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Original research article

# Joint development in the South China Sea: Exploring the prospects of oil and gas cooperation between rivals



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## ABSTRACT

This article evaluates whether the South China Sea's littoral states can cooperatively manage the region's contested oil and natural gas resources. By examining historical intergovernmental joint development agreements (JDAs), it argues that the prospects for significant hydrocarbon cooperation are slim under current political conditions, as rival states rarely establish such accords. Moreover, creating JDAs is insufficient to prompt actual co-development of shared oil and gas deposits or improvements in states' broader relations. Nonetheless, hydrocarbon agreements do have one important positive impact. They prevent resource-related militarized confrontations, thereby reducing the risk of territorial dispute escalation. This incentive, alone, could prompt the South China Sea's claimant states to negotiate JDAs and third party states to encourage these efforts.

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## 1. Introduction

Recently, tensions in the South China Sea have escalated. China's construction of artificial islands is one source of friction, inspiring censure from other littoral states, the United States, and the Permanent Court of Arbitration in The Hague, which ruled in July 2016 that China's controversial "nine-dash line" maritime claim lacks merit [1]. However, the region's most severe militarized confrontation in the last three years was provoked by another issue: oil and natural gas exploration. In May 2014, China and Vietnam became locked in a militarized standoff, after China parked an oil rig in waters near the contested Paracel Islands. Both countries deployed naval and coast guard vessels to the area and ships rammed and turned water cannons on one another, sinking a Vietnamese fishing boat [2]. Although the crisis was contained and the oil rig eventually withdrew, ownership of the sea's hydrocarbon resources remains uncertain. Fears are widespread that competition over oil and gas deposits could provoke further militarized incidents, which might escalate into larger conflicts.

However, hydrocarbon competition could also encourage international cooperation. In the aftermath of the rig crisis, Chinese and Vietnamese officials held discussions on joint development of the South China Sea's oil and gas resources [3]. This initiative was consistent with a broader Chinese foreign policy, of shelving territorial disputes in order to proceed with resource exploration and

development.<sup>1</sup> Observers have also endorsed hydrocarbon cooperation as a means of exploiting the South China Sea's resources while sovereignty disagreements continue [4–6]. Some commentators suggest that collaborative management of oil and gas resources could encourage cooperation on other contentious issues in the South China Sea dispute, including claimant countries' broader disagreement over political sovereignty (for example, [7]:xvi; [8]:178).

This article evaluates the viability of such proposals by examining historical intergovernmental agreements on oil and gas cooperation. Focusing on joint development agreements (JDAs) between rivals, it finds that the prospects for such accords in the South China Sea are limited; rival states rarely create JDAs. However, on the few occasions that rivals have established cooperative hydrocarbon agreements, the accords have had one significant positive effect. They have deterred further militarized confrontations over oil and gas resources. JDAs would therefore reduce the risk of territorial dispute escalation in the South China Sea by making resource disagreements less conflictual.

Unfortunately, cooperative hydrocarbon agreements between rivals have few other positive effects. The historical analysis finds that oil and gas accords are insufficient to prompt actual joint development of hydrocarbon resources or improvements in rivals' broader relations. Instead, for states to jointly develop oil and

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<sup>1</sup> This policy is outlined in a 2011 White Paper on "China's Peaceful Development," <http://www.china-embassy.org/eng/zt/bps/t944141.htm>.

gas resources, political reconciliation must precede or accompany hydrocarbon accords. Despite this limitation, the South China Sea's claimant states may find the prospect of deterring future oil and gas-related confrontations sufficiently appealing to pursue cooperative agreements. The article's final section identifies strategies that they and third party states can adopt to facilitate the creation of JDAs.

