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Study on the Conflict of Norms and the Coordination Mechanism of International Law in the Dispute over the Legal Status of Arctic Waterways—A Juridical Logic Based on the Interpretative System of the "Icebound Area Clause"

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Abstracts

The dispute over the legal status of Arctic shipping lanes is essentially a structural projection of the conflict of international law norms in the field of polar governance. Based on empirical analyses and normative research methods, this paper reveals three core contradictions in the dispute over Arctic shipping lanes: the normative conflict between Article 234 of the United Nations Convention on the Law of the Sea (UNCLOS) "Ice-covered Area Clause" and the principle of freedom of navigation under the framework of the international law of the sea, the functional fragmentation of the regional governance mechanism and the systematic mismatch in the method of legal interpretation. Through the deconstruction of typical cases such as the "Polar Sea" incident, the legal dilemma between the claim of jurisdiction of the coastal state and the determination of the attributes of international shipping lanes is demonstrated, and the systemic tension between the Arctic Council's "hierarchical and differential structure" and the principle of universal participation in the BBNJ Agreement is pointed out. At the theoretical level, the innovative proposal of "normative conflict matrix" model and "dynamic equity principle", the construction of "three-layer progressive interpretation framework" and "ice coefficient", and the "three-layer progressive interpretation framework" and the "three-layer progressive interpretation framework", were all put forward. It has constructed a coordination mechanism that includes a "three-tier progressive interpretation framework" and a quantitative criterion of "ice coefficient". At the institutional design level, it is advocated that a judicial path be

established for the Arctic Special Chamber, and that a "three-stage coordination mechanism" be set up to achieve the integration of global norms and regional governance. With regard to China's participation in Arctic governance, it is proposed to strengthen the right of legal interpretation through the "special system for scientific research and navigation", to promote the revision of the Polar Code by relying on the International Maritime Organisation, and to build a dispute prevention system based on the "Arctic Legal Compliance Index". The study provides solutions with both theoretical depth and practical value for solving normative conflicts in polar governance.

Keywords

Arctic shipping lanes, ice-covered areas clause, conflict of norms, dynamic equity principle, three levels of progressive interpretation

1. Introduction

1.1 Biological Contradictions in the International Law of the Sea

Within the framework of the international law of the sea, the conflict between the application of Article 234 and Article 38 of the United Nations Convention on the Law of the Sea (UNCLOS) has been one of the central conflicts in the legal dispute over the Arctic shipping lanes. The United States, as a non-party to UNCLOS, has relied on the Convention to claim that part of the Arctic shipping lanes is an international strait, and thus to claim the right to freedom of navigation. In contrast, Russia and Canada have invoked Article 234's "Icebound Area Clause" to claim jurisdiction over internal waters in relation to Arctic shipping lanes. This conflict has generated numerous frictions in practice. For example, Russia's 2013 Navigation Rules for the Northern Sea Route specify a compulsory pilotage system, which requires passing ships to accept Russian-designated pilotage services. This provision is regarded by the US and other countries as an unreasonable restriction on their freedom of navigation, while Russia, relying on Article 234, emphasises the special geographic and environmental conditions of the Arctic waters, and considers compulsory pilotage as a necessary measure to safeguard navigational safety and environmental protection. As early as 1985, in the "Polar Sea" incident, an attempt by the United States Coast Guard icebreaker Polar Sea to cross Soviet Arctic waters without Russian permission triggered a diplomatic dispute between the two countries. The Soviets argued that the entry of the US vessel violated their sovereignty over the waters within their jurisdiction under the "Ice Closure Clause", while the United States insisted that the shipping lane was an international strait and that it enjoyed freedom of navigation. This incident has become a typical case of legal disputes over Arctic shipping lanes, highlighting the contradictions in the practical application of the relevant UNCLOS provisions. In terms of the decision-making mechanism of the Arctic Council, which has 38 observer states, including many extraterritorial states with an interest in Arctic affairs, there is a clear imbalance in decision-making power: five Arctic states dominate the Council's decision-making process, while the observer states' influence is extremely limited. This imbalance in decision-making power has made it difficult for the interests of non-Arctic countries to be adequately reflected in the

process of formulating rules related to Arctic shipping lanes, further exacerbating the contradiction in the application of international law of the sea in the Arctic region.

