

ENVIRONMENTAL OBLIGATIONS AND LIABILITY IN THE CONSTRUCTION OF ARTIFICIAL ISLANDS: A COMPARATIVE INTERNATIONAL LAW APPROACH

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Abstract

"This article takes a look at the environmental legal frameworks that regulate the development of artificial islands in a number of different jurisdictions. Significant environmental issues are emerging as a result of governments' increased pursuit of territorial expansion and growth through the creation of artificial islands. These challenges put the boundaries of current international and local legal systems to the point of being tested. The purpose of this research is to identify gaps in the existing regulatory systems by conducting a comparative analysis of domestic laws, international treaties, and case law. Additionally, the research provides integrated solutions that strike a compromise between the goals of development and environmental preservation. According to the findings, there are now a number of obstacles that prevent efficient environmental governance of artificial island projects. These obstacles include jurisdictional issues, uneven liability systems, and tough enforcement problems. This paper makes a contribution to the academic debate by putting up a unified international framework that takes into account the one-of-a-kind environmental consequences that manmade islands have across international borders while still honouring the sovereignty of individual nations."

Keywords. artificial islands, environmental law, international maritime law, environmental liability, UNCLOS, transboundary pollution, coastal development

Introduction

The creation of artificial islands is one of the most audacious attempts that humanity has made to establish its authority over the aquatic environment. These projects radically modify maritime ecosystems while simultaneously establishing new areas for human habitation, trade, and strategic posture. Some historical examples of these projects include the Kansai International Airport in Japan, the Palm Jumeirah in Dubai, and China's vast reclamation works in the South China Sea. Artificial island building is becoming increasingly appealing, particularly for tiny island governments that are facing existential challenges (Peel & Osofsky, 2018). This is because climate change is accelerating the rise in sea level and coastline erosion.

When it comes to environmental stewardship, this expansionary tendency creates important problems within the context of complicated regulatory regimes that frequently overlap with one another. According to Nordquist et al. (2018), the creation of artificial islands sets off a chain reaction of environmental repercussions, which include the destruction of habitat, changes in hydrodynamics, an increase in sedimentation, and the possibility of contamination from materials used in construction. The environmental legal system that governs these consequences continues to be fragmented across a variety of legal areas, including international marine law, environmental treaties, regional accords, and local laws.

Through the prism of comparative international law, this essay investigates the environmental duties and liability procedures that are applicable to the development of artificial islands. The investigation is centred on three questions that are interconnected: (1) What environmental requirements are imposed by the existing local and international legal frameworks with relation to the creation of artificial islands? (2) In what ways are the procedures for culpability and enforcement constructed differently in various jurisdictions? (3) What kinds of organisational changes may lead to more efficient environmental governance for projects using artificial islands?

Legal Framework Governing Artificial Islands

International Maritime Law

The United Nations Convention on the Law of the Sea (UNCLOS, 1982) is the primary international legal document that governs manmade islands. It was established in 1982. Artificial islands that are located inside a nation's Exclusive Economic Zone (EEZ) are specifically addressed in Article 60 of the United Nations Convention on the Law of the Sea (UNCLOS), which grants coastal nations the "exclusive right to construct and to authorise and regulate the construction, operation, and use of artificial islands" (paragraph one of Article 60). On the other hand, this privilege is limited by environmental requirements that are located in other parts of the agreement.

Article 192 places a general responsibility on states to "protect and preserve the marine environment," while Article 194 mandates that states take actions "necessary to prevent, reduce, and control pollution of the marine environment from any source" (UNCLOS, 1982). Both of these articles were ratified in 1982. It is expressly addressed in Article 194(3)(d), which mandates the implementation of measures to reduce the amount of pollution caused by "installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil" (UNCLOS, 1982). Artificial

islands are taken into consideration in this provision.

Natural islands and manmade islands have quite different legal statuses. manmade islands are not the same. According to Article 121 of the United Nations Convention on the Law of the Sea (UNCLOS), artificial islands do not have their own territorial seas, nor do they have any impact on the delimitation of territorial seas, exclusive economic zones (EEZs), or continental shelf. As was proven in the South China Sea Arbitration case (*Philippines v. China*, PCA Case No. 2013-19), this disparity has significant repercussions for the jurisdictional authority that is responsible for environmental protection.

In this historic decision from 2016, the Permanent Court of Arbitration determined that China's extensive island-building activities in the South China Sea had "caused severe harm to the coral reef environment" and that China had "violated its obligations under Articles 192 and 194" of the United Nations Convention on the Law of the Sea (*Philippines v. China*, 2016). Establishing a significant precedent for environmental accountability, the tribunal emphasised that the need to maintain the maritime environment applies to the creation of artificial islands regardless of whether or not there are questions over sovereignty.

