
SHARED SOVEREIGNTY IN PRACTICE: AN INTERNATIONAL LAW PERSPECTIVE ON JOINT CONTROL OF NATURAL RESOURCES

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ABSTRACT

In an increasingly interdependent world, natural resources such as river basins, migratory fish stocks, and polar ecosystems often transcend political boundaries, making unilateral control both impractical and unsustainable. This study analyses how international legal frameworks have responded to this reality by developing mechanisms for cooperative governance that balance national sovereignty with shared responsibility. This paper examines the concept of joint national control over natural resources in international law, with a specific focus on four critical areas of transboundary governance: water sharing, fisheries management, environmental protection, and Antarctic cooperation.

Drawing on a comparative analysis of key treaties, legal instruments, and institutional practices, the paper explores case studies such as the Nile River dispute and the Paraná River model of hydroelectric cooperation, highlighting the divergent paths of conflict and collaboration in water resource management. In the realm of fisheries, it assesses the regulatory role of commissions like the International Whaling Commission and the International Pacific Halibut Commission in sustaining marine biodiversity. Environmental protection is addressed through the lens of marine pollution regulation under the London Convention and its 1996 Protocol, particularly in relation to carbon capture and storage initiatives such as the Northern Lights Project. Finally, the Antarctic Treaty System is examined as a unique model of collaborative sovereignty, where territorial claims are set aside in favor of peaceful scientific cooperation and environmental stewardship.

The findings underscore that while joint national control frameworks have evolved significantly, their effectiveness is contingent upon legal adaptability, political commitment, and institutional capacity. Despite challenges of enforcement and compliance, the paper argues that joint control remains a viable and increasingly necessary approach to governing natural resources that span or lie beyond national jurisdictions. It contributes to the broader discourse on international environmental law by advocating for strengthened cooperative legal regimes to address the global commons.

I. INTRODUCTION

Natural resource, any biological, mineral, or aesthetic asset afforded by nature without human intervention that can be used for some form of benefit, whether material (economic) or immaterial.¹

According to WTO “Natural resources are “stocks of materials that exist in the natural environment that are both scarce and economically useful in production or consumption, either in their raw state or after a minimal amount of processing”. most natural resources share a number of important characteristics, including uneven distribution across countries, exhaustibility, externalities (market failures in the form of unpriced effects resulting from consumption and/or production), dominance in output and trade, and price volatility”.²

The nature of many natural resources, particularly those that are mobile or span large geographical areas, often defies the concept of sovereign boundaries. For instance, migratory fish stocks, transboundary water bodies, and atmospheric resources do not conform to political borders. This transboundary nature of many natural resources necessitates international cooperation and joint management approaches.

Typically, a nation's sovereignty allows control over resources within its territory and jurisdiction, thereby creating an equivalent to national ownership. This sovereignty principle, however, is limited beyond national borders and must balance the claims of other nations. In essence, sovereignty, territory, and property rules have evolved as social tools to manage competing claims and adapt with societal changes.

The concept of joint national control emerged as a response to these challenges, representing a shift from traditional sovereignty-based resource management to collaborative governance frameworks. This approach recognizes that effective resource allocation and management often require international cooperation, particularly when resources traverse political boundaries or exist in shared spaces. The principle of joint control is fundamentally linked to the concept of resource allocation, as it provides mechanisms for equitable distribution and sustainable

¹ 'Natural Resource' (Britannica) <https://www.britannica.com/science/natural-resource> accessed 15 October 2024.

² World Trade Organization, 'World Trade Report 2010: Trade in Natural Resources' (2010) https://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report10_e.pdf accessed 15 October 2024.

management of shared resources.³

International frameworks have evolved to facilitate this collaborative approach, exemplified by conventions such as the UN Convention on the Law of the Sea (1982)⁴, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)⁵, and the Antarctic Treaty System⁶. These agreements demonstrate the global commitment to managing shared resources through cooperative mechanisms rather than unilateral action.

II. ASPECTS OF JOINT CONTROL

Richard B. Bilder, in his article titled 'International Law and Natural Resources Policies'⁷ discusses in detail the frameworks for controlling and accessing natural resources, dictating which nations may "own" or manage specific resources. Bilder divides these frameworks into 4 broad categories recognizing 4 ways of resource allocation namely: sources among the nations of the world. Possible rules include recognizing (1) national control over natural resources; (2) common access to natural resources; (3) joint national control of resources; and (4) international ownership and control of resources. Within the 3rd aspect of 'joint national control of resources, the key aspect is 'equitable utilization'. Such a framework can be seen in riparian states sharing water (water sharing), fisheries, environmental protection and areas on no sovereign claim such as Antarctica. These 4 aspects, namely - water sharing, fisheries management, environmental protection and Antarctica cooperation have been taken as a base upon which the present paper is built.

III. WATER SHARING

Water resources shared by multiple nations are often a source of tension and conflict. However, cooperation in managing such resources can also foster peaceful relations, economic development, and regional stability. This chapter explores two key cases: the Nile River

³ United Nations Environment Programme, 'Global Environment Outlook 6' (UNEP 2019) <https://www.unep.org/resources/global-environment-outlook-6>

⁴ United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

⁵ Convention on the Protection and Use of Transboundary Watercourses and International Lakes (adopted 17 March 1992, entered into force 6 October 1996) 1936 UNTS 269 <https://unece.org/environment-policy/water/about-the-convention/introduction>

⁶ Antarctic Treaty (signed 1 December 1959, entered into force 23 June 1961) 402 UNTS 71 <https://www.ats.aq/e/antarctic treaty.html>

⁷ Richard B. Bilder, 'International Law and Natural Resources Policies' (1980) 20 Natural Resources Journal 451-486 <http://www.jstor.com/stable/2488219> accessed 10th October 2024.

conflict between Egypt and Ethiopia, and the cooperation over the Paraná River between Brazil and Paraguay. While one demonstrates a conflict scenario the other reflects cooperation.

1. The Nile River Conflict

1.1. Historical Background

The Nile River, the lifeblood of several African nations, has long been a source of contention, particularly between Egypt and its upstream neighbors. Egypt's dependence on the Nile for over 90% of its freshwater makes it particularly vulnerable to any actions taken by riparian states that may affect its access to water. The roots of the conflict trace back to 1929, during the colonial era, when Egypt secured a favorable allocation of the Nile's waters under an agreement reaffirmed in 1959. This agreement granted Egypt the majority of the water for its use while Sudan received a smaller share, and the other nine basin countries were excluded from the arrangement. Furthermore, Egypt was given the exclusive right to develop projects along the Nile, with other countries requiring Egypt's permission for any such developments.