## 2. The South China Sea dispute

At present, six countries have issued formal claims to portions of the South China Sea: Brunei, China, Malaysia, the Philippines, Taiwan, and Vietnam.<sup>2</sup> However, the dispute began at least eighty years ago, with Sino–French disagreements over ownership of the Paracel Islands. The territorial contest provoked significant militarized confrontations between China and Vietnam in 1974 and 1988. Yet, it was not until the 1990s that the dispute became a persistent source of tension between many of the region's littoral states. In part, this escalation was due to China's growing level of interest and activity in the South China Sea, as the state attempted to develop its blue water navy and intensified its hunt for hydrocarbon resources, after becoming a net oil importer in 1993. The United States also became more attuned to the dispute during this time period, due to concerns about China's emerging challenge to U.S. naval superiority in the western Pacific and the threat that it posed to the Philippines, a U.S. ally.

Hydrocarbon resources are one issue at stake in the South China Sea dispute. All claimant states would like to increase the amount of oil and gas resources under their control. However, estimates of the region's hydrocarbon endowments vary. China has issued the most optimistic assessments, claiming that the sea contains 125 billion barrels of oil and 500 trillion cubic feet of natural gas resources. In contrast the U.S. Energy Information Agency (EIA) is far more conservative, estimating that the sea contains 11 billion barrels of oil and 190 trillion cubic feet of natural gas reserves [9].<sup>3</sup> Moreover, many of the hydrocarbon deposits in contested portions of the South China Sea are situated in deep water, making them technically challenging and expensive to exploit. Most analysts therefore conclude that oil and gas competition is not the dominant factor driving the South China Sea dispute. Other issues at stake in the contest include the security of sea lanes, freedom of navigation, positional rivalry between the United States and China, and competition over fisheries.

Although far from the only issue involved in the South China Sea contest, oil and gas resources are a source of significant friction. A number of militarized incidents, culminating in the 2014 Sino–Vietnamese rig confrontation, have been provoked by hydrocarbon exploration [10]. Concern about further oil and gas-related contention is widespread (for example, [11]).<sup>4</sup> Yet, some parties to the dispute hope that, rather than inspiring conflict, hydrocarbon resources will be a catalyst for interstate cooperation. Former Taiwanese President Ma Ying-jeou [12], for example, has pushed for joint development of the South China Sea's oil and gas, proposing that claimant states “shift the focus from settling territorial disputes to jointly developing resources.” Malaysia's Prime Minister, Najib Razak, has also endorsed this approach [13].

<sup>2</sup> Indonesia claims waters around the Natuna Islands, but is not considered a South China Sea claimant.

<sup>3</sup> The EIA [9] figures are for proved and probable reserves. In addition, the agency reports that the sea may 5–22 billion barrels of undiscovered oil and 70–290 trillion cubic feet of undiscovered gas.

<sup>4</sup> Other oil-related militarized incidents include confrontations between China and Vietnam over the Wan'an Bei-21 field during the 1990s.

Proponents of hydrocarbon cooperation have two central goals. First, they aspire to develop oil and gas resources that would otherwise be inaccessible, due to ongoing territorial disputes. Second, some of them hope that hydrocarbon collaboration will improve states' broader relations by acting as a confidence building measure.<sup>5</sup> Oil and gas cooperation appears to be a plausible starting point for collaboration because, unlike political authority or control over sea lanes of communication, hydrocarbon deposits can be divided, creating joint gains. As Ma [12] put it: “although sovereignty cannot be divided, resources can still be shared.” In addition, hydrocarbon cooperation is easier than fisheries cooperation because oil and gas reservoirs, unlike fish stocks, do not move. Moreover, numerous cooperative intergovernmental hydrocarbon agreements have been established globally, making the strategy appear viable.

However, in the South China Sea, hydrocarbon cooperation has a rocky history. In 2005, three of the claimant states' national oil companies (NOCs)—the Chinese National Offshore Oil Corporation (CNOOC), the Philippine National Oil Company, and PetroVietnam—established the Joint Marine Seismic Undertaking (JMSU): an agreement that committed the companies to collaborative seismic surveying of approximately 140,000 km<sup>2</sup> of maritime territory around the Spratly Islands.<sup>6</sup> Initially, operations proceeded smoothly. However, the accord collapsed in 2008, after an outpouring of popular resistance in the Philippines [14,15]. Since then, popular opposition to cooperation with China has increased, making joint development of the South China Sea's resources even more challenging. Since 2008, the only claimant states that have made further progress in hydrocarbon cooperation are Brunei and Malaysia, who announced in August 2015 that their NOCs, Petroleum Brunei and Petronas, would jointly develop two oil fields along their maritime boundary. Significantly, Brunei and Malaysia have much friendlier relations than many of the South China Sea's claimant states.