International Environmental Law

In addition to the United Nations Convention on the Law of the Sea (UNCLOS), the building of artificial islands is subject to a number of international environmental accords. Both the Ramsar Convention on Wetlands (1971) and the Convention on Biological Diversity (CBD, 1992) require parties to control activities that might have a negative impact on biodiversity.

The Ramsar Convention on Wetlands safeguards coastal wetlands that could be affected by reclamation operations. Both the London Convention on the Prevention of Marine Pollution (1972) and its Protocol from 1996 specifically address the issue of dumping

materials at sea, which is something that can happen throughout the construction process.

Additional protection is provided by agreements pertaining to regional waters. According to Tanaka (2019), the OSPAR Convention for the North-East Atlantic, the Barcelona Convention for the Mediterranean, and the Noumea Convention for the South Pacific all contain rules that are pertinent to the creation of artificial islands. Typically, these agreements establish regional cooperation channels and enforce rules for environmental impact assessments (also known as EIAs). The growing idea of "transboundary environmental harm" in customary international law places further limitations on the construction of artificial islands. This principle, which was first articulated in the Trail Smelter Arbitration (*United States v. Canada*, 1941) and subsequently affirmed in subsequent cases such as the Pulp Mills on the River Uruguay (*Argentina v. Uruguay*, 2010), establishes that states have a responsibility to prevent activities that occur within their jurisdiction from causing environmental harm to other states or to areas that are beyond the confines of national jurisdiction.

Comparative Analysis of Domestic Legal Approaches

United Arab Emirates

There are a number of artificial island projects that have been explored by the United Arab Emirates (UAE), including the Palm Jumeirah, Palm Jebel Ali, and The World archipelago. These projects are among the most ambitious in the world. According to Abdulqader (2019), the United Arab Emirates' Federal Law No. 24 (1999) for the Protection and Development of the Environment oversees the environmental elements of coastal development and mandates the completion of full environmental impact assessments for significant projects.

However, there has been a lack of consistency in enforcement. In the case of *Marine Construction LLC v. Nakheel PJSC* (Dubai Court

of Cassation, Case No. 282/2011), environmental compliance disputes arose regarding construction standards. However, environmental liability was ultimately subordinated to contractual obligations, which demonstrates a potential weakness in the environmental enforcement regime of the United Arab Emirates (UAE).

Following this, the United Arab Emirates (UAE) has reinforced its regulatory framework, and the Environmental Impact Assessment Program of Dubai Municipality now requires detailed marine ecological research, hydrodynamic modelling, and post-construction monitoring (Dubai Municipality, 2020). These improvements are a reflection of the rising knowledge of the environmental costs connected with previous artificial island initiatives, which include proven consequences on coastal ecosystems and water quality (Burt et al., 2020).

China

The considerable island-building that China has been doing in the South China Sea is an example of a distinct regulatory strategy. Domestically, China's Marine Environmental Protection Law (2017 version) and Environmental Impact Assessment Law (2018 revision) define extensive regulations for marine construction projects. Both of these laws were revised in 2017. Nevertheless, implementation problems arise whenever initiatives are carried out in waterways that are contested.

This difficulty was brought to light by the South China Sea Arbitration, which concluded that China did not carry out appropriate environmental studies before to beginning the construction of large-scale islands (*Philippines v. China*, 2016). The fact that China chooses not to recognise the jurisdiction of the tribunal is illustrative of the constraints that international environmental law faces when it comes into conflict with sovereignty concerns.

Internal courts in China have demonstrated a growing readiness to enforce environmental norms inside waterways that are not subject to

an international dispute. An environmental non-governmental organisation (NGO) was successful in challenging an inadequate environmental study of a coastline reclamation project in the case *Friends of Nature v. Department of Ocean and Fisheries of Jiangsu Province* (2017), which resulted in the revocation of building licenses (Zhang & Zhang, 2019). The Chinese government's internal environmental jurisprudence addressing manmade islands has undergone a considerable development as a result of this case.

The Netherlands

On the other hand, the Netherlands takes a different strategy, which is characterised by integrated coastal management and preventative planning. According to Mostert (2017), the Dutch water boards, also known as waterschappen, have been there since the 13th century, making it one of the oldest environmental governance systems from across the world. The restoration of ecosystems is a priority for contemporary Dutch artificial island projects, such as the Marker Wadden archipelago, which is located in the Markermeer lake.

