

China's distant water fishing industry: Evolving policies and implications

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ABSTRACT

This article examines China's distant water fishing industry, with a focus on China's bilateral fisheries access agreements in Africa. The article argues that China largely conforms to international norms and rules on sustainable fisheries, but that challenges remain in efforts to work with China on the sustainable management of fish stocks. Developed countries contribute to China's policies and behavior in international fisheries in both positive and negative ways.

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1. Introduction

1.1. China's place in global fisheries

Marine fisheries depletion is a serious global natural resource problem. In its 2010 report *State of World Fisheries and Aquaculture*, the UN Food and Agriculture Organization (FAO) states that as of 2008, an unprecedented 85 percent of the world's marine fish stocks were fully exploited, overexploited or depleted [1]. The ocean is the world's largest protein source, and approximately 2.6 billion people depend on the ocean as their primary protein source [2].

As the world's largest producer of fish products (both wild catch and aquaculture), China's role in the sustainable management of international fisheries is at once an issue of enormous environmental, economic and food security implications. According to official statistics, China is the world's largest producer of wild catch (see Fig. 1). China's estimated total marine catch was 12.7 million tons out of an estimated global total of 79.9 million tons in 2009 (which is about 16 percent of the world total) [1]. Some evidence suggests that China may be inflating its catch numbers [3]. Even so, it is likely to be the world's largest or second largest producer of marine catch (after Peru), and remains the world's largest producer of fish products.

2. Material and methods

This article has two aims: to answer a theoretical question about China's behavior in the international system, and to provide empirical data about a topic important to policymakers, scientists,

and environmentalists. As for the first aim, while China participates in several international institutions, including those that govern common resource goods, many scholars of China have debated whether China follows the norms and rules set by such institutions, which were largely created by developed countries. Because China is such a large fishing nation, whether China accepts marine conservation norms and rules is an important question. To ascertain whether China abides by international laws on fisheries, this article examines China's activities in global fisheries by studying China's distant water fishing (DWF) industry. The article argues that China largely accepts international norms and rules governing the ocean, but faces challenges in its capacity to meet commitments to such norms and rules. Moreover, it seems that while China desires to be a responsible participant in ocean resource governance, China also pays close attention to the behavior of developed countries and imitates this behavior, even when it is unsustainable. In other words, China does as developed countries say and do. As for the second aim, little is known about China's DWF industry because of a lack of transparency and the modest availability of recent information on the issue in the English language. Therefore, this article also aims to contribute basic understanding of China's DWF industry and what China's own views on this industry are, through the examination of Chinese sources on the topic.

In order to address these two aims, this article will begin with an overview of the international marine legal system and its impact on the Chinese fishing industry. It then traces the development of China's DWF industry and describes its current parameters. A section on China's DWF operations in Africa, with Liberia as a case study, takes a closer look at China's DWF industry's impact on another region of the world. The article then analyzes some Chinese sources on DWF in order to understand

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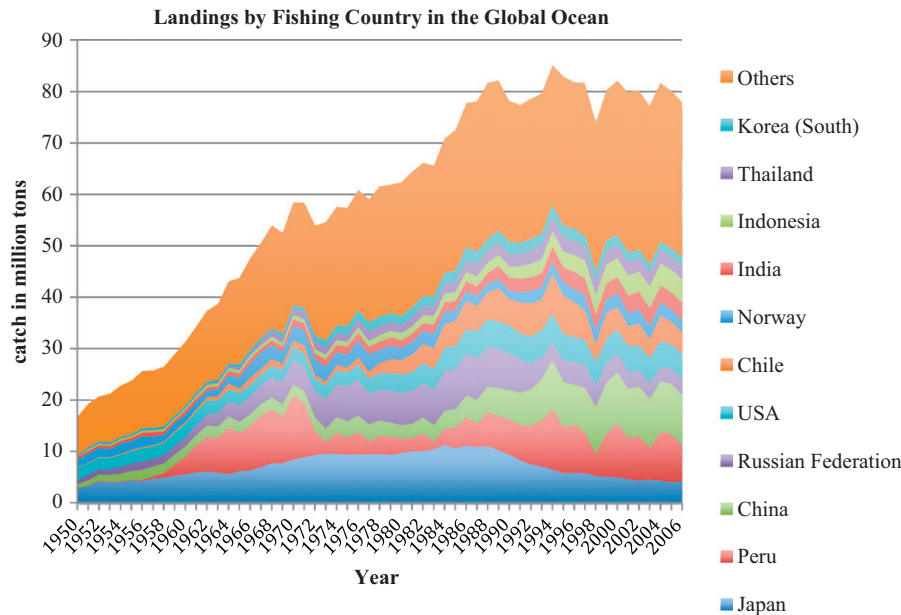


Fig. 1. Source: Sea Around Us Project, www.seaaroundus.org. Note: The Sea Around Us Project calculates its statistics through a number of different sources, therefore its statistics vary from China's officially reported statistics. Some fisheries experts believe that China's catch statistics are artificially inflated [3].

China's thinking and intentions. Finally, the article concludes with some thoughts and policy recommendations on fisheries management moving forward.

3. Background

3.1. Domestic constraints and the impact of UNCLOS on Chinese fishing

The growth of China's DWF industry has been primarily driven by domestic economic concerns. In the 1980s, it became increasingly clear that China's own resources were overfished. The Chinese government has invested in conservation of domestic fisheries resources through seasonal moratoria on fishing, vessel decommissioning, and alternative employment programs, though with mixed results. China's Bureau of Fisheries stated in 2003 that it intended to decrease the size of China's ocean fishing fleet from 222,390 at the end of 2002 by 30,000 to 192,390 in 2010 [4]. However in 2010, the fleet was 204,500 in number [5]. As the UN Convention on the Law of the Sea (UNCLOS entered) into force globally in the mid-1990s (with China's ratification in 1996), it put further restrictions on China's domestic fishing industry [6,7]. China's bilateral fisheries agreements with South Korea, Japan, and Vietnam that came into effect in the early 2000s limited traditional fishing grounds for Chinese fishermen.