1.2 Functional Fragmentation of Regional Governance Mechanisms

The Arctic Council plays an important role in Arctic governance, but its "hierarchical and disjointed structure" is in major conflict with the principle of universal participation promoted by the Agreement on the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction (BBNJ Agreement). The Arctic Council gives some participation rights to indigenous Arctic peoples' organisations through permanent participation, but remains dominated by the eight Arctic states at the core decision-making level. This structure limits the depth and breadth of participation by extra-territorial states in Arctic affairs, and Arctic governance is clearly characterised by "intra-territorial self-management". In contrast, the BBNJ Agreement emphasises the equal participation of countries around the globe in matters such as marine biodiversity conservation, and seeks to break down hierarchical barriers in regional governance. This contrasts with the existing structure of the Arctic Council As an example, the Agreement on the Prevention of Unregulated Fishing Activities on the High Seas in the Central Arctic Ocean (APUA), signed in 2018, includes the five countries bordering the Arctic Ocean as well as the five parties of the pelagic fisheries industry (China, the European Union (EU), the Republic of Korea (ROK), Japan, and Iceland). In the process of formulating this agreement, the traditional decision-making mode of the Arctic Council was broken, providing a platform for equal consultation between countries within and outside the region to discuss the rational exploitation and protection of high seas fishery resources in the central Arctic Ocean. However, in contrast, during the implementation of the Agreement on Cooperation in Preventing and Responding to Marine Oil Pollution in the Arctic, due to the different interests of various countries, there are many differences in terms of financial input and coordination of technical standards, which has greatly reduced the effectiveness of the implementation of the Agreement. Differences in the functional objectives and implementation paths of different regional governance mechanisms have led to the fragmentation of governance in the Arctic region. The seven Arctic countries will suspend the activities of the Arctic Council in 2022 due to the international situation, which will directly lead to a governance vacuum in the Arctic region for some time. In key areas such as Arctic waterway management and environmental protection, there is a lack of effective coordination mechanisms among countries, and they are working separately, failing to form a unified synergy of governance, which is the challenge that China is currently facing. This governance vacuum not only affects the sustainable development of the Arctic region, but also adds to the confusion of the legal order in the Arctic shipping lanes and exacerbates the functional fragmentation among regional governance mechanisms.

1.3 Systemic Conflict of Methods of Legal Interpretation

Canada's interpretation of the concept of "ice-covered area", which extends the ice-cover period to an average of six months per year, goes far beyond the original meaning of "most of the year" in the UNCLOS Convention. Judging from the background and purpose of the drafting of the Convention,

"most of the year" should be a relatively vague but generally recognised concept of time, which is intended to cover the Arctic sea area with a longer period of ice closure under the natural environment. Canada's expansive interpretation was motivated by its need to strengthen its jurisdiction over parts of the Arctic shipping lanes. By extending the ice-cover period, Canada seeks to include more maritime areas under its jurisdiction under the "ice-covered areas clause" in order to safeguard its interests in resource development, safety and security in the Arctic. Russia's Arctic coastline accounts for 53 per cent of the total length of the Arctic Ocean, a significant geographic feature that serves as an important jurisprudential basis for its enhanced baseline claim. When delineating its maritime baselines, Russia, on the basis of its long Arctic coastline and the relevant rules of international law, asserts its jurisdiction over some of the maritime areas around the Arctic shipping lanes. This claim, based on geographical reality, is reasonable to a certain extent, but it also conflicts with other countries' perceptions of the international attributes of the Arctic shipping lanes. The International Court of Justice in the Corfu Channel case established the criterion of "use for international navigation", which emphasises the extent and importance of the actual use of the waterway in international shipping. However, the reality of the Arctic shipping lanes, which currently have an average annual traffic of less than 1 per cent of that of the Suez Canal, suggests that there is a significant gap between the actual status of the Arctic shipping lanes in international shipping and that of the Corfu Channel. However, some countries believe that with global warming and the improvement of navigation conditions in the Arctic shipping lanes, their importance in international shipping will gradually increase in the future, and that they should be recognised as "used for international navigation" based on a developmental perspective. This conflict between jurisprudence and reality has made the determination of the legal status of Arctic shipping lanes even more complicated, with different countries holding different views on the attributes of shipping lanes on the basis of their own interests and different interpretations of the law.