Numerous authors have evaluated the viability of more extensive hydrocarbon collaboration in the South China Sea [6,16–19]. However, these analyses have limited predictive power because they tend to assess the South China Sea case in isolation. In contrast, the following analysis examines comparable historical cases of oil and gas cooperation in order to gain greater purchase on the questions of whether further hydrocarbon collaboration is possible in the South China Sea and its likely effects.

## 3. Why cooperate?

Countries' incentives to cooperatively manage hydrocarbon resources arise from the mismatch between physical and political geography. Oil and gas reservoirs frequently traverse international boundaries or are located in areas where borders have not yet been established. Multiple states can therefore lay claim to these shared deposits and must decide how to manage them. Under these circumstances, each claimant states has three basic choices; it can leave the resources undeveloped, exploit them unilaterally, or collaborate with other claimant countries to exploit the contested reservoirs.

Refraining from resource development has obvious limitations; a state cannot profit from untouched hydrocarbon deposits and runs the risk of another country siphoning off an entire contested

<sup>5</sup> These arguments are consistent with functionalist expectations about the impacts of economic cooperation on political disputes; for a resource-related summary of such arguments, see Lowi [35].

<sup>6</sup> This was an agreement between companies, not countries, and limited to seismic surveying; it did not include provisions for exploratory wells or resource development.

reservoir. However, the second option, unilateral exploitation, is also problematic. When multiple states extract oil without coordinating their actions, they increase the risk of a drop in reservoir pressure, which can render large portions of a hydrocarbon deposit unrecoverable. Unilateral exploitation also antagonizes other claimant states, who may respond with diplomatic censure, economic sanctions, or military action. In addition, unilateral exploiters have difficulty attracting investment to develop shared fields. Oil companies do not want to risk reservoir pressure drops, militarized assaults, and changes in territorial authority. Hence, they either refrain from participating in projects in contested areas or demand advantageous contract terms.

Resource cooperation, the third option, is appealing because it entails none of these geophysical, political, and economic risks. Cooperating countries can preserve reservoirs' geophysical integrity, attract foreign investment, and avoid endangering their broader bilateral relations, in addition to profiting from oil and gas exploitation. States that pursue this strategy usually choose between two institutional instruments: unitization and joint development. In international unitization accords, governments agree to collaboratively exploit a shared reservoir, often using a single operator. In joint development agreements (JDAs), states identify a geographic zone in which they will cooperatively exploit all resource discoveries.<sup>7</sup> JDAs are appealing instruments to use in contested territories, because they enable countries to develop resources without addressing the thornier question of political sovereignty. JDAs vary in terms of formality, the specificity of rules for resource exploration and production, and the size of joint development zones (JDZs).

Between 1958 and 2014, states established forty-five cooperative intergovernmental hydrocarbon agreements.<sup>8</sup> Bahrain and Saudi Arabia signed the first JDA in 1958, to manage the Fasht Abu-Sa'fah oil field in the Red Sea, and Norway and the United Kingdom created the first unitization accord in 1976, for the Frigg gas field in the North Sea. By now, cooperative accords have been established in all regions of the world. The 2000s were the most active decade, in terms of number of agreements signed. Countries are therefore willing to collaboratively manage oil and gas resources, when conditions are favorable.