1.2. Nile Basin Initiative and the Entebbe Agreement

In 1999, the Nile Basin Initiative (NBI) was formed with the aim of creating a more equitable distribution of the Nile's water among all the basin countries. However, dissatisfaction with the slow progress led to the 2010 signing of the Entebbe Agreement by Ethiopia, Rwanda, Uganda, Kenya, Tanzania, and Burundi. This agreement allows these countries to undertake water projects, including dam construction, without needing Egypt's consent, effectively breaking the colonial-era monopoly. Egypt and Sudan opposed this agreement, fearing it would reduce their share of the Nile's water.

1.3. The GERD Dispute

Ethiopia's construction of the Grand Ethiopian Renaissance Dam (GERD) further escalated tensions. GERD, a \$4.7 billion project aimed at generating 6,000 MW of electricity, has the potential to make Ethiopia a net exporter of electricity. However, the dam, which draws water from the Blue Nile, threatens to reduce the flow of water to Egypt and Sudan, raising concerns about the evaporation of billions of cubic meters of water and the subsequent impact on Egypt's agricultural and industrial sectors.

In response to these concerns, diplomatic tensions escalated.

1.4. Path Towards Cooperation

Despite these conflicts, some steps toward cooperation have been made. In 2015, Egypt, Ethiopia, and Sudan signed a preliminary agreement in Khartoum that acknowledged Ethiopia's right to construct the dam while ensuring that Sudan's and Egypt's water supplies would not be severely harmed. Although the agreement marked a significant step towards diplomacy, lingering concerns about the filling of the dam's reservoir and water allocation remain. The fragile cooperation was tested again in 2015 when disputes between Sudan and Egypt over water usage caused a breakdown in negotiations.

2. The Paraná River: A Model of Cooperation

2.1. Background

In contrast to the Nile, the Paraná River presents a case of successful cooperation between riparian states. The Paraná River, which flows from Brazil through Paraguay and into Argentina, is linked to the Guaraní Aquifer, one of the largest freshwater reserves in the world. This river plays a crucial role in supplying water to the most industrialized regions of South America, making it a valuable resource for all the countries it traverses.

The Itaipu Agreement, established in 1966, formalized the cooperation between Brazil and Paraguay for the exploitation of hydroelectric power, and this collaboration was further solidified by the Itaipu Treaty of 1973⁸. In the same year, Argentina joined the initiative by signing the Treaty of Yacyretá⁹ with Paraguay. These treaties marked the inception of two significant hydroelectric projects: the Itaipu and Yacyretá dams. Following the establishment of these agreements, numerous bilateral and multilateral accords concerning the management of the watershed and its tributaries were signed from the 1970s onward, reflecting a growing commitment to collaborative resource management in the region.

⁸ Treaty Between Brazil and Paraguay concerning the Hydroelectric Utilization of the Paraná River (Itaipu Treaty) (signed 26 April 1973, entered into force 21 March 1974) 923 UNTS 3.

⁹ Treaty Between the Republic of Paraguay and the Federative Republic of Brazil concerning the Yacyretá Hydroelectric Power Station (signed 26 April 1973, entered into force 13 August 1973) 923 UNTS 3.

2.2. The Itaipú Dam: A Cooperative Achievement

One of the most notable cooperative projects on the Paraná is the Itaipú Dam, the second-largest dam in the world and a binational project between Brazil and Paraguay. The Itaipú Dam, which produces around 90 million MWh annually, was the result of complex negotiations beginning in 1972 over border disputes between the two nations. The negotiations culminated in the decision to flood the contested areas and build a hydroelectric dam. Argentina, concerned about downstream flow reductions, joined the discussions, resulting in a three-way agreement in 1979¹⁰.

Since becoming fully operational in 1984, the Itaipú Dam has significantly contributed to the energy needs of both Brazil and Paraguay, supplying over 16% of Brazil's total energy consumption and 75% of Paraguay's. Although environmental concerns arose due to the project, the Itaipú Binational Entity has taken active steps to mitigate its environmental impact, including reforestation efforts and water quality preservation initiatives.

2.3. Conflict^{11 12}

The conflict surrounding the Paraná River escalated in early 2023 when Argentina imposed a toll for the use of a segment of the waterway, generating significant tension between Argentina and Paraguay. Paraguay challenged the toll, arguing it contravened the established legislative framework governing the waterway and hindered free navigation. Conversely, Argentina defended its toll, asserting that maintenance work justified the charges as per the same regulations referenced by Paraguay.

The crux of the dispute hinged on the legality of the toll. Argentina's General Ports Administration convened a public hearing in November 2022, proposing a toll of US\$1.47 per tonne for international traffic and AR\$1.47 for Argentine vessels. Paraguayan representatives vehemently opposed this toll, leading to its implementation on January 1, 2023, followed by invoicing primarily aimed at Paraguayan logistics firms. The toll, which constituted

¹⁰ Tripartite Agreement between Argentina, Brazil, and Paraguay concerning the Itaipu Hydroelectric Power Station (signed 19 October 1979) 923 UNTS 3.

¹¹ Salvador Lescano, 'Paraguay-Paraná Waterway Controversy' (NACLA, 2024) <https://nacla.org/paraguay-parana-waterway-controversy> accessed 15 October 2024.

¹² 'Argentina and Paraguay Reach Truce in Waterway Dispute' (Buenos Aires Herald, 2024) <https://buenosairesherald.com/business/argentina-and-paraguay-reach-truce-in-waterway-dispute> accessed 15 October 2024.

approximately 1% of the total transport cost, resulted in a series of legal disputes, including the detention of Paraguayan vessels for non-payment.

2.4. Developments

Tensions reached a peak after an August meeting between Argentine Economy Minister Sergio Massa and Paraguayan officials, where a mutual understanding regarding tolls seemed to have been reached. However, following the meeting, Argentina publicly reaffirmed its intention to maintain the toll, leading to contradictory narratives and escalating hostilities. Paraguay responded to this perceived breach of agreement by unilaterally opening the Yacyretá dam's floodgates, negatively impacting Argentina's power supply. Furthermore, the situation deteriorated as customs disputes arose at the border, with Argentine authorities detaining fuel trucks from Paraguay, exacerbating the already fraught relationship.

2.5. Cooperation

Despite the conflict, diplomatic efforts led to a temporary truce on September 27, 2023, following negotiations at the Brazilian embassy in Buenos Aires. Officials from Brazil, Argentina, Bolivia, Paraguay, and Uruguay signed an agreement acknowledging that while toll collection would continue, Argentina would refrain from initiating legal actions for late payments for a period of 60 days. During this time, the parties committed to establishing a technical committee to evaluate the toll rates, indicating a willingness to cooperate and resolve disputes amicably.

