeded without protest from China.[41]

Malaysia: The Malaysian claims in the SCS are based on the continental shelf principle of the LOSC and have clearly defined coordinates. Malaysia has occupied three of these islands that it considers situated on its continental shelf[42] although boundary lines are simply drawn perpendicularly from two extreme points on the Brunei coastlines.[43] It has tried to build up one atoll by bringing soil from the mainland and has built a hotel.[44]

Philippines: The Philippine claims have clearly defined coordinates, both based upon proximity and the explorations of a Philippine explorer in 1956. In 1971, the Philippines officially claimed 8 islands that it refers to as the Kalayaan, partly on the basis of this exploration. It asserted that those islands were not part of the Spratly Islands and had not belonged to anybody, thus were open to be claimed. They were designated as part of Palawan Province in 1972.[45] The Philippines also has a dispute with PRC over the Malampaya and Camago gas fields and Scarborough Shoal.[46]

Singapore: Singapore claims sovereignty over Pulau Pedra Branca or Pulan Batu Putin, a claim which overlaps with Malaysia's. The disputes had been brought to the International Court of Justice in February 2003. After consideration, the Court found Singapore's claim to effective occupation and control from 1965 (its date of independence) to the date Malaysia's protest in 1979 to be legitimate. In addition, the Court also found that having built a light house, under British rule in 1851, demonstrated that British Singapore did have a physical presence, and it is true that Malaysia did not have a clear relationship with the islands for the entirety of the

[40] Austin, op cit, note 38; United States Energy Information Administration, op cit, note 35.
[41] Kreil, op cit, note 13.
[42] Austin, op cit, note 38; United States Energy Information Administration, op cit, note 35.
[43] Hasjim Djalal, "South China Sea Island Disputes," *Raffles Bulletin of Zoology* Supplement No.8 (2000).
[44] United States Energy Information Administration, op cit, note 35.
[45] Austin, op cit, note 38; United States Energy Information Administration, op cit, note 35.
[46] Tonnesson, op cit, note 10.

relevant period of time. For those reasons the Court unanimously found that Singapore reserves sovereignty over Pulau Pedra Branca.[47]

Taiwan: Taiwan's claims in the SCS are similar to those of China and are based on the same principles.[48] Taiwan has occupied Itu Aba for two decades but has not expanded its occupation.[49] As with China, Taiwan's claims are also not clearly defined.[50]

Thailand: Thailand does not claim any of the islands in the SCS, but has had disputes over some parts of the Gulf of Thailand with Cambodia and Vietnam with respect to overlapping EEZ and continental shelf claims.[51] Overlapping claims between Thailand and Vietnam were settled on 9 August 1997, when Thailand signed an agreement with Vietnam on the delimitation of the maritime boundary in the Gulf of Thailand. This agreement was protested by Cambodia, through a note of verbal of the Ministry of Foreign Affairs and International Cooperation addressed to the Secretary General of the United Nations and dated 28 May 1998. The note outlined the position of Cambodia on the delimitation of the maritime boundary between Thailand and Vietnam. The note stated that Cambodia has never accepted the maritime boundary delimitation proclaimed by Thailand and Vietnam and that the latter constituted a violation of Cambodian sovereignty and its right in its EEZ and on its continental shelf in this part of the Gulf of Thailand. Accordingly, the maritime delimitation is without prejudice to, and does not affect the rights and legitimate interests of Cambodia in the area.[52] This principle is codified by Article 34 of the 1969 Vienna Convention on the Law of Treaties, which prescribes

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[47] International Court of Justice, *Sovereignty Over Pedra Branca/Pulau Putch, Middle Rocks and South Ledge, Malaysia/Singapore* (20 November 2005 [cited 12 October 2006]); available from http://www.amun.org/final/05/ICJ-ICJOpinion-25.pdf#search=%22american%20model%20united%20nations%20international%20court%20of%20justice%20november%2020%22

[48] Djalal, op cit, note 43; United States Energy Information Administration, op cit, note 35.

[49] Djalal, op cit, note 43.

[50] David Rosenberg, *The South China Sea* (1999 [cited 13 March 2006]); available from http://community.middlebury.edu/~scs/why.html.

[51] Kreil, op cit, note 13; Poungthong Onoora, *Handbook for Enforcement of International Fisheries Law*, vol. 5, *Technical Paper* (Bangkok, Thailand: Department of Fisheries, 2004).

[52] Mom Ravin, "Law of the Sea: Maritime Boundaries and Dispute Settlement Mechanisms," (New York: UN-Nippon Foundation Fellowship on the Law of the Sea, 2005).

that "treaty does not create either obligations or rights for a third State without its consent."[53] As of date, the claims have not yet been resolved with Cambodia[54] (Figure 8).

Figure 8: EEZ claims in the Gulf of Thailand.

Source: Bradley, R.E., Pratt, M.A. and Schofield, C.H. "Jane's Exclusive Economic Zones 2002-2003, Coulsdon: Jane's Information Group (year book, M.A. Pratt editor), p. 43.

[53] United Nations, *Treaty Series*, vol. 1155, p. 331.

[54] Onoora, op cit, note 51.

Vietnam: Vietnamese claims are based on history and the continental shelf principle of the LOSC.[55] It claims the entire Spratly Islands as an offshore district of province Khanh Hoa. The Vietnamese have followed the Chinese in using archaeological evidence to bolster sovereignty claims. In 1930, France claimed the Spratly Islands and Paracel Islands on behalf of its then-colony Vietnam.[56] Vietnam has occupied a number of the Spratly Islands as well as the Paracel Islands which were seized by the PRC in 1974.[57] However, Vietnam and the PRC have resolved their disputes over areas in the Gulf of Tonkin to the South of China's Guangdong Province. In December 2000, they signed an agreement which delineated the boundary between their EEZs, opening the way for oil and gas exploration.[58]

Association of South East Asian Nations (ASEAN) in general, and Malaysia in particular, have been keen to ensure that the territorial disputes within the SCS do not escalate into armed conflict. Joint Development Authorities have been setup in areas of overlapping claims to jointly develop as well as explore the areas and ensure profit shoring without settling the issue of sovereignty over the area[59] particularly in the Gulf of Thailand where the cooperative agreements were signed for the Malaysia-Thai and Malaysia-Vietnam Joint Development Areas.[60]

[55] Austin, op cit, note 38.
[56] United States Energy Information Administration, op cit, note 35.
[57] Rosenberg, op cit, note 50.
[58] Kreil, op cit, note 13.
[59] Tonnesson, op cit, note 10.
[60] Kreil, op cit, note 13.

Part II Pelagic Fisheries in the South China Sea Region

A. Fisheries status in the South China Sea region

Fisheries play a very important role in the food security and economies of the majority of States in the SCS region. The average per capita consumption of fish in East and Southeast Asia during the period 2000-2003 was 26.1 kg/year. This is much higher than the world average of 16.3 kg/year (Table 1). This reflects the importance of fish in food security, as well as the general preference for fish as a source of protein in the region.

Fisheries also contribute to the employment and income of millions of people in the region. In 1994, the estimated numbers of full and part-time fishers engaged in marine and inland fisheries were 8.7 million and 1.7 million, respectively. According to FAO's findings, around 85% of the world's fishers are concentrated in Asia, particularly in the SCS region, compared to 77% in 1970. China has the largest number of fishers followed by Vietnam, Indonesia and the Philippines. In total, at least 31 million people are engaged in the fisheries sector (including aquaculture) and related industries in the region.[61]

Furthermore, fisheries play an important role in the economies and international trade of many States in the SCS region. Development of fisheries in the region has been much influenced by the global market. This has been reflected by the rapid development of trawl fisheries in Southeast Asia in the 1970s targeting shrimp for export, the relatively fast development in the early 1980s of purse seine fisheries targeting tuna for canning, and of tuna longlining since the mid 1980s which target tuna for the fresh sashimi markets.[62] During the period 2001-2003, China and Thailand, respectively were the top two global exporters of fishery commodities.

[61] FAO, *Numbers of Fishers, 1970-1995*, 2 ed., vol. 929, *FAO Fisheries Circular* (1999).
[62] Fishery Resources Division FAO Marine Resources Service, op cit, note 33.

Table 1: Fish as seafood supply per capita by States in the SCS region.

Fish, Seafood Supply/Capita/Year (Kilogram)	Year			
	2000	**2001**	**2002**	**2003**
Brunei Darussalam	39	27	26.4	25.8
China	25.7	25.8	25.6	25.4
Cambodia	21	28.4	27.8	27.1
Indonesia	20.3	21	20.8	20.5
Malaysia	60.4	58.1	57	55.9
Philippines	29.7	29.8	29.3	28.8
Thailand	30.6	31.3	30.9	30.6
Vietnam	19	17.9	17.7	17.5
East & South East Asia	25.3	26.7	26.3	26
World	16.2	16.5	16.3	16.1

Source: FAO, *FAOStat Data - Food Supply* (3 March 2006 [cited 29 May 2006]); available from http://faostat.fao.org/faostat/form?collection=FS.NonPrimaryLivestockAndProducts&Domain=FS&servlet=1&hasbulk=0&version=ext&language=EN.

In addition, some States in the region are in the top world group of exporters, namely: Vietnam, Indonesia, and Taiwan. The total value of average annual fishery commodities exported by States in the region was more than 15 billion USD.[63] However, there are also a number of States that rely on imported fish and fishery products to serve their domestic demands.[64]

Since 1945, fisheries - in particular marine capture fisheries - have developed significantly and have rapidly expanded in many developing States of the region, especially China. This development is due to the following factors:

- The introduction of modern technologies and techniques for fishing such as the widely used monofilament nylon gill net in the small-scale fisheries and the trawl net in the commercial fisheries sub-sectors;
- The increased motorization of fisheries boats;
- Technical assistance rendered by donors and multilateral agencies such as FAO;

[63] FAO Fisheries Department, *Yearbooks of Fishery Statistics: Summary Tables* (FAO, 2003 [cited 8 June 2006]); available from ftp://ftp.fao.org/FI/STAT/summary/default.htm.
[64] Deb Menasveta, *APFIC : Its Changing Role*, vol. 5, *Rap Publication* (Bangkok, Thailand: APFIC, 2000).

- Inflow of capital investment for required infrastructures;
- The discovery of new fishing grounds in offshore waters; and
- The recognition of the fisheries contributions by Governments and their common policy of strengthening the fisheries sector. [65]

The fishing gears employed in the SCS are many and varied, including several kinds of trawlers, purse seines, other encircling nets, lift nets, gill nets, bagnets, castnets, beach seines, surface longlines, bottom longlines, hook and line, trolling lines, several kinds of stake traps, fish pots, etc.[66]

According to the University of British Columbia Fisheries Center, the landing fish catch statistics in the SCS region shows a 10-year trend increase in total catch, from 4.7 million tons in 1994 to 5.6 million tons in 2003 (Figure 9 and Annex 2). The average level is about 5 million tons. Four of the States in the region - China, Indonesia, Thailand and Vietnam - are among the top 5 shrimp producers of the world.[67] There is also a high catch percentage for miscellaneous coastal fishes and pelagic fishes (tuna, yellowfin, big eye and skipjack).[68] Global International Waters Assessment (GIWA[69]) characterizes the SCS as severely impacted in terms of overfishing, with severe socioeconomic and community consequences, excessive bycatch and discards, and destructive fishing practices, which include cyanide and dynamite fishing, and the use of small-meshed nets. These impacts show no change.[70]

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[65] Deb Menasveta, "Fisheries Management in the Exclusive Economic Zones of Southeast Asia before and after Rio and the Prospects for Regional Cooperation," *Foreign Relation Journal* 9, no. 2 (1994).
[66] John C. Marr, *Fishery and Resource Management in Southeast Asia* (Washington: Resources for the Future, 1976).
[67] GLOBEFISH, *World Shrimp Markets 2004* (October 2004 [cited 6 Jun 2006]); available from http://www.globefish.org/files/SHRIMPMadrid_171.pdf.
[68] FAO, *Trends in Oceanic Captures and Clustering of Large Marine Ecosystems-2 Studies Based on the FAO Capture Database*, vol. 435, *FAO Fisheries Technical Paper* (FAO, 2003).
[69] GIWA is a water program led by the United Nations Environment Program (UNEP) and has the objective to produce a comprehensive and integrated global assessment of international waters.
GIWA, *GIWA in brief* (8 July 2004 [cited 12 October 2006]); available from http://www.giwa.net/giwafact/giwa_in_brief.phtml
[70] GIWA, *Challenges to International Waters; Regional Assessments in a Global Perspective* (United Nations Environment Programme, 2006).