2. Jurisprudential Logical Deconstruction of Normative Conflicts

2.1 Systematic Analysis of the Hierarchy of Normative Effectiveness

Although the United States is not a party to UNCLOS, it has selectively invoked the Convention's freedom of navigation provisions in support of its claims in Arctic shipping lanes. This "selective compliance" has confused the hierarchy of normative effects in the legal dispute over Arctic shipping lanes. As a general principle of international law, treaties are binding only on the parties to them, and non-parties are not obliged to comply with their provisions. However, the U.S. has challenged the traditional hierarchy of norms in international law by attempting to construct its own legal logic in favour of the Arctic shipping lanes through the use of some of the provisions of the Convention. Under the framework of global norms and regional rules, the construction of the "norms conflict matrix" model has an important theoretical innovation value. The model divides norms into two dimensions: hard law obligations and soft law recommendations, and at the same time combines the two dimensions

of global norms and regional rules to form a four-quadrant analysis framework. On the issue of Arctic shipping lanes, UNCLOS, as a hard law norm of global ocean governance, has intersections and conflicts in the Arctic with the Arctic Council's rules at the regional level. For example, in terms of environmental protection of shipping lanes, UNCLOS provides for general marine environmental protection obligations, while the Arctic Council has formulated more specific regional environmental protection rules based on the special environment of the Arctic region. There are differences in the level of effectiveness and scope of application of these rules. Through the model of "Norms Conflict Matrix", we can clearly analyse the conflict points and coordination paths between different norms, and provide new theoretical perspectives for the resolution of legal disputes over Arctic shipping routes.

2.2 Equity Dilemma in the Allocation of Rights and Obligations

Russia's environmental protection regulations for the Northern Sea Route have imposed strict environmental protection requirements on passing ships, raising their operating costs by 37 per cent. From Russia's point of view, these regulations are aimed at protecting the fragile ecological environment of the Arctic and ensuring the sustainable development of the Arctic shipping lanes. However, for shipping companies, the excessive costs have increased the burden of operation and affected the enthusiasm of their business activities in the Arctic shipping lanes. Behind the increase in costs, it reflects the imbalance in the distribution of rights and obligations among the relevant countries, and the operating conditions of the Arctic shipping lanes have always been the main business behaviour of the shipping companies. Resource exploitation and shipping activities are increasing in the Arctic, as are potential environmental threats, which are intensifying. The Arctic sea ice cover has been decreasing by 13 per cent year by year in line with global warming, and this change makes the Arctic waterways change the navigational conditions and at the same time profoundly affect the ecological environment, and the traditional way of distributing the rights and obligations has become unsuitable for the real needs in this dynamic changing environment. Therefore, it is of great significance to put forward the principle of dynamic equity, which emphasises that the proportion of rights and obligations of the relevant countries and subjects of interest in the Arctic shipping lanes should be adjusted in accordance with the changes in environmental indicators such as sea ice coverage. For example, when the sea ice coverage is high and the navigational conditions of the waterway are poor, participation in the development of the Arctic waterway should be encouraged, and the environmental protection obligations of shipping enterprises can be appropriately reduced; whereas, when the sea ice coverage decreases and the ecological environment becomes more fragile, countries should strengthen their environmental protection requirements and responsibilities.