2.6. Conclusion

The Paraná River conflict exemplifies the complexities of regional resource management and the interplay between national interests. While the imposition of tolls triggered significant tensions, the subsequent negotiations underscore the potential for cooperation among nations sharing common resources. Future efforts should focus on fostering dialogue and establishing equitable frameworks for resource utilization, thus promoting stability and collaboration in the region.

The governance framework for the Paraná River Basin is characterized by a complex array of bilateral and multilateral legal instruments, supported by various Commissions that form the institutional foundation of this regime. This governance system is primarily based on treaties

and institutions associated with the Paraná River and its tributaries, as well as the Guarani Aquifer Agreement. Notably, none of the countries sharing the Paraná River Basin have ratified the United Nations Watercourses Convention, which could offer a standardized set of rules to address potential conflicts between nations. The fragmented nature of the governance system raises the possibility of normative conflicts; however, significant disputes have not arisen in the management of the Paraná River and its tributaries. Existing tensions are primarily linked to the implementation of energy-related treaties that govern the distribution of revenues from hydropower projects within the basin.¹³

3. Analysis

The cases of the Nile and Paraná rivers illustrate two distinct approaches to managing shared water resources: conflict versus cooperation. The Nile River remains a source of tension, as Egypt and Ethiopia struggle to reconcile their respective interests in water security and economic development. On the other hand, the Paraná River showcases the benefits of cooperative management, where shared control of natural resources has led to significant economic gains and strengthened diplomatic relations.

Water, while often a source of conflict, holds the potential to bring nations together through cooperation. The experiences of these regions underscore the importance of international legal frameworks, diplomacy, and joint institutions in resolving disputes and ensuring equitable access to shared resources. Through constructive dialogue and collaboration, countries can transform shared challenges into opportunities for peace and development.

IV. FISHERIES

1. International Whaling Commission (IWC)

The International Whaling Commission (IWC) is an intergovernmental organization established in 1946 under the International Convention for the Regulation of Whaling (ICRW).¹⁴ Its primary goals are to ensure the conservation of whale stocks and to facilitate the

¹³ Alejandro Pastori and Francesco Sindico, 'Transboundary Cooperation' in *[Title of the Book]* (Routledge, 2020) <https://www.taylorfrancis.com/chapters/edit/10.4324/9780429317729-8/transboundary-cooperation-alejandro-pastori-francesco-sindico> accessed 15 October 2024.

¹⁴ International Convention for the Regulation of Whaling (adopted 2 December 1946, entered into force 10 November 1948) 161 UNTS 72

orderly development of the whaling industry. Initially formed by 15 member countries, the IWC has expanded to include over 70 nations today¹⁵.

The IWC was created in response to the significant decline in whale populations due to commercial whaling practices. In its early years, the organization struggled to regulate whaling effectively, leading to severe overexploitation. By the late 1960s, as environmental awareness grew, many former whaling nations shifted towards conservation efforts. This culminated in a global moratorium on commercial whaling adopted in 1982, which took effect in 1986¹⁶.

1.1. Key Responsibilities

- *Conservation Management:* IWC designates whale sanctuaries and sets catch limits for various species.
- *Scientific Research:* It regulates scientific research whaling, allowing countries to take whales for research under specific permits.
- *Aboriginal Subsistence Whaling:* IWC also oversees subsistence whaling conducted by indigenous communities, which is not subject to the moratorium.

1.2. Current Challenges

Despite the moratorium, some countries continue commercial whaling under various exemptions. For instance:

- Norway officially objected to the moratorium and continues minke whale hunting.
- Iceland rejoined the IWC with a reservation that allows it to conduct commercial whaling.
- Japan has been known to exploit a loophole permitting "scientific research" whaling, which has drawn significant international criticism.

¹⁵ Greenpeace, "International Whaling Commission," accessed October 14, 2024, <https://www.greenpeace.org/usa/oceans/save-the-whales/international-whaling-commission/>.

¹⁶ Encyclopaedia Britannica, "International Whaling Commission," accessed October 14, 2024, <https://www.britannica.com/topic/International-Whaling-Commission>.

1.3. Recent Developments

In recent years, tensions have arisen within the IWC regarding its effectiveness and direction. The Florianópolis Declaration in 2018 emphasized conservation goals, prompting Japan to withdraw from the IWC and resume commercial hunting¹⁷. In its withdrawal statement Japan clearly cited 'well-documented' disagreements as the reason for withdrawal.¹⁸ This split between nations continues to challenge the Commission's ability to enforce meaningful conservation measures.

2. International Pacific Halibut Commission (IPHC)

The International Pacific Halibut Commission (IPHC) is an international fisheries organization established to manage the stocks of Pacific Halibut (*Hippoglossus stenolepis*) in the North Pacific Ocean. Formed by an international treaty on March 2, 1929, the IPHC includes Canada and the United States as its member states. The treaty has undergone several revisions, notably in 1953, 1976, and 1979, with the latter clarifying the Commission's role in fishery management through the North Pacific Halibut Act of 1982.¹⁹

2.1. Functions and Activities

The IPHC conducts various activities aimed at ensuring sustainable halibut populations. These include:

- *Stock Assessment*: Utilizing chartered commercial fishing vessels for bottom trawls and long-lining to sample fish stocks.
- *Research*: Conducting studies on fish age by removing otoliths and recording environmental data such as water temperatures.
- *Regulatory Meetings*: Holding annual meetings to discuss management strategies and scientific findings.

¹⁷ International Whaling Commission, "International Whaling Commission," accessed October 14, 2024, <https://iwc.int/en/>.

¹⁸ <https://iwc.int/resources/media-resources/news/statement-on-government-of-japan-withdrawal>

¹⁹ North Pacific Halibut Act of 1982 (Public Law 97-176, 96 Stat 80) (USA).

The IPHC plays a crucial role in maintaining the balance between fishery interests and environmental sustainability. Its research and regulatory framework aim to provide positive economic, environmental, and social outcomes for Pacific halibut resources.

2.2. Recent Developments

The International Pacific Halibut Commission (IPHC) has released a report²⁰ detailing the findings and recommendations from the 2024 Stock Assessment and Research Board (SRB025) meeting. This report underscores the critical need for ongoing research and data collection to support the sustainable management of Pacific halibut stocks. It provides an overview of the current status of the halibut population, highlighting fluctuations in biomass and recruitment levels that are influenced by environmental factors and fishing pressures. The SRB025 meeting emphasized the necessity for adaptive management strategies that utilize the latest scientific data to address uncertainties in stock assessments and bolster the resilience of halibut populations.

