



PhD program in Marine Sciences, Technologies and Management (MTM)

Cycle XXXVIII

**THE LEGAL BASIS FOR REPRESENTATIVE
NETWORKS OF MARINE PROTECTED AREAS
AND THE IMPLEMENTATION OF OTHER
EFFECTIVE AREA-BASED CONSERVATION
MEASURES IN THE MALDIVES AND THE WIDER
INDIAN OCEAN REGION**

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Brief premise

Stepping into the grand museums of European capitals and major United States cities, we encounter a rich tapestry of artifacts that connect us to distant, often ‘exotic’ worlds. These collections, in a profound sense, whisper of a past colonialism that, though chronologically distant, remains intrinsically woven into the fabric of Western life. A museum visit can evoke a palpable sense of that historical existence, prompting unsettling questions: Was this piece acquired ‘ethically’ or was it simply taken? Did the European painter or sculptor, whose career was built upon depicting Indigenous Peoples in their art, ever truly give back to those who inspired their life's work? And, crucially, for the descendants of these cultures, or those still connected to these ancient traditions, are these vast repositories of their own history truly accessible? Likely not. The very placement of these invaluable pieces, often thousands of miles and a world of economic disparity away, renders them largely beyond the reach of their rightful inheritors¹.

The tapestry of global knowledge, particularly in biological diversity, is intricately woven with threads laid during the colonial era. For much of the nineteenth century, a handful of dominant European powers carved the world into colonial possessions, simultaneously fuelling a prodigious surge in biological exploration. This period, while enriching the Western scientific tradition with an understanding of biodiversity, also forged an inherent imbalance: knowledge and specimens were siphoned to the colonial centres, often remaining largely inaccessible to the territories from which they originated².

The dawn of independence for former colonies did not, regrettably, dissipate these disparities. A pervasive economic resource scarcity, coupled with limited access to information, curtailed the scientific output and stature of these nascent countries, preventing them from mirroring the advancements of their former colonizers³. In the realm of biodiversity science, these contrasts are quite evident. A clear correlation exists between scientific productivity and per capita

¹See C WINTLE, 'Decolonizing the Smithsonian: Museums as Microcosms of Political Encounter' (2016) 121(5) *The American Historical Review* 1492.

² A ASASE et al., 'Replacing “parachute science” with “global science” in ecology and conservation biology' (2022) 4(5) *Conservation Science and Practice* e517.

³ *Ibid.*

economic activity, leading to a discord between regions most in need of research and those where it is predominantly conducted⁴.

The path of least resistance for scientists from the developed world often involves perpetuating the *status quo*, engaging in what has come to be known as ‘parachute science’. This model sees researchers descending upon a site, securing permits, conducting their work, and departing, often with minimal genuine engagement with local scientists and communities⁵.

Recognizing these inequities and the appropriation of biological resources, the international community has striven to establish a regulatory framework to foster cooperation and benefit-sharing. This endeavour culminated in the adoption of the Convention on Biological Diversity (Rio de Janeiro, 5 June 1992) (CBD). Its core objectives are the conservation of biological diversity, its sustainable use, and the fair and equitable sharing of benefits derived from genetic resources, facilitated by appropriate access to these resources and the transfer of relevant technologies and funding⁶. The CBD underscores the imperative for developed States to support scientific and technical education, training, and research in developing countries⁷. Furthermore, it unequivocally asserts the sovereign rights of States over their natural resources, stipulating that access to genetic resources is subject to national legislation⁸. Finally, it reinforces the importance of technology transfer, information exchange, and scientific and technical cooperation⁹. The Nagoya Protocol (Nagoya, 29 October 2010) to the CBD further elaborated on the fair and equitable sharing of benefits from the utilization of genetic resources, aiming to contribute to biodiversity conservation and sustainable use.

Similarly, under the umbrella of the United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982) (UNCLOS), which promote the international cooperation in the preservation and protection of the marine environment, the recent Agreement on the Conservation and Sustainable Use of

⁴ P V STEFANOUDIS et al., 'Turning the tide of parachute science' (2021) 31(4) *Current Biology* R184; K A WILSON et al., 'Conservation Research Is Not Happening Where It Is Most Needed' (2016) 14(3) *PLoS Biol*

⁵ P V STEFANOUDIS (n. 4).

⁶ CBD 1760 UNTS 79 art 1.

⁷ *Ibid.* art. 12.

⁸ *Ibid.* art. 15.

⁹ *Ibid.* artt. 16-18.

Marine Biological Diversity of Areas beyond National Jurisdiction (New York, 19 June 2023) (BBNJ Agreement) specifically addresses marine genetic resources from areas beyond national jurisdiction, emphasizing fair and equitable benefit-sharing and capacity building for developing States, particularly Small Islands Developing States (SIDS) like the Maldives. In this context, the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs of the United Nations (OLA/DOALOS or Division) has developed fellowships programme, namely, the United Nations – The Nippon Foundation Fellowship and the Hamilton Shirley Amerasinghe Fellowship, to educate legal officers of developing countries in the implementation of the law of the sea in their territories. In 2024, the Division inaugurated a fellowship programme specifically addressed to SIDS¹⁰.

The way forward for scholars from developed countries in their engagement with developing nations must transcend ‘parachute science’. The approach must pivot from mere knowledge extraction to fostering capacity building and knowledge transfer. Researchers from developed States should acknowledge their role as ‘beneficiaries’ gaining access to invaluable resources and studying others’ ‘homes’. In return, they have a profound responsibility to share the intellectual resource, ensuring developing countries are not denied the chance to cultivate their own scientific expertise. The pursuit of knowledge must inextricably link to the benefit of local communities, respecting that western science is not omnipotent and that local and indigenous knowledge offers insights into natural life cycles¹¹. Researchers must be open to other approaches emerging from developing States, such as the Maldivian *Dhrihum Jazeera* political direction in the framework of blue economy and other sectors¹².

The pursuit of knowledge is crucial for societal advancement. Yet, its efficacy and integrity hinge entirely on the approach adopted. Without a conscious, institutionalized and ethical framework, even the most groundbreaking discoveries

¹⁰ United Nations - Nippon Foundation Fellowship Programme and Hamilton Shirley Amerasinghe Fellowship, *Objectives* (UN) https://www.un.org/oceancapacity/sites/www.un.org.oceancapacity/files/objectives_of_the_fellowship_unnf.pdf accessed 30 July 2025.

¹¹ JA DREW, 'Use of traditional ecological knowledge in marine conservation' (2005) 19(4) *Conservation Biology* 1286.

¹² Republic of Maldives, *Strategic Action Plan (SAP) 2019-2023* (2019).

risk being tainted by the indelible stain of historical inequities. Just as the artistry of Paul Gauguin mainstreaming in several European and North American's museums is also now viewed through the lens of his reprehensible personal conduct, casting a shadow over his celebrated works and illuminating the colonialism inherent in his piece of arts, so too must scientific endeavours be scrutinized¹³.

Scope of research

This PhD research aims to analyse the legal aspects for the establishment of potential marine protected areas (MPAs) and other effective area-based conservation measures (OECMs) in four central atolls of the Maldives (Dhaalu, Faafu, Meemu, and Thaa) and the Wider Indian Ocean Region. This work is born from the institutionalized scientific relationship established in June 2022 through a Memorandum of Understanding (MoU) between the Ministry of Environment, Climate Change and Technology of the Maldives and the University of Milano-Bicocca (Milan, Italy), focused on cooperation and coordination for ecological and socio-economic assessments of existing and potential protected areas in the Maldives¹⁴.

The thesis commences with an analysis of the primary pressures on the Maldives in relation to their implementation of the law of the sea, specifically addressing the designation of baselines in accordance with UNCLOS and the implications of sea-level rise on baseline shifts. Subsequently, it focuses on marine pollution as a significant threat to the marine environment, examining the Maldives' implementation of key international treaties in this realm: the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 22 March 1989) (Basel Convention), the Rotterdam Convention on the Prior

¹³ F EISENMAN, 'In Search of the Primitive: Gauguin, Morris and Imperialist Culture' (2005) 6(1) Australian and New Zealand Journal of Art 4.

¹⁴ *Memorandum of Understanding between the Ministry of Environment, Climate Change and Technology of the Maldives and University of Milano-Bicocca on Cooperation and Coordination to Undertake Ecological and Socio-Economic Assessments of Existing Protected Areas and Potential Protected Areas in the Maldives* (Lisbon, 28 June 2022).

Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam, 10 September 1998) (Rotterdam Convention), and the Stockholm Convention on Persistent Organic Pollutants (Stockholm, 22 May 2001) (Stockholm Convention). The research then addresses climate change as a major threat to the coral reefs surrounding the archipelago, discussing mitigation measures such as ecosystem restoration and potential area-based legal protection. Finally, it delves into the existing MPAs system in the Maldives and explores the possibility of institutionalizing a comprehensive network of MPAs across the archipelago.

This research is conducted through a qualitative analysis of international law, regional frameworks, and domestic legislation of the Maldives. A deepened understanding of the United Nations system has been integrated through a research period abroad, specifically an internship at OLA/DOALOS in New York from September 2023 to December 2023. Furthermore, insights into the science-policy realm, crucial for the practical application of this thesis's findings, have been gained through a year in Copenhagen at the International Council for the Exploration of the Sea (ICES), a pioneering intergovernmental agency at the science-policy interface. The preparation and participation in the Workshop on Nature Restoration and Recovery (WKREST) (4-7 March 2025), coupled with discussions with experts and professors on restoration, culminating in the publication of the WKREST report, have been fundamental in enriching the discourse on ecosystem restoration as a vital mitigation and adaptation approach against the global climate crisis¹⁵.

The results of this thesis are intended for consideration by Maldivian policymakers in the preservation and protection of their marine ecosystems. The institutionalization of this research through the aforementioned MoU aims to proactively avoid the 'parachute science' paradigm; however, the ultimate decision regarding the application of this research rests solely with the Maldivian authorities who will review it.

¹⁵ ICES (2025). Workshop on Nature Restoration and Recovery (WKREST). ICES Scientific Reports.

1 Mapping sovereignty in the 21st century: the Maldives' archipelagic status and maritime delimitations under the United Nations Convention on the Law of the Sea

1.1 Introduction

The United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982) (UNCLOS) entered into force on 16 November 1994, 12 months after the date of deposit of the sixtieth instrument of ratification¹⁶. It lays down a comprehensive legal regime for the peaceful uses of the oceans including, *inter alia*, the definition of marine spaces, the conservation of the marine environment, the equitable and efficient use of the living and non-living resources, and the promotion of conducting marine scientific research through general principles and international cooperation. So far, UNCLOS counts 171 Parties¹⁷. The Republic of Maldives (the Maldives) signed it on 10 December 1982 and ratified it on 7 December 2000.

One of the main achievements of UNCLOS is the definition of the legal regime of marine spaces under and beyond national jurisdiction in an integrated manner, i.e. within one single legal instrument. The extent of sovereignty vested in the coastal State diminishes with the distance from the baseline from which the breadth of the territorial sea is measured, yielding ultimately space to the freedoms of the high seas. Conversely, an alternative perspective suggests that the freedoms, currently just enjoyed on the high seas, have been progressively curtailed in favour of an expanding assertion of control and the exercise of sovereign rights by coastal and archipelagic States¹⁸.

UNCLOS reveals that ocean governance involves balancing dichotomies, including the sovereignty of the coastal State versus the rights enjoyed by third

¹⁶ In accordance with Article 308 'Entry into force' of UNCLOS.

¹⁷ 168 States and the European Union.

¹⁸ 'La mer a toujours été battue par deux grands vents contraires: le vent du large qui souffle vers la terre est celui de la liberté; le vent de la terre vers le large est porteur des souverainetés. Le droit de la mer s'est toujours trouvé au cœur de leurs affrontements', R-J DUPUY, *La mer sous compétence nationale*, in R-J DUPUY and D VIGNES (eds) *Traité du nouveau droit de la mer* (Economica, Paris, 1984) 61.

States and the freedoms of the high seas, as well as the exploitation of marine resources versus their conservation and protection, including the prevention, reduction and control of pollution of the marine environment from different sources.

The sovereignty-dichotomy is the result of geographical, philosophical, and political thoughts from where the law of the sea found its roots. The Dutch humanist and jurist Hugo Grotius (b. 1583 - d. 1645) was one of the major contributors in the fields of international law and nature law. With the writing ‘Mare Liberum’ (firstly published anonymous in 1609), H. Grotius strongly claimed the cruciality of the freedom of navigation and trade. In this way, the author refuted the traditional assumptions in international relations, restricted to the concepts of sovereignty (*imperium*) and possession (*dominium*)¹⁹. In the sixteenth century, international relations were dominated by European colonialism, during which the sovereignty was held by the European States who had the *dominium* on the colonies. H. Grotius’ work was not only a philosophical discussion, but also a political statement. The Dutch jurist was employed by the Dutch East India Company, and ‘Mare Liberum’ could be considered as a ‘lawyer’s argument’²⁰ to claim the trade in the East Indies despite the monopoly in the area retained by the Portuguese.