In addition to the above, 2/3 of the major fish species are overexploited. The carefully constructed fishing regimes could result in increased catches.[71] However, there are the deeper coralline areas and those situated in the central part of the sea that is currently exploited, and thus there is potential to increase production despite the certain difficulties posed by fishing in these areas.[72]

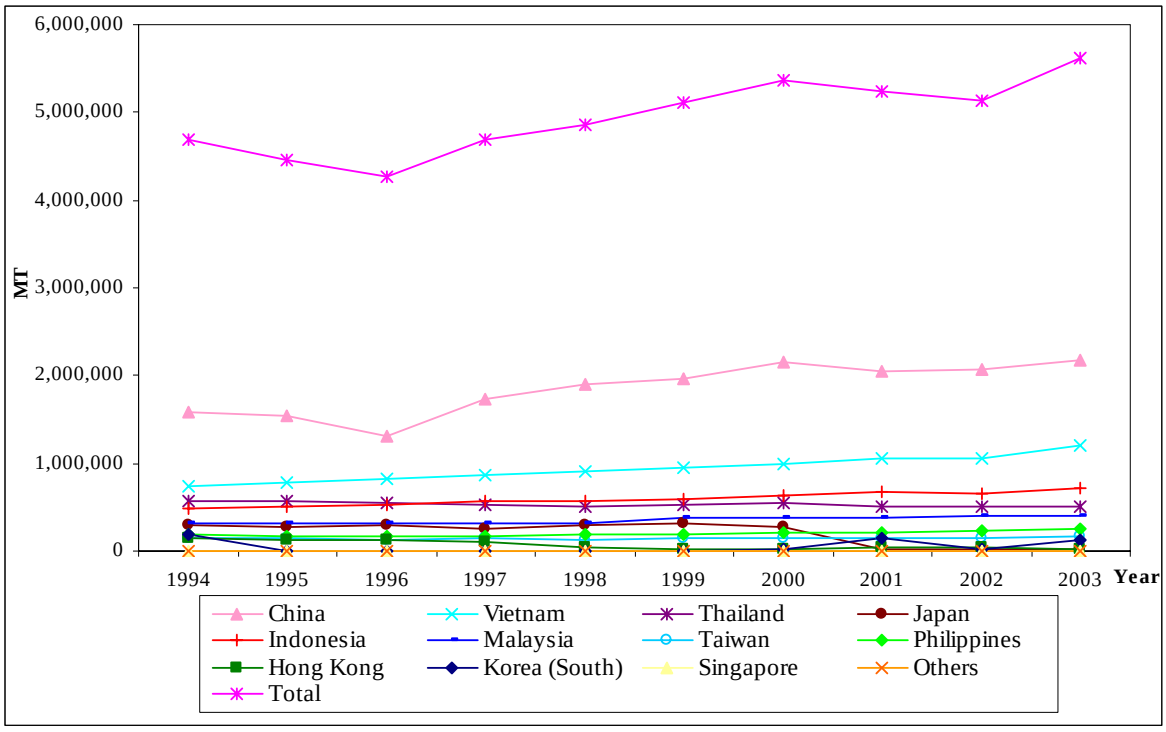

Figure 9: Landing fish catch (Metric tones) in the SCS region.

Source: University of British Columbia Fisheries Center, *Landings in South China Sea* (2005 [cited 17 May 2006]); available from http://saup.fisheries.ubc.ca/TrophicLevel/LMETaxon.aspx?lme=36&fao=0&Name=South%20China%20Sea&typeOut=4.

[71] Daniel Pauly and Villy Christensen, "Stratified Models of Large Marine Ecosystems: A General Approach and an Application to the South China Sea," in *Large Marine Ecosystems: Stress, Mitigation, and Sustainability*, ed. Kenneth Sherman (Washington, D.C.: American Association for the Advancement of Science, 1993).

[72] Alcala A.C., "Fish Yields of Coral Reefs of Sumilon Island, Central Philippines," *Nat. Resource Counc. Philipp. Res. Bull.* 36, no. 1 (1981); White A.T., "Two Community-Based Marine Reserves: Lessons for Coastal Management," in *Coastal Area Management in Southeast Asia: Policies, Management Strategies and Case Studies*, ed. T.E. Chua and D. Pauly, *ICLARM Conference Proceedings* (1989).

B. Status of pelagic resources and fisheries in the South China Sea region

The SCS is one of the most important and abundant commercial fisheries in the world. Shared stocks of pelagic fish such as scads and mackerels, and highly migratory species such as tuna and tuna-like stocks are the most common commercial stocks in this region.[73]

In the SCS, there are 28 potential shared fish stocks, several of which are fished by two or more States. They are mainly neritic and small pelagic species, including scads (*Decapterus* spp.), trevallies (*Caranx* spp.), torpedo scad (*Megalaspis cordyla*), sardines (*Sardinella* spp.), anchovies (*Stolephorus* spp.), Spanish mackerel (*Scomberomorus* spp.) and mackerels (*Rastrelliger* spp.).[74] Major small pelagic species in the SCS are outlined in Annex 3.

The small pelagic fish production obtained from the Western Central Pacific, which mainly includes the SCS, by the States of the region has increased continuously from about 1.4 million tones in 1994 to about 1.9 million tones in 2003 (Figure 10 and Annex 4). Indonesia, the Philippines and Thailand have been the most important producers. The main fishing gear for small pelagic fish in this region is the purse seine, followed by the paired trawler. However, in a study of small pelagic fisheries, it was found that most of these straddling stocks shared among the States in the SCS reached their maximum sustainable yield in 1987.[75] The straddling stocks are the stocks occurring within the EEZs of two or more coastal States, or both within the EEZ and in an area beyond and adjacent to it.[76]

In the SCS, tuna fisheries are the major larger pelagic fisheries. The main tuna fisheries are carried out by means of longlines, purse seines and pole-and-line fishing, or live-bait fishing. Longlines tend to catch the older, larger, non-schooling, subsurface swimming tunas,

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[73] Wang, op cit, note 16.

[74] Yanagawa H., "Status of Fisheries and Stocks of Small Pelagic Fishes in the South China Sea Area," in *Report of Third Regional Workshop on Shared Stocks in the South China Sea Area* (Kuala Terengganu, Malaysia: Marine Fishery Resources Development and Management Department, Southeast Asian Fisheries Development Center, 1997).

[75] Ibid.

[76] United Nations, op cit, note 5, Article 63.

whereas purse seines and pole-and-line fishing tend to catch the younger, smaller, schooling, surface-swimming tunas.[77]

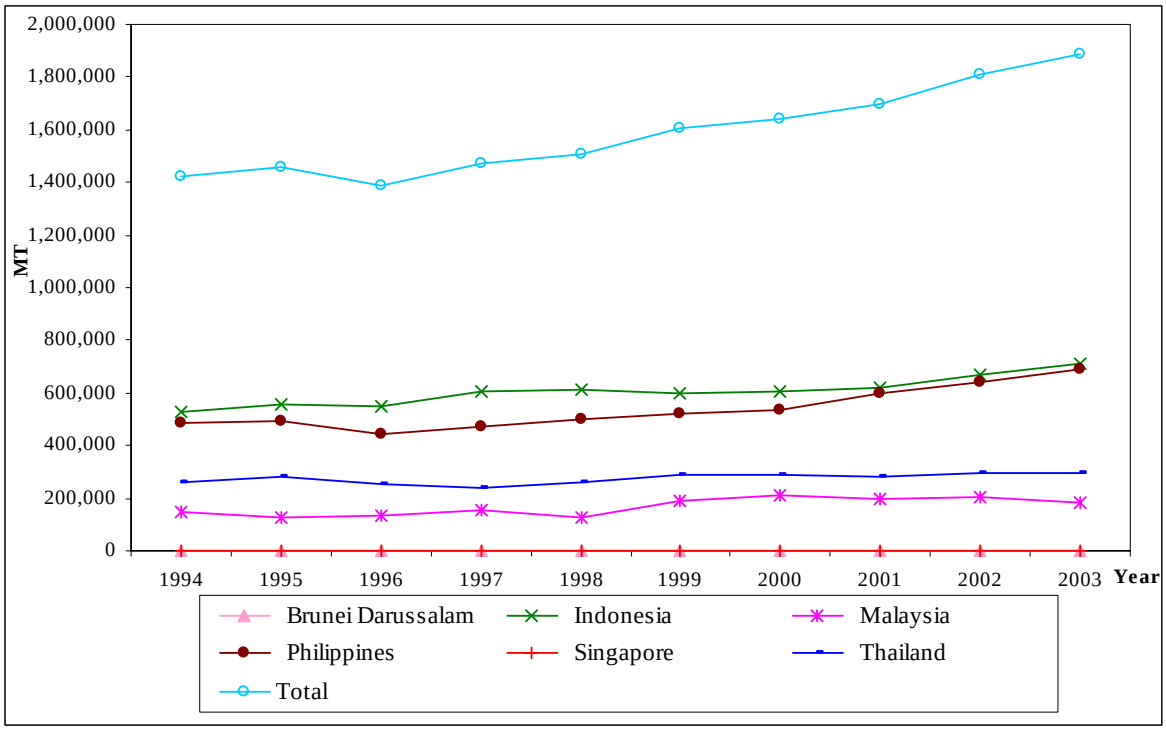

Figure 10: Total miscellaneous pelagic fish production obtained from the Western Central Pacific (SCS, Celebes Sea, Northern Australia) by States in the SCS region.

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from http://faostat.fao.org/faostat/form?collection=Fishes&Domain=FishCatch&servlet=1&hasbulk=0&version=ext&language=EN.

[77] Marr, op cit, note 66.

Longlines, exceedingly lengthy lines (tens of kilometers), bear baited hooks, which are suspended below the surface by means of buoys and lines. The bait is frozen fish taken aboard in port, so that longlines boats are independent of land except for normal bunkering requirements. Purse seines are very long (hundreds of meters) and deep (tens of meters) sheets of netting, which are set in a circle around schools at the surface. The netting has floats along one side and weights along the other, so that, after it is set, the net hangs down from the surface in the form of the cylinder. The bottom of the cylinder is then "pursed" by a cable drawn through rings attached to the bottom of the net, and the fish, if they have not already escaped, are trapped at this point in the process. Like longline boats, purse seiners are independent of land beyond the normal operational requirements.[78]

Live-bait fishing is carried out by throwing overboard small fishes, carried alive in bait tanks and bait wells on the fishing boats, to attract tuna, usually skipjack or yellowfin, to the vessel and to bring about the "feeding frenzy". At this time, the tuna are easily caught on unbaited barbless hooks attached by relatively short lines to sturdy poles by which the tuna are flipped aboard the vessel. Thus, live-bait fishing is really a combination of two fisheries, one for live bait and one for tuna. Although the tunas may be (but are not necessarily) found well offshore on the high seas, the bait species occur in inshore waters. The inshore component of this fishery thus mainly occurs within the territorial seas of the coastal States, and thus subjected to a licensing regime, including fees. The bait fish used in the SCS, which is similar to the bait species available in Hawaii, is much smaller than the species used in the eastern Pacific and Japan. Tuna fisheries have been considered to be managed on a regional or worldwide basis because[79]:

- The demand continues to exceed the sustainable production;
- Of the high-seas nature of some tuna resources;
- Of the wide distribution and highly migratory nature of some species[80]; and

[78] Ibid.
[79] Ibid.
[80] Gomez E. D., "Is the Degradation of Resources in the South China Sea Reversible? Approaches to Sustainable Management" (paper presented at the International Symposium on Protection and Management of Coastal Marine Ecosystem, Bangkok, Thailand, 12-13 December 2000).

- The mobility of the tuna fleets can be shifted from one place to another.

Moreover, some developing States have an interest in the tuna fisheries as a potential source of foreign currency so they have tended to regard themselves as coastal states with respect to the high-sea tuna fisheries, although the fisheries may be far offshore in many cases. However, the tuna fisheries of the SCS are not presently overexploited, as distant water fishing States are not be able to compete with the lower labor costs of the SCS States and increased fuel costs will also favor boats from local bases within the SCS. In addition, the almost certain extension of fishery jurisdiction resulting from the eventual resolution of the region's boundary issues, will close the SCS to unrestricted fishing by non-SCS States. Thus, the skipjack tuna resource, which its production has the greatest potential to increase in the area, may be largely available only in the internal waters of Indonesia and the Philippines.[81]

The landings of tuna production from the Western Central Pacific by States in the SCS area have also increased from about 1 million tones in 1994 to more than 1.5 million tones in 2003. The main producers are Indonesia, the Philippines and China (Figure 11 and Annex 5).

[81] Marr, op cit, note 66.