Key recommendations include enhancing monitoring programs, fostering collaboration among stakeholders, and investing in research initiatives that examine the effects of climate variability on halibut stocks. The report concludes with a strong call for a sustained commitment to sustainable fisheries management practices to ensure the long-term viability of Pacific halibut and the communities that rely on this essential resource.

3. Great Lakes Fishery Commission

The Great Lakes Fishery Commission (GLFC) is a bi-national organization established to manage and protect the fishery resources of the Great Lakes, which are shared by the United States and Canada.²¹ Formed under the Convention on Great Lakes Fisheries, concluded in 1954 and ratified in 1955, the Commission plays a crucial role in coordinating research, managing fisheries, and controlling invasive species, particularly the sea lamprey.

²⁰ International Pacific Halibut Commission, *Report of the 25th Session of the IPHC Scientific Review Board* (26 September 2024) <https://www.iphc.int/uploads/2024/09/IPHC-2024-SRB025-R-Report-of-the-SRB025.pdf> accessed 20 October 2024.

²¹ Convention on Great Lakes Fisheries between the United States and Canada (signed 10 September 1954, entered into force 11 October 1955) 6 UST 2836

Structure and Membership

The GLFC consists of eight members: four appointed by the President of the United States and four by the Privy Council of Canada. Each member serves a six-year term. The Commission's primary responsibilities include:

- Conducting scientific research on fish populations.
- Making recommendations for sustainable fishery management.
- Implementing measures to control invasive species, notably the sea lamprey, which poses a significant threat to native fish populations.

3.1. Invasive Species Management

The sea lamprey, an invasive parasitic species, has severely impacted fish stocks in the Great Lakes since its introduction. The GLFC has developed strategies to control this species, including the use of a lampricide known as TFM, which targets sea lampreys while minimizing harm to other aquatic life. The Commission collaborates with various agencies, including Fisheries and Oceans Canada and the U.S. Fish and Wildlife Service, to enhance control efforts.

3.2. Recent Developments

In recent years, there has been an increase in funding from both governments aimed at bolstering sea lamprey control programs. This funding supports initiatives to restore ecosystems and enhance fish populations affected by invasive species. With the signing of the recent federal spending bill, the Great Lakes Fishery Commission (GLFC) expects to receive a \$7 million increase in its annual budget. The increase in funding will allow the Commission to invest needed dollars into crumbling sea-lamprey control infrastructure, devote more resources to science for fishery restoration and provide \$1.8 million to help “Restore the Rapids” in Grand Rapids while ensuring sea lamprey protection is a top priority.²² Canada has

²² Grand Rapids Whitewater, ‘Grand River Restoration Project Sees a Boost in Federal Funding for Sea Lamprey Control’ (2024) <https://grandrapidswhitewater.org/grand-river-restoration-project-sees-a-boost-in-federal-funding-for-sea-lamprey-control/> accessed 15 October 2024.

committed to increasing its investment in the Sea Lamprey Control Program by \$8.7 million over five years, with an annual increase of \$2.5 million.²³

V. JOINT CONTROL IN ENVIRONMENTAL PROTECTION

International pollution control has evolved through various collaborative frameworks, demonstrating the principle of joint national control. The foundation of this approach was established through the Trail Smelter Arbitration (1941)²⁴, which established the fundamental principle that no state has the right to use or permit the use of its territory in such a manner as to cause injury to the territory of another state.

The principle of joint national control has been particularly evident in addressing climate change. The Paris Agreement (2015)²⁵ represents a landmark achievement in collaborative pollution control, establishing nationally determined contributions (NDCs) within a framework of mutual accountability and transparent reporting²⁶. This agreement demonstrates how nations can maintain sovereignty while participating in coordinated international action against pollution

Marine pollution control provides another significant example of joint national control, particularly through the United Nations Convention on the Law of the Sea (UNCLOS). Article 194 of UNCLOS²⁷ specifically requires states to take measures "to prevent, reduce and control pollution of the marine environment from any source," emphasizing the need for collaborative action⁶. The Regional Seas Programme²⁸, initiated by UNEP in 1974, has further facilitated joint action through regional frameworks for addressing marine pollution. One such convention of importance which has garnered attention recently is the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter²⁹, also known as the London

²³ Government of Canada, 'Canada Increases Investment in Sea Lamprey Control Program' (April 2018) <https://www.canada.ca/en/fisheries-oceans/news/2018/04/canada-increases-investment-in-sea-lamprey-control-program.html> accessed 15 October 2024.

²⁴ Trail Smelter Arbitration (United States v Canada) [1941] 3 RIAA 1905

²⁵ Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNFCCC, FCCC/CP/2015/10/Add.1.

²⁶ Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNFCCC Dec 1/CP.21

²⁷ United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3.

²⁸ UNEP, 'Regional Seas Programme: Protecting the Ocean's Future' (2016) UNEP Annual Report 45

²⁹ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 29 December 1972, entered into force 30 August 1975) 1046 UNTS 120.

Convention. This convention and related recent developments have been discussed in particular below.

1. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter³⁰

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter³¹, entered into at London on 19th November 1972 by 15 parties, aims to protect the marine environment and its living organisms, which are essential for human survival. The contracting parties recognize the importance of managing marine resources sustainably and ensuring that activities within their jurisdiction do not harm the environment of other states or areas beyond national jurisdiction. The Convention emphasizes the need for international cooperation in controlling marine pollution, particularly from dumping, while acknowledging that pollution can arise from various sources.

Both the London Convention and its Protocol provide the global rules and standards regarding dumping, as mandated by Article 210.6 of the UN Convention on the Law of the Sea (1982)³². It is also instrumental in Development of guidance under the Protocol that complements the advice formulated under other agreements, such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)³³, the International Convention for the Prevention of Pollution from Ships (MARPOL)³⁴, the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (1995), and the UNEP Regional Seas Programme.³⁵

³⁰ Ibid

³¹ Ibid

³² Ibid 34

³³ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (adopted 22 March 1989, entered into force 5 May 1992) 1673 UNTS 126.

³⁴ International Convention for the Prevention of Pollution from Ships (MARPOL) (adopted 2 November 1973, entered into force 2 October 1983) 1340 UNTS 62.

³⁵ International Maritime Organization, 'London Convention and Protocol: Their Role and Contribution to Protection of the Marine Environment' (2012)

<https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/22780LDC%20Leaflet%20with%20ut%2040%20Anniv%20logo2012Web1.pdf> accessed 15 October 2024.