The doctrine of freedom of the sea advocated by H. Grotius was a threat to the British assertions to control the seas around Great Britain against Dutch fishers²¹. In full response, The English jurist John Selden (b. 1584 - d. 1654) published ‘Mare Clausum’ (1635), where the sea is described, similarly to the land territory, as susceptible of private dominion and property²². Particularly, the second section of J. Selden’s book was entirely dedicated to the British *dominium* on the sea. As discussed by Eric G.M. Fletcher (b. 1903 - d. 1990), late politician in the United Kingdom, ‘if the “Mare Liberum” was the inspired harbinger of the future,

¹⁹ H GROTIUS, *The Free Sea* (translated by R Hakluyt, Natural Law and Enlightenment Classics, Liberty Fund 2004) 25.

²⁰ As written by E G M FLETCHER, ‘Grotius was consulted and wrote his treatise on the law of prize, which is in the nature of a brief and is, at any rate, “a lawyer’s argument”’, in E G M FLETCHER, ‘John Selden (Author of Mare Clausum) and His Contribution to International Law’ (1933) 19 Transactions of the Grotius Society 1.

²¹ E G M FLETCHER (n. 20). Even so the English claims to the high seas to the south and east of England were not mentioned in *Mare Liberum*.

²² E G M FLETCHER (n. 20). This theory is inspired by the historical empires and their relations with the sea, i.e. the Greeks, the Egyptian, and the Roman Empire.

the “Mare Clausum” was the faithful mirror of the actual and the exhaustive record of the past²³.

Throughout the history, various philosophers and jurists have contributed to the discussion concerning sovereignty and freedoms on the sea²⁴. Balancing these theories has remained central to the evolution of the law of the sea, which has been shaped extensively by Western colonialism and postcolonial maritime powers, far removed from the world of the 21st century.

In contemporary times, the interdisciplinary approach to studying the dynamics between society and nature has contributed to a deconstruction of traditional legal concepts, encouraging a rethinking of sovereignty.

One such reconceptualization is embodied in the notion of ‘biopolitical *encaring*’, a political approach to the governance of human societies and the surrounding environment that is grounded not in sovereign authority but in practice of care, attentiveness, and ethical responsibility. More specifically, biopolitics, as conceptualized by the philosopher Michel Foucault (b. 1926 - d. 1984), refers to the mode through which political power governs human, animal, and environmental components by means of regulations and institutional frameworks²⁵. *Encaring* is a neologism and can be intended as taking care of something in an active and continuative way and shaping the governance structure around the imperative of nurturing rather than dominating²⁶.

In addition to traditional models of governance based on sovereignty and *dominium*, biopolitical *encaring* emphasises a sustained commitment to the well-being of socio-ecological systems. This concept has gained traction in academic fields such as political ecology, post-colonial studies, and anthropology, where it is

²³ E G M FLETCHER (n. 20)

²⁴ T TREVES, ‘Historical Development of the Law of the Sea’ in D ROTHWELL, A G OUDE ELFERINK, K N SCOTT AND T STEPHENS (ed), *The Oxford Handbook of the Law of the Sea* (Oxford University Press 2015).

²⁵ M FOUCAULT, *Society Must Be Defended: Lectures at the Collège de France, 1975–1976* (Allen Lane 2003) M FOUCAULT, *Security, Territory, Population: Lectures at the Collège de France, 1977–1978* (Palgrave Macmillan 2007); M FOUCAULT, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–1979* (Palgrave Macmillan 2008).

²⁶ V DE LUCIA, ‘Rethinking the encounter between law and nature in the Anthropocene: From biopolitical sovereignty to wonder’ (2020) 31 *Law and Critique* 329.

used to explore complemented models of governance that challenge dominant paradigms rooted in exploitation or sovereign control²⁷.

UNCLOS may be seen as an early attempt to integrate principles of *encaring* into ocean governance, as many of its provisions are founded in scientific and technical reasoning rather than expressions of raw sovereign power. The delineation of normal and straight baselines and the extension of the continental shelf are both contingent on scientific-technical assessments. These legal processes are informed first by environmental knowledge, coastal geography in the case of baselines, or seabed features in the case of the continental shelf, and only subsequently by the exercise of State sovereignty.

In addition, sovereignty is expressed not only through rights but also through responsibilities, such as those articulated in Part XII of UNCLOS concerning the protection and preservation of the marine environment. Article 192 imposes a general obligation on States to protect and preserve the marine environment.

As Vito De Lucia (2019) observes:

Power governs no longer through sovereign command, but through technical norms and scientific regimes of knowledge (though always through law!). Power, through biopolitics, becomes equivalent with Earth-care.²⁸

The concept of biopolitical *encaring* also encompasses a commitment to sustainability and conservation, positioning these principles as a response to the unmonitored exploitation of natural resources. Within this framework, the health and resilience of terrestrial and marine ecosystems are fundamental to human well-being. As such, governance should aim to protect, regulate, and enhance natural processes rather than dominate or deplete them²⁹.

This perspective finds partial expression in UNCLOS, which integrates scientific evidence into the regulation of marine living resources. A pertinent example is found in the provisions governing the exclusive economic zone (EEZ),

²⁷ *Ibid.*; A BASHFORD, 'Global biopolitics and the history of world health' (2006) 19 *History of the Human Sciences* 67; C BIERMANN and B MANSFIELD, 'Biodiversity, purity and death: conservation biology as biopolitics' (2014) 32 *Environment and Planning D: Society and Space* 257.

²⁸ V DE LUCIA (n. 26) 336.

²⁹ *Ibid.*

particularly Article 61(3), which obliges coastal States to adopt conservation measures that maintain or restore fish stocks to levels capable of producing the maximum sustainable yield, taking into account a range of environmental and economic considerations. These include the needs of coastal communities, the specific circumstances of developing States, the interdependence of fish stocks, and internationally recognized standards at regional or global levels. Through such provisions, UNCLOS demonstrates, once again, an early incorporation of scientific knowledge into legal frameworks, an approach that aligns with the logic of biopolitical *encaring*, wherein the management of natural resources is informed by ethical responsibility and ecological care, rather than being solely an exercise of sovereign authority.

In contemporary times, not only the dynamics but also the actors of ocean governance are undergoing significant transformations. Emerging economies are asserting their interests more prominently, advocating for a more inclusive and equitable legal framework that ensures access and use of marine resources.

Among the most compelling examples are Small Island Developing States (SIDS), which are increasingly redefining themselves as ‘Large Ocean States’. This reconceptualization shifts the narrative from one geographical vulnerability to one of strong access to the ocean and its living and non-living resources. Large Ocean States are pioneers in redefining both sovereignty and governance by establishing extensive marine protected areas (MPAs) in partnerships with non-State actors to finance and manage these zones, ultimately reshaping the discourse of ocean governance and administration^{30,31}.

While officially classified as a SIDS in the United Nations panorama³², The Maldives is a prominent example of a Large Ocean State, with less than 300 square kilometres of land but over 90,000 square kilometres of marine territory -

³⁰ N CHAN, “‘Large Ocean States’: Sovereignty, Small Islands, and Marine Protected Areas’ (2018) 24(4) *Global Governance: A Review of Multilateralism and International Organizations* 537.

³¹ For the sake of clarity and alignment with the main legal frameworks and relevant literature, this thesis adopts the term “small island developing States” (SIDS), as officially recognized by the United Nations, although the term “Large Ocean State” may better reflect the unique characteristics of these countries.

³² ‘SIDS are a distinct group of 39 States and 18 Associate Members of United Nations regional commissions that face unique social, economic and environmental vulnerabilities.’ <https://www.un.org/ohrls/content/about-small-island-developing-states> accessed 19 May 2025.

underscoring the vital importance of the ocean and its resources to the country's identity, economy, and resilience. As noted by Amr Danyal Shamun, Third Secretary of the Permanent Mission of the Republic of Maldives to the United Nations, 'Our identity, economic vitality, and property are deeply tied to the oceans. The vibrant coral reefs and the rich marine ecosystems found in our waters are the main sources of our livelihoods'.³³

Non-State actors are also increasingly asserting their rights and interests within the framework of the law of the sea. Notably, Indigenous Peoples are advancing claims to self-determination and to the permanent authority or administration over natural resources, including marine areas adjacent to their ancestral territories. Under the current legal framework and prevailing interpretation of UNCLOS, however, only States are entitled to exercise sovereign rights, and so control authority, over maritime zones. UNCLOS does not explicitly acknowledge the rights or interests of Indigenous Peoples, a significant limitation that has drawn growing attention, particularly in light of recent United Nations General Assembly resolutions calling for enhanced inclusion of Indigenous communities in ocean governance³⁴.

As Arvid Pardo observed in 1984:

Whatever the future may bring, one thing is certain: The law of the sea will continue to evolve under the pressure of perceived security, economic, and political needs of the more influential members of the international community³⁵.

An illustrative example of the progressive development of the law of the sea is reflected in the adoption of the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Agreement), adopted in New York on 19 June 2023 and about to enter into force on 17 January 2026. The BBNJ Agreement aims to address existing legal and governance gaps in

³³ A DANYAL SHAMUN, 'Statement by Mr Amr Danyal Shamun, Third Secretary, Permanent Mission of the Republic of Maldives to the United Nations' (General Assembly, Item 75: Oceans and the Law of the Sea and Sustainable Fisheries, 5 December 2023, UNHQ, New York).

³⁴ UNITED NATIONS GENERAL ASSEMBLY, *Resolution adopted by the General Assembly: Oceans and the Law of the Sea* (11 December 2023) A/RES/78/69; UNITED NATIONS GENERAL ASSEMBLY *Resolution adopted by the General Assembly: Oceans and the Law of the Sea* (16 December 2024) A/RES/79/144.

³⁵ A PARDO, 'The Law of the Sea: Its Past and Its Future' (1984) 63(1) *Oregon Law Review* 7.

the regulation of the high seas by enhancing the capacity of States to conserve and sustainably use marine biodiversity in areas beyond national jurisdiction, notably through the establishment of area-based management tools and the promotion of international cooperation. Among the general principles and approaches guiding the implementation of the Agreement, particular emphasis is placed on the use of relevant traditional knowledge held by Indigenous Peoples - and local communities - with due respect for their rights. The Agreement also explicitly acknowledges the special circumstances of SIDS and least developed countries, ensuring that their specific needs and capacities are fully taken into account³⁶.

UNCLOS SYSTEM

United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982)

Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (New York, 28 July 1994)

Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (New York, 4 August 1995)

Agreement Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (New York, 19 June 2023)³⁷

The changing landscape of ocean affairs demands an evolution on the interpretation of UNCLOS to address contemporary complexities. This evolution must consider emerging States and other key stakeholders, as well as advancing technologies, the socio-environmental impacts of climate change, and modern security challenges.

UNCLOS is a significant milestone in international law, providing a comprehensive framework for governing the world's oceans and seas. Its historical importance is undeniable, having established rules on maritime boundaries, navigation rights, and environmental protection, leading to reduced conflicts and promoting peaceful ocean uses. With 171 Parties, including major maritime powers,

³⁶ Article 7, BBNJ Agreement.

³⁷ In accordance with its Article 68(1), '[The] Agreement shall enter into force 120 days after the date of deposit of the sixtieth instrument of ratification, approval, acceptance or accession'.

UNCLOS stands as the venerable *Constitution for the Oceans*, an enduring pillar of relevance in the contemporary world³⁸.

However, the law of the sea is facing new and evolving challenges that require adaptation. Emerging States, especially SIDS, are asserting their sovereignty, and rights to access marine spaces and their resources in the face of climate change and sea level rise. The socio-environmental impacts of climate change, particularly the rising sea levels, threaten the stability of baselines and the concept of statehood, especially for low-lying island nations like the Maldives.

This chapter critically examines the manner in which the Maldives has delineated and asserted its sovereignty through the legal framework provided by UNCLOS. It begins with an analysis of the extent to which UNCLOS was influenced by the geopolitical and legal priorities of dominant maritime powers during the twentieth century, with particular attention to the codification of the Archipelagic State regime. The discussion then shifts to the pressing challenges of the twenty-first century, notably the existential threat posed by sea-level rise to low-lying island States. The chapter interrogates the implications of climate-induced shifts in baselines for maritime entitlements and the continuity of statehood, underscoring the limitations of a legal regime that was not designed to address such profound environmental transformations. In its final section, the chapter incorporates the perspectives of non-State actors, including Indigenous Peoples, whose relationships with maritime spaces often transcend the territorially bounded, State-centric constructs of international law, yet whose contributions to contemporary ocean governance are gaining increasing recognition. Through this analysis, the author foregrounds the evolving disjuncture between a legal convention shaped by twentieth-century paradigms and the complex legal, environmental, and ethical challenges of the twenty-first century.

³⁸ T T B KOH, 'A Constitution for the Oceans' (Remarks at the final session of the Third United Nations Conference on the Law of the Sea, 6 December 1982).

1.2 When sea level rise outpaces legal adaptation

Sea-level rise would cause extensive damage to the land and infrastructure of [low-lying, small, coastal, and Island States] and even threaten the very survival of some island states.