The combination of domestic resource depletion and China's implementation of UNCLOS has led to unemployment in China's fishing industry. Restrictions on the Bohai and Yellow Sea mean a direct and indirect loss of RMB 16 billion annually for Liaoning Province [8]. Liaoning province is now allowed 4000 fishing boats in the Sino-Korean and Sino-Japanese areas, which has meant 40,000 fishermen are facing difficulties, and 170,000 people are indirectly affected. A third of Liaoning's fishing industry and fishermen has been affected. Shandong has lost 40 percent of its former fishing areas. In 2009, Yantai City in Shandong Province, for example, reported dismantling 23 fishing boats and transferring over 100 fishermen out of the fishing industry in order to meet China's obligations to bilateral fishing agreements with Japan, Korea, and Vietnam [9]. Restrictions in the East

China Sea have also impacted Jiangsu and Zhejiang. In Jiangsu, two-thirds of previous fishing areas have been lost, affecting 30,000 fishermen [8].

China has sought to relieve unemployment pressures through development of its aquaculture and DWF industries (see Fig. 2). Expansion of China's distant water fishing industry is *currently* driven more by employment concerns and profit than by food needs. About half of the fish (particularly the high-value species) that China catches is exported to developed countries, though domestic consumption of high-value fish products is predicted to rise as China's middle class expands. China has the largest labor force employed in the fishing and aquaculture sector globally, with a total of 13.3 million people employed in the sector, and 8.5 million people employed full time [1]. China's aquaculture sector has relieved some of the pressure from unemployment in the marine capture sector: between 1990 and 2000, employment in the aquaculture sector in China increased by 189 percent [1]. One report advocates the continued development of China's DWF industry as a solution to nationally displaced fishermen because it will have a multiplier effect throughout the economy. For example, the report estimates that 29 distant water fishing boats built in 2008 had a ripple effect in China's economy of about RMB 3.4 billion (about \$500 million) [10].

Since Chinese domestic fishing has been considerably curtailed and despite China's pledges of cooperation on fisheries issues, illegal fishing boats captured abroad are often of Chinese origin. Since 2001, the South Korean Coast Guard has captured 3808 Chinese boats fishing illegally in South Korean waters [11]. Taiwan reported an increase in illegal Chinese fishing vessels near Kinmen following a Chinese ban on fishing in China's rivers to stem overfishing [12].

China's fishing activities in Asia have gradually developed a security dimension as competition for resources increases in disputed territory. In the past few years, disputes between fishing vessels from different countries in the South China Sea have increased as China, the Philippines, and Vietnam detain each other's fishing vessels in waters that each country claims as its own [13]. In April and May 2012, relations between the Philippines and China soured due to a standoff between a Philippine naval ship and Chinese marine surveillance vessels

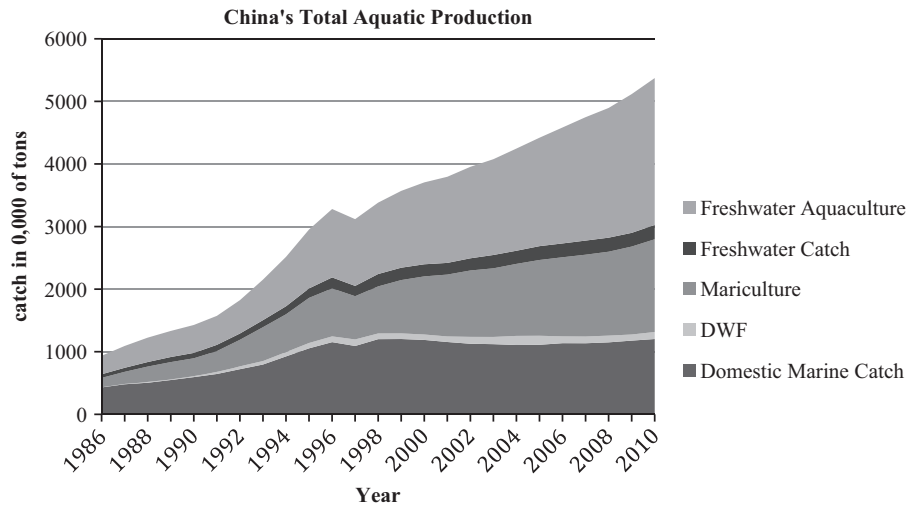


Fig. 2. Source: 2011 China Fishery Statistical Yearbook.

over alleged illegal Chinese fishing around Scarborough Shoal. Tensions in other parts of China's near seas have escalated as well, for example in violent skirmishes between Chinese fishermen and the coast guards of Japan and Korea in September and December 2010 respectively. In June 2011, a Chinese fishing boat collided with an exploration cable from a Vietnamese seismic survey vessel. In December 2011, an illegal Chinese fisherman stabbed to death a South Korean coast guard official. As a result of all of these dynamics, Chinese fishing fleets are traveling farther to fish, affecting areas outside of Asia.

3.2. Overview of China's distant water fishing industry

Article 62 of UNCLOS stipulates that when a coastal State does not "have the capacity to harvest the entire allowable catch, it shall, through agreements or other arrangements ... give other States access to the surplus of the allowable catch." This provision has led to fisheries access agreements to allow a state's DWF fleets to fish in the exclusive economic zones (EEZs) of other host countries. Historically the largest DWF entities are Japan, Spain, South Korea, the former USSR/Russia, and Taiwan.

China's "Distant Water Fishing Supervisory Provisions," promulgated by the Ministry of Agriculture in 2003, defines distant water fishing as "citizens, legal entities, and other organizations of the People's Republic of China engaging in marine fishing and its processing, supply and product transportation activities on the high seas and in the sea areas under the jurisdiction of other countries, but does not include fishing activities in the Yellow Sea, East China Sea, or South China Sea" and states that "the Ministry of Agriculture is responsible for the planning, organization, and administration of the distant water fishing industry, though the Ministry also works with the State Council and other related departments over policy and supervision of the industry" [14]. The Provisions provide a variety of instructions on regulation, licensing, requirements, and supervision for the industry. The Ministry of Agriculture's Bureau of Fisheries has a Distant Water Fishing Subdivision.