A thorough legal framework is created by the Dutch Water Act (2009) and the Environmental Management Act. This framework necessitates intensive environmental evaluation, engagement with stakeholders, and management plans that are adjustable to changing circumstances. In the case of *Urgenda Foundation v. State of the Netherlands* (Supreme Court of the Netherlands, 2019), the court ruled that the Dutch government is obligated to exercise a duty of care with regard to climate change. This decision has ramifications for coastal projects that are susceptible to the effects of rising sea levels.

An example of how artificial land development may contain environmental betterment goals from the very beginning is the "Building with Nature" technique that is being implemented in the Netherlands. This approach is demonstrated by the Sand Motor project that is located close

to The Hague (van Slobbe et al., 2021). When compared to corrective efforts that are implemented after environmental harm has already taken place, this integrated approach stands in stark contrast.

Small Island Developing States

When it comes to artificial islands, Small Island Developing States (SIDS) have certain issues that are particular to them. Countries such as the Maldives, which have eighty percent of their landmass situated at an elevation of less than one metre above sea level, consider the construction of artificial islands to be an essential requirement rather than a desirable development. According to Wadey et al. (2017), the Maldives has developed Hulhumalé, an artificial island that is home to more than 50,000 people, as a means of adapting to the effects of rising sea levels.

Local legislation in small island developing states (SIDS) often reflects capacity limits. The Maldives Environmental Protection Act (No. 4/93) includes fundamental standards for environmental assessments; nevertheless, the execution of these criteria is difficult due to a lack of readily available technical and financial resources. Additional help is provided by regional frameworks such as the Noumea Convention; yet, enforcement continues to give rise to difficulties.

Despite the fact that it did not explicitly address manmade islands, the case of *Teitiota v. New Zealand* (UN Human Rights Committee, 2020) found that the effects of climate change may produce situations that violate the right to life as outlined in international human rights law. When it comes to executing artificial island projects as climate adaptation measures, this precedent may bolster the legal position of small island developing states (SIDS).

Environmental Liability Mechanisms

Prevention: Environmental Impact Assessment

The Environmental Impact Assessment (EIA) standards are the foundation of the

preventative liability measures that are in place for the development of artificial islands. In the case of Pulp Mills on the River Uruguay (*Argentina v. Uruguay*, 2010), the International Court of Justice acknowledged environmental impact assessment (EIA) as "a practice, which in recent years has gained so much acceptance among States that it may now be considered a requirement under general international law" in situations where activities raise the possibility of causing environmental damage that extends across international borders.

There is a large amount of variation in national approaches to EIA. In accordance with the National Environmental Policy Act (NEPA), the United States of America mandates that artificial islands that are allowed by the federal government must submit comprehensive Environmental Impact Statements. This was established in the case of *Ocean Advocates v. United States Army Corps of Engineers* (402 F.3d 846, 9th Cir. 2005), in which the court determined that the environmental implications of a dock expansion project were not adequately considered.

Artificial island projects are specifically included within the scope of the Environmental Impact Assessment Directive (2014/52/EU) of the European Union, which mandates the evaluation of both direct and indirect effects on marine ecosystems from the projects. Different member states have different approaches to implementation, with the Netherlands and Denmark often adhering to more stringent requirements than the nations of the Mediterranean (Aragão, 2018 and others).

Remediation: Environmental Restoration Requirements

On the other hand, the application of legal requirements to repair environmental harm caused by artificial islands continues to be uneven between countries. A comprehensive framework that is based on the "polluter pays" principle is established by the Environmental Liability Directive (2004/35/CE) of the European

Union. This directive mandates that operators must restore damaged natural resources to the state they were in before the intervention. Its applicability to marine habitats, on the other hand, has been limited in practice (Jendroska, 2019).

Both the Oil Pollution Act and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in the United States of America offer mechanisms for the evaluation and repair of natural resource damage in the event of specified pollution occurrences. Important precedents for assessing maritime environmental damages were created in the case *United States v. BP Exploration & Production Inc.* (No. 2:10-cv-04536, E.D. Louisiana 2015) about the Deepwater Horizon oil disaster. These precedents may be applied to the implications of artificial island building.

There is the possibility that restoration criteria may be explicitly integrated into permits for projects involving artificial islands. The National Environment Agency was responsible for monitoring the substantial criteria for mangrove replanting and coral transfer that were included in Singapore's Semakau Landfill, which was an artificial island formed from land that had been reclaimed (Lai et al., 2019). Instead of approaching repair as a post-hoc response to harm, this method incorporates it into the design of the project itself.