Malé Declaration on Global Warming and Sea Level Rise, Malé, 18 November 1989³⁹

It is significant to recognize that as early as 1989, over three decades ago, small island States began articulating their concerns regarding the threats posed by climate change, with particular emphasis on sea level rise. The convening of the first Small States Conference on Sea Level Rise in November 1989, held in Malé, the capital of the Maldives, represented a foundational moment in the history of international climate diplomacy and justice. At a time when global awareness of anthropogenic climate change was still nascent, this initiative by small island States demonstrated both foresight and a deep understanding of the existential risks posed to low-lying coastal and island nations. The principal outcome of this Conference was the adoption of the Malé Declaration on 18 November 1989. This document constitutes one of the earliest coordinated expressions of political will among vulnerable countries in response to climate change. The Declaration formalised a series of commitments, including the establishment of cooperative mechanisms among small low-lying States to formulate climate-related policies and the development of preliminary frameworks for monitoring the effects of climate change. In addition to fostering intra-regional cooperation, the Malé Declaration served as a collective appeal to the broader international community, urging immediate action to mitigate climate change and calling for the creation of a comprehensive legal framework to safeguard and manage affected coastal zones.

The significance of the Malé Declaration lies not only in its substance but also in its historical context. Adopted in 1989, during a period when international awareness of climate change was still emerging, the Declaration underscores the fact that small island States, despite contributing minimally to global greenhouse gas emissions (GHGs), were among the first to articulate the profound vulnerabilities they faced due to rising sea levels. As such, the Declaration stands as an early and enduring testament to the leadership of vulnerable countries within

³⁹ Malé Declaration on Global Warming and Sea Level Rise (18 November 1989).

the global climate regime: a leadership grounded in lived experience, scientific awareness, and a normative call for urgent and equitable international action.

In 1990, the First Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) highlighted the vulnerability of small low-lying States and coastal communities to sea level rise, storm surges, and coastal flooding, with particular attention to the Maldives in the Indian Ocean, and Pacific islands⁴⁰. After that, several IPCC Assessment Reports confirm and emphasise this vulnerability, attributing it not only to climatic factors but also to anthropogenic influences such as demographic patterns and human-induced subsistence practices - a conclusion reached with a high degree of confidence⁴¹.

The issue of sea level rise was notably absent from the nine-year long negotiations of UNCLOS, which took place between 1973 and 1982⁴². This legal gap stems from the historical context in which UNCLOS was formulated, with the primary focus of international discourse on the marine environment revolving around the multifaceted issues and sources of marine pollution⁴³, rather than considerations of climate change and its effects. The first notable effort to draw attention to the implications of GHG emissions within an international policy forum was made by Irving Mintzer during the Public Hearing of the World Commission on Environment and Development (WCED) in June 1985. I. Mintzer underscored the urgency of addressing climate change, warning that it was already late to begin

⁴⁰ IPCC, *Climate Change: The 1990 and 1992 IPCC Assessments* (1992). In this report the predicted mean sea level rise was about 20 centimetres by 2030, and 65 centimetres by the end of the XXI century, with significant regional variations (p. 52-53). Additionally, the rate of change of the predicted rise in sea level would have been about three to six times faster than that seen over the last 100 years or so (p. 80). Particularly, data shown sea level would go on rising from 2030 to 2100, as much again as from 1990-2030 (p. 82).

⁴¹ M OPPENHEIMER, BC GLAVOVIC, J HINKEL, R VAN DE WAL, AK MAGNAN, A ABD-ELGAWAD, R CAI, M CIFUENTES-JARA, RM DECONTO, T GHOSH, J HAY, F ISLA, B MARZEION, B MEYSSIGNAC, and Z SEBESVARI, 'Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities' in H-O PÖRTNER, DC ROBERTS, V MASSON-DELMOTTE, P ZHAI, M TIGNOR, E POLOCZANSKA, K MINTENBECK, A ALEGRÍA, M NICOLAI, A OKEM, J PETZOLD, B RAMA, NM WEYER (eds.), *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (Cambridge University Press 2019) 321. A deeper analysis of the IPCC findings is provided in Chapter III of this thesis which highlight the role of SIDS in Climate Change Law.

⁴² NORAL, 'UNCLOS and sea level rise' (2023) 149 *Marine Policy*.

⁴³ Part XII of UNCLOS titled 'Protection and Preservation of the Marine Environment' addresses the potential environmental impacts of activities in the marine environment. In Section 5 of Part XII, it establishes general obligations for States to take measures to prevent, reduce and control pollution of the marine environment from various sources. These sources include land-based sources, seabed activities, activities pursued in the Area, disposal of waste, vessels, and the atmosphere, as outlined in Articles 207-212.

the process of policy formulation concerning the impacts of greenhouse warming
44 .

The implications of sea level rise for international law, particularly in relation to the provisions of UNCLOS, are multifaceted. These include, *inter alia*, the shifting of baselines and the consequent redefinition of maritime entitlements over marine spaces, the potential alteration of the legal status of geographic features such as islands, rocks, and low-tide elevations, as well as the territorial integrity of low-lying small island States.

The delineation of the marine spaces of the coastal State begins with the drawing of the baselines. Article 5 of UNCLOS defines the normal baseline as ‘the low-water line along the coast as marked on large scale charts officially recognized by the coastal State’. In instances where islands feature fringing reefs, as seen in tropical States, such as the Maldives with coral reef formations, the baselines are to align with the low-water line of the reef, as defined in Article 6 of UNCLOS. For specific scenarios, such as ‘where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity’, the method of straight baselines connecting appropriate points may be employed, as outlined in Article 7(1) of UNCLOS. To prevent the assertion of overly expansive claims, the straight baselines ‘must not depart to any appreciable extent from the general direction of the coast, and the sea areas lying within the lines must be sufficiently closely linked to the land domain to be subject to the regime of internal waters’ as specified in Article 7(3) of UNCLOS⁴⁵. In the depiction of straight baselines, UNCLOS endeavours to consider natural and human-made formations that could influence its determination, including the presence of river mouths, bays, ports, roadsteads, and low-tide elevations, as elaborated in its Articles 9, 10, 11, 12, and 13.

An archipelagic State, as defined in Article 46 of UNCLOS, refers to ‘a State constituted wholly by one or more archipelagos and may include other islands.’ Pursuant to Article 47, such a State is permitted to draw straight archipelagic

⁴⁴ World Commission on Environment and Development, *Our Common Future* (UN Doc A/42/427, 4 August 1987) para 29.

⁴⁵ Within the internal waters, the coastal State holds identical sovereign power as it does within its territorial land.

baselines connecting the outermost points of the outermost islands and drying reefs of the archipelago, provided that the baselines encompass the principal islands and form a closely related geographical, economic, and political entity. The Maldives, composed entirely of a chain of atolls and islands in the Indian Ocean, qualifies as an archipelagic State under this definition.

As evidenced by the aforementioned provisions, the delineation of baselines is intrinsically linked to the several physical and geographical factors, including the position of the low-water line, the natural configuration of the coastline, the geographic arrangement of the archipelago, and, in certain cases, the presence of coastal infrastructure. This approach reflects an attempt to ground maritime space determinations in observable natural features, thereby aligning with the concept of *biopolitical encaring*, which refers to a mode of governance that primarily integrates scientific, ecological, and technical knowledge, rather than subordinating them to politically arbitrary legal authority. In this context, the method to baseline delineation respects the environmental and geographic realities of coastal and archipelagic States, prioritising data-driven assessments over purely strategic or power-based claims - poles apart the approach often taken with terrestrial borders.

Regrettably, the natural features associated with the coastlines have been increasingly affected by sea level rise, thereby challenging the stability of baselines and calling for adaptive, science-informed responses. As sea levels increase due to climate change, coastlines may erode, submerge, or shift inland; altering the geographical location of the low-water line, which serves as the normal baselines. At the same time, rising sea level can potentially alter the natural formations and destroy infrastructures used as reference points in the establishment of straight baselines. Consequently, disputes may arise when the shifting of coastline can affect the delimitation of overlapping EEZs and continental shelves, creating conflicts between neighbouring States over shared maritime boundaries.

Even more concerning, several small island States face a direct threat to their territorial integrity due to rising sea level and natural disasters. The looming risk of complete inundation raises substantial concerns regarding their continued statehood and, consequently, their sovereignty over submerged territories and associated

maritime zones⁴⁶. In this regard, the Convention on Rights and Duties of States adopted by the Seventh International Conference of American States (Montevideo, 26 December 1933) (Montevideo Convention) sets out the criteria for statehood, which are now widely recognized as customary international law. These essential qualifications include: a permanent population, a defined territory, a government, and the capacity to enter into relations with other States. Given the critical role of a land territory in establishing statehood, the loss of land due to rising sea levels presents unique challenges. Among these criteria, the requirement of a defined territory becomes particularly problematic for small island States at risk of total submersion. The legal implications extend beyond statehood itself and directly affect maritime entitlements. Under UNCLOS, maritime zones are defined in relation to the land territory of the State. This reflects the principle that *the land dominates the sea*, meaning that sovereignty over maritime spaces is dependent on the existence of land territory. Without such territory, a State may lose its legal basis to claim and exercise jurisdiction over marine spaces.

Although numerous scholars had addressed the implications of sea level rise for international law since the 1990s⁴⁷, it was not until 2008 that the international community began to formally acknowledge and engage with the issue at the intergovernmental level⁴⁸. This temporal gap illustrates the disconnect between scientific understanding and institutional responsiveness, highlighting the difficulty of addressing urgent and evolving challenges in a rapidly changing global context.

Starting from 2008, the International Law Association (ILA) formed two key committees in response to the growing threat of sea level rise, especially for low-lying small island States.

⁴⁶ M GAGAIN, 'Climate Change, Sea Level Rise, and Artificial Islands: Saving the Maldives' Statehood and Maritime Claims through the Constitution of the Oceans' (2012) 23 Colorado Journal of International Environmental Law and Policy 77.

⁴⁷ A SOONS, *A Soons*, 'The Effects of a Rising Sea Level on Maritime Limits and Boundaries' (1990) 37 Netherlands International Law Review 207; E BIRD and V PRESCOTT, 'Rising Global Sea Levels and National Maritime Claims' (1989) 1 Marine Policy Reports 177; D. CARON, 'When law makes climate change worse: rethinking the law of baselines in light of a rising sea level' (1990) 17 Ecology Law Quarterly 621; D FREESTONE and J PETHICK, 'International Legal Implications of Coastal Adjustments under Sea Level Rise: Active or Passive Policy Responses?' in J Titus and N Psuty (eds), *Adaptive Options to Sea Level Rise: Report to the Intergovernmental Panel on Climate Change from the Miami Conference on Adaptive Responses to Sea Level Rise and Other Impacts of Global Climate Change, Vol 1* (1990); S P MENEFFEE, 'Half Seas Over: The Impact of Sea Level Rise on International Law and Policy' (1991) 9 UCLA Journal of Environmental Law and Policy 175.

⁴⁸ N ORAL (n. 42)

The ILA Committee on Baselines under the International Law of the Sea (2008-2012) (ILA CommBaselines)

The ILA CommBaselines concluded that the legally recognized normal baseline is the low-water line along the coast as depicted on nautical charts that are officially approved by the relevant coastal State, based on a specified vertical datum. However, in cases where significant physical changes render the chart inaccurate, international judicial bodies have allowed the use of external evidence to ascertain the correct position of the legal baseline⁴⁹. The ILA CommBaselines further determined that normal baselines are ‘ambulatory’, meaning they can shift seaward due to factors like accretion, land uplift, or human-made developments (such as harbours and reclaimed land), and landward due to erosion or rising sea levels. In extreme scenarios, such landward movement may result in complete territorial loss, which could eliminate the baselines and consequently the maritime zones dependent on them. The ILA CommBaselines acknowledged that the current legal framework governing normal baselines is insufficient to effectively address the serious challenges posed by substantial territorial loss due to sea level rise⁵⁰.

The ILA Committee on International Law and Sea Level Rise (2012-ongoing) (ILA CommSLR)

In its most recent resolution, the ILA CommSLR reaffirmed that legal certainty, stability, equity, and international cooperation are essential principles for addressing the complex implications of sea level rise for low-lying small island States⁵¹. A central conclusion of the resolution is that, where baselines and maritime zone limits have been lawfully established in accordance with UNCLOS and duly deposited with the United Nations Secretary-General, these entitlements should remain valid even if the physical coastline changes due to climate-induced sea level

⁴⁹ INTERNATIONAL LAW ASSOCIATION COMMITTEE ON BASELINES UNDER THE INTERNATIONAL LAW OF THE SEA, 'Baselines under the International Law of the Sea' in *International Law Association Report of the Seventy-Fifth Conference (Sofia 2012)* 25.

⁵⁰ *Ibid.* 31.

⁵¹ INTERNATIONAL LAW ASSOCIATION, Resolution 01/2024 (Committee on International Law and Sea Level Rise) (2024).

rise. This stance reflects a commitment to legal stability and seeks to safeguard the maritime rights of vulnerable states⁵².

The resolution also endorses the principle of the finality of maritime boundaries, stating that boundaries settled by treaty or international adjudication should remain in force regardless of subsequent geographical alterations caused by submergence⁵³.

Finally, The ILA CommSLR thus supports the emerging view that statehood and membership in international organizations, including the United Nations, must be preserved, even in scenarios where sea level rise renders most of a state's territory submerged or uninhabitable in the mid- to long-term⁵⁴. The ILA CommSLR has also recommended the deployment of both hard defence structures (e.g., sea walls, groynes) and soft engineering solutions, including vegetation or the manipulation of sediments for protecting the territory from inundations and sea level rise⁵⁵. In addition to these measures, several low-lying States have also undertaken land reclamation projects⁵⁶ and the construction of artificial or floating islands as long-term adaptation strategies.