China's DWF industry dates back to 1985, when China's fishing industry began expanding outward from China. Despite lack of experience, knowledge, and technology, Chinese companies pursued DWF as an economic opportunity. One company, Liaoning Dalian Distant Water Fishing Company, was on the verge of bankruptcy in 1984 when its chairman Zhang Yi expanded operations to include DWF [15]. At that time, only 100 million

tons of fishery products were produced annually globally and Zhang Yi argued that 3 billion tons of fishery products could be taken every year without harming the biological balance. The company's first fishing boat, purchased from Germany, sailed to the Bering Strait. Now the company's boats are found in the North Pacific, South Pacific, Atlantic, and Indian Oceans. Zhang Yi argues that with a population of 1.3 billion people, China's share of world fishing resources is too small. He says that China should abide by the fishing standards set by advanced countries. For China, DWF should be seen from a national food security perspective—China should make use of world resources to meet its needs.

Zhang Yanxi, China's then Vice Minister of Agriculture, set forth a similar view. In describing China's first DWF fleet, that of the China National Fishing Corporation whose 13 boats set sail to West Africa in 1985, he argued that DWF was necessary to meet the demand of China's population undergoing rapid economic development and to enrich the food basket of both urban and rural areas in China. As living standards improve, he explained, demand for marine products will further increase [16].

The DWF industry has continued to grow since then (see Figs. 3 and 4). China maintains that DWF is an important part of its official "going out" strategy, which was elaborated in China's 2001–2005 tenth five-year plan and encourages Chinese companies to search for new markets and invest abroad [17].

Today China has the largest DWF fleet in the world in terms of quantity of vessels, although China's production capacity and industrial scale is much smaller than that of developed countries [10]. China has a number of fisheries access agreements in the form of state-to-state bilateral agreements that allow its distant water fleets access to resources in the EEZs of other nations. Some discrepancy exists in Chinese sources on the size and production of the DWF industry. One article, citing figures from the Chinese Bureau of Fisheries, states that in 2010, China had 1899 DWF boats, with a total output of RMB 13.6 billion (about \$2.07 billion), representing a growth of 8 percent and 53 percent over the period of the tenth five-year plan [18]. The 2011 China Fisheries Yearbook reports that in 2010, the industry had 111 DWF enterprises operating in 35 countries with 1989 boats, producing a total of 1.116 million tons, valued at RMB 11.92 billion (about \$1.8 billion), the latter two figures representing an increase over the previous year of 14.2 percent and 32 percent respectively. Of the total catch, 636,000 t worth RMB 6.27 billion came from the EEZs of other countries, whereas 476,000 t worth RMB 5.57 billion was taken from the high seas [19]. The

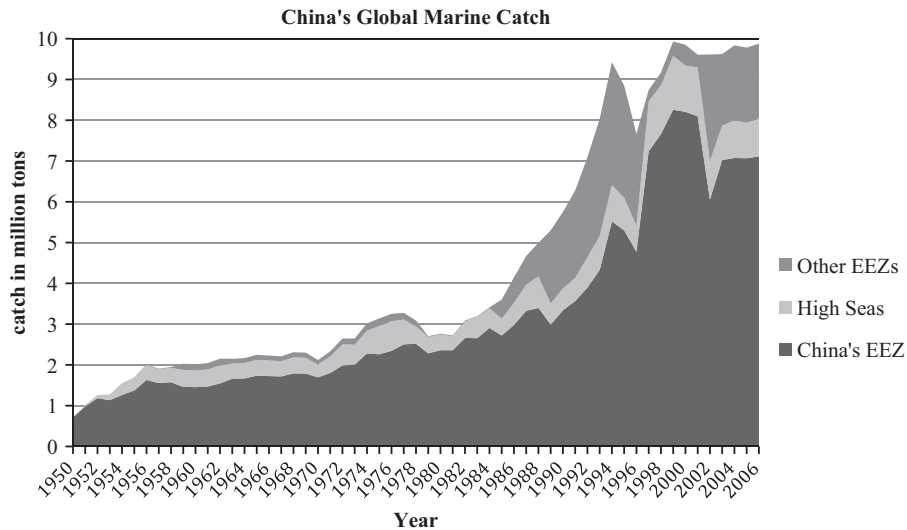


Fig. 3. Source: Sea Around Us Project, www.searoundsus.org. Note: Here EEZ catch includes both catch in the EEZs of neighboring countries in the Yellow Sea, East China Sea, and South China Sea as well as distant waters. China distinguishes between the two.

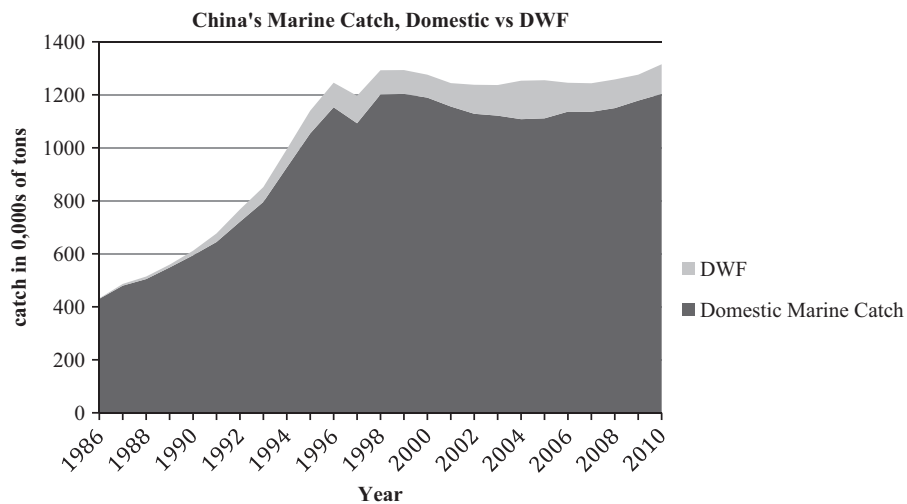


Fig. 4. Source: 2011 China Fishery Statistical Yearbook. Note: DWF includes high seas catch and distant waters, excluding catch in the Yellow Sea, East China Sea, and South China Sea.