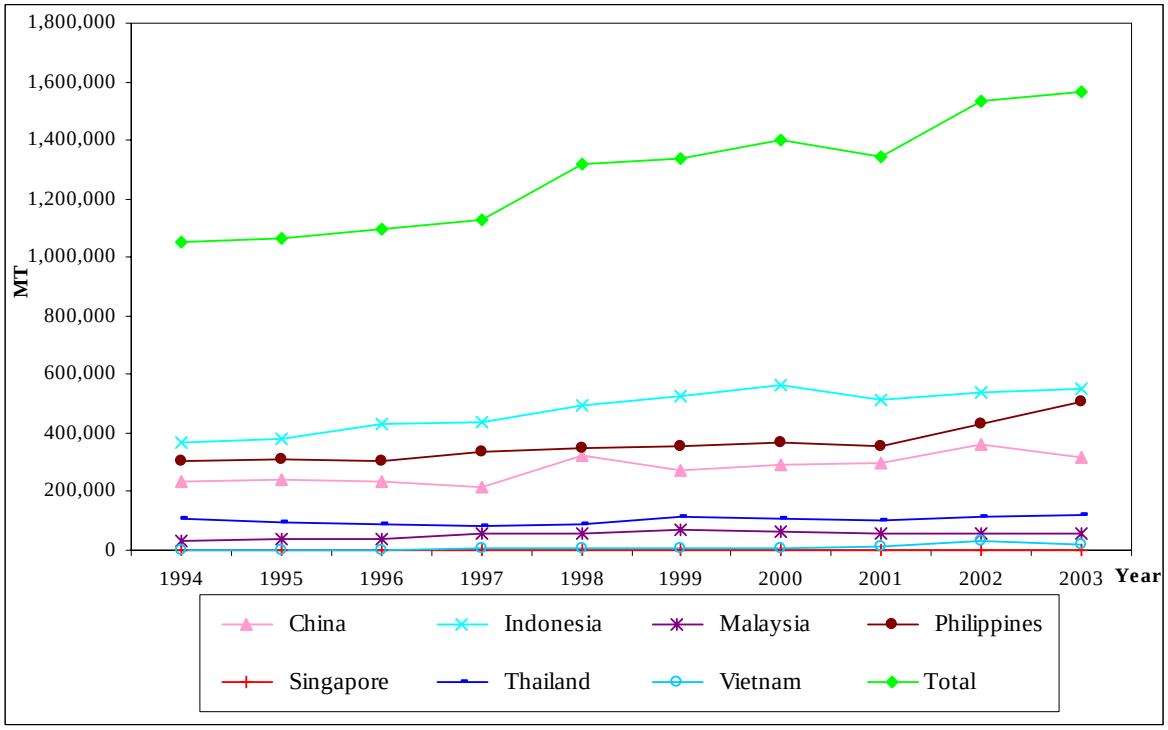

Figure 11: Total tunas, bonitos, billfishes production obtained from the Western Central Pacific (SCS, Celebes Sea, Northern Australia) by States in the SCS region.

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from http://faostat.fao.org/faostat/form?collection=Fishes&Domain=FishCatch&servlet=1&hasbulk=0&version=ext&language=EN.

Part III Sustainable Management of Pelagic Fisheries in the South China Sea Region

A. Aspects of pelagic fisheries management problems in the South China Sea region

- **Resource aspects**

The resource and fishery management in the region must give due regard to the multiplicity of species in the SCS. The importance of such a holistic approach is increasingly being recognized by practitioners and the international community as ecosystem approaches to management emerge. This has several implications that are almost not considered in single-species fisheries management approaches. In the SCS region, the information commonly necessary for management is not adequate. However, even if the production of such information were possible, it would be of little or no value if provisions were not made for an acceptable political mechanism with a rational management framework. Moreover, even if the necessary management information was available, and there were a rational management mechanism, management would not be possible on the species-by-species basis since so many species are taken in a single fishery.[82]

The lack of resource knowledge, in particular the lack of updated information on the distribution or range of the self-perpetuating population units, must also be indicated. According to the FAO Species Identification Sheets for Fishery Purposes, there are only 3 of 324 commercially important species which are restricted to one State, and only 9 species restricted to 2 States. Thus, 312 or 96 percent are found in 3 or more States.[83] The lack of resource knowledge can also be the obstacle for effective implement of ecosystem based management, which is one of important management approaches.

This situation is further amplified due to the fact that the maximum sustainable yield (MSY) continues to be used as the default biological reference point for determining the

[82] Ibid.
[83] Ibid.

allowable catch of harvested marine species, including within the EEZ[84] and the high seas.[85] Problems regarding MSY as a biological reference point include[86]:

- It is species specific rather than ecosystem based;
- It can not be properly defined until the overall catch begins to decline, thus leading to over-exploitation[87]; and
- It may result in excessive reduction in mean size, mean age and catch rate for the target population, thus making the stock more susceptible to the effects of environmental fluctuation on breeding success.[88]

- **EEZ delimitation aspects**

The States in the SCS region are expanding their fishing efforts and these have been increasing largely due to the continuously increasing population growth in the SCS States as well as the importance of marine fisheries as an economic sector in the region. The disputed EEZ claims among the SCS States[89], outright poaching, and the ambiguity regarding the extent to which coastal States can govern the passage of foreign vessels in their EEZs, are all key factors which are contributing to the rise in fishing disputes.[90] The coastal States assert that the LOSC grants them sovereign rights over living and non-living resources in their EEZs,[91] and

[84] United Nations, op cit, note 5, Article 62(3). It indicates that "In giving access to other States to its exclusive economic zone under this article, the coastal State shall take into account all relevant factors, including, inter alia, the significance of the living resources of the area to the economy of the coastal State concerned and its other national interests,…".

[85] Ibid., Article 119. It indicates that "1. In determining the allowable catch and establishing other conservation measures for the living resources in the high seas, States shall: (a) take measures which are designed, on the best scientific evidence available to the States concerned, to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, including the special requirements of developing States,…".

[86] Martin Tsamenyi and Felicity Woodhill, *Sustainable Use of Large Migratory Fish in the Southern and Indian Oceans: Gaps in the International Legal Framework* (Wollongong, Australia: October 1999).

[87] Caddy J. F. and Mahon R., *Reference Points for Fisheries Management*, vol. 347, *FAO Fisheries Technical Paper* (Rome: Food and Agriculture Organization of the United Nations, 1995).

[88] Ibid.

[89] Jorge R. Coquia, "Maritime Boundary Problems in the South China Sea," *University of British Columbia Law Review* 24 (1990).

[90] Guoxing, op cit, note 12.

[91] United Nations, op cit, note 5, Article 56(1(a)). It indicates that "(a) sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and wind;".

the authority to prohibit foreign vessels from fishing without their express permission. The increasing trend in the number of purse seines and fishing grounds is most destructive since most of the pelagic species in the region are straddling fish stocks and highly migratory fish stocks.

The problem has persisted for decades, and fishers have been frequently arrested and their equipments have been confiscated by the coast guard authorities in the region.[92] Some of the incidents which have occurred in the region include frequent sightings of Chinese fishing boats off Palawan, which is situated east of the disputed Spratly Islands. Furthermore, in March 2001, Vietnamese fishers were arrested by the Philippine Navy and Coast Guard on Fearless Shoal, which is near the Southern tip of Palawan; and on 25 June 2001, a Malaysian vessel suspected of illegal fishing in Indonesian waters was reported by an Indonesian Navy boat. These fishing disputes clearly contribute to the difficulties in establishing effective fisheries management in the region.

- **Fisheries aspects**

  - **Overexploitation and overfishing**

Overexploitation occurs when living resources are caught at a rate that exceeds the maximum harvest that allows the population to be maintained by reproduction.[93] One of the main factors causing overexploitation is overfishing. Overfishing was identified as the priority concern in many pasts of the East Asia region. It is primarily caused by the excessive fishing effort of industrial fishing fleets, but small-scale fishers also overexploited near shore fish stocks. It is also often in combination with destructive fishing practices. Excessive by-catch and discards aggravate overfishing because they change the age structure of fish populations, disrupt food webs and threaten endangered species. Discards also create major inter-fishery problems if the discards from one fishery include species which are valuable to another.[94]

[92] Guoxing, op cit, note 12.
[93] GIWA, op cit, note 70.
[94] Ibid.

Throughout the SCS region, the reduction and collapse of the fisheries has led to a widespread loss of income and employment. In many areas, particularly around the Philippines and Indonesia, where fish are mostly exported thus causing local fish consumption to decline.[95] The fisheries depend on the small pelagic fishes more than the species with long life span which have been depleted.

The fisheries are common pool resources[96] and commonly open access, thus they are difficult to protect. Many fish stocks in the SCS, particularly pelagic stocks which are straddling fish stocks, do not belong to a single State, but are fished by many States in the region. Moreover, the fishers lack awareness of the impacts of destructive fishing practices and have the view that if they do not exploit the fisheries then others will. These attitudes therefore result in overfishing and a lack of interest in maintaining fish habitats.[97]

In addition, fishing regulations, such as property rights, quotas, protected areas and bans on destructive practices, are difficult to enforce for any Government and are especially problematic for developing States. Insufficient enforcement is therefore also identified as a cause of overexploitation.[98]

- **Excess fishing capacity**

Excess capacity not only includes vessels that are larger than they need to be to catch and land fish which is currently available, but also includes the vessels' ability to harvest stocks beyond the stock's ability to recover. This threatens the sustainability of fish stocks being exploited and constitutes a potential threat to other stocks as well. Overcapacity has resulted from investors purchasing additional vessels to generate more income even if the vessel size is not optimal from a socio-economic point of view. In some States, these vessels

[95] Ibid.
[96] Ibid.
[97] Ibid.
[98] Ibid.

are bought with public funds, in the form of subsidies, although FAO studies indicate that this trend is declining.[99]

Excess fishing capacity continues to be a significant issue in most regions of the world, including the SCS region. This results in the full, or over exploitation, of many coastal pelagic and demersal fish stocks. Due to the open-access nature of fisheries, it remains very difficult to control fishing capacity, particularly in the high seas.[100] Thus, fishing capacity continues to increase unchecked.

- **Illegal, Unreported and Unregulated Fishing**

In the last two decades, attention to the problems caused by inadequate controls over fishing effort has increased all over the world. The problems of dealing with fishing operations that take place outside relevant management arrangements, or beyond the effective control of flag States, have attracted considerable attention. These are known as Illegal, Unreported and Unregulated Fishing (IUU fishing)[101], which has been defined as follows:[102]

Illegal fishing refers to activities:

- Conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
- Conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization but operate in contravention of the conservation and management measures adopted by that organization and by which the States are bound, or relevant provisions of the applicable international law; or
- In violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization.

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[99] Manning, op cit, note 1.
[100] Ibid.
[101] Alex G. Oude Elferink and Donald R. Rothwell, eds., *Oceans Management in the 21st Century: Institutional Frameworks and Responses* (Leiden; Boston: Martinuss Nijhoff, c2004).
[102] FAO, *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (Rome, Italy: FAO, 2001).

Unreported fishing refers to fishing activities:

- Which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or
- Undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization.

Unregulated fishing refers to fishing activities:

- In the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organization, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organization; or
- In areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

IUU fishing can take place in all capture fisheries and in all waters. The practice is problematic in inland fisheries as well as in marine capture fisheries, both in zones of national jurisdiction and on the high seas.[103]

In the SCS region, IUU fishing is also a serious concern due to the increasing level of exploitation of marine resources and the lack of effective control over ships and maritime areas. Both local and foreign fishing vessels conduct IUU fishing such as coral reef fishing, use of explosives and poisonous substances, capture of sea mammals, use of highly efficient fishing gears and use of small mesh-sized nets particularly in territorial waters and EEZs. Indeed, in zones of national jurisdiction, IUU fishing by small-scale fishers and by commercial vessels is common, while it is mostly undertaken by foreign vessels in EEZs. There is also substantial IUU fishing in the high seas, which lack effective management arrangements and suffer from weak flag State control.[104] These activities undermine efforts to conserve and manage fish stocks in not only pelagic fisheries, but all capture fisheries. The national and

[103] David J. Doulman, *Illegal, Unreported and Unregulated Fishing: Mandate for an International Plan of Action* (Rome, Italy: FAO, 2000).
[104] Ibid.

regional fisheries management organizations in the region can easily fail to achieve management goals when faced with IUU fishing. This situation leads to the loss of both short and long-term social and economic opportunities, as well as lead to negative effects on food security and environmental protection.[105] Moreover, IUU fishing can lead to the eventual collapse of a fishery, or seriously impair efforts to rebuild stocks that have already been significantly depleted. The impacts of IUU fishing can also extend beyond the target fish stocks, negatively affecting other marine species and damaging the wider marine ecosystem. High levels of by-catch of both juvenile fish and non-target species by IUU fishing represent just one of the numerous counter-conservation management impacts.[106]

In some SCS States, such as the Philippines and Indonesia, there has been some analysis of the economic losses resulting from IUU fishing with differing valuations from certain types of IUU fishing. In the Philippines, it is estimated that the annual loss caused by IUU fishing activities is PhP 50 billion or almost USD 894 million.[107] The World Resource Institute estimates the total net loss from blastfishing alone is PhP 67.2 billion or about USD 1.2 billion.[108] On the other hand, the Philippine Navy reports that the annual loss to illegal fishing activities is estimated at only PhP 11 billion or USD 196.5 million.[109] For Indonesia, around USD 4 billion is lost annually to illegal fishing activities.[110] Those estimates reveal the impacts of IUU fishing from the value of the fish, but do not reflect the actual loss which effect fish habitats and the marine environment, such as the resulting loss of ecosystem health and services.