A prominent example is the Maldives, which has implemented extensive engineering interventions, notably the creation of Hulhumalé, an artificial island designed to provide a secure refuge in the event of widespread inundation⁵⁷. While such technological responses may offer effective resilience in practice, they expose a critical limitation of the current legal framework under UNCLOS. Artificial islands do not qualify as 'islands' for the purposes of generating maritime zones.

⁵² *Ibid.* 1.

⁵³ *Ibid.* 2.

⁵⁴ *Ibid.* 3.

⁵⁵ INTERNATIONAL LAW ASSOCIATION COMMITTEE ON INTERNATIONAL LAW AND SEA LEVEL RISE, 'Final Report of the ILA Committee on International Law and Sea Level Rise' in *International Law Association Report of the Eighty-First Conference (Athens 2024)* 49.

⁵⁶ Land reclamation refers to the process of creating new land by infilling or draining areas of the sea, wetlands, or other water bodies to make them suitable for human use, such as urban development, agriculture, or infrastructure. This process can also involve the construction of artificial islands, which are entirely man-made landforms built to extend habitable or usable space beyond existing coastlines. See S Y CHEE, A G OTHMAN, Y K SIM, A N M ADAM and L B FIRTH, 'Land reclamation and artificial islands: Walking the tightrope between development and conservation' (2017) 12 *Global Ecology and Conservation* 80–95.

⁵⁷ J HINKEL et al. 'The ability of societies to adapt to twenty-first-century sea-level rise' (2018) 8 *Nature Climate Change* 570, 573.

Consequently, they are excluded from enjoying territorial seas, EEZs, or continental shelves⁵⁸.

This disconnect highlights again the broader issue that technological innovation in response to climate threats is not yet matched by corresponding legal developments. However, like for the other discussed themes, the legal status of artificial islands is also a complex issue which arose from different legal opinions over the years. On one hand, the international law may adapt to modern possibilities, considering artificial islands as defined territory entitled to maritime spaces⁵⁹. On the other hand, the attribution of statehood to artificial islands may address potential abuse by States manipulating maritime boundaries, an exemplary case is the conflict in the South China Sea⁶⁰. Without forgetting the environmental impacts of land reclamation and the construction of artificial islands⁶¹.

Complementing the work of ILA, the International Law Commission (ILC), a subsidiary body of the United Nations General Assembly, formally included the topic ‘Sea-level rise in relation to international law’ in its long-term programme of work during its seventy-first session in 2019. This initiative reflects growing recognition within the United Nations system of the complex and far-reaching legal challenges posed by sea-level rise.

The work of ILC addresses key issues across three central domains: the law of the sea, the status and continuity of statehood, and the protection of persons affected by the physical and legal consequences of rising sea levels. Since the topic’s inclusion, the ILC has issued three substantive reports published

⁵⁸ Article 11 of UNCLOS excludes artificial islands as reference infrastructure for the establishment of straight baselines. Article 60 of UNCLOS restricts artificial islands from generating their own territorial sea or other maritime rights, save a 5000 metres safety zone.

⁵⁹ M GAGAN (n. 46)

⁶⁰ Y TANAKA, *The South China Sea Arbitration: Toward an International Legal Order in the Oceans* (Hart Publishing 2019).

⁶¹ C LARSON, ‘China’s Island building is destroying reefs’ (2015) 349 *Science* 1434, 2015; F BULLERI and M G CHAPMAN, ‘The introduction of coastal infrastructure as a driver of change in marine environment’ (2010) 47 *Journal of Applied Ecology* 26; Z MOUSSAVI and A AGHAEL, ‘The environment, Geopolitics, and Artificial Islands of Dubai in the Persian Gulf’ (2013) 81 *Procedia - Social and Behavioral Sciences* 311; Z YU and Z ZHENG, ‘Exploration of Measures to Reduce the Impact of Artificial Island Construction on Marine Environment for Maldives’ (2024).

respectively in 2020⁶², 2022⁶³, and 2023⁶⁴. These works contribute to the progressive development and codification of international legal frameworks to one of the most pressing challenges of the 21st century involving the marine environment.

The Pacific Islands Forum (PIF) has played a key role in shaping the work of ILC on sea-level rise in relation to international law. Representing the collective voice of some of the most vulnerable countries, PIF has issued key statements aimed at shaping international legal standards, the Declaration on preserving Maritime Zones in the Face of Climate Change-related Sea-level Rise (2021), and the Declaration on the Continuity of Statehood and the Protection of Persons in the Face of Climate Change-related Sea-level rise (2023). A consistent position across these declarations is the assertion that once maritime zones are established in accordance with UNCLOS, they should remain fixed, irrespective of subsequent physical changes to the coastline due to sea level rise. This approach seeks to preserve the sovereign rights and maritime entitlements of Pacific Island States, and other low-lying States, in the face of a rapidly changing environment.

Similarly, the Maldives, in its 2019 submission to the ILC, emphasized that maritime entitlements and boundaries should remain stable once lawfully established under UNCLOS. The Maldives rooted its argument in the principles of legal certainty, equity, and fairness, highlighting the disproportionate impact that fluctuating baselines would have on small island States, whose economies and territorial identities are closely tied to their maritime zones. The submission further contended that bilateral maritime boundaries must remain legally binding, protected

⁶² INTERNATIONAL LAW COMMISSION, *Sea-level rise in relation to international law, First issues paper by Bogdan Aurescu and Nilüfer Oral, Co-Chairs of the Study Group on sea-level rise in relation to international law* (United Nations General Assembly, A/CN.4/740, 28 February 2020).

⁶³ INTERNATIONAL LAW COMMISSION, *Sea-level rise in relation to international law Second issues paper by Patrícia Galvão Teles and Juan José Ruda Santolaria, Co-Chairs of the Study Group on sea-level rise in relation to international law* (United Nations General Assembly, A/CN.4/752, 19 April 2022).

⁶⁴ INTERNATIONAL LAW COMMISSION, *Sea-level rise in relation to international law, Additional paper to the first issues paper (2020), by Bogdan Aurescu and Nilüfer Oral, Co-Chairs of the Study Group on sea-level rise in relation to international law* (United Nations General Assembly, A/CN.4/761, 13 February 2023).

under the principle of *pacta sunt servanda*, and that sea-level rise cannot constitute a ‘fundamental change of circumstances’ sufficient to invalidate such agreements⁶⁵.

These State-led initiatives have significantly shaped the evolving position of the ILC, which has recognized a broad and growing consensus among States in support of the fixation of maritime baselines and outer limits⁶⁶. This approach is increasingly viewed as essential to ensuring legal stability and continuity in the law of the sea. It marks a notable shift toward a more resilient and adaptive interpretation of UNCLOS, one that responds to the existential threats faced by small island States due to climate-induced sea level rise. By embracing this perspective, the international legal community reinforces the core values enshrined in UNCLOS, namely, peaceful relations, international cooperation, and legal predictability, while adapting the framework to contemporary global challenges.

Finally, this analysis is focused on the interpretation of UNCLOS, which is why it does not explicitly address the human rights of affected people whose territories are continuously threatened by sea-level rise and natural disasters related to climate change; however, these rights are crucial and have been extensively discussed in the works of both ILA and ILC, as well as in the 2024 statement by United Nations Special Rapporteur David R. Boyd on the human right to a clean, healthy, and sustainable environment after a visit in the Maldives⁶⁷.

1.3 The Maldives and the contested legal construction of maritime zones under UNCLOS

The Constitution of the Maldives defines the national territory encompassing the land, airspace, sea, and seabed within the archipelagic baselines,

⁶⁵ THE REPUBLIC OF MALDIVES, ‘Submission to the UN: Sea-level rise in relation to international law’ (31 December 2019) 2019/UN/N/50.

⁶⁶ N ORAL, et al, 'Rising Hopes Amid Rising Seas: Developments in International Law Addressing the Threat of Sea-Level Rise' (2024) United Nations Chronicle <https://www.un.org/en/un-chronicle/rising-hopes-amid-rising-seas-developments-international-law-addressing-threat-sea> assessed 22 July 2025.

⁶⁷ D R BOYD (Special Rapporteur on the human right to a clean, healthy and sustainable environment), *Visit to Maldives: Report of the Special Rapporteur on the human right to a clean, healthy and sustainable environment*, David R. Boyd (United Nations General Assembly, A/HRC/58/59/Add.1, 25 April 2024)

and includes the territorial waters, the seabed and air space thereof beyond these baselines⁶⁸.

With the Maritime Zones of Maldives Act No. 6/96, the Maldives officially proclaimed its status as archipelagic State⁶⁹, drawing straight archipelagic baselines, apparently in accordance with Article 47 of UNCLOS. The delineation of these straight baselines has been the subject of debate, as certain aspects may conflict with the criteria set forth in Article 47 of UNCLOS⁷⁰.

1. An archipelagic State may draw straight archipelagic baselines joining the outermost points of the outermost islands and drying reefs of the archipelago provided that within such baselines are included the main islands and an area in which the ratio of the area of the water to the area of the land, including atolls, is between 1 to 1 and 9 to 1.
2. The length of such baselines shall not exceed 100 nautical miles, except that up to 3 per cent of the total number of baselines enclosing any archipelago may exceed that length, up to a maximum length of 125 nautical miles [...]

⁶⁸ Constitution of the Republic of Maldives 2008, art 3.

⁶⁹ Article 46 of UNCLOS defines an archipelagic State as a State ‘constituted wholly by one or more archipelagos and may include other islands’.

⁷⁰ OFFICE OF OCEAN AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE, *Limits in the Seas No. 126 Maldives Maritime Claims and Boundaries* (2005).

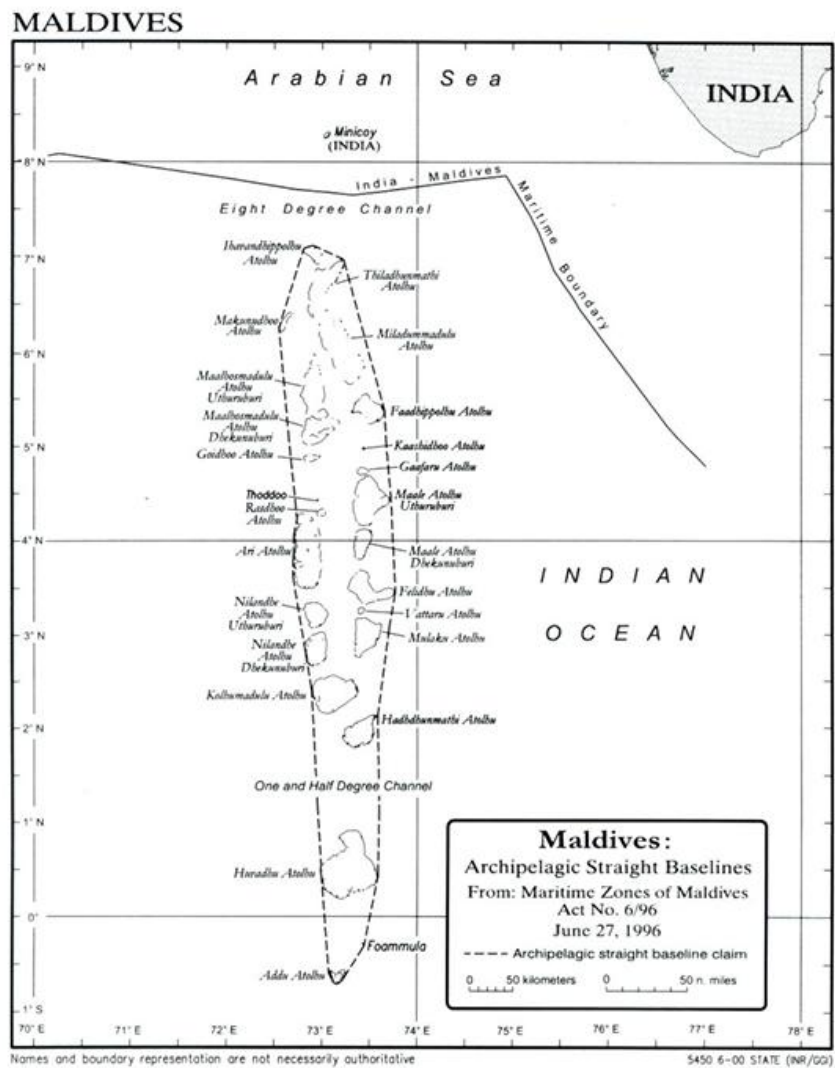


FIGURE 1.1 MALDIVES: ARCHIPELAGIC STRAIGHT BASELINES.

Source: OFFICE OF OCEAN AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE, *Limits in the Seas No. 126 Maldives Maritime Claims and Boundaries*, 2005.

The Maldivian Water-Land-Area-Ratio is 2.63:1⁷¹. This means that, for every unit of land area in the Maldives, there are approximately 2.63 units of marine area. This ratio falls within the range specified by Article 47(1) of UNCLOS, which states that the ratio of the area of water to the area of land, including atolls, should be between 1 to 1 and 9 to 1.