2011 China Fishery Statistical Yearbook reports that of the total catch, 54 percent was transported back to China, and the rest was sold abroad. Tuna and squid accounted for 14.6 percent and 32.9 percent of total catch respectively [5]. According to another report published in 2008 by a task force examining DWF of the over 1800 boats in the industry in 2007, about 500 of them were squid jiggers, almost 400 were tuna boats, almost 800 were trawling boats, and over 100 were purse-seiners and other fishing vessels [20]. According to the 2011 China Fisheries Yearbook, Chinese companies have 732 vessels operating in eight Asian countries, with 456 off the east coast of North Korea (predominantly squid jiggers), 133 vessels in Indonesia, 72 vessels in Myanmar, and additional vessels in Malaysia, India, Thailand, the Philippines, and Bangladesh. On the high seas, China has profitable squid operations in the North and Southeast Pacific Ocean, as well as in the Southwest Atlantic Ocean (including squid operations in Argentina's waters). In 2010, Chinese companies landed 240,000 t of squid valued at RMB 2.4 billion, and introduced 100 new squid jiggers built in Zhoushan into the industry. China's tuna industry in the Western and Central Pacific Ocean landed 160,000

t worth RMB 2.5 billion in 2010. Chinese companies plan on expanding albacore tuna fishing since "as yet international organizations have no management measures in place" for this species, and 30 new longline vessels were introduced in 2010 for this purpose [19]. Several sources were in agreement that the DWF industry directly employs about 50,000 people. Another report states that in the Putuo district of the city of Zhoushan in Zhejiang province, the DWF industry employs 6000 people directly and another 40,000 people indirectly [10].

The DWF industry has evolved from being entirely state-owned to being 70 percent privately owned. A third of the industry is composed of a large Chinese state-owned enterprise, Chinese National Fisheries Corporation and its subsidiaries, which maintained 556 of a total of 1652 boats in the industry in 1999. The rest of the industry is composed of regional middle-sized companies and small coastal companies [21]. Because of this gradual change in ownership structure, the Chinese government now has less control over the activities of its fishing enterprises.

China plans to expand its DWF industry and update its fleets through state subsidies. China aims to increase its DWF fleet to

2300 ships by the end of the twelfth five-year plan (in 2015) for an output of 1.7 million tons and an estimated value of RMB 18 billion (about \$2.6 billion) [10]. One report explains the Ministry of Agriculture's eleventh five-year plan to develop the DWF industry, stating that the Ministry of Agriculture coined the concept of "grabbing the high seas and EEZs with two hands, they form two wheels turning together" [20]. The report states that this plan aimed to increase the DWF industry to 2200 boats by the end of the eleventh five-year plan (in 2010), with 1400 boats fishing in the EEZs of other countries for a target of 840,000 t of catch with a value of RMB 5.5 billion and 840 boats on the high seas for a target of 860,000 t of catch and a value of RMB 6 billion, with an expansion from operations in 34 countries to 38—though it does not appear that this plan was successful. The plan also aimed to improve the quality of fishing operations through quality assurance systems, improved processing (such as a mobile processing seabase), and utilization of ports that are farther away to develop new large-scale fishing operations.

China also plans to develop nontraditional fisheries, such as Antarctic krill. In 2010, the Ministry of Agriculture implemented an inaugural exploratory catch of Antarctic krill that resulted in 1846 t and "laid a solid foundation for the development and utilization of Antarctic resources." China also "carried out preliminary research on the fishing area, meteorological conditions, fishing equipment and methods, processing and utilization, as well as the biological traits of Antarctic krill" [18,22].

To achieve these objectives, the Chinese state will "provide corporate tax relief; reduce import duties or value added taxes; provide subsidies to renovate boats; reduce taxes on import of second hand equipment like ultra-low temperature, trawling, and purse-seiner tuna boats; provide subsidies for the development and exploration of new fisheries, and fuel subsidies" [20]. The Chinese state invested over RMB 10 million every year during the tenth five-year plan (2001–2005) to develop fisheries resources (such as tuna and squid) and more efficient fishing technology.

Without such subsidies, it is doubtful that China's DWF industry would remain profitable. As three economists showed in their analysis of subsidies from 2003 to 2008 provided to China National Fisheries Corporation, the subsidies necessary for the company to remain profitable rose steeply beginning in 2006, to the point that subsidies were equal to approximately half of the company's net profit in 2008 [23].¹ China is the world's second largest subsidizer of its fishing industry, with harmful, capacity-increasing subsidies equaling 20 percent of the overall value of its catch in 2000 [24].

4. Analysis

4.1. China's distant water fishing operations in Africa

China's involvement in African fisheries potentially impacts African food security and livelihood. The World Bank estimates that up to half of the animal protein in West African diets comes from fish [25]. Fishing is an important source of employment for many African countries, for example the fishing sector employs 10 percent of the labor force in Ghana, Sierra Leone, and Cape Verde, and 17 percent in Senegal [26].

China is already an important presence in West African fisheries. For example, in Liberian coastal waters, China is the

largest foreign fishing country and some argue that Chinese illegal fishing and overfishing are displacing local fishermen [27]. In Senegal, ocean products make up the largest export good to China (63 percent in 2005) and the fishing and shipping industries are by far the predominant destinations for Chinese foreign direct investment into the country [28]. *Senegal Peche*, a subsidiary of China National Fisheries Corporation, is the largest commercial fishing company in Senegal, with a fleet of 12 boats [28].

Exact details of China's DWF industry in Africa are hard to come by due to a lack of publicly available information. China signed bilateral agreements with South Africa (1978), Guinea-Bissau (1984), Guinea (1985), Senegal (1985), Sierra Leone (1985), and Mauritania (1991) to allow for Chinese companies to fish in the offshore waters of these countries.² The *2011 China Fisheries Yearbook* reports that in 2010, China's DWF companies had 394 vessels operating in 11 African countries, with the larger-scope operations in Mauritania, Guinea, and Morocco. In West Africa, total catch amounted to 166,000 t worth RMB 1.71 billion. These figures represent a decrease of 13 and 10 percent from the previous year respectively, which the *2011 Yearbook* attributes to a decline in natural resources, increased fishing licensing fees, and restrictions on coastal processing facilities and fishing seasons. In 2010, new partnerships were reached with Madagascar and Mozambique, which signifies an expansion into East African fisheries [19]. In 2005, there were approximately 70 foreign trawlers and sardine purse seiners in Sierra Leone's waters, and among them Dalian International Company and China Water Distant-water Fisheries Company LLC had 20 and 16 shrimp trawling boats, respectively [29]. Another publication (from 2010) mentions 202 trawling vessels in West Africa, 110 of them over 20 years old and "in need of replacement in order to maintain competitiveness" [10].