1.1. Brief overview of the Convention³⁶:

The convention consists of 22 articles followed by 3 annexes. The convention was entered into by recalling resolution 2749(XXV) of the General Assembly of the United Nations³⁷ on the principles governing the sea-bed and the ocean floor and the subsoil thereof, beyond the limits of national jurisdiction.

The Convention aims to control marine pollution from waste dumping, obligating parties to take measures that prevent harm to human health, marine life, and the lawful uses of the sea, in accordance with their capacities (Articles I and II)³⁸. "Dumping" is defined as the intentional disposal of waste at sea, with specific exemptions for operational waste. Provisions prohibit dumping materials listed in Annex I, require a special permit for Annex II materials, and mandate a general permit for all others (Articles III and IV³⁹). In emergencies, dumping bans may be lifted if minimal environmental impact is ensured and reported, and each party must designate authorities for permits, record-keeping, and monitoring (Articles V-VII).

The Convention fosters regional cooperation and support from international organizations for waste management, training, and equipment provisions, while also setting up mechanisms to address liability and resolve disputes over dumping-related environmental harm (Articles VIII-X⁴⁰). Amendments require a two-thirds majority, and the Convention is enacted 30 days post-ratification, with withdrawal provisions available to parties (Articles XV, XIX, XXI)⁴¹.

The annexes provide detailed lists of prohibited materials, those requiring special permits, and guidelines for issuing permits. Annex I lists substances that are strictly prohibited from being dumped, such as organohalogen compounds, mercury, and radioactive wastes. Annex II identifies materials requiring special care, such as wastes containing significant amounts of certain heavy metals and bulky wastes that may obstruct fishing or navigation. Annex III outlines criteria for assessing the environmental impact of dumping and establishes procedures for determining permit issuance, emphasizing the need for an adequate scientific basis to

³⁶ CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER

<<https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf>>

³⁷ UNGA Res 2749 (1970) A/RES/2749(XXV) (17 December 1970) Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction.

³⁸ Ibid 43

³⁹ Ibid 43

⁴⁰ Ibid 43

⁴¹ Ibid 43

evaluate the consequences of dumping (Annex III⁴²). These annexes are crucial for ensuring that the Convention's objectives are met through specific, actionable guidelines.

2. The London Protocol ⁴³

2.1. Introduction

The London Protocol (1996), a key international convention under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972), was initially aimed at prohibiting the disposal of waste at sea. In 1996, the "London Protocol" was agreed to further modernize the Convention and, eventually, replace it. Under the Protocol, all dumping is prohibited, except for possibly acceptable wastes on the so-called "reverse list". The London Protocol entered into force on 24 March 2006.⁴⁴ As the need for a transition to a low-carbon economy became more urgent, amendments were made to adapt its framework for environmental stewardship to modern decarbonization efforts. Notably, in 2006 and 2009, amendments were introduced to facilitate the safe sequestration of CO₂ in sub-seabed geological formations and enable the cross-border transportation of CO₂ to support carbon capture and storage (CCS) initiatives.

The *Northern Lights Project* is one of the first ventures to capitalize on this evolving legal framework, showcasing how international cooperation and open-source infrastructure can address the legal and logistical challenges of cross-border CCS operations.

2.2. Summary of the Protocol⁴⁵

The 1996 Protocol emphasizes the urgent need to protect the marine environment and promote sustainable use and conservation of marine resources. It acknowledges the achievements made under the 1972 Convention and highlights the importance of precautionary and preventive

⁴² Ibid 43

⁴³ London Protocol on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 7 November 1996, entered into force 24 March 2006) 2041 UNTS 71.

⁴⁴ International Maritime Organization, 'London Convention and Protocol' (2024) <https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/London-Convention-Protocol.aspx> accessed 15 October 2024.

⁴⁵ International Maritime Organization, 'Protocol Amended 2006 to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972' (2006) <https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf> accessed 15 October 2024.

approaches to marine pollution. The Protocol encourages regional and national measures that may be more stringent than international standards, recognizing the unique circumstances of developing states, particularly small island developing states.

The 1996 Protocol allows stricter national or regional standards, especially for developing and small island states, and commits to immediate international action to control pollution from dumping to protect marine ecosystems for future generations (Preamble, Articles 2, 3)⁴⁶. Key terms like "dumping" and "permit" are defined, with a framework requiring Parties to take effective steps to prevent, reduce, and eliminate pollution at sea and to follow a precautionary approach, acting to prevent harm even without conclusive evidence (Article 1, Articles 2, 3)⁴⁷.

The Protocol restricts dumping to certain listed materials requiring a permit and bans sea incineration and waste export for disposal. Parties must also issue permits, track records, and enforce compliance, promoting collaboration to apply Protocol standards effectively (Articles 4-12)⁴⁸. Liability procedures for environmental damage and dispute resolution mechanisms, including arbitration, are established (Articles 15, 16). The Protocol includes amendment and withdrawal procedures, defines the roles of the administering Organization, and incorporates annexes detailing waste types allowed for dumping and relevant assessment criteria (Articles 21-25, 19)⁴⁹.

2.3. Amendments to the London Protocol: Addressing CO2 Transportation

The London Protocol (LP) stands as the most advanced international regulatory framework addressing carbon capture and sequestration (CCS) in sub-seabed geological formations and marine geoengineering.

In 2006, the Contracting Parties to the LP adopted amendments aimed at regulating CCS in sub-seabed geological formations for the purpose of permanent isolation. This practice is primarily applicable to significant point sources of CO₂ emissions, such as power plants and cement manufacturing facilities, while explicitly excluding the utilization of CO₂ waste streams for enhanced oil recovery. The Intergovernmental Panel on Climate Change (IPCC)

⁴⁶ Ibid 50

⁴⁷ Ibid 50

⁴⁸ Ibid 50

⁴⁹ Ibid 50

recognizes CCS as one of the viable short-term technological options for mitigating net CO₂ emissions to the atmosphere.

The **2009 amendment**⁵⁰ to the London Protocol was a pivotal step towards removing barriers to the international deployment of CCS technologies. Before this amendment, Article 6⁵¹ of the Protocol prohibited the export of CO₂ from one contracting party to another for sub-seabed geological storage. However, with the pressing need to mitigate climate change, the amendment was designed to permit cross-border transportation of CO₂, thus supporting landlocked regions in accessing offshore storage facilities.

The 2009 amendment plays a critical role in facilitating global decarbonization efforts. The Protocol's framework supports the safe and secure storage of CO₂ in geologic formations beneath the seabed, offering a viable solution for carbon sequestration. Additionally, the Protocol opens the door for landlocked countries to participate in CCS activities by transporting CO₂ to offshore storage sites.