The criticisms arise in relation to the drawing of baselines. The Maldives has established an archipelagic baseline system composed of thirty-seven segments,

⁷¹ *Ibid.*

which determine the breadth of the territorial sea and other maritime zones of the Maldives. The lengths of these segments range from 0.2 miles to 120.3 miles, with three of them exceeding 100 miles in length (segments 14-15, 28-29, and 36-37). In light of this, the Maldives does not meet the requirement of Article 47(2) of UNCLOS, which sets a limit of 3 per cent of the total number of baselines that can exceed 100 nautical miles in length⁷². In the case of the Maldives with thirty-seven segments, this would mean that just one segment can exceed 100 nautical miles. Since the Maldives has three segments that exceed this limit, it is not in compliance with this specific requirement of UNCLOS.

The Maldives' non-compliance with UNCLOS rule concerning the drawing of archipelagic baselines has not been officially justified by the State. This raises the question of whether the country's unique geographic configuration - comprising 1,192 islands stretching nearly 900 kilometres in length - renders strict adherence to UNCLOS criteria impracticable, or whether the deviation is merely the result of a technical oversight.

One possible avenue for addressing these challenges could be for the Maldives to seek membership in the International Hydrographic Organization (IHO). The IHO plays a central role in ensuring that maritime spaces are systematically surveyed and charted to uphold navigational safety and marine environmental protection. By coordinating national hydrographic services and establishing international standards for nautical charts and publications, the IHO fosters consistency and data-sharing across jurisdictions. Its guidance on hydrographic surveys, coupled with a strategic focus on building technical capacity, offers member States tailored support to meet both domestic needs and global obligations more effectively⁷³.

⁷² The document *Limits in the Seas No. 126 Maldives Maritime Claims and Boundaries*, authored by the OFFICE OF OCEAN AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE (2005), contains data pertaining to the lengths of Maldivian baselines, measured in miles. According to Article 47(2) of UNCLOS, it specified that the length of three per cent of these baselines may exceed 100 nautical miles. The U.S. Department of State document employs mile measurements, meanwhile, UNCLOS standardizes measurements in nautical miles. This is just a specification, but not fundamental since the result is unchangeable. Consequently, owing to this conversion factor, it follows that more than three per cent of the Maldivian baselines, as delineated in the U.S. Department of State document, surpass the 100-nautical-mile threshold in length.

⁷³ INTERNATIONAL HYDROGRAPHIC ORGANIZATION, *IHO capacity building strategy* (2021) <https://iho.int/uploads/user/Inter->

The maritime area enclosed by the archipelagic straight baselines constitutes the archipelagic waters in accordance with Article 49(1) of UNCLOS. Archipelagic waters are neither internal waters nor territorial sea, instead, they have a *sui generis* legal status, combining elements from both maritime zones. The concept of archipelagic waters arose as a diplomatic compromise during the negotiations of UNCLOS. It aimed to reconcile the differing perspectives of archipelagic States, advocating for the characterisation of these waters as internal waters, and maritime States, as dominant naval powers, seeking to preserve navigational freedoms through these waters⁷⁴.

Archipelagic States were satisfied by the recognition of their absolute sovereignty over the enclosed waters, the airspace over them, as well as to the seabed and the subsoil, and the resources contained therein as established in Article 49(1,2) of UNCLOS. Additionally, any rights recognised in favour of third States in archipelagic waters would not affect in any way the legal status of these waters as an integral part of the archipelagic State's territory, as outlined in Article 49(4) of UNCLOS. However, several rights have been granted to third States within archipelagic waters,

Firstly, the rights recognized in favour of third States within the archipelagic waters pertains to the longstanding rights traditionally enjoyed by these States, primarily neighbouring ones, within the archipelagic waters. As outlined in Article 51(1) of UNCLOS, the archipelagic State is mandated to 'recognize traditional fishing rights and other legitimate activities of the immediately adjacent neighbouring States in certain areas falling within archipelagic waters', under the conditions of bilateral agreements between the concerned States.

Secondly, the archipelagic State is required to 'respect existing submarine cables laid by other States and posing through its waters without making a landfall'. This includes the permission of the archipelagic State to 'the maintenance and replacement of such cables upon receiving due notice of their location and the intention to repair or replace them'.

[Regional%20Coordination/CBSC/MISC/Capacity_Building_Strategy_2021_ver05.pdf](#) accessed 22 July 2025.

⁷⁴ S KOPELA, *Dependent Archipelagos in the Law of the Sea* (Brill | Nijoff, 2013).

Thirdly, Article 47(6) of UNCLOS delineates additional rights of neighbouring States, stating: ‘If a part of the archipelagic waters of an archipelagic State lies between two parts of an immediately adjacent neighbouring State, existing rights and all other legitimate interests which the later State has traditionally exercised in such waters and all rights stipulated by agreement between those States shall continue and be respected’.

Fourthly, concerning navigational rights, ships of all States are entitled to the right of innocent passage through archipelagic waters. However, under Article 25 of UNCLOS, a coastal State may temporarily suspend the innocent passage of foreign ships in specified areas of its territorial sea. Similarly, Article 52 extends this authority to archipelagic States, allowing them to suspend innocent passage within designated areas of their archipelagic waters.

Fifthly, Article 53 of UNCLOS introduces the concept of ‘archipelagic sea lanes passage’. Like the concept of transit passage through straits used for international navigation⁷⁵, archipelagic sea lanes passage grants extensive navigation and overflight rights to all vessels, including warships, and aircraft of third States. These rights are exclusively enjoyed within the sea lanes and the air routes specially designated by the archipelagic State in consultation with the competent international organisation, namely the International Maritime Organization (IMO). If an archipelagic State does not designate sea lanes or air routes, the right of archipelagic sea lanes passage may be exercised along the routes typically used for international navigation.

The introduction of the archipelagic sea lanes passage was a substantial concession made by archipelagic States to address the concerns of maritime powers regarding the passage of warships and submerged submarines and overflight⁷⁶. Additionally, Article 53(4) of UNCLOS further stipulates that the archipelagic sea

⁷⁵ In straits used for international navigation (Article 53, UNCLOS), all ships and aircraft enjoy the right of transit passage, which shall not be impeded, except in cases outlined in Article 54(1) of UNCLOS. Transit passage means ‘the exercise of the freedom of navigation and overflight solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone’ (Article 54(2), UNCLOS).

⁷⁶ S KOPELA (n. 74)

lanes passage extends to the adjacent territorial sea of the archipelagic States, representing a concession, that, to some extent, constrains their sovereignty⁷⁷.

The majority of archipelagic States have recognized both innocent passage and archipelagic sea lanes passage in their national legal framework⁷⁸. The legislation of the Maldives also provides for archipelagic sea lanes passage in its archipelagic waters. Article 12 entitled ‘Entry into archipelagic waters’ of the Maritime Zones of Maldives Act No. 6/96 enacts that:

Foreign vessels shall have the right of continuous and expeditious archipelagic passage in the sea lanes designated by the Government of Maldives from among international navigation channels. Such passage shall be in accordance with the regulations made under this Act.

As of now, the Maldives has not designated any archipelagic sea lanes. Consequently, in accordance with Article 53 of UNCLOS, the ‘right of archipelagic sea lane passage may be exercised through routes normally used for international navigation’. Historically, the routes commonly utilised for international navigation through the Maldives’ territory include the Equatorial Channel, One and a Half Degree Channel, and Kaashidhoo Channel (or Kardiva Channel)⁷⁹.

In the territorial sea of the Maldives, Article 13 entitled ‘Entry into the territorial sea’ of the Maritime Zones of Maldives Act No. 6/96 applies:

(a) Save such vessels engaged in innocent passage compatible with international laws, no vessel shall enter the territorial sea of Maldives except in accordance with the laws and regulations of Maldives.

Point (b) of the same article has sparked some debates, including a claim by the United States of America (United States):

(b) No foreign warship or foreign nuclear-powered ship or ship carrying nuclear or other inherently dangerous or noxious substances shall enter the territorial sea of Maldives for any purpose except with prior authorization of the Government of Maldives and in accordance with the laws and regulations of Maldives.

⁷⁷ *Ibid.*

⁷⁸ *Ibid.*

⁷⁹ *Ibid.*

The Maldives claims that a foreign warship, nuclear-powered ship, or a ship carrying nuclear or other inherently dangerous or noxious substances must receive authorization from the Maldives prior to entering the territorial sea, which is a requirement not envisaged in UNCLOS and even stronger than requiring a previous notification – as some other States assert. This provision is contested by the United States as not in line with UNCLOS. Specifically, Article 23 of UNCLOS states that:

Foreign nuclear-powered ships and ships carrying nuclear or other inherently dangerous or noxious substances shall, when exercising the right of innocent passage through the territorial sea, carry documents and observe special precautionary measures established for such ships by international agreements

UNCLOS does not require pre-authorization for nuclear-powered ships and other ships carrying dangerous substances. Instead, it mandates that these ships enjoy the right of innocent passage and should adhere to specific precautionary measures outlined in international agreements.

Given the specific circumstances of the Maldives - as a geographically remote SIDS, with limited capacity to effectively monitor and control its maritime zones, and possessing a highly sensitive and biodiverse marine environment - it may be justifiable for the archipelagic State to require prior authorization for the entry of vessels carrying hazardous or toxic substances into its territorial waters. This position can be supported by Article 21(1) of UNCLOS, which grants coastal States the authority to adopt laws and regulations relating to innocent passage through their territorial sea. In particular, Article 21(1)(f) permits the adoption of measures aimed at the preservation of the marine environment and the prevention, reduction, and control of pollution. In this context, the request of the Maldives of prior authorization for foreign nuclear-powered ships and vessels carrying nuclear or other inherently dangerous or noxious substances before entering its territorial sea can be regarded as an environmental protection measure aimed at preventing potential pollution incidents.

In line with the Article 33 of UNCLOS, the Maldives has described its contiguous zone and the jurisdiction over it in Articles 5 and 10 of the Maritime Zones of Maldives Act No. 6/96:

The maritime area contained within 12 nautical miles measured from the outer limits of the territorial sea [...] shall be the contiguous zone of Maldives [...]

Maldives may exercise within the contiguous zone the control necessary to prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within the territory of Maldives and its territorial sea and to punish the infringement of the above laws and regulations committed within the territory and the territorial sea of Maldives.

As defined in Part V of UNCLOS, the EEZ of the coastal State is a zone contiguous to the territorial sea, including the contiguous zone, up to 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. Within the EEZ, the coastal State has sovereign rights for the purpose of exploring, exploiting, conserving, and managing natural resources, both living and non-living, of the seabed and subsoil and the suprajacent waters and with regard to other activities for the economic exploitation and exploration of the zone. The coastal State has jurisdiction with regard to the establishment and use of artificial islands, installations and other structures, marine scientific research and the protection and preservation of the marine environment. The sovereign rights of the coastal State shall be exercised due to regard to the rights and duties of other States. In the EEZ, third States enjoy the freedoms of navigation and overflight, and of the laying of submarine cables and pipelines, with regard to the rights and duties of the coastal State.

For the purposes of preservation of living resources in the EEZ, Article 61 of UNCLOS mandates that the coastal State shall establish conservation measures. These measures, such as determining the total allowable catch for fish resources, are based on the best available scientific evidence, such as the MSY, to prevent species overexploitation. This scientific foundation reflects a broader logic of biopolitical *encaring*, whereby the State assumes responsibility for the health of marine life through expert-led governance. By integrating ecological science into legal and regulatory frameworks, coastal States engage in a form of environmental care that aligns with their sovereign duties under international law. The management of marine biodiversity thus becomes for the coastal State both a legal obligation and an exercise of biopolitical *encaring* over life in its maritime spaces.

Additionally, as outlined in Article 61(4) of UNCLOS, the coastal State is required to consider the impacts on species associated with or dependent upon the harvested species. This provision hints at the concept of ecosystem-based management (EBM), a well-established practice in current natural resource management, though not explicitly stated in UNCLOS.

Without prejudice to the provisions on the conservation of marine resources, Article 62 of UNCLOS promotes the optimum utilisation of the living resources in the EEZ.

In essence, UNCLOS attempts to strike a delicate balance between the sustainable exploitation of marine species and their preservation. This regulatory balance resonates deeply with the concept of *biopolitics* developed by the philosopher M. Foucault, which frames governance as the incitement, production, management and organization of life itself⁸⁰.

The *biopolitics* of M. Foucault departs from traditional sovereign power, characterized by the right to decide life and death, and instead focuses on the regulation and optimization of life, aiming to sustain and control populations through scientific and administrative techniques. The regime of UNCLOS for marine resources can be interpreted as a biopolitical plan, wherein States assume responsibility for the careful management of fish populations. Through measures such as setting total allowable catches based on scientific data, such as MSY, States engage in a governance that both sustains life and organizes it for productive ends.

The Maldives proclaimed its EEZ, and dispositions for the entrance of foreign ships, in the Maritime Zones of Maldives Act No. 6/96:

(6) The maritime area adjacent to and beyond the territorial sea [...] together with the seabed thereof up to 200 nautical miles measured from the archipelagic baselines [...] shall be the exclusive economic zone of Maldives.

(14) No foreign vessel shall enter the exclusive economic zone of Maldives except with prior authorization from the Government of Maldives in accordance with the laws of Maldives.