Fisheries governance experts argue that fisheries access agreements on the whole have led to unsustainable use of fisheries resources and have negatively impacted the socioeconomic development of host countries [30–35]. In Africa, DWF has depleted fisheries resources through overfishing, misreported catches and landings, fishing in illegal areas (such as artisanal zones or in the waters of other countries), transshipped catch at sea, or using inappropriate methods or gear (e.g., trawling or illegal mesh sizes). DWF has led to overcapacity in the fishing industry, and has negatively impacted domestic large- and small-scale (artisanal) fishers by squeezing them out of the industry (due to one or more of the following reasons: fewer fish are available, DWF nations pay higher license fees than locals do, or foreigners destroy the gear of domestic fishermen). DWF has not led to increased employment, economic growth, or food security in host countries. Between 1992 and 1996, employment in the fishing sector in Ghana decreased by 20 percent because of decreased catch per boat [36]. Fisheries access agreements, especially those signed with Asian countries, lack transparency. These agreements may foster dependency on the fishing nation for income from fishing fees—in Mauritania, fishing fees account for 27 percent of the state budget [30]. Government corruption is a key challenge to sustainable fisheries management in resource-rich African countries, for example officials in some countries sell too many fishing licenses in order to collect the fees, fishing nations may intervene diplomatically on behalf of their fleets caught fishing illegally, and inspectors may be bribed to not report fishing violations [34]. Some host countries may be afraid of cracking down on illegal fishing because it may jeopardize other development aid projects contributed by the fishing nation, for example

¹ In 2008, the company's total income was about RMB 202 million, while total costs were about RMB 151, for a net profit of about RMB 51 million. However, that same year, the company was given about RMB 18 million in fuel subsidies and about RMB 7 million in other subsidies for a total of RMB 25 million, or about half of the company's net profit.

² There are probably more agreements, but these were the only agreements for which evidence could be found.

in Mozambique commentators believe that illegal Chinese fishers escape punishment because China has become so influential in that country [34].

Illegal, unreported, and unregulated (IUU) fishing is a significant governance problem to which China contributes. Estimates of global IUU fishing range from 14 percent to almost 30 percent of global catch, with an estimated value between \$10 billion and \$23.5 billion annually [37]. IUU fishing is most prevalent in FAO area 34, the Eastern Central Atlantic, which is off the coast of West Africa, with total estimated catches being approximately 40 percent greater than reported catches [37]. Many DWF fleets fish in this area and contribute to the problem.

There is a correlation between IUU fishing and poor governance, with IUU fishing being greater in areas where countries score low on governance indicators, such as in West Africa [37]. Of all possible vulnerability indices in one study, poor governance was the most statistically significant in predicting IUU fishing [38].

Addressing IUU fishing is important because of the negative economic, social, and environmental impacts it has. IUU fishing poses threats to: sustainable management of fisheries resources (for example by skewing stock assessments); food security; the livelihoods of people dependent on the resource, especially in developing countries; and the broader ecosystem (for example by disregarding regulations on bycatch or gear restrictions). Illegal fishing also poses dangers to consumers because vessels often do not comply with hygiene standards.

Illegal fishing boats of Chinese origin or with Chinese crew have been captured off the coast of African countries. Reports by observers in Guinea and Sierra Leone state that Chinese and South Korean vessels dominate IUU fishing in West Africa [31,38]. Of IUU vessels observed fishing illegally in Guinean waters, over half were Chinese, far more than those of any other country [31,38]. Liberia has licensed 17 fishing vessels, but one World Bank fisheries specialist estimated that there were 200 industrial vessels operating in Liberian waters [39]. Many of these vessels are based in Guinea. In March 2009, a vessel with 70 t of illegal catch was captured by a South African patrol boat in Tanzanian water 180 nautical miles from Dar es Salaam [40]. Guinea-Bissau reports that 40,000 t of fish are illegally captured from its waters annually—45 percent of the country's revenue comes from fishing taxes [41]. South Africa has had problems with Chinese poaching abalone from its coastal waters [42]. Mozambique captured an illegal Chinese ship with 13 metric tons of fish, including shark fins and tuna [43]. Evidence indicates that Chinese vessels reflag to flags-of-convenience states, but Chinese vessels seem to do so less frequently than other DWF entities [44].

4.1.1. Case study: Liberia

This section examines in detail the impact of China's DWF in one West African country, Liberia, for a better understanding of the issues involved. Liberia's protracted civil war ended in 2003, leaving the country faced with serious challenges in employment, crime, infrastructure, and government capacity. Liberia has rich natural resources, including offshore fisheries. Over 80 percent of Liberia's population of 4 million depends on fish as a protein source [45]. Liberia's commercial species include the croaker (cassava fish), barracuda, grouper, bonito, snapper, swordfish, and butter nose. According to one commercial fishing company in Liberia, 70 percent of their catch is shipped to Europe and 30 percent stays in Africa. High-value catch such as shrimp are destined for Europe, while lower quality fish such as croaker stay in Africa.

Artisanal fishermen have exclusive rights to fish in the artisanal fishing zone, which extends six nautical miles from the coast.

There are about 33,000 artisanal fishermen, composed of three types: the Popo, who fish with purse-seining vessels; the Fanti, who have large motorized canoes with a crew, use large nets and fish farther out from shore; and the Kru, who fish alone on small canoes with hook and line. Liberia also has a small industrial fishing sector composed of three companies, which employ about 200 people. Only the industrial fleets are required to have fishing licenses. Industrial vessels frequently violate the moratorium on industrial fishing in the artisanal zone.

There are two Chinese fishing companies in Liberia: Dalian Haiyang, which is a state-owned company, and Nashile, which is privately owned. Each company has two pairs of trawling vessels. The Chinese have a processing center in Ghana, and often bring fish caught in Liberian waters there for processing since Liberia does not have processing centers. Dalian Haiyang has been in Liberia since 2003, while Nashile has been in Liberia since the beginning of 2010.