Compensation: Financial Liability for Environmental Harm

The methods of financial accountability for environmental harm caused by manmade islands are extremely complex and varied. There are certain jurisdictions that demand environmental insurance or bonding as a statutory obligation. Developers of significant coastal projects in the United Arab Emirates are now required to post environmental performance bonds. These bonds are only released once post-construction monitoring has shown that the project complies with

environmental criteria (Dubai Municipality, 2020).

Quantifying the harm done to the environment continues to be difficult. In the case of *Qatar v. Bahrain* (International Court of Justice, 2001), which was a territorial dispute involving the creation of artificial islands, the court accepted that there was environmental damage, but it struggled to create adequate compensation techniques. This particular scenario demonstrates the need of utilising standardised methods for determining the value of marine ecosystem services and damages.

Through the Environmental responsibility Directive, which encompasses "damage to protected species and natural habitats" even in the absence of negligence (Jendroska, 2019), the European Union has been a pioneer in expanding the scope of environmental responsibility. This approach to strict responsibility stands in contrast to fault-based systems, which are prevalent in many Asian countries. In these jurisdictions, establishing a causal relationship between the creation of artificial islands and environmental harm is one of the most difficult legal challenges.

Jurisdictional Challenges and Enforcement

Overlapping Maritime Claims

In the case of artificial islands erected in seas that are contested, environmental regulation is made more difficult by the presence of jurisdictional ambiguity. According to Lyons (2018), the South China Sea is the most notable example of a situation in which overlapping territorial claims have facilitated significant island-building with minimal environmental accountability.

In the case of the Philippines against China (2016), the South China Sea Arbitration held that environmental duties under UNCLOS apply regardless of whether or not there are issues over sovereignty. The rejection of the verdict by China, on the other hand, exemplifies the practical limitations of international adjudication in the absence of voluntary

cooperation. This particular instance exemplifies how environmental preservation may be sacrificed to territorial contestation.

The fragmentation of jurisdictions between different agencies can be a barrier to efficient environmental governance, even within waterways that are not in dispute. In the United States, artificial islands that are located in federal waters may be required to obtain permits from the Army Corps of Engineers, the Environmental Protection Agency, the Bureau of Ocean Energy Management, and the National Marine Fisheries Service. This can create difficulties in terms of coordination, as was demonstrated in the case *Centre for Biological Diversity v. United States Army Corps of Engineers* (941 F.3d 1288, 11th Cir. 2019).

Extraterritorial Application of Environmental Laws

Another obstacle that must be overcome in order to ensure compliance is the extraterritorial applicability of domestic environmental legislation. In the case of *Environmental Defence Fund v. Massey* (986 F.2d 528, District of Columbia Circuit 1993), a court in the United States decided that the National Environmental Policy Act (NEPA) may be applied to operations that took place in Antarctica. This decision established a prospective precedent for the extraterritorial application of environmental regulations. This strategy, however, has been restricted by later rulings such as *NRDC v. United States Department of the Navy* (2002 WL 32095131, Central District of California 2002), particularly in situations where there are ramifications for foreign policy.

By entering into agreements with foreign countries and imposing market access conditions, the European Union has been increasingly active in its pursuit of extraterritorial execution of environmental norms. For instance, the EU-Singapore Free Trade Agreement includes environmental requirements that might potentially be applicable to the large land reclamation

initiatives that Singapore is engaged in (Harrison, 2018).

International Environmental Dispute Resolution

Mechanisms for the international arbitration of disputes pertaining to environmental claims that are associated with manmade islands are yet incompletely established. When it comes to manmade islands, the International Tribunal for the Law of the Sea (ITLOS) has only handled them in a peripheral manner, such as in the case of Land Reclamation by Singapore in and around the Straits of Johor (*Malaysia v. Singapore*, 2005). This is despite the fact that the United Nations Convention on the Law of the Sea (UNCLOS) mandates that disputes be resolved through the ITLOS.

Ultimately, the International Tribunal for the Law of the Sea (ITLOS) enabled a settlement that required project modifications and compensation for transboundary environmental harm (*Malaysia v. Singapore*, 2005). When it came to this particular dispute, ITLOS ordered the parties to organise an expert panel to evaluate the environmental implications of Singapore's land reclamation. In light of this, it is clear that international courts have the ability to facilitate the negotiation of solutions to environmental conflicts that include manmade islands.

Different systems for the settlement of environmental disputes have also been devised by regional agencies. The Association of Southeast Asian Nations (ASEAN) Agreement on Transboundary Haze Pollution creates a regional cooperation framework that has the potential to be applied to the building of artificial islands; however, enforcement of this framework has been restricted (Nguiragool, 2017).