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[105] FAO, op cit, note 102.

[106] Environmental Justice Foundation, *EJF Summary Conclusions on IUU Fishing* (March 2006 [cited 24 June 2006]); available from http://www.ejfoundation.org/pdf/hstf_submission.pdf.

[107] Porfirio Alino, "Fisheries Resources of the Philippines" (paper presented at the Australian Consultation with the Philippines and Indonesia on the Identification of Researchable Options for the Development of Policy and Management Frameworks to Combat Illegal, Unreported and Unregulated (IUU) Fishing Activities in Indonesian and Philippine Waters, Wollongong, Australia, March 2002).

[108] Laureta Burke, Elizabeth Selig, and Mark Spalding, *Reefs at Risk in Southeast Asia* (Washington: World Resource Institute, 2002).

[109] Vice Admiral Emesto H De Leon AFP, "The Role of the Philippine Navy in Protecting the Country's Maritime Interest Particularly the Fishing Industry" (paper presented at the 6th National Tuna Congress, General Santos City, 2-3 September 2004).

[110] "Illegal Fishing Still Rampant in Ri Waters," *Jakarta Post*, 20 August 2002.

B. Regional instruments related to the sustainable management of pelagic fisheries in the South China Sea region

Regional instruments are intended to address international fisheries management and conservation issues at the regional level. The regional fisheries management organizations (RFMOs) play a very important role at this stage.

In the SCS region, the RFMO which plays a very significant role is the Southeast Asian Fisheries Development Center (SEAFDEC). SEAFDEC is an autonomous intergovernmental body established as a regional treaty organization in 1967 to promote fisheries development in Southeast Asia. SEAFDEC aims specifically to develop the fishery potentials of the region through training, research and information services to improve the food supply by rational utilization and development of the fisheries resources. Its services cover the broad areas of fishing gear technology, marine engineering, fishing ground surveys and stock assessment, post-harvest technology as well as development and improvement of aquaculture techniques.[111]

SEAFDEC currently consists of 11 member States, namely: Brunei, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. The Council of Directors, composed of nominees from Member States, is the policy-making body that provides directives and guidance on activities of SEAFDEC. SEAFDEC has a Secretariat as an administrative unit, and four technical Departments, namely: the Training Department (TD) in Thailand, the Marine Fisheries Research Department (MFRD) in Singapore, the Aquaculture Department (AQD) in the Philippines, and the Marine Fishery Resources Development and Management Department (MFRDMD) in Malaysia.[112]

SEAFDEC has conducted several programs for sustainable management of marine fisheries resources in the SCS region. The most important program regarding pelagic fisheries is named: *Information Collection for Sustainable Pelagic Fisheries in the South China Sea Program*. This Program is a collaborative program undertaken by SEAFDEC, financed by

[111] Southeast Asian Fisheries Development Center, *About SEAFDEC* (2004 [cited 12 July 2006]); available from http://www.seafdec.org/aboutus.htm.
[112] Ibid.

Japan, and executed by MFRDMD, MFRD and TD together with an overall coordination by the SEAFDEC Secretariat. Participating States include Brunei, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam.[113]

The Program has three components:

- Component I (MFRDMD, MFRD and TD) aims to finalize the overall framework and mechanism of the Program, responsibilities of SEAFDEC Departments and participating States, and methodologies of pilot data collection and analyses and observation of the current status of landing and processing;
- Component II aims to carry out the pilot data collection and analyses on the basis of the decision of the Technical Meeting. This will be undertaken by MFRDMD and TD. The survey of the actual status of operation and catches of purse seine fishery as well as the fish biology studies plan to be conducted; and
- Component III focuses on examination to maximize pelagic fish resources utilization. This is to be undertaken by MFRD.[114]

The program has been conducted for 5 years (2002-2006), and the final result of the program will be presented at a conference at the end of 2006.

C. International instruments related to the sustainable management of pelagic fisheries in the South China Sea region

Since the end of the 20th Century, world fisheries have been in a crisis, with many regional fisheries regarded as being in extreme danger of collapse. International laws as well as international instruments have an important role to play in dealing with this crisis.[115]

The LOSC, which came into force in 1994, has drastically changed the concept of ocean governance and set forth new legal frameworks for marine fisheries and environmental protection. In response to the rapid change in the global fisheries situation, especially during the past decade, and in order to facilitate the effective implementation of the LOSC, a number

[113] Southeast Asian Fisheries Development Center, *Information Collection for Sustainable Pelagic Fisheries in the South China Sea* (7 July 2006 [cited 10 July 2006]); available from http://www.seafdec.org/program/program14.htm.
[114] Ibid.
[115] Stuart Kaye, *International Fisheries Management* (Boston: Kluwer Law International, 2000).

of international instruments and initiatives have been adopted by the international community.[116] Notable instruments of particular relevance to fisheries management include:

- The 1995 Agreement for the Implementation of the Provision of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks;
- The 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas;
- The 1995 Code of Conduct for Responsible Fisheries; and
- FAO International Plans of Action addressing specific key issues of the 1995 Code of Conduct for Responsible Fisheries.

These instruments, as well as the LOSC itself, play a very important role in marine fisheries management including the management of pelagic fisheries in the SCS.

1. The 1982 United Nations Convention on the Law of the Sea

The LOSC was adopted by the Third United Nations Conference on the Law of the Sea (UNCLOS III) in New York on 30 April 1982 after nine years of negotiations which aimed to erect a comprehensive constitution for the oceans.[117] The LOSC was concluded and opened for signature on 10 December 1982 at Montego Bay, Jamaica.[118] It has been signed by 157 States and as at 8 November 2006, 152 States are Parties. These States include all of the China Seas States except Cambodia, Thailand and North Korea (Table 2).

[116] Menasveta, op cit, note 64.
[117] United Nations, *The United Nations Convention on the Law of the Sea (a Historical Perspective)* (United Nations, 2006 [cited 15 June 2006]); available from http://www.un.org/depts/los/convention_agreements/convention_historical_perspective.htm.
[118] United Nations, *United Nations Convention on the Law of the Sea of 10 December 1982: Overview and Full Text* (United Nations, 16 March 2006 [cited 15 June 2006]); available from http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm.

Table 2: Status of the China Seas States to the LOSC and the related Agreements, as at 8 November 2006.

State or Entity	United Nations Convention on the Law of the Sea[119] (in force as from 16 November 1994)		Agreement relating to the implementation of Part XI of the Convention[120] (in force as from 28 July 1996)		Agreement for the implementation of the provisions of the Convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks[121] (in force as from 11 December 2001)		Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas[122] (in force as from 24 April 2003)	
	✍ Signature 🗎 Declaration	Ratification/ Accession (a)/ 🗎 Declaration	✍ Signature	Ratification/ Accession (a)/ Content to be bound (p)	✍ Signature 🗎 Declaration	Ratification/ Accession 🗎 Declaration	✍ Signature	Ratification/ Accession (a)
TOTALS	**157 (🗎 35)**	**152 (🗎 58)**	**79**	**126**	**59 (🗎 5)**	**62 (🗎 27)**	**35**	**35**
Brunei	✍	5 November 1996		5 November 1996 (p)				
Cambodia	✍							
China	✍	🗎 7 June 1996	✍	7 June 1996 (p)	🗎			
Indonesia	✍	3 February 1986	✍	2 June 2000	✍			
Japan	✍	20 June 1996	✍	20 June 1996	✍	7 August 2006	✍	20 June 2000
Malaysia	✍	🗎 14 October 1996	✍	14 October 1996 (p)				
North Korea	✍							
Philippines	🗎	🗎 8 May 1984	✍	23 July 1997	✍			
Singapore	✍	17 November 1994		17 November 1994 (p)				
South Korea	✍	29 January 1996	✍	29 January 1996	✍		✍	24 April 2003
Thailand	✍							
Vietnam	✍	🗎 25 July 1994		27 April 2006 (a)				

[119] United Nations, *Table Recapitulating the Status of the Convention and of the Related Agreements* (8 November 2006 [cited 27 November 2006]); available from http://www.un.org/Depts/los/reference_files/status2006.pdf.
[120] Ibid.
[121] Ibid.
[122] FAO, *Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas - Status* (November 2006 [cited 27 November 2006]); available from http://www.fao.org/Legal/treaties/012s-e.htm.

At the time of its adoption, the LOSC embodied in one instrument traditional rules governing oceans uses, and at the same time introduced new legal concepts and regimes addressing new concerns. The LOSC also provided a framework for further development of specific areas of the Law of the sea. Today, it is the globally recognized regime - the framework convention for all matters relating to the Law of the Sea.[123]

The LOSC comprises 320 articles and 9 annexes, governing all aspects of ocean space, such as delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes relating to ocean matters.[124] The EEZ is one of its most revolutionary features, and one which already has had a profound impact on the management and conservation of the resources of the oceans including pelagic fisheries in the SCS. The desire of coastal States to control fish harvest in adjacent waters was a major driving force behind the creation of the EEZ.[125] The adoption of the EEZ within the framework of the LOSC has placed 90 percent of the world's fisheries under national jurisdiction.[126] The EEZ is defined as "an area beyond and adjacent to the territorial sea"[127] that "shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured".[128] The prescribed management regime applicable to the EEZ is very important because more than 80 percent of all commercial stocks are caught within 320 kilometers of coastal shores.[129] In the EEZ, coastal States exercise sovereign rights for the purpose of exploring and exploiting, conserving and managing the living and non-living natural resources of the area.[130] The LOSC also requires coastal

[123] United Nations, op cit, note 118.
[124] Ibid.
[125] United Nations, op cit, note 117.
[126] FAO, *UNCED and Its Implications for Fisheries*, vol. 8, *Cofi/93/Inf.* (Rome, Italy: FAO, 1993).
[127] United Nations, op cit, note 5, Article 55. It indicates that "The exclusive economic zone is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention.".
[128] United Nations, op cit, note 5, Article 57. It indicates that "The exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured.".
[129] McGinn A. P., "Chapter 4: Promoting Sustainable Fisheries," in *State of the World 1998: A Worldwatch Institute Report on Progress Towards a Sustainable Society* (New York, USA: Norton, 1998).
[130] United Nations, op cit, note 31.

States to implement conservation measures applicable to fishing vessels in their EEZs.[131] It reflects the interests of coastal States with regard to natural resources, certain economic activities and the exercise of jurisdiction over marine science research and environmental protection.

The other important key features related to the marine resource management are those concerning the resources of the high seas.[132] The LOSC stipulates that all States which enjoy the traditional freedoms of scientific research and fishing on the high seas are obliged to adopt, or cooperate with other States in adopting, measures to manage and conserve living resources. Under the LOSC, highly migratory species of fish, which are mostly pelagic species as specified in Annex I of the LOSC,[133] are accorded special protection.[134]

With respect to territorial sea and internal waters, States are provided with no provisions regarding management regimes, leaving them absolute and unfettered control over the management scheme they might wish to implement.[135]

Although States bordering enclosed or semi-enclosed seas are expected to cooperate in managing living resources, environmental and research policies and activities because those activities taken by one State may have a direct impact on the rights, obligations, and interests of other States.[136] However, the LOSC created important dispute resolution regimes and

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[131] United Nations, op cit, note 5, Article 62(4). It indicates that "4. Nationals of other States fishing in the exclusive economic zone shall comply with the conservation measures and with the other terms and conditions established in the laws and regulations of the coastal State…".

[132] United Nations, op cit, note 5, Article 118. It indicates that "States shall cooperate with each other in the conservation and management of living resources in the areas of the high seas. States whose nationals exploit identical living resources, or different living resources in the same area, shall enter into negotiations with a view to taking the measures necessary for the conservation of the living resources concerned. They shall, as appropriate, cooperate to establish subregional or regional fisheries organizations to this end.".

[133] United Nations, op cit, note 5, Annex I.

[134] United Nations, op cit, note 5, Article 64(1). It indicates that "1. The coastal State and other States whose nationals fish in the region for the highly migratory species listed in Annex I shall cooperate directly or through appropriate international organizations with a view to ensuring conservation and promoting the objective of optimum utilization of such species throughout the region, both within and beyond the exclusive economic zone…".

[135] Kaye, op cit, note 115.

[136] United Nations, op cit, note 5, Article 123. It indicates that "States bordering an enclosed or semi-enclosed sea should cooperate with each other in the exercise of their rights and in the performance of their duties under this Convention…".

mechanisms[137], including the International Tribunal for the Law of the Sea (ITLOS)[138], in order to settle disputes regarding jurisdiction over resources and related issues that might occur among coastal States.