The first major problem that the Liberian Bureau of Fisheries has with the Chinese companies is conflict with the artisanal fishermen. Occasionally this conflict turns violent [39]. The Chinese fishing boats collide with the artisanal canoes "monthly," mostly with the Fanti but also with the Kru. There are accounts of artisanal fishermen being sprayed with hot water by the Chinese. Kru fishermen have been knocked off of their boats by Chinese vessels. The Bureau of Fisheries handled one case in which a Liberian sailor was detained on a Chinese trawling boat and severely beaten—ultimately the Chinese company paid for the damages and the Liberian sailor dropped the case. In summer 2010, a Liberian fisherman accused the Chinese of giving him serious burns. Not all of the cases get reported to the Bureau of Fisheries, but the Bureau tries to address the ones that do. One of the difficulties is the crew sometimes covers vessel names with fishing nets, so it is hard to identify which vessels they are. The Liberian industrial companies and the Popo do not have conflicts with the Chinese, but they complain about Chinese fishing practices because it takes fish away from the local fishermen.

The second major problem is unsustainable fishing methods. The Chinese are engaged in pair trawling, where two ships drag a huge net in between them, a destructive practice because it scoops up everything in its path and results in large numbers of bycatch (such as juvenile or nontarget species) and fewer fish for local fishermen. The Bureau of Fisheries stated that the Chinese will trawl for up to 6 h, and that many of the fish caught in the first hour will have perished and are no longer fit for consumption. West African states largely agreed to stop this destructive practice at an Economic Community of West African States (ECOWAS) meeting in Gambia. The numbers of pair trawlers in Liberia has been reduced significantly from about 30 vessels in 2006–07, but there are currently eight vessels engaged in the practice.

A third problem is language. One Bureau of Fisheries official reported that the Chinese visit the Bureau with an interpreter or speak a little bit of English, but then when there is a problem, "they pretend they don't speak English."

Despite these issues, the Bureau of Fisheries said that they welcomed the Chinese presence, as long as they abide by the rules. The Chinese have provided helpful aquaculture training to Bureau officials. However, the Liberian liaison to the Chinese fishing companies said that he fears that if Liberia strengthens these rules over pair-trawling, the Chinese companies will leave [39]. He argues that local Liberians have benefited from having cheaper fish on the market thanks to Chinese production. If the Chinese leave, then the prices will be set by the fish producers, for what will be a "sellers' market." He said that there are 20–30 vessels fishing illegally in Liberian waters, so the companies who are fishing legally should be rewarded. Indeed, the representative

of Nashile stated that his company would consider leaving if Liberia outlawed pair-trawling [39].

4.2. Chinese views on its distant water fishing industry

Studying what Chinese government officials, scholars, and journalists say about the development of China's DWF industry is useful for better understanding the ideas that influence China's policies and actions on the matter. While this section is by no means comprehensive, it provides a preliminary view of Chinese literature on the topic and attempts to begin to fill a knowledge gap for other countries on what China's concerns and ambitions are in this industry. In sum, voices in China discussing the DWF industry fall across a spectrum that ranges from expansionary to cautionary.

Two industry reports encourage the further development of DWF. It is hardly surprising that these stakeholders would have a great interest in the continued existence of their industry; of course this is also the case in other countries.

In September 2010, a task force composed of twelve people affiliated with the State Council, Chinese DWF companies, industry associations, and universities published a report advocating supporting and strengthening China's DWF industry [10]. The report states that even though much of the world's traditional fisheries are overexploited, there is room for expansion into other fisheries, such as Antarctic krill. Because of the pressure on China in terms of arable land and population, the report continues, developing distant water ocean resources, especially on the high seas, will decrease pressure on China's land and domestic ocean resources. In advocating for expansion of DWF for food security reasons, the report argues that "marine biological resources are seen as the largest store of protein, therefore owning and mastering the ocean means owning and mastering the future."

The report sees expanding DWF as a way to guard China's ocean interests and seek international space for development because, it says, the more international space China has, the more resources and benefits China can obtain. The report argues that while the ocean ecosystem should be managed under a framework of sustainable development, at the same time those countries that have had a longer history of using the ocean have achieved more say in how ocean resources are distributed and thus receive a larger share of those resources; in other words, the authors say, the international fisheries management system is one of "if you occupy and possess, then you have rights and interests." Later in the document, the authors note that there are serious challenges in the "race to seize" international resources, including the fact that developed countries "secretly" subsidize their DWF fleets or act on behalf of their industries through political, economic, or diplomatic means.

The report says that the DWF industry serves as a way of consolidating and expanding China's diplomatic relations and overseas economic cooperation. It continues saying, "the status of China in international institutions has greatly increased, and with it China's voice has expanded in every kind of natural resource conservation organization, reflecting China's real existence in maritime space and upholding its rights." In all the organizations that China has participated in, China's DWF industry has "actively won a definite quantity of fishing quotas." The report points out that China's DWF also contributes to friendship and cooperation with other countries, by promoting local economic development, providing training and employment, and fulfilling other social responsibilities like disaster relief.

A second report published in 2008 by an industry association strives to provide a comprehensive overview of China's DWF industry in terms of economics and trade, law, regulation and management, stages of development, policies, future trends,

industry development, and positive and negative aspects [20]. The report indicates that the industry is concerned about a lack of competitiveness with developed countries because of China's outdated boats and equipment, skyrocketing fuel prices, as well as a lack of information about resources and risk assessment.

China pays attention to what DWF fleets in other countries are doing. The report provides a great amount of detail on the DWF operations of Japan, the former USSR, the EU, South Korea, and Taiwan, such as numbers and types of vessels, and amounts and types of catch. The report details the development of fisheries vessels, equipment, and technology—such as bigger and better boats, magnetic fishing techniques, satellite systems and remote sensing—by developed countries such as Norway, Spain, the Netherlands, South Korea, Iceland, Germany, the United States, Japan, and France.

China also pays attention to the international legal and regulatory landscape that China's DWF companies face. The report details barriers to aquatic imports in developed countries such as technical barriers, rules of transparency and origin, safeguarding measures, and quotas. Many countries have "tedious and strict rules of origin requirements," which, the authors say, have become a protectionist tool and are non-tariff barriers in practice. The EU has strict requirements for its aquatic imports, such as on sanitary standards, "green barriers" for health reasons, and labeling requirements—"this type of strict system, for developing countries, is a kind of new trade barrier." For its part, the United States has a number of labeling and packaging requirements plus numerous regulations on protection of marine resources. The United States pays a great deal of attention to environmental issues, the report notes (and lists many U.S. environmental conservation laws), and "can place trade sanctions on other countries to compel them to abide by these laws, which serve as barriers to imports." The authors say that it is hard for Chinese DWF companies to meet the requirements of export-destination countries, for example the companies cannot meet a majority of EU requirements. The report points out that international management of high seas resources has become stricter as well. Coastal states increasingly want to protect their ocean resources, and now require more cooperation with existing regulations, levy higher fishing license fees, and are creating new restrictions. The report notes the recent establishment of regional fisheries management organizations (RFMOs) and fishing-quota allocations, which "make competition intense on the high seas."