Although the amendment was passed, it requires ratification by two-thirds of the Protocol's contracting parties to enter into force. As of 2024, the necessary number of ratifications has not been achieved, making it uncertain when the amendment will become operational. The International Energy Agency (IEA) emphasized that removing international legal obstacles such as this prohibition is crucial for the global deployment of CCS technologies, particularly if CCS is to play a significant role in emissions reduction efforts and Legal Options for Addressing Article 6 of the London Protocol⁵²

Pending the full ratification of the 2009 amendment, several options under international law may be pursued by contracting parties to overcome the existing barriers posed by Article 6, one such being provisional application. The IEA has recommended this approach as it would allow contracting parties to begin cross-border CCS operations while awaiting the amendment's formal entry into force⁵³. This provisional application system is essential to

⁵⁰ 2009 Amendment to the London Protocol (adopted 18 October 2009, not yet in force) LP.3(4) (amending the London Protocol on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1996).

⁵¹ Ibid 50

⁵² IEA (2011), *Carbon Capture and Storage and the London Protocol*, IEA, Paris, <https://www.iea.org/reports/carbon-capture-and-storage-and-the-london-protocol>

⁵³ Ibid

maintaining the momentum of CCS projects worldwide while ensuring that international environmental standards are upheld⁵⁴.

In **2013**, the Parties further amended the protocol to encompass marine geoengineering activities, permitting such activities solely for research purposes. Marine geoengineering may involve the introduction of natural substances or organisms into the marine environment to enhance CO₂ uptake and thereby reduce atmospheric CO₂ levels.⁵⁵

3. The Northern Lights Case

3.1. Introduction

The Northern Lights project, inaugurated on 26 September 2024, marks a pivotal moment in the development of cross-border carbon capture, utilization, and storage (CCUS) infrastructure. As the world's first commercial, open-access CO₂ transport and storage network, it offers a unique framework for international cooperation in pollution control. This case study highlights the importance of such collaborative ventures in addressing transboundary environmental challenges and sets a precedent for future CCUS projects.

3.2. Background of the Northern Lights Project

To address CO₂ emissions from industrial facilities, the Norwegian government, in collaboration with industry stakeholders, has initiated the "Longship Project," a comprehensive carbon capture and storage (CCS) initiative. The project focuses on capturing CO₂ from facilities along Norway's eastern coast, where the gas will be liquefied and transported by specialized vessels to an intermediate storage facility on Norway's western coast. From there, the liquefied CO₂ will be transported through pipelines to permanent storage sites on the Norwegian continental shelf. The vessel-based transportation method is designed to scale the project, enabling CO₂ capture from additional sources and facilitating storage from various industries, including international contributors. The government funded 80% of the **Longship**

⁵⁴ GE Vernova (2024), *Future of Energy: London Protocol and Carbon Capture Storage*, <https://www.gevernova.com/gas-power/future-of-energy/london-protocol-carbon-capture-storage>.

⁵⁵ International Maritime Organization, 'London Protocol: Why It Is Needed 20 Years' (2016) <<https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/London%20Protocol%20Why%20it%20is%20needed%2020%20years.pdf>> accessed 15 October 2024.

project, of which Northern Lights forms a part.⁵⁶

Northern Lights is a joint venture established in 2017 between TotalEnergies, Equinor, and Shell. The project commenced construction of its primary facilities in 2021 and is now fully operational, providing storage solutions for CO₂ emitters across Europe. The project exemplifies how proactive international collaboration can address environmental concerns while complying with international law.

Key factors contributing to the project's success include:

- Norway's strategic conclusion of bilateral agreements with neighboring countries,
- The establishment of an open-source infrastructure accessible to multiple European jurisdictions,
- Active financial and regulatory engagement by the Norwegian government.

3.3. International Law and Cross-Border CO₂ Transport

One of the significant legal challenges in the project was ensuring compliance with the London Protocol, an international convention designed to prevent marine pollution, which governs the cross-border transfer of CO₂ for sub-seabed geological storage. The protocol sets minimum standards for environmental regulation among its signatory jurisdictions, with the option for countries to opt into an amendment that allows the export of CO₂.

Article 6⁵⁷ of the London Protocol states, "Contracting Parties shall not allow the export of wastes or other matters to other countries for dumping or incineration at sea." This provision initially prohibits CO₂ export for storage, as such activity is classified as "incineration at sea," posing challenges to the establishment of an international CO₂ transport and storage market.

In **2009 amendment**⁵⁸ proposed to permit "the export of carbon dioxide streams for disposal," provided there is an "agreement or arrangement" between the relevant nations. Under this

⁵⁶ IEAGHG, 'World's First Commercial Pact on Cross-Border CO₂ Transport and Storage' (4 October 2024) <<https://ieaghg.org/news/world-s-first-commercial-pact-on-cross-border-co2-transport-and-storage/>> accessed 15 October 2024.

⁵⁷ Ibid 50

⁵⁸ Ibid 57

proposal, cross-border CO₂ transport would necessitate bilateral or multilateral agreements that define “permitting responsibilities” in accordance with the London Protocol and other applicable international laws. Additionally, if CO₂ is exported to a state that is not a party to the London Protocol, the agreement must include standards equivalent to those in the Protocol.

Norway signed the amendment in 2010; however, it requires a two-thirds majority vote under **Article 21**⁵⁹ of the London Protocol, a threshold that has yet to be met. In 2019, Norway and the Netherlands proposed a provisional application of the 2009 amendment, which was adopted as Resolution LP.5(14) on October 11, 2019. This resolution allows Contracting Parties to provisionally apply the 2009 amendment, enabling Norway to enter into agreements for CO₂ export.

Norway, alongside seven other countries, has opted into this amendment. To comply with international law, Norway has entered into several bilateral agreements with European neighbors, including Sweden, Belgium, Denmark, the Netherlands, and Switzerland between 2022 and 2024. These agreements establish the legal framework for the transportation and storage of CO₂, facilitating transboundary cooperation in pollution control.

3.4. Ongoing Challenges for International CCS Projects⁶⁰

Despite mechanisms allowing provisional bypasses of Article 6 of the London Protocol, the lack of a cohesive international regulatory solution remains a significant challenge for CCS initiatives. The London Protocol has only 53 ratifying states, which is less than the 87 signatories of the London Convention. The impact of the 2009 amendment will be limited unless it is recognized as generally accepted international law under the United Nations Convention on the Law of the Sea (UNCLOS).