2. The 1995 Agreement for the Implementation of the Provision of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks

In the last two decades, straddling fish stocks and highly migratory fish stocks became a target for certain distant water fishing vessels. Since the adoption of the LOSC, and the establishment of the EEZ by a large number of coastal States, relocation of some major distant water fisheries vessels to areas adjacent to EEZ has taken place. This has resulted in an increase in catches of straddling fish stocks and highly migratory fish stocks. The LOSC, having been negotiated as part of a package agreement, contains provisions that call for cooperation among States in this regard. However, these provisions are too general and are widely regarded by many to be insufficient and ineffective to prevent many problems resulting from such unregulated fisheries. As a response to this shortcoming, the United Nations Conference on Environmental and Development (UNCED), held in Rio in 1992, called for the convening of a specialized conference on straddling fish stocks and highly migratory fish stocks.

On 4 August 1995, the Conference adopted the Agreement for the Implementation of the Conservation Provision of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.[139]

The 1995 UN Fish Stocks Agreement is an implementation agreement for the LOSC with respect to issues not adequately addressed at the time of UNCLOS III: the conservation and

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[137] United Nations, op cit, note 5, Part XV. It mainly indicates that States Parties shall settle any dispute between them concerning the interpretation or application of LOSC by peaceful means chosen by the Parties.
[138] United Nations, op cit, note 5, Annex VI.
[139] Jean-Pierre Levy and Gunnar G. Schram, *United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks : Selected Documents* (The Hague ; Boston: Martinus Nijhoff Publishers, c1996); hereinafter referred to as "the 1995 UN Fish Stocks Agreement"

management of straddling fish stocks and highly migratory fish stocks. In particular, the 1995 UN Fish Stocks Agreement provides for an implementation framework for Articles 63 and 64 and relevant provisions made in Part VII of the LOSC.[140]

Straddling fish stocks are those that straddle the boundary of a State's EEZ and the high seas (some stocks straddle 'out' of an EEZ while others straddle 'into' an EEZ), while highly migratory fish stocks are those that generally roam over large distances and maybe found in numerous EEZ jurisdictions and the high seas. Highly migratory species are defined by a listing in Annex 1 of the LOSC.[141]

The main provision of the 1995 UN Fish Stocks Agreement can be summarized as follows:

- Elaborates general principles concerning conservation and management of straddling fish stocks and highly migratory fish stocks;
- Applies the concept of the precautionary approach to the conservation and management of these stocks;
- Emphasizes the special role of RFMOs in the conservation and management of straddling fish stocks and highly migratory fish stocks;
- Elaborates upon the obligation of states to cooperate in the conservation and management of straddling fish stocks and highly migratory fish stocks. This includes a duty upon States not to authorize vessels to fish for such fish stocks unless the States are party to, or co-operate with, any sub-regional or regional fisheries management organization or arrangement which has competence to establish conservation and management measures for the stock concerned;
- Elaborates upon the obligations of states with respect to vessels flying their flag on the high seas;
- Introduces innovative enforcement provisions for the high seas; and
- Introduces provisions with respect to the requirements of developing States. [142]

The 1995 UN Fish Stocks Agreement is binding only upon those States that are party to it. As at 8 November 2006, there are 62 States party to the Agreement. None of the States in SCS

[140] Grant Bryden, *United Nations Fish Stocks Agreement* ([cited 17 May 2006]); available from http://www.oceansatlas.com/world_fisheries_and_aquaculture/html/govern/instit/intlinstr/unfsa.htm.
[141] United Nations, op cit, note 133.
[142] Bryden, op cit, note 140.

region is a party to the Agreement (Table 2). They, however, sent representatives to attend the informal consultation meetings of State Parties to the 1995 UN Fish Stocks Agreement in order to prepare for the Review Conference of the Agreement which was convened by the Secretary-General of the United Nations from 22 to 26 May 2006, at the United Nations Headquarters in New York. [143]

At the Review Conference, delegations recalled that all provisions of the Agreement shall be interpreted and applied in the context of and in a manner consistent with the LOSC. RFMOs and arrangements were recognized as the primary mechanism for international cooperation in conserving and managing straddling fish stocks and highly migratory fish stocks. The Review Conference encouraged States, as appropriate, to recognize that the general principles of the Agreement should apply to discrete fish stocks in the high seas as well. The Review Conference also strongly recommended that States individually and collectively through RFMOs should strengthen their commitment to adopt and fully implement conservation and management measures for straddling fish stocks and highly migratory fish stocks. Furthermore, the Review Conference recommended to urge all States with an interest in fisheries for straddling fish stocks and highly migratory fish stocks that have not yet done so to become parties to the Agreement as soon as possible and disseminate information about the Agreement, including its objective and the rights and duties it provides.[144]

[143] United Nations, *Fifth Round of Informal Consultations of States Parties to the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* (New York: United Nations, 2006); United Nations, *Fourth Informal Consultations of States Parties to the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* (New York: United Nations, 2005).

[144] United Nations, *Report of the Review Conference on the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* (New York: United Nations, 2006).

3. The 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas[145]

According to the LOSC, the high seas include "all parts of the sea that are not included in the EEZ, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State".[146] In the case of the SCS, it is not clear if there are any areas which could fall beyond areas of national jurisdiction. This is because of the territorial disputes among many coastal States over sovereign claims on the Spratly Islands and the Paracels Islands. However, if hypothetical EEZs are drawn from these coastal States' baselines, ignoring both the Spratly Islands and the Paracels Islands, the area enclosed by the line in the middle of Figure 12 will be the high seas in the SCS. But if only the Spratly Islands are ignored, the potential high seas area would be reduced to the area depicted in the middle of Figure 13. On the other hand, if the effect of extending EEZs from the Spratly Islands is considered, the potential to eliminate all high seas in the SCS can be seen in Figure 14.

[145] Hereinafter referred to as "the Compliance Agreement".

[146] United Nations, op cit, note 5, Article 86. It indicates that "The provisions of this Party apply to all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State…".

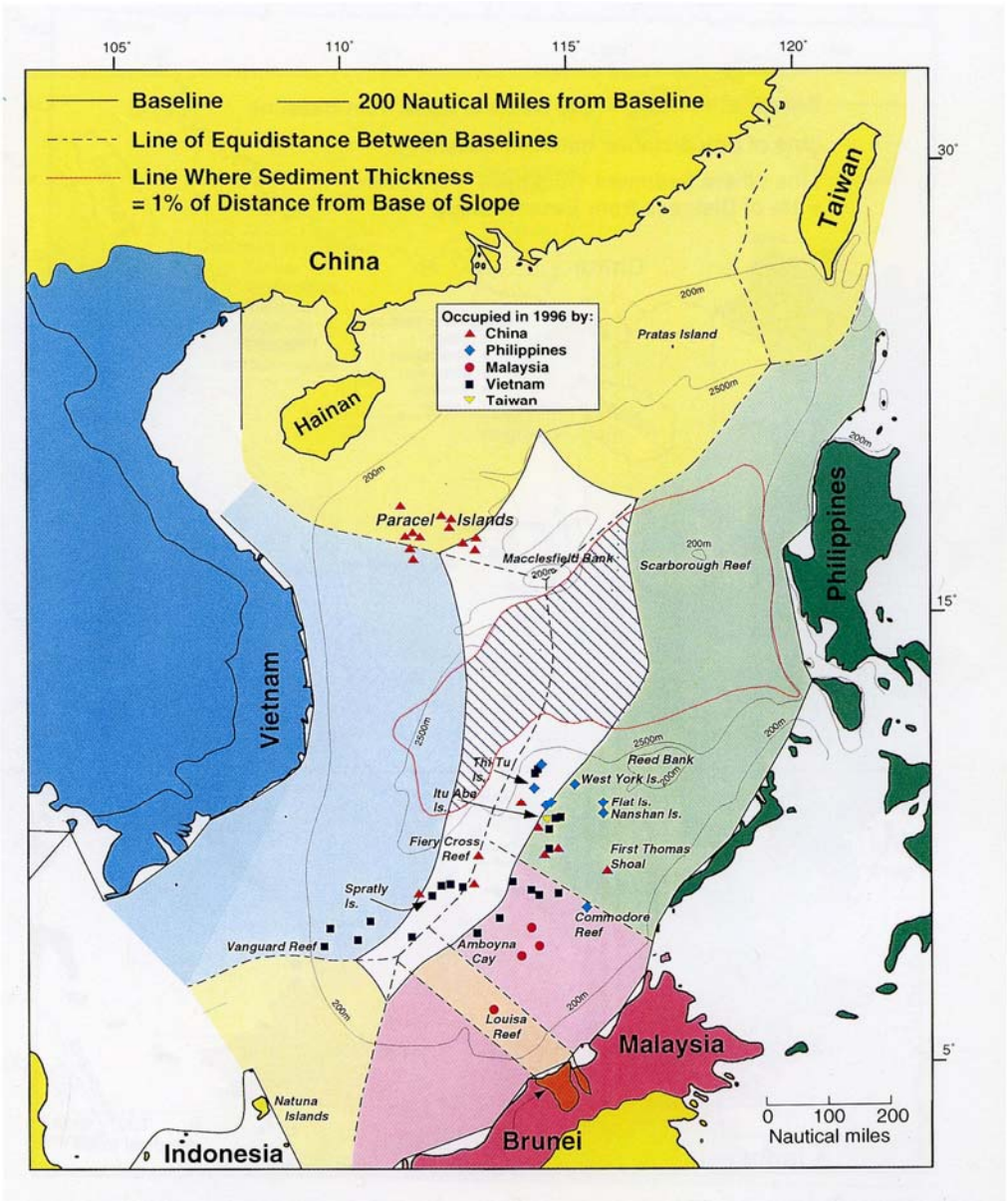

Figure 12: Allocation of the SCS and features out 200 nautical miles from defensible baselines, ignoring both the Spratly Islands and the Paracel Islands.

Source: Mark J. Valencia, Jon M. Van Dyke, and Noel A. Ludwig, *Sharing the Resources of the South China Sea* (The Hague; Boston: Cambridge, MA: M. Nijhoff Publishers; Sold and distributed in the U.S.A. and Canada by Kluwer Law International, c1997), p. 264.

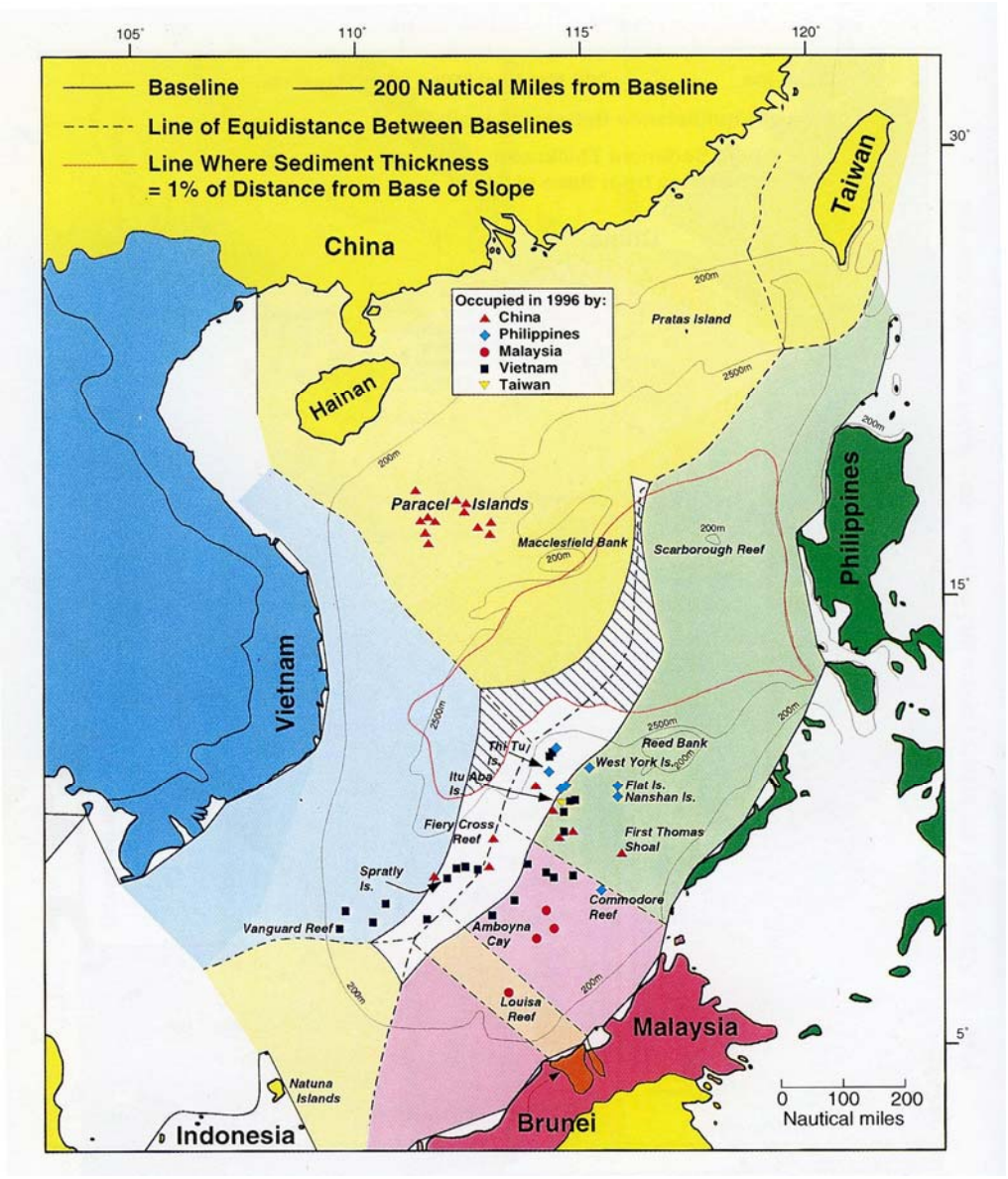

Figure 13: Allocation of the SCS and features out 200 nautical miles, ignoring the Spratly Islands but giving full effect to the Paracel Islands based on defensible baseline claims.