Several academic articles also assess the impact of an evolving international marine governance system on China and its fishing industry [46–50]. One article emphasizes active cooperation with other countries over sustainable use of fisheries resources, stressing the need for China to establish an image of a responsible fishing country [51]. The authors note that since the 1990s, African countries have stepped up administration and mutual cooperation over fisheries, will become increasingly strict and request higher returns for use of the resource, and thus make it harder for China to fish there. Moreover, the article continues, resources in East and West Africa are already fully developed, making it difficult to enter the industry there—these factors will make the cost of fishing rise and efficiency and profitability decline. Furthermore, the authors warn, if China does not adopt a cooperative attitude with coastal countries on protecting fisheries resources nor abide by their laws, then China will lose the permission from many host countries to fish there. Argentina and Uruguay (as well as other South American countries), where China fishes for squid, have changed their regulations over administration and maritime surveillance, equipment, statistics and reports, and handling of fish—if China does not meet some of these new conditions, the article states, China will lose the

permits that it has worked hard to earn. The article does caution that some developed DWF countries, in order to enhance their own competitiveness in areas, will certainly use the excuse of resource conservation to keep other new countries out, such as by signing agreements with these host countries that limit the number of countries and fishing boats in certain areas. But overall, the piece calls for strengthening responsible fishing; improving DWF administration such as observation and monitoring, registration and permit systems, and quality control; and creating a fishing statistical system so China can macro-manage its fishing scale, improve knowledge of fisheries working conditions, and fulfill obligations to provide necessary data to international organizations and concerned countries. Finally, the article calls for adjusting the subsidy system so that it is more “green,” for example by providing stakeholders with training about sustainable fishing according to UNCLOS.

Another article outlines the major problems facing the sustainable development of China’s DWF industry, including: (1) DWF fleets increasing too fast to protect ocean resources; (2) marine pollution not yet being effectively curbed; (3) dramatic increases in the costs of production, especially fuel; (4) a drastic reduction of fishing zones because of UNCLOS, leading to a loss of income for fishermen; (5) a continuous decline in fishing resources, for example fish becoming smaller; and (6) the price of fish being too low [52].

While some Chinese fisheries scholars point to the ecological strains on global fisheries in their publications, others appear to not take them very seriously, nor do they seem to consider the socioeconomic impact of the fishing activities of DWF fleets on host countries. One article in particular merits some extended discussion to illustrate this attitude. In “Research on Management Models of China’s Fishing Companies in Africa,” the author opens by describing the “rich, uncontaminated, and profitable” fisheries resources in Africa that provide “a hot spot” of opportunities for China, a country, which in contrast, is plagued by overcapacity in its own fisheries [53]. The author entreats the reader to understand local policies and conditions in Africa, and to abide by local laws, lest “opportunities become a trap.” The author provides three cases studies in Equatorial Guinea, Morocco, and Cameroon from which Chinese distant water fishing companies can learn management techniques. The author then delves into the first case study on Guinea. He explains that while Guinea has a long coastline with rich natural resources, there are many disadvantages: because Guinea is among the weaker economies of the third world, consumption of fish in Guinea is so low that selling fish in Guinea is not profitable enough to cover production costs; to protect artisanal fishers, Guinean regulations do not allow issuance of long-term permits to foreign industrial vessels—only monthly or six-month temporary permits are available to outsiders; and finally, because Guinea lacks port infrastructure such as cold storage facilities, fish products must be transported to Las Palmas in Gran Canaria. This situation “results in a unique model of management: purchase of free permits, ‘guerrilla-style’ fishing.” The author elaborates that “when the resources are good,” Chinese fishing companies can buy temporary fishing permits to legally fish in Guinea, but “when resources are bad, Chinese fishing companies can immediately withdraw from Guinea in order to avoid losses. This management mode is economical and flexible.” The author then describes how a World Bank project to provide fishing boats in Morocco failed because “Moroccan fishermen lacked management knowledge and fishing technology, were unable to make a profit, and thus unable to repay the cost of the boats.” He suggests a joint-venture scheme with Morocco that involves valuing Chinese fishing boats at double their true cost, Morocco’s need to rely on China for repair and importing gear from China,

and the most important positions on the boats and fish processing jobs going to Chinese (“even if Morocco wants employment of locals,” these Chinese positions “Morocco cannot replace” with locals). After this, author describes a third management model with Cameroon. Because Cameroon does not allow foreigners to fish in national waters, a Chinese company can form a joint venture with a local Cameroonian company and then rent boats to the joint venture. The Cameroonian partner obtains authorization, but China independently manages the company. The Chinese partner directly pays the Cameroonian partner the fishing license and usage fees. Thus, “China’s pair-trawling technology not only gets permission for use in Cameroonian fishing areas, but also can be used to its fullest extent.” China’s independent management of the joint venture company means that it can “avoid interference from the Cameroonian partner.” Finally, China “only has to pay the Cameroonian side the annual fishing license and usage fees,” and then “using pair-trawling technology, the Chinese side can obtain the biggest profit.” The article ends with a nod to “win-win cooperation.”

This article is somewhat unusual because a scholar affiliated with the French department of Dalian Foreign Language University wrote it, as opposed to someone affiliated with a fisheries-oriented institution. While Dalian is an important fishing city and he uses three francophone African countries as examples, it is unclear where the author’s expertise comes from, what his sources are, or whether the models he describes have all actually been tested in Africa. While the publication itself is not well known,³ nonetheless this article was found in a key Chinese academic research database. Regardless of whether or not the article is representative of the majority of Chinese fishing companies, it is at the very least a (remarkably candid) voice in the public discussion over Chinese DWFs.