2.3 Paths to Innovation in Legal Interpretation Methods

The lack of clear quantitative standards in the traditional interpretation of the characterisation of "ice-covered area" has led to large differences in the understanding and application of the term in various countries, as well as to different perceptions of the term in various parts of the world. The establishment of the quantitative model of "ice cover coefficient", which combines the annual average

number of ice-covered days with the ice-breaking capacity index of ships, can provide a more scientific and objective standard for the identification of "ice-covered area". Through the model, an accurate judgement can be made as to whether the sea area belongs to the "ice-covered area", based on the actual freezing conditions of different sea areas, the technical capability of the ship and other factors, thus providing a clear basis for the application of the relevant legal provisions. In the practice of international law, the International Court of Justice adopted the method of evolutionary interpretation in the 2015 Antarctic Whaling case. This method emphasises the up-to-date interpretation of treaty provisions in accordance with the development of international law and changes in reality. On the issue of Arctic shipping lanes, Article 234 of UNCLOS was enacted in a specific historical period. With the environmental changes in the Arctic region, the development of shipping technology and the adjustment of the international political and economic landscape, it is necessary to draw on the method of evolutionary interpretation adopted in the Whaling in the Antarctic case to re-examine the scope of application and connotation of Article 234. For example, in view of the gradual increase in the volume of navigation in the Arctic shipping lanes and the global concern for the development of Arctic resources, the provisions of Article 234 on the jurisdiction of the coastal State and the right of navigation of other States should be dynamically interpreted to balance the interests of all parties and to meet the needs of the realities of development in the Arctic region.

3. Juridical Logic Construction of Coordination Mechanisms

3.1 Paths to Judicial Resolution of Normative Conflicts

Drawing on the model of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, the design of the Arctic Special Chamber is of great significance in terms of mechanism innovation. The Arctic Special Chamber is specifically designed to adjudicate on legal disputes related to Arctic shipping lanes, and its set-up can pool professional resources and enhance the efficiency and professionalism of judicial settlement. In terms of composition, judges with expertise in multiple fields, such as Arctic law, the environment and shipping, can be included to ensure the scientific and impartial nature of the decisions. At the same time, the Arctic Special Chamber should tailor its design in terms of jurisdiction, trial procedures, etc. in accordance with the special circumstances of the Arctic region, so as to better adapt to the complexity of legal disputes over Arctic shipping lanes. The establishment of the "prior compliance review" system, which requires coastal states to submit their legislation to the Arctic Council's Legal Committee for review before enacting legislation related to Arctic shipping lanes, can avoid legal conflicts at the source of legislation, and the Arctic Council's Legal Committee, which is comprised of legal experts from member states, is broadly representative. By reviewing the legislative proposals of the coastal States, it is possible to assess the international law of the sea, the rules of regional governance and the balance of interests of each country from a variety of perspectives to ensure that newly enacted laws are in line with the overall legal order and development needs of the Arctic region and to reduce the number of legal disputes arising from the conflict between domestic

legislation and international norms.

3.2 Systemic Innovations in the Methods of Treaty Interpretation

Constructing a "three-level progressive interpretation framework", i.e., providing systematic rules to resolve disputes over the interpretation of treaties related to Arctic shipping lanes, and conducting in-depth interpretation of treaty provisions from the original meaning of the text, the background of contracting to the actual needs. At the level of textual intent, the original legislative intent of the treaty is determined by analysing the literal meaning and grammatical structure of the treaty text. For example, the provisions of UNCLOS concerning the "ice-covered area" are clearly defined in terms of the textual intent of the treaty, including its basic definition, scope of application, etc., and its content is also clearly specified. At the level of treaty-making background, the international political, economic, environmental and other background factors at the time of the signing of the treaty are examined to understand the considerations of the treaty makers by the contracting parties. Taking the treaty related to Arctic shipping lanes as an example, understanding the degree of development of the Arctic region at that time, the interests and demands of various countries, and the overall understanding of the international community on Arctic governance will help to more accurately grasp the connotation of the provisions of the treaty. At the level of practical needs, the treaty should be clarified in the light of the current environmental changes, shipping development and resource exploitation in the Arctic region, so as to keep abreast of the times. For example, with the average annual volume of navigation in the Arctic shipping lanes increasing by 420 per cent from 2010 to 2020, this significant change in reality should be included in the evolutionary interpretation of the relevant treaty, so as to adapt to the increasingly important international shipping status of the Arctic shipping lanes and balance the interests of all countries in terms of the use, management and protection of the shipping lanes, and so on.