Source: Mark J. Valencia, Jon M. Van Dyke, and Noel A. Ludwig, *Sharing the Resources of the South China Sea* (The Hague; Boston: Cambridge, MA: M. Nijhoff Publishers; Sold and distributed in the U.S.A. and Canada by Kluwer Law International, c1997), p. 265.

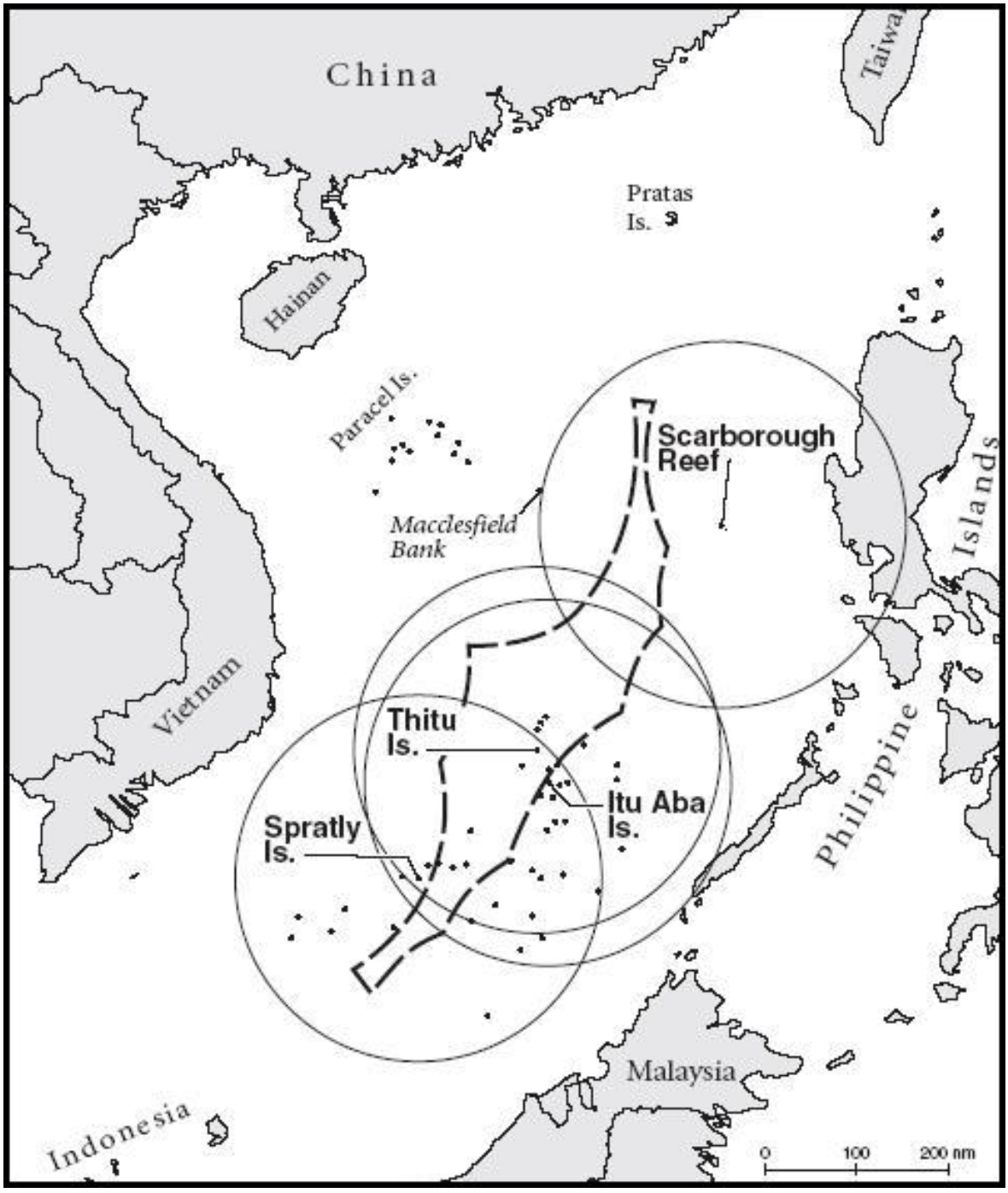

Figure 14: The circles drawn to show the effect of extending 200 nautical miles EEZs from the Spratly Islands.

Source: Ji Guoxing, "Rough Waters in the South China Sea: Navigation Issues and Confidence-Building Measures," (East-West Center, 2001).

As previously stated, as the various territorial disputes of the SCS remain currently unresolved, it is assumed that the SCS contains a maritime area which can be considered as high seas. This makes the Compliance Agreement a significant international instrument for pelagic fisheries management in the region.

The Compliance Agreement was approved by the FAO Conference at its twenty-seventh session in Rome on 24 November 1993. It entered into force on 24 April 2003, upon receipt by the Director-General of the FAO of the twenty-fifth instrument of ratification. The Compliance Agreement is an important international agreement that fits within a framework of multilateral, regional, and bilateral agreements on the conservation and management of high sea fisheries. It is consistent with the LOSC, and in certain respects, overlaps with the 1995 Fish Stocks Agreement. The Compliance Agreement forms a central element of the FAO Code of Conduct for Responsible Fisheries, which sets out principles and standards of behavior for responsible fishing.[147]

The intent of the Compliance Agreement is to deter the practice of re-flagging fishing vessels as a means of avoiding compliance with international conservation and management measures, i.e. re-flagging fishing vessels to States that do not effectively control their vessels and/or that do not participate in, or cooperate with, RFMOs. This practice is commonly associated with IUU fishing, which is a problem that continues to present a serious threat to global fisheries and marine ecosystems. Re-flagging and the broader practice of IUU fishing, seek to avoid compliance with international conservation and management measures. Such practices have very negative impacts on the long-term sustainability of fish stocks, compromise the effectiveness of RFMOs, and undermine the rights and interests of responsible fishing States.[148]

The Compliance Agreement seeks to address this problem by strengthening the responsibilities of flag States over their vessels that fish on the high seas. Specifically, it requires flag States to implement authorization and recording procedures for high seas fishing vessels. States are required to ensure that they can legally exert control over a vessel before authorizing it to

[147] Primary Production Committee, "International Treaty Examination of the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Sea," in *Report of the Primary Production Committee* (New Zealand).
[148] Ibid.

fish on the high seas, and are prohibited from authorizing vessels with a history of fisheries-related non-compliance. The Compliance Agreement also sets forth procedures for exchange of information on high seas fishing vessels, and provides the basis for improved international cooperation with regard to IUU fishing.[149] These measures contribute to the elimination of IUU fishing and assist in insuring the long-term sustainability of fish stocks and protection of biodiversity from the adverse impacts of fishing on the high seas.[150]

As at 8 November 2006, there are 35 States party to the Agreement but none of the States in the SCS region is a party. In fact, there were only two China Seas States which signed the Agreement: Japan and South Korea (Table 2).

4. The 1995 Code of Conduct for Responsible Fisheries

The 1995 Code of Conduct for Responsible Fisheries[151] was adopted by FAO membership on 31 October 1995[152] during the 28th Session of the FAO Conference held in Rome between 20 October and 2 November 1995.[153] More than 170 FAO members States adopted the Code by consensus. It was recognized that fisheries, which include the management, catching, processing, marketing of fish stocks and aquaculture, provide an important source of food, employment, and income for people throughout the world. Therefore everyone involved in fishing must help conserve and manage the world fisheries.[154] The Code, which is voluntary rather than mandatory, aims to establish principles for responsible fishing, in accordance with the relevant rules of international law, and to serve as an instrument of reference to help States establish or improve the legal, institutional and managerial arrangements required for responsible and sustainable fishing. It applies globally to all fisheries, including fisheries within the EEZ and the territorial sea, as well as

[149] Ibid.
[150] Ibid.
[151] Hereinafter referred to as "the Code".
[152] Christopher Hedley, *FAO Code of Conduct for Responsible Fisheries* ([cited 5 August 2006]); available from http://www.intfish.net/treaties/summaries/3308.htm.
[153] Tsamenyi and Woodhill, op cit, note 86.
[154] FAO, *What Is the Code of Conduct for Responsible Fisheries?* (Rome, Italy: FAO, 2001).

those on the high seas, and to all stages of the fishing process, including capture, post-harvest production and trade.[155]

The main provisions of the Code are summarized as follows[156]:

- Implementation of management measures to ensure the sustainable use of marine living resources;
- Conservation of target species, species belonging to the same ecosystem or associated and dependent species;
- Prevention of overfishing and excess fishing capacity;
- Support for fisheries management decisions with the best available scientific evidence;
- Application of the precautionary approach to fisheries conservation and management;
- Protection of endangered species;
- Promotion of selective and environmentally safe fishing gear and practices;
- Protection and rehabilitation of critical fisheries habitats;
- Promotion of international cooperation to facilitate conservation and management of living aquatic resources, especially straddling stocks and highly migratory stocks, throughout their range of distribution;
- The adoption of compatible conservation measures in areas under national jurisdiction and on the high seas; and
- Development of effective monitoring, control and surveillance measures.

According to the FAO, 52 of its member States report having fisheries management plans in place that incorporate elements of the Code, including measures to promote use of selective fishing gear, to prohibit destructive practices and to ensure that permitted catch-levels reflect the state of stocks and allow depleted populations to recover. Fifty States are taking steps to make sure that their ships fishing in the EEZs of other States are properly authorized, and to better monitor foreign

[155] Hedley, op cit, note 152.
[156] Tsamenyi and Woodhill, op cit, note 86.

vessels operating in their own EEZs. Forty-nine States have implemented policies aimed at limiting accidental by-catch and reducing discards.[157]

In addition, to fulfill the obligation and to operationalize the Code in Southeast Asian States which all are located in the SCS region, SEAFDEC has initiated a comprehensive project on the Regionalization of the Code of Conduct for Responsible Fisheries. This project aims to address lacunas in State implementation, and to clarify provisions of the Code which are critical to the fisheries development of Southeast Asia. This project has established four phases of regionalization exercises, namely:

- Fishing Operations (Phase I);
- Aquaculture Development (Phase II);
- Fisheries Management (Phase III); and
- Fisheries Post-Harvest Technology and Trade (Phase IV).

To achieve the goals set for the regionalization exercises, a series of processes and activities have been undertaken such as the identification of regional core experts and advisors; organization of workshops and technical meetings to elicit national views on the global Code; the mobilization of core experts workshops for the preparation of the regional technical; and the drafting of the regional guidelines. At present, SEAFDEC has completed regionalization exercises for Responsible Fishing Operations[158] and Aquaculture Development[159] and elaborated the respective regional guidelines. In the pipeline is the regionalization of Fisheries Management[160] including the harmonization of Integration of Fisheries into Coastal Area Management[161] with Fisheries Management.[162]

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[157] FAO, *Progress Reported in Implementation of International Fishing Code* (2005 [cited 5 August 2006]); available from http://www.fao.org/newsroom/en/news/2004/45169/index.html.
[158] FAO, *Code of Conduct for Responsible Fisheries* (Rome, Italy: 1995), Article 8.
[159] Ibid., Article 9.
[160] Ibid., Article 7.
[161] Ibid., Article 10.
[162] Southeast Asian Fisheries Development Center, *Regionalization of the Code of Conduct for Responsible Fisheries* (2006 [cited 5 August 2006]); available from http://www.seafdec.org/program/program11.htm.

5. FAO International Plans of Action addressing specific key issues of the 1995 Code of Conduct for Responsible Fisheries[163]

Even after the Code was adopted in 1995, members of the FAO Committee on Fisheries (COFI) determined that the implementation of the Code's provisions would be greatly reinforced by a set of voluntary International Plans of Action (IPOA). Three such plans, each addressing a specific issue, were developed in 1998 and adopted by the twenty-third session of COFI in February 1999, after which they were endorsed by the FAO Council at its June 1999 session. The three IPOAs are as follows:

- The IPOA for reducing incidental catch of seabirds in longline fisheries[164];
- The IPOA for the conservation and management of sharks[165]; and
- The IPOA for the management of fishing capacity.[166]

In addition to the three IPOAs enumerated, the twenty-third session of COFI (1999) called for the elaboration of a fourth IPOA, namely:

- The IPOA to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.[167]

This IPOA was developed in 2000, adopted by consensus at the 24th session of COFI on 2 March 2001, and endorsed by the 120th session of the FAO Council on 23 June 2001. The four IPOAs are summarized as follows:

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[163] Hereinafter referred to as "FAO-IPOA".