⁸⁰ M FOUCAULT (n. 25); V DE LUCIA (n. 26); A DESTASIO, 'Agamben e Foucault: Due modelli irriducibili di biopolitica' (2023) XXV *Etica & Politica* 406, 408.

Under Article 14, the Maldives stipulates that any foreign vessel entering its EEZ must first obtain prior authorization. This requirement has been criticised, notably by the US, for being inconsistent with UNCLOS⁸¹. According to Article 58(1) of UNCLOS, within the EEZ, all States enjoy the freedoms referred to in Article 87, including freedom of navigation and overflight. These freedoms are fundamental components of the EEZ regime and do not require prior notification to, or permission from, the coastal authorities, provided they are exercised in accordance with UNCLOS.

While coastal States hold jurisdiction in certain areas, such as marine scientific research and the protection and preservation of the marine environment, as disciplined in Article 56(1), these powers do not extend unilaterally imposing conditions on the navigational freedoms of foreign vessels.

Nevertheless, the position of the Maldives must be considered in light of its specific vulnerabilities and geographic context. As SIDS characterized by geographical remoteness, limited maritime surveillance capabilities, and high ecological sensitivity, the Maldives faces significant challenges in monitoring and protecting its vast maritime domain. The requirement of prior authorization may thus be understood as a precautionary measure aimed at addressing risks such as illegal fishing, marine pollution, unauthorized scientific research, or the transit of hazardous and noxious substances, including nuclear materials.

While these concerns are legitimate from an environmental perspective, UNCLOS provides limited legal bases for coastal States to impose such restrictions. As seen before, in the territorial sea, Article 21(1)(f) explicitly allows coastal States to adopt laws and regulations relating to innocent passage, including measures for the prevention, reduction, and control of marine pollution. However, UNCLOS contains no equivalent provision authorizing coastal States to adopt laws and regulations for limiting navigation in the EEZ. As such, any attempt to impose a prior authorization requirement in the EEZ is an overreach of jurisdiction under UNCLOS.

⁸¹ OFFICE OF OCEAN AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS (n. 70).

1.4 The historical development of the maritime boundaries of the Maldives

Another key aspect governed by UNCLOS is the establishment of maritime boundaries between coastal States. Generally, States with opposite or adjacent coasts might claim overlapping EEZ, necessitating negotiations for the delineation of maritime boundaries as outlined in Article 74 of UNCLOS.

The Maldives has established all the maritime boundaries with its neighbouring States, which include the Democratic Socialist Republic of Sri Lanka (Sri Lanka), the Republic of India (India), and the Republic of Mauritius (Mauritius).

The Agreement between Sri Lanka, India and the Maldives concerning the determination of the trijunction point (point T) in the sea beyond the Gulf of Mannar came into effect on 31 July 1976. This agreement defined the point T in the Indian Ocean as being equidistant from the coasts of the three signatory States⁸², approximately 200 nautical miles from each coast. Mirefenfushi Island, in Malé Atoll, stands as the closest Maldivian territory to point T. The seabed surrounding Mirefenfushi Island slopes more gently than in other parts of the atoll, featuring a distinct reef that as evidently served as a reference point for calculating point T⁸³.

The Maldives and the India signed an agreement to establish a maritime boundary between their EEZs in the Arabian Sea on 28 December 1976, which went into effect on 8 June 1978⁸⁴. The maritime boundary extends almost 500 nautical miles north and west from point T. The boundary consists of twenty turning points connecting arcs of Great Circles, in the Arabian Sea⁸⁵.

⁸² Agreement between Sri Lanka, India and Maldives concerning the Determination of the Trijunction Point between the three Countries in the Gulf of Mannar (signed 23, 24 and 31 July 1976). The point T is defined as follows: 04° 47.04" N (latitude), and 77° 01.40" E (longitude).

⁸³ J I CHARNEY and L M ALEXANDER, *International Maritime Boundaries Volume II* (Martinus Nijhoff Publishers 1993).

⁸⁴ Agreement between India and Maldives on Maritime Boundary in the Arabian Sea and Related Matters (signed 28 December 1976).

⁸⁵ OFFICE OF OCEAN AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE, *Limits in the Seas No. 78 Maritime Boundary: India – Maldives and Maldives' Claimed "Economic Zone"*, 1978.

The first segment of the boundary, 223 nautical miles, tends north-westerly from the point T, closely equidistant from the southwest coast of India – from Cape Comorin to Quilon - and from the northeast Maldives atolls, including Malé, Fadiccolu, Miladummadulu, and Tiladummati. Turning westward the boundary continues for another 273 nautical miles, between the Indian islands called Minicoy and Suheli Par and the Maldives' atolls called Tiladummati and Ihavandiffulu⁸⁶.

J. I. Charney and L. M. Alexander (1993) argue that the marked disparity in political, economic and military powers between India and the Maldives likely influenced the outcome, ensuring that India received no worse than a modified equidistant line even though would be possible to mount a case that Minicoy Island should be discounted because of its detachment from the rest of Indian territory. Minicoy Island, the southernmost island of the Lakshadweep (Laccadives) Archipelago, lies approximately 215 nautical miles southwest of the city of Kochi along the Malabar coast of India. Covering an area of 4.4 square kilometres with a population of about 5,000, Minicoy Island serves as the sole Indian reference point controlling the 215-nautical-mile boundary. According to J. I. Charney and L. M. Alexander, if the Maldives had raised the argument that the equidistance line should have been modified because of Maldives' longer frontage and the isolated position of Minicoy Island from the Indian mainland, it could have been countered by contrasting the major continental nature of the Indian coast and the fact that Minicoy is larger and has a much bigger population than any of the islands in Ihavandiffulu Atoll which forms the northernmost part of Maldives⁸⁷.

India and the Maldives intended to terminate the boundary 200 nautical miles from their coasts. However, according to 'Limits in the Seas No. 78' of 1978 edited by the Department of State of the United States, point 1 of the maritime boundaries are calculated to be 197 nautical miles and 203 nautical miles from the Maldives and India respectively.

After more than forty years since the agreements with India and Sri Lanka on maritime boundary delimitations, the maritime boundaries between Mauritius

⁸⁶ *Ibid.*

⁸⁷ J I CHARNEY AND L M ALEXANDER (n. 83)

and the Maldives were defined in 2023. In this instance, a bilateral agreement between the two States was not achieved through direct negotiations. Consequently, a Special Chamber of the International Tribunal for the Law of the Sea (ITLOS) finalized the delimitations of the EEZs and the continental shelves between the two neighbouring States in the ‘Dispute concerning delimitation of the maritime boundary between Mauritius and Maldives in the Indian Ocean (Mauritius/Maldives)’ on 28 April 2023.

Before discussing this arbitration concerning the delimitation of the EEZs as well as of the continental shelves, it is essential to provide the legal definition of the continental shelf and the jurisdiction of the coastal State over it.

As for the other maritime spaces, the continental shelf is regulated by UNCLOS, specifically in Part VI. The continental shelf is a submerged, and relatively shallow edge of a land territory that extends from the shoreline into the ocean. It is a valuable geological, ecological, and resource-rich area with significance for both marine sciences and law of the sea. Article 76(1) of UNCLOS defines juridically the continental shelf as:

the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.

According to Article 76(4,5) of UNCLOS, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles, non-exceeding 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or 200 nautical miles from 2,500 metre isobath.

With a view to exercise sovereign rights on the continental shelf beyond 200 nautical miles from the baselines, coastal States shall submit to the Commission of the Limits of the Continental Shelf (CLCS) scientific information and data on the outer limits. Once the CLCS makes its recommendations on the submission, the limits of the shelf established by the coastal State based on these recommendations shall be final and binding, as outlined in Article 76(8) of UNCLOS.

On 26 July 2010, the Maldives submitted information to the CLCS regarding the limits of the continental shelf beyond 200 nautical miles from the baselines from which the territorial sea is measured⁸⁸.

On 9 August 2010, the United Kingdom communicated that the submission of the Maldives does not take full account of the 200 nautical mile Fisheries and Environment Zones of the British Indian Ocean Territory (BIOT)⁸⁹.

On 29 October 2010, Mauritius presented a note verbale reiterating its sovereignty over the Chagos Archipelago. Mauritius does not recognize the BIOT, claiming that the Chagos Archipelago ‘was illegally excised by the United Kingdom from the territory of Mauritius prior to its independence in violation of United Nations General Assembly resolutions 1514 (XV) of 14 December 1960 and 2066 (XX) of 16 December 1965’⁹⁰.

In a subsequent note verbale, Mauritius informed that, after discussions with the Maldives, the Maldives agreed to amend its submission to the CLCS to include the EEZ of Mauritius in the Chagos Archipelago. However, the Maldives did not make any amendment to its submission^{91,92}.

Article 74(2) of UNCLOS defines that ‘If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV’. Essentially, Part XV of UNCLOS establishes the dispute settlement mechanisms, including arbitration, conciliation, and judicial

⁸⁸ REPUBLIC OF MALDIVES, *Executive Summary of the Submission by the Republic of Maldives to the Commission on the Limits of the Continental Shelf pursuant to Article 76, Paragraph 8, of the 1982 United Nations Convention on the Law of the Sea* (July 2010) MAL-ES-DOC, 5.

⁸⁹ PERMANENT MISSION OF THE UNITED KINGDOM TO THE UNITED NATIONS, *Note verbale No. 171/10* (9 August 2010). The BIOT is known as an Overseas Territory of the United Kingdom situated in the Indian Ocean, comprising the seven atolls of the Chagos Archipelago. The largest is Diego Garcia, which is the site of a military basis of the United Kingdom and the U.S.

In February 2019, the Advisory Opinion of the International Court of Justice called for the Chagos Archipelago to be given to Mauritius (See *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965* (Advisory Opinion) I.C.J. Reports 2019, 95).

⁹⁰ PERMANENT MISSION OF THE REPUBLIC OF MAURITIUS TO THE UNITED NATIONS, *Note verbale No. 10887/10* (29 October 2010).

⁹¹ PERMANENT MISSION OF THE REPUBLIC OF MAURITIUS TO THE UNITED NATIONS, *Note verbale No. 11031/11*, 24 March 2011.

⁹² Lastly, on 17 November 2020, India sent a note verbale in which states that the Maldives’ submission to the CLCS does not prejudice matters relating to the delimitation of maritime boundaries with India. (PERMANENT MISSION OF THE REPUBLIC OF INDIA TO THE UNITED NATIONS, *Note verbale No. NY/PM/443/8/2020*, 17 November 2020).

settlement, to ensure the peaceful resolution of disputes related to the interpretation and application of the provisions ruled in UNCLOS.

Article 287 of UNCLOS lists the procedures which can be pursued in case of a dispute: ITLOS established in accordance with Annex VI, the International Court of Justice (ICJ), an arbitral tribunal constituted in accordance with Annex VII, and a special arbitral tribunal constituted in accordance with Annex VIII for one or more categories of disputes specified therein.

On 23 August 2019, Mauritius informed ITLOS on the institution of arbitral proceedings against the Maldives, pursuant to Annex VII to UNCLOS. Following consultations held by the President of ITLOS with representatives of Mauritius and the Maldives, a Special Agreement was concluded between the two States on 24 September 2019 to submit the dispute concerning the delimitation of the maritime boundary between them in the Indian Ocean to a Special Chamber of ITLOS to be formed pursuant to Article 15(2) of the Statute of ITLOS⁹³.

The Maldives submitted preliminary objections under Article 294 of UNCLOS and Article 97 of the Rules of ITLOS. At the core of this submission is the long-standing unresolved sovereignty dispute between Mauritius and the United Kingdom – which is not a party to the proceedings – with respect to the Chagos Archipelago, which is referred to by the United Kingdom as the BIOT, so subject to its sovereignty. According to the Maldives, a prerequisite for the determination of Mauritius' claims would be a decision by ITLOS on that sovereignty dispute, but ITLOS does not have jurisdiction to make such a determination. The Maldives noted that the United Kingdom took the same view in a written statement to Parliament on 5 November 2019, where the Minister of State for Foreign and Commonwealth Affairs set out the United Kingdom's position as follows:

The United Kingdom is not a party to these proceedings, which can have no effect for the UK or for maritime delimitation between the United Kingdom (in respect of the British Indian Ocean Territory) and the Republic of the Maldives. [...] A fundamental principle of international law and the international legal order is the principle of consent. It follows that the Special Chamber is not in a position to pronounce itself on the sovereignty dispute

⁹³ *Dispute concerning delimitation of the maritime boundary between Mauritius and Maldives in the Indian Ocean (Mauritius/Maldives)* (Judgement of 28 April 2023) ITLOS Reports 2023, 4.

between the United Kingdom and Mauritius without the consent of the United Kingdom to resolve the sovereignty dispute before the Special Chamber⁹⁴.

The Special Chamber rejected the preliminary objections of the Maldives and found that it has jurisdiction to adjudicate upon the dispute submitted to it by the Parties concerning the delimitation of the maritime boundary between them in the Indian Ocean⁹⁵.

Mauritius is an archipelagic State located in the southwest and central Indian Ocean. It officially recognizes the Chagos Archipelago as an integral part of its territory⁹⁶. The islands of the Chagos Archipelago lie approximately 1,188 nautical miles northeast of the main island of Mauritius and 269 nautical miles south of the Maldives.