3.3 Normative Integration of Hybrid Governance Models

The creation of a "three-stage coordination mechanism". At the global level, the BBNJ Agreement sets environmental benchmarks and provides a global basic standard for environmental protection in the Arctic shipping lanes, ensuring that the ecological environment of the Arctic region is in harmony with the goals of the global protection of marine ecology, which is an environmental protection benchmark with a global scope. At the regional level, the Arctic Council, with its in-depth understanding of the Arctic region and long-term governance experience, has formulated navigation standards to regulate the order of shipping in Arctic shipping lanes in order to ensure the safety of navigation. At the bilateral level, the Sino-Russian "Silk Road on Ice" agreement can be used to pilot innovative modes and rules of co-operation between the two countries and to explore special rules and regulations in the areas of joint scientific research, resource development, and waterway construction, according to the needs and actual situation of the two countries' co-operation in the Arctic region. Through this three-stage global, regional and bilateral coordination, the organic integration of governance norms at different levels can be realised, and an Arctic legal database can be established, integrating 87 relevant

treaties and 212 domestic regulations to provide comprehensive and systematic legal information support for Arctic waterway governance. The database should have a convenient search function, and be able to be classified and queried according to different legal fields, countries, treaty types, etc. Meanwhile, the database should be updated in real time to ensure the timeliness of the information. Through the establishment of an Arctic legal database, countries and relevant subjects of interest can have a clearer understanding of the legal system in the Arctic region and avoid legal conflicts arising from the lack of transparency of legal information and the promotion of the uniform implementation and coordinated development of norms for the governance of the Arctic waterways.

4. A Normative Response to China's Participation in Arctic Governance

4.1 Strategic Use of the Right to Interpret the Law

Under the framework of the Silk Road on Ice, China can rely on the Sino-Russian joint scientific research mechanism in the Arctic (the Sino-Russian Arctic Joint Scientific Research Framework Agreement was signed in 2016), and innovatively construct a "special system for scientific research navigation". The system can refer to the right to scientific research granted by Article 238 of the United Nations Convention on the Law of the Sea (UNCLOS), and combine it with the practical experience of China's Arctic Scientific Expedition Management Provisions (2017), to clarify that scientific research vessels enjoy special rights such as the right of preferential passage and exemption for data collection in Arctic shipping lanes. Specifically, China can push the Arctic Council to adopt the Special Protocol on Scientific Research Navigation, which stipulates that research vessels participating in the construction of the "Silk Road on Ice" can be exempted from the mandatory pilotage service of coastal countries (as required by Article 21 of Russia's Navigation Rules for the Northern Sea Route) after completing the filing procedure with the Arctic Council, but are required to share real-time hydrometeorological data. With the 3.2 petabytes (PB) of ice data obtained from the 12 Arctic expeditions of Xuelong 2 in 2019-2023, China has established the world's most complete database on Arctic ice conditions, which provides an empirical basis for breaking through the ship access standards set by Article 12 of Canada's Arctic Water Pollution Prevention and Control Act (AWPPCA). It is noteworthy that the practice of interpreting Article 5 of the Norwegian Treaty of Svalbard, which grants the States Parties the right to freedom of scientific research, provides an extraterritorial legal reference for China to build a "special regime for scientific research voyages".

4.2 Proactive Construction of Normative Authority

China should promote the revision of the Polar Code through the International Maritime Organisation (IMO) and establish a "dynamic ice classification system". The system can draw on the ICE-1 to ICE-5 ice standards developed by Finland's Aker Arctic, combined with the real-time ice monitoring data of the Beidou satellite navigation system (with an accuracy of up to 0.5 metres in 2023), to classify Arctic shipping lanes into a dynamically updated five-level ice zone. The specific implementation plan includes submitting the Technical Guidelines for Dynamic Classification of Ice Areas for Polar Vessels

at the 107th IMO MSC (2024), suggesting the conversion of the traditional fixed ice levels (e.g., PC1-PC7) into a dynamic classification system based on real-time ice thickness data (D-ICE1 to D-ICE5). At the same time, based on the "Arctic Digital Waterway" project led by China (data from 46 research vessels from 17 countries have been accessed), the world's first dynamic ice sharing platform for Arctic waterways should be constructed. Referring to the experience of the Norwegian-led "Arctic Black Carbon Emission Reduction Guidelines" (2021), China, together with Russia, can formulate the "Arctic LNG Vessel Safety Code" by 2025, focusing on the breakthrough of the quantitative index system for the ice-breaking capacity of LNG carriers in Arctic shipping lanes (Arc7) and environmental protection standards (sulphide emission <0.1%).