#### 4. Hydrocarbon cooperation between rivals

To determine whether oil and gas cooperation is possible in the South China Sea, this analysis focuses on a particular subset of historical cases: intergovernmental hydrocarbon agreements between rival states. "Strategic rivals" are countries that identify each other as "competitive and threatening enemies."<sup>9</sup> Their hostility is based on territorial, positional, and ideological differences and they frequently share a history of militarized conflict. Most international wars have been fought by rivals, as disagreements between them are prone to escalation ([20]:16). In the South China Sea, multiple relationships can be classified as territorial rivalries: in particular, those between China and the Philippines and China and Vietnam.<sup>10</sup> These countries' hydrocarbon competitions pose the greatest threat to international security and, consequently, represent the most tantalizing prospects for oil and gas cooperation.

Unfortunately, rivals are likely to have difficulty cooperating. Since their relationships are highly competitive and characterized by mutual mistrust, leaders of rival states are very concerned about cheating. They also tend to view international cooperation as a zero-sum game, rather than an opportunity for joint benefits [21]. These propensities impede interstate bargaining, which constrains rivals' ability to reach collaborative accords. Hydrocarbon cooperation among rivals is especially unlikely, because oil is a strategic resource; reappropriation could upset a finely tuned international balance of power. In addition, leaders of rival states are constrained by domestic politics [22]. Joint resource development can be interpreted as "sharing with the enemy," provoking intense popular opposition. Rivals are therefore least-likely cases for hydrocarbon cooperation. Oil and gas accords between these countries should be rare and limited in scope.

The historical record bears out these expectations. Of the forty-five unitization and joint development agreements created between 1958 and 2014, only five were signed by strategic rivals: China and Japan (2008), Argentina and the United Kingdom (1995), Equatorial Guinea and Gabon (2004), Guinea-Bissau and Senegal (1993), and North and South Yemen (1988). All five of these accords were informal JDAs; the agreements did not require ratification by state legislatures and contained no enforceable punishments for noncompliance. In most of them, governments pledged to cooperate in hydrocarbon exploration and production, but provided few detailed rules for resource development.

Although limited in scope, these historical agreements had one significant positive effect. While they were in place, participant states did not engage in any oil or gas-related militarized confrontations.<sup>11</sup> Incidents like the Sino-Vietnamese rig clash did not occur. This restraint indicates that hydrocarbon agreements between rivals can moderate international resource competition, most likely by discouraging unilateral exploitation of contested oil and gas reservoirs. Moreover, by relieving one source of interstate animosity, hydrocarbon accords reduce the risk of dispute escalation. Rivals may still fight over other issues. However, oil and gas resources are no longer a provocation. JDAs make hydrocarbon disagreements less conflictual.

Yet, historical JDAs between rivals have few other independent positive impacts. Of the five agreements, only two—between Guinea-Bissau and Senegal and North and South Yemen—were followed by actual joint development of contested resources. Importantly, in these two cases, governments committed themselves to political reconciliation prior to or concomitant with oil and gas agreements. Thus, rather than inspiring improvements in rivals' broader relations, JDAs depended on it. Alone, JDAs only prevent hydrocarbon-related confrontations.

To explore these findings in greater detail, the following sections present the five historical JDAs between rivals in turn. Each case study identifies the source of participants' bilateral rivalry, the process that led to their JDA, and the agreement's effects. The presentation begins with the three cases that did not result in co-development of hydrocarbon resources and concludes with the two that did.

##### 4.1. China–Japan (2008)

After falling dormant after World War II, China and Japan's rivalry revived in the 1990s. One of the issues contributing to its intensification was China's growing power. Another was the states' escalating competition for territorial authority in the East China Sea. Sovereignty in the region has resource implications; the sea

<sup>7</sup> Unitization is primarily employed to manage discovered reservoirs that cross established international boundaries. In contrast, joint development is predominantly used in areas where international boundaries have not yet been delimited and resources are prospective, rather than proved.

<sup>8</sup> A full list of accords is available from the author.

<sup>9</sup> Definition and rivalry codings are from Thompson and Dreyer [20].

<sup>10</sup> Since October 2016, relations between China and the Philippines have begun to thaw, due to the Philippine president, Rodrigo Duterte's, softer position towards China.