Article 74(1) and Article 83(1) on the delimitation of the EEZs and continental shelves, respectively, between States with opposite or adjacent coasts, outlines for an ‘equitable solution’, without defining the method to be employed in achieving it.

In *Mauritius/Maldives*, both Parties agreed on the three-stage equidistance circumstances methodology should apply to the maritime delimitation in the EEZs and continental shelves within 200 nautical miles^{97,98}.

⁹⁴ UNITED KINGDOM PARLIAMENT, MINISTER OF STATE FOR FOREIGN AND COMMONWEALTH AFFAIRS, ‘British Indian Ocean Territory’ (Written Statement, 5 November 2019, UIN HCWS90).

⁹⁵ *Mauritius/Maldives (Judgement)* ITLOS Reports 2023.

⁹⁶ For a more detailed analysis on maritime claims and boundaries related to Mauritius, see OFFICE OF OCEAN AND POLAR AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE, *Limits in the Seas No. 140 Mauritius: Archipelagic and other Maritime Claims and Boundaries* (2014).

⁹⁷ As delineated by the Special Chamber in the *Mauritius/Maldives*: ‘While its application is not mandatory, the equidistance/relevant circumstances method not only leads to an equitable solution in most cases but also brings transparency and predictability to the process of delimitation (*Bay of Bengal Maritime Boundary Arbitration between Bangladesh and India, Award of 7 July 2014, Reports of International Arbitral Awards*, Volume XXXII, p. 105, para. 339; *Delimitation of the Maritime Boundary in the Atlantic Ocean (Ghana/Côte d’Ivoire)*, Judgment, ITLOS Reports 2017, 4, p. 86 (para. 281); *Maritime Delimitation in the Indian Ocean (Somalia v. Kenya)*, Judgment, I.C.J. Reports 2021, 206, pp. 251-252 (para. 128))’.

⁹⁸ The three-stage approach is defined as: (1) drawing of a provisional equidistance line, based on the geography of the coasts of the Parties and mathematical calculations; (2) determining whether there are any relevant circumstances requiring adjustment of the provisional equidistance line; if yes, adjusted it; (3) checking whether the delimitation line results in any significant disproportion between the ratio of the respective coastal lengths and the ratio of the maritime areas allocated to each Party. This approach has been employed i.e. *Maritime Delimitation in the Black Sea (Romania v. Ukraine)* (Judgement of 3 February 2009) I.C.J. Reports 2009, 3, and *Delimitation of the maritime*

In the establishment of the provisional equidistance line, discussions primarily include the consideration of the status of the Blenheim Reef, situated in the Chagos Archipelago. After reviewing the arguments of the Parties, The Special Chamber finds that Blenheim Reef, as a low-tide elevation and drying reef, is not a site for appropriate base points for the construction of the provisional equidistance line. On the other hand, the Special Chamber finds that a low-tide elevation of Blenheim Reef, situated wholly or partly within 12 nautical miles of Île Takamaka, can be used as a baseline for measuring the 200 nautical miles limit of Mauritius⁹⁹.

For the establishment of an equidistance line, the Special Chamber measured the lengths of the Parties' relevant coasts: Mauritius' relevant coast is 40.3 kilometres and the Maldives' relevant coast is 39.0 kilometres. This results in a ratio of the lengths of the relevant coasts of the Parties as 1:1.033 in favour of Mauritius. The delimitation line allocates to Mauritius 45,331 square kilometres and to the Maldives 47,232 square kilometres¹⁰⁰. This results in a ratio of the areas allocated to the Parties as 1:0.960 in favour of the Maldives. The Special Chamber's decision appears to have been equitable between the Parties, even though the relevant coastal length of Mauritius is higher than that of the Maldives, but the area allocated to Mauritius is less than the area allocated to the Maldives.

Regarding the maritime delimitation between the continental shelves of the Parties, the Maldives claimed entitlement to a continental shelf beyond 200 nautical miles, within 200 nautical miles limit of Mauritius, in the submission to the CLCS. Meanwhile, Mauritius claimed the continental shelf beyond 200 nautical miles to the Special Chamber in the *Mauritius/Maldives*.

The Special Chamber found it has jurisdiction to delimit the continental shelves between the Parties, including the continental shelves beyond 200 nautical miles. However, the Special Chamber also found that, in the circumstances of the *Mauritius/Maldives*, it was unable to determine the entitlement of Mauritius to the continental shelf beyond 200 nautical miles in the Northern Chagos Archipelago

boundary in the Bay of Bengal (Bangladesh/Myanmar) (Judgement of 14 March 2012) ITLOS Reports 2012, 4.

⁹⁹ *Mauritius/Maldives (Judgement)* ITLOS Reports 2023.

¹⁰⁰ *Ibid.*

Region. Consequently, it decided to not proceed to delimit the continental shelf between Mauritius and the Maldives beyond 200 nautical miles¹⁰¹.

To date, the maritime boundaries of the Maldives with neighbouring States have been clearly defined, apart from the delimitation of the continental shelf beyond 200 nautical miles between Mauritius and the Maldives.

In the context of *Mauritius/Maldives*, the author examines the exclusion of the Chagossians, the Indigenous Peoples of the Chagos Archipelago, in judicial and administrative processes, highlighting the persistent practice of marginalizing Indigenous Peoples within jurisdictional frameworks¹⁰². This occurs notwithstanding recent United Nations General Assembly resolutions on the law of the sea, which advocate for the inclusion of Indigenous People and the recognition of their rights concerning access to and use of marine resources¹⁰³.

¹⁰¹ *Ibid.*

¹⁰² The *amicus curiae* from the Chagossian Committee (Seychelles) was not accepted by the ITLOS and, consequently, was not included in the official case files. The advisors for the *amicus curiae* were Sebastian Schnitzenbaumer, Jamie Trinidad, Stephen Allen, and Thomas Burri. A revised version of the submission was subsequently published in the following work: S ALLEN, T BURRI, AND J TRINIDAD, ‘Stakeholders or bystanders? - An attempt by Seychelles Chagossians to intervene in the International Tribunal for the Law of the Sea’ in L JEFFREY, C MONAGHAN, M O’GORMAN (eds), *Challenges and Prospects for the Chagos Archipelago* (Routledge 2024).

¹⁰³ The author’s analysis has been published as: C. CANELLA, *Claiming Indigenous Rights: The Unacknowledged Amicus Curiae Submission by the Chagossian Committee (Seychelles)*, in ASCOMARE, Vol. 4, ‘Humanity Across the Waves – Rethinking the Law of the Sea through a Human Rights Lens’.

2 International cooperation in waste management for marine pollution prevention: the case of Maldives

2.1 Introduction

The Maldives, an archipelagic State comprising a chain of coral islands that extends about 870 kilometres from north to south, crossing the equator, and about 130 kilometres from east to west, is internationally renowned for its clear turquoise waters, unspoiled beaches, and vibrant coral reefs. These natural assets contribute significantly to its appeal as a premier tourist destination, attracting around one million internationally visitors annually¹⁰⁴. The tourism sector constituted the largest share of the GDP, accounting for 18.7 per cent in 2023, followed by the wholesale and retail trade sector at 8.9 per cent¹⁰⁵. However, the sustainability of the tourist sector is increasingly under threat. Although the Maldivian marine environment may appear pristine, it is, in fact, confronting a severe and escalating pollution crisis. This environmental degradation poses a direct risk to the very natural resources upon which the tourism industry, and, by extension, the national economy, relies.

Daily, a large of tons of waste generated from agricultural, urban and industrial are dumped into the marine waters¹⁰⁶. The consequences of such pollution

¹⁰⁴ In 2022, 1,675,303 tourists were recorded, and for the year 2023 1,878,543 tourists have landed in the Maldives. The Ministry of Tourism of the Republic of Maldives has estimated an increase of 0.5 per cent of arrivals for 2024. Tourist origin is India, Russia, China, United Kingdom, Germany, Italy, USA, France, Spain, and Switzerland (in order to the market share). MINISTRY OF TOURISM, Republic of Maldives. Maldives Tourism Updates Issue 1(2024, January 4).

¹⁰⁵ MALDIVES BUREAU OF STATISTICS, *Annual Gross Domestic Product Maldives* (2024).

¹⁰⁶ It is estimated that more than 1,000 tons per day of solid waste generated across the archipelago. L DI MARIO, J VON KORIE, and M HAIKAL, *Metals and Plastic Recycling in Maldives*, (ADB South Asia Working Paper Series No. 96, 2023). However, the lack of data and record do not permit a proper estimation of the quantity of waste dumped into the Maldivian marine areas. L MOOSA, *Maldives National Waste Accounts 2018 & 2019 Final Report* (31 March 2021).

are severe, leading to the degradation of marine ecosystems, the loss of biodiversity, and resulting in significant social and economic disruptions¹⁰⁷.

This phenomenon is not unique to the Maldives but represents a global plague. The FAO estimates that 2,250 cubic kilometres of effluent are discharged annually into the world's oceans and seas. This includes 1,260 cubic kilometres from agricultural drainage, 660 cubic kilometres from industrial wastewater, and 330 cubic kilometres from urban wastewater¹⁰⁸. The Maldives is significantly affected by all these sources of pollution.

The past two decades have seen a significant increase in the use of synthetic fertilizers, pesticides, livestock pharmaceuticals, and other agrochemicals in the archipelago. This trend has contributed to growing concerns over environmental degradation, microbial resistance, and water contamination¹⁰⁹. Although agriculture represented only 1.3 per cent of the Maldivian GDP as of 2018, the sector has expanded nationally, partly to offset the decline in fishery catches¹¹⁰. This expansion has been marked by a sharp rise in agrochemical imports and use, with reports indicating that some farmers apply pesticides up to ten times per season, far above recommended levels¹¹¹. Such practices risk eradicating beneficial insects, promoting microbial resistance, and threatening long-term agricultural sustainability and public health¹¹².

¹⁰⁷ C P KAPINGA and S H CHUNG, *Marine Plastic Pollution in South Asia* (UN ESCAP Working Paper, 2020).

¹⁰⁸ FAO, *The state of the world's land and water resources for food and agriculture – Systems at breaking point. Synthesis report 2021* (2021).

¹⁰⁹ J PENUELAS, F COELLO, and J SARDANS, 'A better use of fertilizers is needed for global food security and environmental sustainability' (2023) 12(5) *Agriculture & Food Security*.

¹¹⁰ While the number of Maldivian fishers has been on a downturn trend since 2013, the number of farmers has been stable. ASIAN DEVELOPMENT BANK, *Maldives Economic Update 2020* (November 2020).

¹¹¹ A M HAMEED and H NIMSHA, *Maldives National Chemical Profile* (Ministry of Environment and Energy, Republic of Maldives, November 2016).

¹¹² Ecological balance is defined as 'a state of dynamic equilibrium within a community of organisms in which genetic, species and ecosystem diversity remain relatively stable, subject to gradual changes through natural succession'. If pesticides can play a vital role in agriculture, protecting crops from pests, at the same time, their abuse can devastate yields and significantly disrupt the delicate ecological balance. Pesticides often harm beneficial insects and pollinators, disrupting food chains and impacting the populations of animals that rely on these insects for food. Additionally, pesticides can run off into waterways after application, or leach through the soil, contaminating groundwaters. They can be toxic to organisms living in aquatic environments. Finally, some pesticides are persistent and accumulate in the bodies of organisms as they move up the food chain, this phenomenon is called bioaccumulation. WWF, 'Ecological balance' https://wwf.panda.org/discover/knowledge_hub/teacher_resources/webfieldtrips/ecological_balance/ accessed 22 July 2025.

Agricultural runoff is now the primary source of nitrogen and phosphorus entering marine environments¹¹³. These nutrients fuel excessive algal growth, leading to harmful algal blooms (HABs), oxygen depletion, and the collapse of marine ecosystems. HABs have increased in frequency across the Indian Ocean, particularly along the coast of India¹¹⁴. While the Maldives has not experienced widespread HABs, a notable bloom of *Caulerpa racemosa* was observed in 2011, likely driven by nutrient enrichment and coral reef decline - factors exacerbated by climate change¹¹⁵.

Solid waste management in the Maldives is similarly challenged. The 'Maldives National Waste Accounts 2018 & 2019 Final Report' documented the inefficient system highlighting the stark disparities in waste generation and management across three units: the Greater Malé Area, local community-inhabited atolls, and resort-dominated industrial islands.

The Greater Malé Area, home to roughly 116,000 people within 5.8 square kilometres, is among the world's most densely populated regions. From 2004 to 2014, waste generation rose by 155 per cent reaching an average of 1.7 kilogram per person per day¹¹⁶. Although most of this waste is organic and compostable, limited segregation has led to widespread open burning and landfilling at Thilafushi, an artificial island designated for waste disposal¹¹⁷.

In contrast, atoll communities produce around 0.8 kilogram per capita per day, with about 25 per cent of islands practicing basic household-level segregation¹¹⁸. Kitchen and green waste constitute approximately 88 per cent of the total waste produced, though hazardous materials, such as waste oil and laboratory chemicals, are also present¹¹⁹. Food and green waste are commonly unsafely buried

¹¹³ FAO (n. 108)

¹¹⁴ KB PADMAKUMAR, NR MENON and VN SANJEEVAN, 'Is Occurrence of Harmful Algal Blooms in the Exclusive Economic Zone of India on the Rise?' (2012) *International Journal of Oceanography*; M THOLKAPIYAN, P SHANMUGAM and T SURESH, 'Monitoring of ocean surface algal blooms in coastal and oceanic waters around India' (2014) 186 *Environmental Monitoring and Assessment* 4129.