The article has no mention of sustainable fishing or contribution to local community development, and seems mainly concerned with how to circumvent local laws (presumably aimed at addressing resource conservation and local livelihood in the first place) in order to maximize profit. The very name “guerrilla fishing” connotes destruction, the word for “guerrilla” in Chinese literally translating as “moving attack”—it certainly does not imply long-term natural resource management, nor does the author’s subsequent description of what “guerrilla fishing” is. Pair-trawling is one of the most unsustainable forms of fishing and the author comes across as almost gleeful at the idea of Chinese companies trawling freely without Cameroonian interference. Mention of the local populations—from the Guineans too poor to purchase fish, to Moroccan labor, to Cameroonian business partners—seems utilitarian.

5. Discussion and conclusion

China on the whole has demonstrated a record of cooperation with regard to sustainable fisheries management, but regulates domestic fishing better than DWF. The 1995 “Code of Conduct for Responsible Fisheries” is a non-binding agreement that lays out guidelines for the sustainable and responsible use of fisheries [54]. A 2009 study scores 53 of the top fishing countries according to Code of Conduct guidelines across nine indicators in six evaluation fields [55]. Overall, China ranked 22 out of 53 countries, with an average score just above failing, ahead of Spain and Russia, but behind the United States, Japan, and South

³ According to the website, www.newwestchina.com, the publication is run by the Shaanxi Provincial Propaganda Department and the Shaanxi Academy of Social Sciences with the mission of advocating for the development of western China.

Korea. On an indicator comparing intentions and actions, China scored passing on intentions but failing on actions, indicating an enforcement problem. The study on China that informed this report noted that Chinese domestic fishing is better regulated than DWF [56]. China scored more poorly on important indicators for international fishing—measures of illegal, unreported, and unregulated (IUU) fishing and so-called flags of convenience—than it did on domestic measures. On IUU fishing, China ranked 44 out of 53, with a failing score. On flags of convenience, China ranked 46 out of 53, with a failing score, but higher than the other major DWF entities of Japan, Russia, South Korea, Spain, and Taiwan.

Several international agreements attend to fisheries issues that UNCLOS left unaddressed. Many of these agreements have important implications for DWF nations. China has a mixed record with regard to these conventions [57].⁴ For example, China has signed but not ratified 1995 “Fish Stocks Agreement” because it disagrees with the understandings of enforcement authorization and use of force during inspections of fishing vessels by authorities other than the flag state [58,59]. However, even though China has not ratified the agreement, according to the agreement’s guidelines China is a member of a number of RFMOs, including the International Whaling Commission (IWC); the international Commission for the Conservation of Atlantic Tunas (ICCAT); the Asia-Pacific Fisheries Commission (AFPC); the Western and Central Pacific Fisheries Commission (WCPFC); the Inter-American Tropical Tuna Commission (IATTC); and the Indian Ocean Tuna Commission (IOTC).

China has also signed but not ratified the 1995 “Compliance Agreement,” which requires flag states to license high seas fishing vessels; monitor vessels fishing on the high seas so that they act in accordance with sustainable fishing practices; not allow authorization of vessels that act in violation of conservation measures; and share relevant vessel information with the FAO [60].

The 2001 “Plan of Action on IUU Fishing” is a non-binding agreement that addresses IUU fishing [61]. The Plan was followed in 2009 by a binding “Port State Measures Agreement,” which would require port states to inspect fishing vessels and deny entry to those engaged in IUU fishing [62]. China has not signed.

The Chinese government no longer has as much control over Chinese companies, even state-owned enterprises, as it once did, which makes it difficult for the government to supervise the actions of DWF enterprises. The DWF industry prospect report admitted that industry cooperation with the rules is much looser now that small- and medium-sized private companies comprise about 70 percent of the industry, as opposed to 25 years ago when the industry was only state-owned. Because the industry is now less organized and less skilled, the report explained, it is easier for conflicts to develop in host countries if foreign operations overlap with local ones. The Chinese government does not even have much say over state-owned companies—government may appoint the leadership, but day-to-day management is up to the leaders.

China faces capacity challenges in terms of resources and education. On December 22, 2010, the Chinese government announced that it would be dispatching state observers to monitor DWF operations, which “is necessary for the government’s implementation of international agreements and conventions ... and plays an important role in maintaining

international fishing rights and building an image of a responsible fishing country” [63]. But Chinese fishing companies struggle to keep accurate logbooks and observer data, properly identify bycatch and properly attribute catch to the correct country of origin. The companies also lack language ability. In one report that detailed fish processing and traceability in China, the author identified several weaknesses in the supply chain that made it difficult to identify origins of the catch that feed China’s fish processing industry, much of the fish undoubtedly coming from IUU fishing [64]. Importantly, developed countries are complicit in this system of trade and processing because most of the final products (the majority being high-end fish such as salmon, whitefish and tuna) end up on European, American, and Japanese markets.

Developed countries play a role in shaping Chinese behavior in both desirable and less than desirable ways. While Chinese analysts largely accept international norms and laws on fisheries, at the same time they also observe carefully how developed countries deal with the same norms and laws *in practice*. China pays close attention to the level of technology and fishing methods used by developed countries and strives to be similarly competitive in its own fishing methods. Moreover, great demand in developed countries for products from unsustainable fisheries is a driver of the expansion of the Chinese DWF industry. Fisheries are a “weakest link” type of collective action conundrum, which means that unless *all* participants cooperate to manage the resource sustainably, the collective good will not be provided [65]. Thus if the behavior of developed countries belies their rhetoric of sustainability, China will not have any reason to believe it should not act in a similar fashion.

In terms of policy considerations, promoting consumer awareness and education about sustainable fishing is important both in China and developed countries. In China, even though many government documents allude to sustainable fishing, in many cases it does not seem like these documents actually internalize environmental awareness but rather mention sustainable fishing because it is politically correct to do so. Chinese stakeholders additionally lack scientific information about sustainability. Even though environmental awareness is more substantial in developed countries, consumers there are not making sustainable seafood choices. Improving consumer- and producer-based programs and creating better traceability systems would help address this problem. Importing countries can also ratify the Port State Measures Agreement domestically to prevent contributing to IUU fishing. Finally, developed countries should continue to strengthen governance abroad, particularly in developing countries like in West Africa.

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⁴ Xue Guifang reviewed some of the laws and regulations that China has adopted as a flag state and concludes that China has largely acted responsibly, even though China could improve in some areas.

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