<sup>11</sup> "Militarized confrontations" are identified using the Militarized Interstate Dispute (MID) dataset [36].

contains valuable natural gas deposits. In the 1980s and 1990s, Chinese oil companies moved increasingly further offshore, to explore for and develop these reservoirs.

Bilateral tensions in the East China Sea came to a head in 2003, when Chinese operators set up a production platform above the Chunxiao gas field, less than two kilometers from the maritime median line between China and Japan. Japanese authorities insisted that the companies share data on the field in order to ensure that they were not siphoning off Japanese reserves. When Chinese officials refused these demands, Japan launched its own exploration projects, intensifying the dispute. In November 2004, a *Han* class submarine was identified in Japanese waters and, in January 2005, two Chinese destroyers moved into the Chunxiao area [23–25]. These operations appeared to confirm popular suspicions: that hydrocarbon competition would trigger militarized conflict.

However, during the same period, the two countries were attempting to reach an agreement on resource cooperation. In October 2004, they launched the “Japan–China Consultations Concerning the East China Sea and Other Matters.” Twelve rounds of bilateral discussions culminated in the *Principled Consensus on the East China Sea Issue* (2008). The agreement created a small JDZ in the middle of the sea and permitted Japanese participation in development of the Chunxiao field.

Since the agreement was signed, no further militarized incidents have occurred around the East China Sea’s gas fields. However, the JDA has not helped improve broader Sino–Japanese relations. Instead, the states’ territorial rivalry has intensified, due to confrontations near the contested Senkaku/Diaoyu Islands, 450 kilometers southwest of China and Japan’s JDZ. In September 2010, following a confrontation near the islands, Chinese officials cancelled the second round of talks on implementing the *Principled Consensus* [26]. As a result, the accord has not resulted in any collaborative resource development. Instead, China has continued to unilaterally develop gas resources on its side of the median line, without Japanese participation.

#### 4.2. Argentina–United Kingdom (1995)

Anglo–Argentine hydrocarbon cooperation followed a similar trajectory to China and Japan’s. The states’ rivalry began in 1965, when their territorial dispute over the Falkland/Malvinas Islands escalated. It intensified with the Falklands War (1982). However, when Argentina’s democratically elected Menem government came to power in 1989, leaders were eager to repair the bilateral relationship. In February 1990, Argentina and the United Kingdom agreed to restore diplomatic relations and put the topic of island sovereignty aside in order to proceed with cooperation on other issues [27]. In September 1995, the states established the *Joint Declaration on Cooperation Over Offshore Activities in the South West Atlantic*. This agreement created the Special Area: a JDZ southwest of the islands.

While the accord was in place, Argentina and the United Kingdom did not engage in any resource-related militarized incidents. However, the JDA did not result in actual joint development of oil resources. Instead, two weeks after the Joint Declaration was signed, the Falkland Islands Government embarked upon unilateral resource development, by inviting bids for oil exploration in territories outside of the Special Area. Over the next five years, no exploration occurred in the states’ JDZ and, in July 2000, the United Kingdom and Argentina suspended meetings of the South West Atlantic Hydrocarbons Commission, the organization created to manage the *Joint Declaration*, in order “to allow time for reflection” on participants’ “divergent interpretations” of the accord [28]. Thus, rather than improving bilateral relations, the Anglo–Argentine JDA was a source of friction. In March 2007, after bilateral relations dete-

riorated further, Argentina formally withdrew from the accord. No joint resource development was ever conducted in the Special Area.

#### 4.3. Equatorial Guinea–Gabon (2004)

Equatorial Guinea and Gabon have been rivals since the 1970s, due to their disagreement over island and maritime authority in resource-rich Corisco Bay, located at the terminus of their land boundary. In February 2003, the countries’ dispute intensified, when Gabon’s defense minister landed on a contested island and reiterated his state’s territorial claims. Equatorial Guinea protested and the incident seemed poised for escalation. However, in July 2004, following United Nations mediation, the two states signed a Memorandum of Understanding on oil and gas development in Corisco Bay. They also agreed to determine their maritime boundary and pursue a settlement of their territorial dispute [29,30].