[164] FAO, *International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries, International Plan of Action for the Conservation and Management of Sharks, International Plan of Action for the Management of Fishing Capacity* (Rome, Italy: FAO, 1999).

[165] Ibid.

[166] Ibid.

[167] FAO, *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (Rome, Italy: FAO, 2001).

- **The IPOA for reducing incidental catch of seabirds in longline fisheries**[168]

The IPOA-SEABIRDS is a voluntary instrument that applies to all States whose fishermen engage in longline fisheries.[169] Key longline fisheries in which incidental catch of seabirds are known to occur are: tuna, swordfish and billfish in certain regions of the oceans.[170] The IPOA-SEABIRDS sets out the activities which implementing States are expected to carry out, including an assessment of weather a problem exists with respect to the incidental catch of seabirds in its longline fishery, adopting a National Plan of Action for reducing in incidental catch of seabirds in longline fisheries (NPOA-SEABIRDS) and the elaboration of procedures for national reviews and reporting requirements.[171]

In the SCS region itself, the incidental catch of seabirds in longline fisheries has not been observed. The species of seabirds most frequently taken are albatrosses and petrels in the Southern Ocean, northern fulmars in the North Atlantic and albatrosses, gulls and fulmars in the North Pacific fisheries.[172] According to FAO, only a few States have official schemes in place to prevent bird deaths, but many have indicated that steps to tackle the problem are being adopted on an individual basis in their fisheries sectors.[173] However, all of the concerned States are encouraged to implement the IPOA-SEABIRDS, particularly those who operate longline fisheries in the mentioned oceans.

- **The IPOA for the conservation and management of sharks**[174]

The IPOA-SHARKS is a voluntary instrument that applies to all States whose fishermen engage in shark fisheries. It sets out the activities which implementing States are expected to carry out, including an assessment of whether a problem exists with respect to sharks, adopting a

[168] Hereinafter referred to as "IPOA-SEABIRDS".
[169] FAO, op cit, note 164.
[170] FAO, *International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries* (5 August 2006 [cited 5 August 2006]); available from http://www.fao.org/figis/servlet/static?xml=ipoa_seabirds.xml&dom=org&xp_nav=2.
[171] FAO, op cit, note 164.
[172] FAO, op cit, note 170.
[173] FAO, op cit, note 157.
[174] Hereinafter referred to as "IPOA-SHARKS".

National Plan of Action for the conservation and management of sharks (NPOA-SHARKS), as well as procedures for national reviews and reporting requirements.[175]

The fishers of the SCS region have conducted fisheries for sharks in coastal waters for decades. During recent years, the increase in effort and yield of shark catches, as well as the expansion of the fishing grounds, has taken place. Generally, conservation and management of sharks is impaired by the lack of accurate data on catch, effort, discard, and trade data, as well as limited information on the biological parameters of many species and their identification.[176] However, to date, there is no Stock Assessment Report (SAR) for sharks in the SCS region, although SEAFDEC has developed a research project on the biology and conservation of sharks which may form a basis for the formulation of SAR. Indonesia has also carried out studies in 2000 and 2001 on shark biology and shark fisheries.[177] According to FAO, plans addressing shark fishing now exist in six States, with ten other States close to finalizing them.[178] But, as of date, there is no NPOA-SHARKS in the SCS region.[179]

- **The IPOA for the management of fishing capacity**[180]

The IPOA-CAPACITY is a voluntary instrument that applies to all States whose fishermen engage in capture fisheries. The immediate objective of the IPOA-CAPACITY is for the States and RFMOs to put in place an efficient, equitable and transparent management of fishing capacity by 2003, and not later than 2005.[181] It also enumerates urgent actions to be taken by States and identifies mechanisms in order to promote their implementation. The urgent actions are as follows:

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[175] FAO, op cit, note 164.

[176] FAO, *The International Plan of Action for the Conservation and Management of Sharks* (5 August 2006 [cited 5 August 2006]); available from http://www.fao.org/figis/servlet/static?dom=org&xml=ipoa_sharks.xml.

[177] IUCN Species Survival Commission's Shark Specialist Group and TRAFFIC, *Report on Implementation of the International Plan of Action for Sharks (IPOA-Sharks): AC18 DOC. 19.2* (8-12 April 2002 [cited 5 August 2006]); available from http://www.cites.org/common/com/ac/18/E18i-10.doc.

[178] FAO, op cit, note 157.

[179] IUCN Species Survival Commission's Shark Specialist Group and TRAFFIC, op cit, note 177.

[180] Hereinafter referred to as "IPOA-CAPACITY".

[181] FAO, *International Plan of Action for the Management of Fishing Capacity* (5 August 2006 [cited 5 August 2006]); available from http://www.fao.org/figis/servlet/static?xml=ipoa_capacity.xml&dom=org&xp_nav=2&xp_banner=fi.

- Assessment and monitoring of fishing capacity which includes measurement of fishing capacity, urgent measurement of diagnosis and identification of fisheries and fleets as well as establishment of records of fishing vessels;

- Preparation and implementation of national plans by development of national plans and policies, giving subsidies and economic incentives and having regional considerations; and

- Having international considerations as well as the immediate actions for major international fisheries requiring urgent measures. [182]

So far, FAO reports that nine States have national plans in place to limit excess fishing capacity, and another 42 States are in the processes of drafting such plans including some States in the SCS region.[183]

- **The IPOA to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing**[184]

The IPOA-IUU is also a voluntary agreement, within the framework of the Code, which applies to all States and entities and to all fishers. It contains proposed measures to prevent, deter and eliminate IUU fishing. These measures focus on all State responsibilities, including flag State responsibilities, coastal State measures, port State measures, internationally agreed market-related measures, research and regional fisheries management organizations. Special requirements of developing States are also considered, as are reporting requirements and the role of FAO.[185] The measures proposed by IPOA-IUU are summarized as follows:

- All States responsibilities which include 2 parts which are international instruments and national legislation.

  For international instruments, States are encouraged, as a matter of priority, to ratify, accept or accede to, as appropriate, the LOSC, the 1995 UN Fish Stocks Agreement and the 1993 FAO Compliance Agreement. Also, States should fully and effectively implement the Code and its associated International Plans of Action.

[182] FAO, op cit, note 164.
[183] FAO, op cit, note 157.
[184] Hereinafter referred to as "IPOA-IUU".
[185] FAO, op cit, note 167.

With respect to national legislation, States should address in an effective manner all aspects of IUU fishing. States should develop and implement their National Plans of Action which address State control over nationals, vessels without nationalities, legal sanctions with sufficient severity, non cooperating States, economic incentives and MCS of fishing activities.

- Flag State responsibilities, including the requirement for the establishment of fishing vessel registries, record of fishing vessels, issue authorization to fish as well as the control of transhipment and support activities.

- Coastal State responsibilities include the implementation of effective MCS, cooperation with other States and information exchange, the regulation of foreign fishing access and the application of legal sanctions of sufficient severity.

- Port State measures which are to deny port access to IUU fishing boats (except for vessels in distress), port inspection of vessel documents and catch, collect and exchange of information, cooperation with flag and coastal States, as well as cooperation with regional fisheries management organizations.

- Internationally-agreed market measures that include import and export control, catch documentation and certification requirements, pre-shipment inspection, labeling, self requirement and paper trails for the fish trade.

- Implications of non-compliance should include multilateral bans on import of fisheries products, ban on high seas fishing, sanctions against non-compliant fishing vessels, loss of access to waters of other States, to avoid collapse of resources and loss of revenues.[186]

According to FAO, thirty-five Sates have developed plans to curtail IUU fishing including some States in the SCS region.[187]

[186] Ibid; Martin Tsamenyi and Ron West, "International Requirements to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing" (paper presented at the National Workshop on IUU Fishing, Jakarta, Indonesia, 28 April 2005).
[187] FAO, op cit, note 157.

Part IV Potential Approaches towards the Sustainable Management of Pelagic Fisheries in the South China Sea Region

Since pelagic stocks in the SCS region are mainly straddling fish stocks and highly migratory fish stocks, their sustainable management at the national level is obviously not enough. A comprehensive management regime at the international level needs to be further developed and implemented to be more effective. However, at the international level, sustainable use approaches, which are recognized as fundamental to the management of renewable resources, need to be applied within specific fisheries instruments and implemented at all levels.[188] The potential approaches for sustainable management of pelagic fisheries in the SCS, therefore, should include the following:

a. Ratification and implementation of the international fishery instruments

To apply internationally agreed standards for responsible and sustainable marine resources management, including the elimination of IUU fishing in both waters under national jurisdiction and the high seas, the SCS States should be seriously encouraged to ratify or accept and implement effective international fishery instruments including:

- The LOSC;
- The 1995 UN Fish Stocks Agreement;
- The Compliance Agreement;
- The Code; and
- The four FAO international plans of action (IPOA-SEABIRDS, IPOA-SHARKS, IPOA-CAPACITY, IPOA-IUU).

In particular, States should ratify the LOSC which is one of the most comprehensive international treaties and the framework convention for the other international agreements enumerated above. All SCS States should be a party to the LOSC. The LOSC provides the legal

[188] Tsamenyi and Woodhill, op cit, note 86.

framework absolutely necessary for sustainable management of pelagic fisheries in the SCS region. The LOSC grants coastal States sovereign rights over living resources in their EEZs as well as provides the legal regime for their protection and conservation. The LOSC also provides a comprehensive framework for marine conservation that coastal States are specifically required to conserve living resources in their EEZs. In addition, the LOSC promotes scientific research and protects the right to conduct it.

Currently, there are only two States in the SCS region, Cambodia and Thailand, who are not parties to the LOSC. Their non-party status has constantly brought them some disadvantages both in international fisheries as well as in the exercise of the freedom of navigation for commercial vessels, particularly when dealing with the States who are parties to the LOSC. For instance, Thailand can not submit disputes with Malaysia regarding the freedom of navigation for Thai fishing vessels in Malaysia's EEZ to ITLOS. This has seriously disadvantaged Thailand in its negotiations with Malaysia.

The States of the SCS region should also be strongly encouraged to ratify or accept and implement other international instruments mentioned above. At present, none of the SCS States are parties to them. These instruments collectively support and elaborate the rights and obligations under the LOSC, which are also necessary for sustainable management of pelagic fisheries in the SCS region.

b. Cooperation in the conservation and management of marine resources

The majority of the States in the SCS region have enclosed or semi-enclosed seas. Article 123 of the LOSC, provides that States bordering an enclosed or semi-enclosed sea should cooperate with each other in the exercise of their rights and in the performance of their duties under the LOSC. This imposes upon the littoral States bordering the SCS region the duty to coordinate the management, conservation, exploration and exploitation of marine living resources as well as to coordinate their scientific research policies and undertake appropriate joint programs. This cooperation can be undertaken directly or through an appropriate regional organization.

It is clear that the SCS States should cooperate directly or through an appropriate regional organization in many matters relating to fisheries. The management measures taken by one State should be compatible with similar measures adopted by other States, particularly when they fish the same stocks. Moreover, cooperation through regional institutions should reduce the likelihood of States becoming involved in fisheries disputes. RFMOs should also aim to recover the cost of conservation, management and research activities from their members.[189] To date, SEAFDEC is the only effective RFMO which conducts research on pelagic fisheries in the SCS region. However, its projects now focus more on scientific research, particularly on the fisheries biology of pelagic resources in the SCS region. Future tasks for the SCS States themselves, as well as the RFMOs, include the development of collaborative agreements on how to exploit the shared stocks rationally, with careful consideration of catch allocation, fishing regulation, surveillance and fisheries laws. This undertaking may require the assistance of impartial bodies such as FAO and the Asia-Pacific Fishery Commission (APFIC). The collaborative agreements may also help to abate active disputes, particularly territorial disputes among the States in the SCS region.

c. Ecosystem management approach

There is no single internationally agreed definition of "ecosystem management approach" but the concept is generally associated with management based on the best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function.[190] Ecosystem management approach requires holistic decision-making. That is, the impact of an activity on one element in the ecosystem may have consequences on other components of the same system.[191] The ultimate goal of an ecosystem management approach is to promote sustainable development. The application of it to oceans involves the maintenance of ecosystem integrity, functioning and health in order to ensure the sustainable use of ocean resources for present and future generations.[192]

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[189] FAO, op cit, note 154.
[190] United Nations, *Ocean and the law of the sea, Report of the Secretary-General* (New York: United Nations, 2006).
[191] Kaye, op cit, note 115.
[192] United Nations, op cit, note 190.