4.3 Systematic Construction of Dispute Prevention Mechanisms

To construct the "Arctic Legal Compliance Index", an assessment system with 18 core indicators should be established, specifically including: environmental compliance (30% weighting, including 6 items such as oil pollution emergency response capability and black carbon emissions), navigation safety (25% weighting, including 5 items such as ice class certification and crew qualification), protection of indigenous people's rights and interests (20% weighting, including 4 items such as application of traditional knowledge and assessment of cultural impacts), data transparency (15% weighting, including 3 items such as openness of logbooks and sharing of scientific research data), and data security (15% weighting). Transparency (15% weighting, including 3 items such as logbook disclosure rate and scientific research data sharing). The index can rely on the case base of the Arctic Dispute Resolution Centre of the Shanghai International Arbitration Court (to be established in 2022) to establish a dynamic scoring model. Pilot a "pre-compliance certification" system for major projects such as the China-Russia Yamal LNG project, which requires project parties to complete a "three-stage compliance review" through a third-party organisation accredited by the Arctic Council (e.g., DNV-GL) prior to the establishment of the project, including a basic review (in line with international law such as UNCLOS), a regional review (to meet the recommendations of the Arctic Council), and a country-specific review (to pass domestic laws such as the Arctic Environmental Protection Act of the Russian Federation). The "China-Russia Joint Cruise on the Arctic Waterway" mechanism, which will be piloted in 2023 (with a cumulative total of 12,000 nautical miles cruised), has resulted in an "Arctic Navigation Operation Manual" containing 23 key compliance points, which can be used as a template for extension to projects along the "Silk Road on Ice".

5. Concluding Remarks

The legal risks and governance challenges facing the Arctic reflect the complex intertwining of emerging geopolitics and ecological security in the context of globalisation. From the ambiguity of the United Nations Convention on the Law of the Sea to the exclusivity of regional mechanisms such as the Arctic Council, and from the dispute over the legal status of shipping lanes to the crisis of national sovereignty triggered by sea-level rise, the fragmentation of Arctic governance highlights the

limitations of the international legal system, which is deeply understood by the international community. At the same time, the development of Arctic shipping lanes, the tension between the use of resources and environmental protection, and the conflicting interests of countries both within and outside the region have made the coordination of rules even more difficult.

As a near-Arctic country and an important stakeholder in Arctic affairs, China has always adhered to the principles of "respect, cooperation, win-win situation and sustainability", deepened China-Russia Arctic cooperation through the joint construction of the "Silk Road on Ice", promoted the synergistic governance of the Arctic through the application of both soft and hard laws, contributed Chinese public products to the sustainable development of the Arctic, and actively participated in the multilateral governance of the Arctic. China will continue to improve its domestic polar legislation and enhance its Arctic scientific research and shipping capacity, relying on the concept of "community of human destiny", promote the construction of inclusive international rules, and bridge the gap between the "Icebound Region Clause" and the "Icebound Region Clause". Relying on the concept of "Community of Human Fate", China will promote the construction of inclusive international rules to bridge the differences in the application of the "Ice Clause", deepen cooperation under bilateral and multilateral platforms, balance the rights and interests of Arctic waterway development and the responsibility of ecological protection, and push forward the institutional realisation of the community of Arctic fate.

In the future, the success or failure of Arctic governance will be determined by whether the zero-sum game mentality can be transcended and whether the sharing of rights and responsibilities in the Arctic can be realised under the scientific consensus and legal framework. China should actively participate in the formulation of Arctic laws and rules, promote the formation of a stable and flexible Arctic governance paradigm, and provide Oriental wisdom for the peaceful use of the Arctic and the benign evolution of the global maritime order.

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