Since the Memorandum of Understanding was signed, its effects have been similar to those of the Anglo–Argentine and Sino–Japanese JDAs. Equatorial Guinea and Gabon have not engaged in any oil and gas-related militarized confrontations. However, the memorandum has not been followed by actual joint development of oil and gas resources or by broader improvements in bilateral relations. The states have not delimited their boundary and remain rivals.

#### 4.4. Guinea-Bissau–Senegal (1993)

In the final two cases, participant states have jointly developed hydrocarbon resources, as well as avoided militarized incidents, since creating their JDAs. The key factor enabling this more expansive cooperation was the timing of political reconciliation. In these two cases, rivals significantly improved their broader relations prior to or concomitant with their hydrocarbon accords. Political reconciliation facilitated hydrocarbon cooperation, rather than the other way around.

Guinea-Bissau and Senegal’s rivalry, like the previous three cases, was rooted in a territorial dispute. The contest began in the 1970s, when Guinea-Bissau achieved independence and the states inherited a boundary disagreement from their former colonizers, Portugal and France. In 1977, the countries initiated negotiations to resolve the issue. When these failed to produce a mutually acceptable settlement, the states turned to international adjudication. In 1989, an Arbitral Tribunal ruled that a 1960 Franco–Portuguese agreement had established the countries’ maritime boundary. Guinea-Bissau rejected the ruling and opened a case before the International Court of Justice (ICJ), initiating the states’ rivalry ([31]; [20]:227–28).

The legal proceedings before the ICJ were acrimonious. However, the countries subsequently settled their dispute through further negotiations. In 1993, they created the *Management and Cooperation Agreement*, which established a JDZ for fisheries and hydrocarbon resources in a large, triangular area straddling the 1960 maritime boundary. The accord officially resolved the states’ territorial disagreement, which ended their rivalry. The timing of rivalry termination, concomitant with Guinea-Bissau and Senegal’s JDA, indicates that hydrocarbon cooperation was not the cause of the broader improvement in bilateral relations. Rather, it was one, simultaneous component of a larger reconciliation. This shift, from rivalry to amity, facilitated the creation of Guinea-Bissau and Senegal’s second JDA, in 1995, and actual joint development of shared oil deposits. The countries began issuing exploration permits for their JDZ in 2006 and, over the last decade, oil companies have

conducted seismic surveys and exploratory drilling in the area.<sup>12</sup> The states have also refrained from oil and gas-related militarized confrontations, since establishing their first JDA.

#### 4.5. North and South Yemen (1988)

The rivalry between North Yemen (the Yemen Arab Republic) and South Yemen (the People's Democratic Republic of Yemen) began in 1967, when the latter achieved independence from the United Kingdom.<sup>13</sup> In this case, the sources of rivalry were primarily ideological, rather than territorial. South Yemen's Marxist government challenged the legitimacy of the North Yemeni regime and each state supported dissident groups in the other. The countries also engaged in border clashes, which increased in the late 1970s ([20]:172). Nonetheless, in November 1988, the two Yemens signed a JDA: the *Agreement for the Exploitation of (and Investment in) the Joint Area Between the Two Sectors of Yemen* (also known as the *Aden Agreement*). The states unified 18 months later, in May 1990.

The timing of these developments suggests that hydrocarbon cooperation precipitated political change. However, a closer examination of the case reveals that North and South Yemen were firmly committed to unification, prior to establishing the *Aden Agreement*. In the *Taiz Agreement*, signed in April 1988, seven months before the JDA, the two Yemens pledged to "continue towards . . . step-by-step reunification through peaceful and democratic means." The *Taiz Agreement* also referred to existing organizations and commissions on unification and called for the creation of a timetable to draft a new constitution for the unified state ([32]:654). The Yemens' JDA was therefore a product of political reconciliation, not its cause. It was followed by actual joint development of oil resources, by the unified Yemeni state. The two states did not engage in further, resource-related militarized confrontations, as they had ceased to be independent political entities.