Moreover, requiring individual agreements for each CO₂ transport initiative introduces complexities, as ratification or provisional application declarations alone are insufficient. As CCS projects evolve, the legal frameworks and responses from contracting parties will be crucial in shaping the international CCS landscape. The ongoing developments in 2023

⁵⁹ Ibid 50

⁶⁰ Wikborg Rein, 'Legal Challenges with Cross Border Transportation of CO₂' (2024) <https://www.wr.no/aktuelt/legal-challenges-with-cross-border-transportation-of-co2> accessed 15 October 2024.

highlight the urgency for a unified approach to facilitate the growth of CCS as a viable solution for reducing global CO₂ emissions.

3.5. Conclusion

With the Northern Lights project now operational, the CCUS industry is poised to expand as other countries and stakeholders take note of the project's success. The lessons learned from this pioneering initiative, particularly regarding international legal frameworks, open-access infrastructure, and public-private risk-sharing, are likely to inspire similar projects across the globe, reinforcing the role of cross-border cooperation in pollution control.

In conclusion, Northern Lights sets a benchmark for future environmental projects, underscoring the critical importance of international collaboration in addressing global pollution challenges. By embracing shared responsibilities and establishing comprehensive legal and regulatory frameworks, countries can collectively mitigate environmental risks while fostering sustainable economic development.

VI. ANTARCTIC

The Antarctic Treaty System (ATS) represents a groundbreaking model of international collaborative management, establishing Antarctica as a continent dedicated to peace and science. The 1959 Antarctic Treaty, which entered into force in 1961, created a unique framework where territorial claims are effectively "frozen," allowing nations to cooperate in resource management without the traditional constraints of territorial sovereignty⁶¹.

The collaborative management framework was significantly strengthened by the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol, 1991)⁶², which designates Antarctica as a "natural reserve devoted to peace and science" and implements a comprehensive ban on mineral resource activities other than scientific research⁶³. This prohibition reflects a collective decision to prioritize environmental protection over resource exploitation, marking a departure from traditional resource management approaches.

⁶¹ Antarctic Treaty (signed 1 December 1959, entered into force 23 June 1961) 402 UNTS 71

⁶² Protocol on Environmental Protection to the Antarctic Treaty (adopted 4 October 1991, entered into force 14 January 1998) 30 ILM 1455.

⁶³ Protocol on Environmental Protection to the Antarctic Treaty (adopted 4 October 1991, entered into force 14 January 1998) 30 ILM 1455

Scientific research in Antarctica demonstrates the practical implementation of joint national control. Through the Scientific Committee on Antarctic Research (SCAR), nations coordinate research efforts and share facilities, creating a unique model of international scientific collaboration. The system of Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs) further illustrates how nations collectively manage access to and protection of specific areas.

1. The Antarctic Treaty⁶⁴

The Antarctic Treaty represents a landmark of Cold War-era cooperation, establishing a unique framework for managing Antarctica's natural resources. Originating in the mid-1950s, the Treaty's conception stemmed from scientists persuading the United Nations to foster international scientific cooperation. This led to the designation of the International Geophysical Year (IGY) from 1 July 1957 to 31 December 1958, during which scientists from 12 nations conducted research in Antarctica and demonstrated the potential for collaborative governance of the continent's resources. The Treaty was subsequently signed in Washington in 1959, with a core aim that "Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord"

Parties to the Treaty and Decision-Making

The Treaty currently has 57 member states, with 29 of them having "Consultative Party" status, allowing them to vote in the Antarctic Treaty Consultative Meetings (ATCM). Only the Consultative Parties, which include the original 12 signatories, control the decision-making process, with each decision requiring a consensus. Nations that conduct scientific research in Antarctica can apply to become Consultative Parties, thereby gaining voting rights. Non-Consultative Parties, while involved in research, hold observer status and cannot vote (Antarctic Treaty Art IX⁶⁵).

Secretariat and Support Mechanisms

The Antarctic Treaty Secretariat, established in Buenos Aires in 2004, supports ATCM and Committee for Environmental Protection (CEP) meetings, facilitates information exchange,

⁶⁴ Antarctic Treaty (signed 1 December 1959, entered into force 23 June 1961) 402 UNTS 71.

⁶⁵ Ibid 71

and disseminates relevant information as directed by the ATCM. The CEP, an advisory body under the Madrid Protocol, convenes annually alongside the ATCM to address environmental protection matters and make policy recommendations to safeguard Antarctica's natural resources.

Key Provisions of the Antarctic Treaty

1. *Peaceful Use:* Antarctica is designated for peaceful purposes only; all military activities are prohibited except for support of scientific research and other peaceful purposes(Art I).
2. *Scientific Cooperation:* Freedom of scientific investigation is protected, with an emphasis on collaboration and information sharing among member states(Art II, III).
3. *Frozen Territorial Claims:* Existing territorial claims are “frozen,” preventing the assertion or establishment of new claims, preserving the international status quo on sovereignty(Art IV).
4. *Prohibition of Nuclear Activities:* Nuclear explosions and the disposal of radioactive waste in Antarctica are strictly prohibited(Art V).
5. *Inspection and Transparency:* Contracting Parties may appoint observers with rights to inspect any installations, equipment, and activities to ensure compliance with the Treaty’s peaceful-use and environmental standards(Art VII, VIII).
6. *Dispute Resolution:* Disputes are to be resolved through peaceful negotiation, with the option to bring unresolved issues to the International Court of Justice as a last resort(Art XI).
7. *Regular Consultative Meetings:* Consultative Parties meet regularly to discuss the Treaty’s implementation, environmental concerns, and other relevant issues affecting the Antarctic region(Art IX).

2. Recent Developments (2023-2024)

The year of 2024

In 2024, Iran made unprecedented claims regarding Antarctic territory. The commander of

Iran's Regular Navy declared property rights in Antarctica and announced intentions to raise Iran's flag there and preparing to start both scientific and military activities. This claim stands in direct conflict with the Antarctic Treaty's principles, as Iran is not a signatory to the Antarctic Treaty System⁶⁶.

The 46th Antarctic Treaty Consultative Meeting (ATCM) in Kochi, India (May 2024) addressed several critical areas:

- Operational aspects of the Antarctic Treaty System
- Scientific cooperation frameworks
- Tourism management protocols
- Climate change implications
- Biological prospecting regulations⁶⁷

A significant outcome was India's announcement of the Maitri-II research station development, expanding the global scientific presence in Antarctica⁶⁸.

The year of 2023

The 45th ATCM in Helsinki (2023) marked a pivotal moment with the adoption of the Helsinki Declaration on Climate Change in Antarctica. This declaration emphasized:

- Recognition of Antarctica's role in global climate systems
- Urgent need for protective measures
- Reaffirmation of the mining prohibition under Article 7 of the Environmental

⁶⁶ Nuclear Threat Initiative, 'Antarctic Treaty' (2024) <<https://www.nti.org/education-center/treaties-and-regimes/antarctic-treaty/>> accessed 25 October 2024.