Emerging Trends and Reform Proposals

Ecosystem-Based Management Approaches

Ecosystem-based management, sometimes known as EBM, is a concept that is making its way into the realm of managing the

repercussions of manmade islands. Instead of concentrating simply on the mitigation of a particular project, EBM takes into account the cumulative effects that are felt over the entirety of marine ecosystems. The Great Barrier Reef Marine Park Act in Australia is a good example of this strategy since it mandates that any projects that might potentially have an effect on the reef must take into account the ecosystem-wide implications of those developments (Brodie & Waterhouse, 2018).

Another example is provided by the Maritime Spatial Planning Directive (2014/89/EU) of the European Union, which mandates that member states must design integrated plans that take into account the cumulative environmental consequences of all sectors. This comprehensive approach solves the restriction of project-by-project evaluation, which has served as the defining characteristic of the conventional approach to the management of artificial islands.

Enhanced EIA Requirements and Strategic Environmental Assessment

In a number of jurisdictions, efforts are being made to enhance the Environmental Impact Assessment procedures for artificial islands through the implementation of reforms. In order to address the objections that were brought up during the South China Sea Arbitration, China's updated Environmental Impact Assessment Law now mandates that cumulative consequences and climate change implications be taken into consideration (Zhang & Zhang, 2019).

Strategic Environmental Assessment (SEA), which examines the environmental effects of policies and programs rather than individual projects, provides a method that is complimentary to the one being discussed. Coastal development strategies that may contain artificial islands are subject to environmental assessment, as stipulated by the European Union's Sea Environment Directive (2001/42/EC) (Aragão, 2018). This directive mandates that plans and programs that are anticipated to have major environmental

consequences must undergo environmental evaluation.

International Cooperation and Capacity Building

In especially for territories that have complicated maritime boundaries and little regulatory capability, increased international collaboration is a critical reform avenue that presents an opportunity for improvement. The Regional Seas Programme of the United Nations Environment Programme has established protocols that explicitly address land-based sources of marine pollution and coastal zone management. These protocols have the potential to be relevant to the creation of artificial islands (Tanaka, 2019).

Agreements between neighbouring states that are bilateral in nature provide an additional avenue. A joint monitoring committee was created between Malaysia and Singapore in order to supervise the environmental implications of Singapore's reclamation efforts (*Malaysia v. Singapore*, 2005). This committee was established in response to the provisional measures that were implemented by the ITLOS in the case of Land Reclamation by Singapore in and around the Straits of Johor. Several additional places that are experiencing transboundary consequences from manmade islands might benefit from the use of this paradigm.

Conclusion

The development of artificial islands offers a number of difficult environmental governance concerns, which are only partially addressed by the legislative frameworks that are already in place. This comparative research indicates substantial differences in the ways in which nations strike a balance between the imperatives of growth and the conservation of the environment when it comes to the creation of new land from the sea. On the basis of this evaluation, several conclusions may be drawn.

To begin, international environmental law imposes significant, fundamental requirements

with regard to artificial islands; yet, the implementation and enforcement of these obligations continue to be uneven. In spite of the fact that the South China Sea Arbitration ruled that environmental requirements of the UN Convention on the Law of the Sea apply to island-building operations independent of sovereignty issues, actual enforcement methods continue to be restricted when governments reject the authority of authorities.

Secondly, the success of domestic legal procedures varies greatly from one individual to the next. Both the integrated water management system and the "Building with Nature" concept of the Netherlands are examples of how environmental betterment may be incorporated into the construction of artificial islands from the very beginning. As an illustration of the costs associated with insufficient initial controls, the reactive regulatory actions that were witnessed in the United Arab Emirates (UAE) following environmental harm caused by early Palm Island development are a good example.

Thirdly, there is a need for additional development of liability mechanisms in order to handle the specific characteristics of environmentally damaging maritime environments. Approaches that are currently in use have difficulty addressing problems related to measurement, causality, and suitable remediation requirements for the consequences of manmade islands. The Environmental Liability Directive of the European Union provides the most complete approach; nevertheless, even this framework has only seen limited application to maritime habitats.

The future governance of artificial islands should pursue three different reform pathways:

- (1) strengthening preventive mechanisms through enhanced EIA requirements and ecosystem-based management;
- (2) developing standardised approaches to environmental damage assessment and compensation; and

(3) enhancing international cooperation, particularly in regions with transboundary impacts and overlapping maritime claims. These three reform pathways are outlined below.

Due to the fact that climate change is accelerating the rise in sea level and the erosion of coastal areas, it is quite likely that manmade islands will become increasingly prevalent aspects of our nautical landscape. In the next decades, ensuring that these projects are carried out after proper environmental protections have been implemented will be a significant problem for environmental legislation on both the international and domestic levels.

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