### 5. Prospects of hydrocarbon cooperation in the South China Sea

As the five historical cases demonstrate, JDAs between rivals are rare and have limited independent causal power. On the positive side, hydrocarbon accords appear to deter resource-related crises. None of the rivals that established JDAs engaged in oil or gas-related militarized confrontations while the agreements were in place. However, on the negative side, these accords did not generate broader improvements in participants' bilateral relations. Nor did they prompt actual joint development of hydrocarbon resources. Instead, for states to cooperatively exploit oil and gas resources, rivalry termination had to precede or accompany JDA creation.

These findings do not bode well for oil and gas cooperation amongst the South China Sea's most contentious dyads: China and Vietnam and China and the Philippines. Given the rarity of intergovernmental hydrocarbon accords between rivals, these states are unlikely to establish collaborative agreements, especially now that the Permanent Court of Arbitration has delegitimized China's maritime claims. There is somewhat more hope for China and the Philippines, given the recent thaw in bilateral relations, led by Philippine president Rodrigo Duterte since October 2016 [33]. Nonetheless, should these claimant states beat the odds and create JDAs, the agreements will not lead to actual joint development of oil and gas resources, unless the countries terminate their rivalries prior to or concomitant with the establishment of their hydrocar-

bon accords: a development that remains unlikely, under current political conditions.

However, while actual joint development of oil and gas resources may be out of reach, China, the Philippines, and Vietnam may still want to negotiate JDAs. If the states can establish agreements, the historical record suggests that these will deter further oil and gas-related militarized confrontations. The prospect of eliminating such crises, and thereby reducing the risk of dispute escalation, may be sufficiently enticing for leaders to attempt to establish hydrocarbon accords. In addition, among the South China Sea's less hostile dyads—effectively, any that do not include China—cooperation is more plausible and may result in actual joint development of oil and gas resources. Thus, for all claimant states, taking a crack at hydrocarbon cooperation is likely to be worth the effort, as long as they keep their expectations in check.

To facilitate cooperation, rival claimants could take two main steps. First, they should dampen their hostile rhetoric. Interstate rivalries are largely a matter of perception: whether states—including their populations—view each other as threatening enemies. If governments present themselves as adversaries, issuing aggressive statements and conducting shows of force, international tensions increase and the potential for hydrocarbon cooperation declines. In contrast, if rivals in the region can temper their actions and rhetoric and moderate their populations' hostility, as China and the Philippines have recently done, establishing JDAs becomes more feasible.

Second, cooperation will become more viable if the South China Sea's claimant states are willing to pursue bilateral hydrocarbon agreements, rather than a multilateral accord. Historically, there has never been a multilateral, intergovernmental JDA, even between friendly countries. Bilateral arrangements are less complicated to negotiate and, consequently, easier to establish. The best prospects for hydrocarbon cooperation are therefore geographical areas that are claimed by only two states, rather than those that fall within the claims of three or more. This restriction will impede the establishment of JDZs within the Spratly Islands. However, negotiations can address contentious, resource-endowed areas that are jointly claimed by China and the Philippines or China and Vietnam.

Third party states, including the United States, can also facilitate JDA creation by supporting neutral parties' geological exploration in the South China Sea. One impediment to international bargaining over contested oil and gas resources is incomplete information about the location and volume of reservoirs; it is difficult for governments to commit to agreements if they do not know exactly what they are gaining or giving up. Competing countries have difficulty collecting these data themselves, as the JMSU and Sino-Vietnamese rig confrontation demonstrate. However, international expeditions, such as those undertaken by the International Ocean Discovery Program (IODP) and the United Nations Committee for Coordination of Joint Prospecting for Mineral Resources (CCOP), have greater freedom of movement [34].

None of these strategies is failsafe. It will be difficult for the South China Sea's most contentious dyads to create JDAs. Moreover, without broader political reconciliation, these agreements will not lead to actual joint development of oil and gas resources. Nor will JDAs improve countries' political relations. However, they will remove one source of friction in the South China Sea dispute, thereby enhancing regional security. This prospect, alone, may be worth the effort.

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