⁶⁷ Antarctic Treaty Secretariat, 'Final Report of the Forty-Sixth Antarctic Treaty Consultative Meeting' (2024) ATCM XLVI/SP 1 <https://documents.ats.aq/ATCM46/fr/ATCM46_fr011_e.pdf>

⁶⁸ Ministry of Earth Sciences, Government of India, 'India's Antarctic Program: Strategic Vision 2024-2035' (2024) <https://moes.gov.in/schemes/polar-science-cryosphere?language_content_entity=en>

Protocol⁶⁹

The Helsinki meeting specifically reinforced the ban on mineral resource activities beyond scientific research, as stipulated in Article 7 of the Protocol on Environmental Protection to the Antarctic Treaty.

VII. ANALYSIS OF JOINT NATIONAL CONTROL OF NATURAL RESOURCES

1. Key Observations

Evolution of Control Frameworks

Joint control frameworks for natural resources have significantly progressed from basic bilateral agreements to more intricate multilateral systems. Initially marked by colonial-era monopolistic control (such as the governance over the Nile River), these frameworks now aim for a more balanced and equitable resource distribution. This shift underscores a growing emphasis on inclusive decision-making processes that accommodate all stakeholder nations.

However, we also see a shift back to the bilateral framework as observable in the case of the London protocol. Keeping the success of 'entering' into multilateral treaties is becoming a challenge given the increasing 'exits' of parties from various frameworks.

Common Challenges

a) Legal and Regulatory Challenges

- Ratifying international convention amendments (e.g., the London Protocol's CO2 transport amendment) can be challenging.
- Conflicts between national laws and international agreements complicate enforcement.
- Developing unified regulatory frameworks remains complex.

⁶⁹ Antarctic Treaty Consultative Meeting, 'Helsinki Declaration on Climate Change in Antarctica' (2023) ATCM XLV/Dec.1 <<https://www.ats.aq/devAS/Meetings/Measure/806>>

b) Political and Economic Challenges

- Power imbalances and historical claims can strain negotiations.
- Economic disparities affect nations' capacities to engage effectively.
- Competing national interests often diverge from collective benefits.

c) Implementation Challenges

- Enforcing agreements across jurisdictions can be difficult.
- Variations in technical capacities impact participation.
- Resource allocation, benefit-sharing, and compliance monitoring present ongoing issues.

2. Other emerging Trends

Emerging trends are shaping the landscape of joint natural resource management:

- There is a heightened focus on environmental protection within resource management frameworks.
- Indigenous rights and traditional resource use are increasingly recognized.
- Climate change considerations are becoming integral to resource management.
- Innovative financing mechanisms are being developed for sustainable projects. (eg: green financing).

VIII. SUGGESTIONS AND CONCLUSION**1. Suggestions for Improved Joint National Control of Natural Resources**

To enhance the effectiveness of joint control over natural resources, several recommendations can be implemented, focusing on strengthening legal frameworks, institutions, stakeholder engagement, environmental protections, and the integration of advanced technologies. These

suggestions aim to create adaptable, collaborative structures that prioritize sustainable resource management.

Legal Framework Enhancement

Strengthening legal frameworks is essential to ensure that agreements between nations are comprehensive, enforceable, and adaptable. Streamlining ratification processes can accelerate the implementation of critical amendments, reducing bureaucratic delays. Moreover, establishing standardized templates for bilateral agreements could simplify negotiations and reduce inconsistencies. Additionally, flexible frameworks are needed to accommodate evolving needs, such as environmental changes or technological advancements. Clear and robust enforcement mechanisms must also be embedded in agreements to ensure compliance and accountability across jurisdictions.

Institutional Strengthening

Effective institutional structures are fundamental to sustainable resource management. Capacity-building initiatives, especially for developing nations, are critical in leveling the playing field and ensuring all parties can contribute meaningfully. Enhancing scientific research cooperation will enable informed decision-making rooted in shared, reliable data. Improved monitoring and evaluation systems will track progress, while transparent decision-making processes foster trust and facilitate smoother cooperation among nations. Together, these improvements will bolster institutional capacity and resilience.

Stakeholder Engagement

Greater inclusivity in stakeholder participation is vital for equitable resource management. Indigenous communities should be actively involved, as their knowledge and historical connection to natural resources can provide valuable insights. Additionally, encouraging public-private partnerships can mobilize resources and expertise, while improved communication and transparency will ensure that decisions are well-informed and widely supported. Strengthening regional cooperation mechanisms will further unify efforts and harmonize resource management goals.

Environmental Protection

Incorporating stringent environmental protections into resource management frameworks is crucial. Agreements should integrate climate change considerations to future-proof resource management practices. Enhanced environmental impact assessments, common standards for environmental protection, and continuous monitoring of environmental impacts will help maintain ecological integrity and sustainability. By prioritizing environmental health, nations can manage resources more responsibly and mitigate negative effects on ecosystems.

Technology and Innovation

Harnessing advanced technology is a promising avenue for improving resource management. Developing *shared data platforms* and *standardized monitoring systems* can facilitate better resource tracking and enhance transparency. Additionally, digital infrastructure and technologies like remote sensing can provide real-time environmental data, while artificial intelligence and blockchain could improve accuracy in monitoring and resource tracking. Together, these innovations will modernize and streamline resource management practices.

2. Conclusion

The research affirms that the concept of joint national control over natural resources has evolved significantly, shifting from unilateral approaches to more collaborative governance models that prioritize equitable distribution and sustainability. This evolution validates the hypothesis that such frameworks have matured in response to contemporary transboundary challenges. However, the effectiveness of international legal mechanisms varies across contexts. While frameworks like the Antarctic Treaty System exemplify successful models of cooperative management, others such as the Nile Basin Initiative expose persistent tensions and structural limitations, thereby substantiating the partial effectiveness hypothesized in this study. Moreover, practical joint control initiatives—such as the Itaipú Dam project and the GERD-related negotiations—demonstrate that cross-border cooperation is both possible and beneficial, though heavily dependent on sustained dialogue, political will, and robust institutional frameworks. These findings collectively underscore the potential of joint national control as a pragmatic and necessary approach to managing shared natural resources. To enhance its efficacy, continued international collaboration, adaptive legal regimes, and inclusive stakeholder engagement remain essential. Ultimately, this study offers valuable

insights for strengthening global resource governance and contributes meaningfully to the discourse on international environmental and natural resource law.