The ecosystem management approach requires that the components of an ecosystem, the phenomena and activities that affect it and the legislative and policy frameworks be coordinated in a systematic manner to address interactions and cumulative effects. This may require the creation of new institutional frameworks, as well as appropriate coordination and collaboration among the various sectors involved, and perhaps new policy and legislative instruments. The ecosystem approach is science-based. However, scientific understanding of ocean ecosystems, particularly of the SCS, is still very limited. Thus, the application of the precautionary approach is essential. Monitoring the state of the ecosystem over time to evaluate the effects of both natural changes and management measures is also necessary.[193] The application of such an approach generally includes the following steps:

(a) Identification of the geographical scope for the application of the ecosystem management approach;

(b) Scientific research and analysis of the components of the ecosystem, their interaction and functioning;

(c) Assessment of the condition of the ecosystem;

(d) Establishment of ecological and operational objectives to maintain biodiversity, productivity, water quality and habitat quality in a given ecological region;

(e) Identification of pressures and impacts on the ecosystems;

(f) Selection of ecological indicators to ensure that ecological objectives are being met;

(g) Analysis of existing legal framework and identification of gaps, overlaps and inconsistencies;

(h) Management of human activities that affect or might affect the ecosystem;

(i) Monitoring of natural changes in ecosystems and the effects of management measures through ecological indicators;

(j) Adjustment of the management system, if necessary; and

(k) Management structures.[194]

[193] Ibid.
[194] Ibid.

In order to avoid excess fishing capacity of pelagic resources that will severely affect to the ecosystem in the SCS region, the SCS States should have resource exploitation governed by adequate fisheries laws and regulations, as well as monitored through a reliable fisheries data collection system. The SCS States should support monitoring of pelagic fishery resources and the marine environment, which is fundamental to the conservation and rational utilization of fishery resources.

Moreover, the dissemination of information regarding relevant international and national laws and regulations will raise awareness and will make all stakeholders conscientious in protecting the fishery resources and the marine environment in the SCS region. In developing and managing the pelagic fisheries, the SCS States also have to consider an institutional mechanism in order to see whether the existing mechanism has been satisfactory or still sufficient to cope with the increasing problems of implementation.

It will also be important to promote independent scientific studies and reviews of pelagic stocks in the SCS region, the results of which will facilitate the work of RFMOs and provide a point of comparison with analysis provided by RFMOs.

Conclusion

The SCS region, composed of nine coastal States which have the highest population growth in the world, is a LME with unique oceanographic, biographic and ecological characteristics. The SCS region is very important, mainly for strategic reasons, both in the economic and the military senses. In addition, there are rich hydrocarbon deposits as well as pelagic and other fisheries resources in the SCS region. However, the maritime boundary and territorial disputes among the coastal States of the SCS region seriously undermine the peaceful and optimal utilization of these resources.

The important role of fisheries in the food security and economy of the majority of States in the SCS region cannot be overemphasized. Fisheries contribute to the employment and income of people in this region as well as to the international trade of these States. Pelagic resources, both small pelagic species such as scads and mackerels, and large pelagic species such as tunas, are considered significant.

The goal of sustainable fisheries management in the SCS region is hindered by several pelagic fisheries management problems pertaining to resource issues, issues with respect to EEZ delimitation, and fisheries issues, notably overfishing. It is obvious that IUU fishing is an important root problem. However, many national and international instruments, if properly implemented, offer solutions to these issues and the joint development zones should be strongly considered among the SCS States, particularly in the conflicted areas.

In the SCS region, SEAFDEC plays a very important role as an RFMO for pelagic fisheries management. At the international level, there are several notable effective fisheries instruments such as the LOSC, the 1995 UN Fish Stocks Agreement, the Compliance Agreement, the Code of Conduct and the four IPOAs of FAO. However, the frameworks provided under these international instruments will depend on the extent to which States are willing to become parties and implement their provisions.[195]

[195] Tsamenyi and Woodhill, op cit, note 86.

Although there are management activities already initiated by a number of States in the region and by regional bodies such as SEAFDEC, they are currently confined to developing statistical databases and collecting biological and bio-economic information on the exploited pelagic stocks. These undertakings are intended to gain more knowledge of the stocks and their distribution as well as to assess the state of their exploitation. The direction of future tasks to be assisted by impartial bodies such as FAO and APFIC should be towards the development of collaborative agreements on the rational exploitation of shared stocks, with careful consideration of catch allocation, fishing regulation, surveillance and fisheries laws.[196] Any management system must require compliance to operate effectively.

At present, those available instruments are creative. The SCS States should underline the importance of capacity-building as well as confidence-building in implement them. If they are successfully implemented they would provide a reliable system of sustainable resources management not only for pelagic fisheries in the SCS region but also all marine fisheries resources in the world.

[196] Menasveta, op cit, note 64.

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Annex 1: Total fishery production (Metric tones) obtained from the Western Central Pacific by States in the SCS region.

Total Fishery Production	Year									
Western Central Pacific	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Brunei Darussalam	4,497	4,796	7,489	4,630	5,157	3,282	2,558	1,537	2,112	2,053
Cambodia	30,578	31,231	31,800	30,066	33,715	38,812	36,428	42,537	46,317	55,364
China	306,027	292,448	277,926	258,753	369,179	292,187	318,121	332,811	393,320	360,031
Indonesia	2,238,967	2,445,702	2,448,173	2,661,538	2,667,397	2,766,205	2,877,433	3,041,324	3,038,851	3,268,721
Malaysia	632,859	611,995	639,478	678,701	649,560	784,487	792,634	785,297	797,296	778,320
Philippines	1,756,999	1,792,015	1,717,389	1,713,937	1,757,388	1,799,585	1,823,681	1,896,415	1,976,565	2,119,419
Singapore	13,638	13,661	13,422	13,223	11,089	9,932	9,823	7,083	7,180	6,507
Thailand	2,330,535	2,329,304	2,204,966	2,101,214	2,121,308	2,320,823	2,453,792	2,253,504	2,156,334	2,287,526
Vietnam	1,001,010	1,058,886	1,115,488	1,163,542	1,228,393	1,302,230	1,410,579	1,557,002	1,608,209	1,866,277
Total	**8,315,110**	**8,580,038**	**8,456,131**	**8,625,604**	**8,843,186**	**9,317,543**	**9,725,049**	**9,917,510**	**10,026,184**	**10,744,218**

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from: http://faostat.fao.org/faostat/form?collection=Fishes&Domain=FishCatch&servlet=1&hasbulk=0&version=ext&language=EN.

Note: Graph of the data presented on p. 21.

Annex 2: Landing fish catch (Metric tones) in the SCS region.

Year	China	Vietnam	Thailand	Japan	Indonesia	Malaysia	Taiwan	Philippines	Hong Kong	Korea (South)	Singapore	Others	Total
1994	1,593,624	740,691	564,494	299,295	486,299	324,483	142,946	200,239	138,282	181,510	7,364	7,081	4,686,309
1995	1,549,766	771,296	574,581	271,915	502,991	316,495	140,475	175,510	131,483	2,696	6,814	6,966	4,450,988
1996	1,307,154	829,997	546,116	291,922	521,062	321,150	134,645	168,801	120,847	1,896	6,669	9,277	4,259,536
1997	1,740,940	860,403	518,989	251,826	563,129	313,803	141,513	168,902	115,908	1,917	6,147	6,605	4,690,081
1998	1,904,794	902,272	499,019	305,633	564,525	323,302	131,188	185,822	37,692	2,066	5,041	6,898	4,868,252
1999	1,971,002	952,685	521,150	306,394	596,373	390,017	139,337	199,977	26,188	4,687	4,273	5,662	5,117,745
2000	2,151,217	1,003,225	541,945	265,842	627,534	388,973	140,908	204,740	30,722	11,507	3,438	3,378	5,373,428
2001	2,044,325	1,063,177	512,524	14,185	681,163	387,437	140,224	212,102	33,151	147,051	2,061	2,326	5,239,726
2002	2,069,590	1,060,428	510,047	14,266	664,976	393,672	144,374	226,871	32,613	12,154	1,691	2,942	5,133,623
2003	2,180,771	1,204,167	517,458	14,227	724,373	398,411	170,449	243,443	29,244	126,913	1,282	2,620	5,613,358

Source: University of British Columbia Fisheries Center, *Landings in South China Sea* (2005 [cited 17 May 2006]); available from: http://saup.fisheries.ubc.ca/TrophicLevel/LMETaxon.aspx?lme=36&fao=0&Name=South%20China%20Sea&typeOut=4.

Note: Graph of the data presented on p. 32.

Annex 3: Major small pelagic resources in the SCS region.

No.	Species Group	Being exploited by coastal States	Potential transboundary
1.	Mackerels: - *Rastrelliger* spp. - *Scomber japonicus*		x
2.	Scads: - *Decapterus* spp. - *Selar* spp. - *Atule* spp.		x
3.	Torpedo Scad (*Megalaspis cordyla*)		x
4.	Sardines: - *Sardinella* spp. - *Dussumieria* spp. - *Sardinops* spp.		x
5.	Jacks: - *Caranx* spp. - *Trachurus* spp.		x
6.	Spanish mackerel (*Scomberomorus* spp.)		x
7.	Small tunas: - *Auxis* spp. - *Euthunnus* spp. - *Thunnus tonggol*		x
8.	Anchovies (*Stolephorus* spp.)	x	
9.	Bombay-duck (*Harpadon nehereus*)	x	
10.	Hairtails (*Trichiurus* spp.)	x	
11.	Wolf-herring (*Chirocentrus* spp.)	x	
12.	Barracudas (*Sphyraena* spp.)	x	

Annex 3: Major small pelagic resources in the SCS region. (Cont.)

No.	Species Group	Being exploited by coastal States	Potential transboundary
13.	Pomfrets: - *Formio niger* - *Stromateus* spp.	x	
14.	Flyingfishes (*Hirundichthus* spp.)	x	
15.	Mullets: - *Mugil* spp. - *Liza* spp.	x	

Source: Devaraj M. and P. Martosubroto, eds., *Small Pelagic Resources and Their Fisheries in Asia-Pacific Region*, vol. 31, *The APFIC Working Party on Marine Fisheries, First Session* (Bangkok, Thailand: RAP Publication, 13-16 May 1997).

Annex 4: Total miscellaneous pelagic fish production obtained from the Western Central Pacific (SCS, Celebes Sea, Northern Australia) by States in the SCS region.

Miscellaneous pelagic fishes (Metric tones)	Year									
Western Central Pacific	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Brunei Darussalam	0	0	0	0	0	0	33	0	8	8
Indonesia	529,887	553,832	552,655	609,120	613,957	599,107	602,807	622,073	667,742	711,970
Malaysia	145,369	129,190	136,050	155,923	126,323	188,346	214,566	197,959	205,019	186,434
Philippines	489,106	492,507	445,355	468,584	501,937	524,573	535,448	597,939	642,851	692,916
Singapore	1,175	977	858	837	909	689	574	386	307	263
Thailand	259,743	281,919	252,492	236,983	261,234	291,220	290,672	278,934	296,849	295,559
Total	**1,425,280**	**1,458,425**	**1,387,410**	**1,471,447**	**1,504,360**	**1,603,935**	**1,644,100**	**1,697,291**	**1,812,776**	**1,887,150**

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from: http://faostat.fao.org/faostat/form?collection=Fishes&Domain=FishCatch&servlet=1&hasbulk=0&version=ext&language=EN.

Note: Graph of the data presented on p. 34.

Annex 5: Total tunas, bonitos, billfishes production obtained from the Western Central Pacific (SCS, Celebes Sea, Northern Australia) by States in the SCS region.

Tunas, bonitos, billfishes (Metric tones)	Year									
Western Central Pacific	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
China	234,289	241,639	235,872	217,654	323,100	269,897	294,174	298,717	358,595	314,181
Indonesia	367,607	380,363	427,886	438,101	495,880	524,527	563,436	510,694	539,916	552,250
Malaysia	34,336	37,256	41,154	54,640	54,871	67,485	62,399	58,934	59,792	55,808
Philippines	303,563	307,423	304,665	335,192	349,114	356,167	366,858	353,884	430,026	507,181
Singapore	96	81	81	118	82	102	80	56	44	41
Thailand	109,737	97,605	88,832	80,559	88,312	112,532	108,027	102,617	115,161	117,820
Vietnam	0	0	0	3,200	7,400	7,000	6,500	15,800	30,900	17,500
Total	**1,049,628**	**1,064,367**	**1,098,490**	**1,129,464**	**1,318,759**	**1,337,710**	**1,401,474**	**1,340,702**	**1,534,434**	**1,564,781**

Source: FAO, *FAOStat Data - Fish Production* (23 August 2005 [cited 8 May 2006]); available from: http://faostat.fao.org/faostat/form?collection=Fishes&Domain=FishCatch&servlet=1&hasbulk=0&version=ext&language=EN.

Note: Graph of the data presented on p. 37.