¹¹⁵ S MONTANO et al., 'Acropora muricata mortality associated with extensive growth of *Caulerpa racemosa* in Magoodhoo Island, Republic of Maldives' (2012) 31 *Coral Reefs* 793.

¹¹⁶ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of Maldives, *State of the Environment, 2016* (2016) 26.

¹¹⁷ L MOOSA (n. 106)

¹¹⁸ MINISTRY OF ENVIRONMENT AND ENERGY (n. 116) 26.

¹¹⁹ MINISTRY OF ENVIRONMENT AND ENERGY (n. 116) 170.

in backyards, while non-biodegradable waste is either collected or transported to the Island Waste Management Centre¹²⁰. However, samples of charred plastics and microplastics have been found in the vicinity of islands inhabited by Maldivian communities. This evidence substantiates that open burning practices extend beyond the disposal of green waste to encompass other materials, thereby presenting a discernible threat to human health and surrounding environment¹²¹.

Resort islands generate the most waste per capita - approximately 3.5 kilogram per bed night - but typically apply more systematic waste management, including segregation and transfer to centralized facilities. National regulations also mandate that each resort establish a dedicated waste management centre, equipped with storage areas and treatment facilities, while prohibiting open burning practices¹²².

Despite several national legal measures (See Annex I), the overall system remains unsafe, fragmented and under-resourced. Official data on total waste volumes are also lacking, and management practices vary widely¹²³.

The situation is further compounded by the structural challenges inherent to SIDS, which affects primarily the Maldivian archipelago. These include geographic fragmentation, logistical isolation, and constraints in both technical capacity and financial resources. The Maldives consist of a vast number of remote and dispersed inhabited islands and atolls. This spatial dispersion presents considerable logistical challenges, particularly in the areas of waste segregation, collection, transportation, and disposal. Such limitations pose substantial barriers to the establishment and maintenance of comprehensive systems for waste collection, treatment, and environmental monitoring, thereby complicating efforts to implement sustainable waste management practices¹²⁴.

Environmental assessments conducted in Maldivian waters consistently highlight the persistent inefficiencies within the national and local waste

¹²⁰ L MOOSA (n. 106) 6.

¹²¹ F SALIU et al., 'Microplastic and charred microplastic in the Faafu Atoll, Maldives' (2018) 136 *Marine Pollution Bulletin* 464.

¹²² L MOOSA (n. 106) 8.

¹²³ *Ibid.*; MINISTRY OF ENVIRONMENT, Republic of Maldives, *Maldives First Biennial Update Report under the United Nations Framework Convention on Climate Change* (2019).

¹²⁴ S MALATESTA et al., 'The right place. Solid waste management in the Republic of Maldives, between infrastructural measures and local practices' (2015) 19(2) *Miscellanea Geographica*.

management systems. This ongoing issue poses significant concerns for the delicate marine environment. Although the Maldives does not produce persistent organic pollutants (POPs), including polychlorinated biphenyls (PCBs), these hazardous chemicals have been detected within its territory, introduced through imported goods. Due to the limited capacity of the country for proper treatment and disposal, these chemicals contribute to marine environment pollution and pose ongoing risks to the ecosystem¹²⁵. The Marine Research Higher Education Center (MaRHE Center), located in Faafu Atoll, has been a leading institution in scientific research concerning pollution in Maldivian waters. A study conducted by researchers at the MaRHE Center specifically identified the presence of anthropogenic contaminants, including caffeine, fluoxetine, and norfluoxetine, in marine sponges situated near waste disposal sites¹²⁶. These compounds, originating from household plumbing, pharmaceuticals, and landfills, pose significant threats to marine biodiversity. Caffeine interferes with coral heat-shock proteins, aggravating bleaching events¹²⁷,

¹²⁵ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of the Maldives, *National Implementation Plan to the Stockholm Convention on Persistent Organic Pollutants* (2016) 20; A COLOMBO et al., 'Maldives: An archipelago that burns. A first survey of PCDD/Fs and DL-PCBs from human activities' (2014) 497-498 *Science of the total environment* 499.

¹²⁶ C RIZZI et al., 'First record of emerging contaminants in sponges of an inhabited island in the Maldives' (2020) 156 *Marine Pollution Bulletin*.

¹²⁷ *Ibid.*; R L SILER et al., 'Caffeine and Pharmaceuticals as Indicators of Waste Water Contamination in Wells' (1999) 37(3) *Groundwater* 321; G V AGUIRRE-MARTÍNEZ, T A DEL VALLS and M L MARTÍN-DÍAZ, 'General stress, detoxification pathways, neurotoxicity and genotoxicity evaluated in *Ruditapes philippinarum* exposed to human pharmaceuticals' (2016) 124 *Ecotoxicology and Environmental Safety* 18; D CRUZ et al., 'Caffeine impacts in the clam *Ruditapes philippinarum*: alterations on energy reserves, metabolic activity and oxidative stress biomarkers' (2016) 160 *Chemosphere* 95.

Caffeine harms cnidarians by disrupting the expression of heat shock proteins, which are key to maintaining metabolic function and recovering from short-term stress. E BROMAGE et al., 'Quantification of coral heat shock proteins from individual coral polyps' (2009) 376 *Marine Ecology Progress Series* 123.

Additionally, caffeine may contribute to bleaching in tropical sea anemones by impairing protein phosphorylation. K POLLACK, K BALAZS and O OGUNSEITAN, 'Proteomic assessment of caffeine effects on coral symbionts' (2009) 43(6) *Environ Sci Technol* 2085; S J SAWYER and L MUSCATINE, 'Cellular mechanisms underlying temperature-induced bleaching in the tropical sea anemone *Aiptasia pulchella*' (2009) 204(20) *J Exp Biol* 3443.

Finally, the two most consumed mollusc species in Southeast Asia, *Perna viridis* and *Polymesida expansa*, have been found to contain trace levels of caffeine in their tissues. S BAYEN et al., 'Direct injection of tissue extracts in liquid chromatography/tandem mass spectrometry for the determination of pharmaceuticals and other contaminants of emerging concern in mollusks' (2015) 407 *Analytical Bioanalytical Chemistry* 5553.

while fluoxetine and norfluoxetine disrupt behaviour, reproduction, and neurophysiology of the aquatic organisms¹²⁸.

Marine plastic pollution also poses a significant environmental challenge in the region, earning the Indian Ocean the epithet of *a soup of plastics* and rendering it one of the most contaminated oceans globally. Numerous studies report high concentrations of plastics in the Maldivian inner reef environments¹²⁹. Even in remote areas like Magoodhoo in Faafu atoll, significant amounts of plastic have been detected in both beach sediments and seawater samples¹³⁰. Much of the plastic and microplastic collected in Magoodhoo appears to be charred, likely due to the harmful local practice of open-air burning of waste, including plastics¹³¹. Alarmingly, high levels of microplastics have also been found in coral bodies around Magoodhoo, underscoring the widespread contamination threatening the fragile ecosystems of tropical coral reefs¹³². Microplastics have been also identified in fish harvested in Maldivian waters, which are commonly consumed by locals. Specifically, contaminants have been detected in 80 per cent of collected *Selar crumenophthalmus* and 76.2 per cent of examined *Decapterus macarellus*¹³³. This issue poses not only environmental threat but also a potential threat to human health. However, there are currently insufficient studies to confirm the latter. Last but not least, one of the most concerning studies on plastic contamination in the Maldives revealed that Naifaru, in the Lhaviyani Atoll¹³⁴, a densely populated island with

¹²⁸ F ZINDLER et al., 'Norfluoxetine is the only metabolite of fluoxetine in Zebrafish (*Danio rerio*) embryos that accumulates at environmentally relevant exposure scenarios' (2020) 54(7) Environ Sci Technol 4200.

Specifically, in the amphipod *Echinogammarus marinus*. M C BOSSUS et al., 'Behavioural and transcriptional changes in the amphipod *Echinogammarus marinus* exposed to two antidepressants, fluoxetine and sertraline' (2014) 151 Aquatic Toxicology 45. Also, in the mosquitofish *G. holbrooki* where fluoxetine compromises the usual antipredator behaviour. J M MARTIN et al., 'The psychoactive pollutant fluoxetine compromises antipredator behaviour in fish' (2017) 222 Environmental Pollution 592.

¹²⁹ F SALIU et al. (n. 121).

¹³⁰ *Ibid.*

¹³¹ *Ibid.*

¹³² C RAGUSO et al., 'First detection of microplastics in reef-building corals from a Maldivian atoll' (2022) 180 Marine Pollution Bulletin.

¹³³ F SHIYANA et al., 'The presence of microplastics in fishes of South Maldives' (2022) 1055 IOP Conf Ser: Earth Environmental Sciences.

¹³⁴ Local communities in Naifaru generates waste that is typically burned, discarded into the ocean, or dumped at a designated site on the northern tip of the island, which often spills over onto the beach. T B PATTI et al., 'Spatial distribution of microplastics around an inhabited coral island in the Maldives, Indian Ocean' (2020) 748 Science of The Total Environment

5,408 inhabitants in 0.55 square kilometres, hosts one of the highest densities of plastics worldwide¹³⁵.

The Maldivian government has definitely made commendable efforts to improve waste management, including the enactment of regulations¹³⁶, public awareness campaigns¹³⁷, and international partnerships¹³⁸. Still, major obstacles remain. Although international legal frameworks exist to address marine pollution and the transboundary movement of hazardous waste, implementation gaps persist. This chapter examines the Maldives as a case study to highlight the urgent need for responsible and coordinated international cooperation in waste governance, with the objective of preventing marine pollution. It analyses the evolution and scope of international legal and policy frameworks governing waste management, with a focus on instruments aimed at protecting the marine environment. It highlights the shared responsibility of waste-exporting States, particularly their duty to prevent the transboundary movement of waste to countries lacking the requisite capacity for environmentally sound management, and the importance of the Prior Informed Consent (PIC) procedure. In this context, the chapter also assesses the extent to which the Maldives has incorporated and operationalized these international commitments within its national legal and institutional frameworks. Recognizing that marine pollution transcends national boundaries, this chapter also explores regional approaches that may be pursued within the specific geographic context of the Maldives. It examines the role of regional cooperation in addressing marine pollution, with particular attention to successful regional initiatives and area-based conservation strategies. These best practices underscore the potential of collaborative, regionally tailored approaches to complement and reinforce global ocean governance.

¹³⁵ *Ibid.*

¹³⁶ The first Waste Management Act was enacted on 18 December 2022 (Law No. 24/2022), with the aim to define the standards and procedures for sustainable waste management.

¹³⁷ The Greater Malé Environmental Improvement and Waste Management Project aims to provide a sustainable solution to solid waste management, improving the construction of management facilities, capacity-building programs, and public awareness campaigns, in order to educate the civil society in a better manage of their waste. MINISTRY OF ENVIRONMENT, Republic of Maldives (n.d.) 'About our waste management project' <https://mymaldiveshome.environment.gov.mv/about-our-waste-management-project/> accessed 23 July 2025.

¹³⁸ For instance, the Greater Malé Environmental Improvement and Waste Management Project is funded by, among the others, Asian Development Bank. Japan Fund for Poverty Reduction, and Asian Infrastructure Investment Bank.

2.2 The role of the international community in the regulation of waste management and the compliance of the Maldives

Addressing environmental pollution requires adherence to foundational principles of sustainable environmental governance: the ecosystem approach and the precautionary principle, which are essential for preventing the discharge of debris and hazardous substances.

The Convention on Biological Diversity (Rio de Janeiro, 5 June 1992) (CBD) provides an overarching framework for the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from genetic resources¹³⁹. Within this context, the ecosystem approach was formally defined in Decision V/6 of the Conference of the Parties (COP) to the CBD in 2000 as ‘a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way.’¹⁴⁰ This approach emphasizes holistic, interdisciplinary, and transdisciplinary management that considers the full complexity of marine and terrestrial ecosystems, not merely at the species or population level, but by examining the ecological roles, trophic relationships, and habitats. The implementation of the ecosystem approach must be grounded in scientific evidence and involve the active participation of all relevant stakeholders, including Indigenous Peoples, local communities, and the private sector. Such inclusive and knowledge-based management ensures that conservation and sustainable use efforts are both effective and equitable.

Complementing the ecosystem approach is the precautionary principle, as articulated in Principle 15 of the Rio Declaration on Environment and Development (1992). This principle states: ‘where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing

¹³⁹ CBD 1760 UNTS 79, art 1.

¹⁴⁰ CBD COP, *Decision V/6. Ecosystem Approach* (Nairobi, 15–26 May 2000).

cost-effective measures to prevent environmental degradation’¹⁴¹. The precautionary principle underscores the importance of proactive environmental protection in the face of scientific uncertainty. It has since been incorporated into numerous international legal instruments and policy frameworks, including the CBD and its associated protocols. Notably, the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention) also reaffirms the application of Principle 15, recognizing its relevance in managing substances that pose long-term risks to ecosystems and human health.

Together, the ecosystem approach and the precautionary principle provide a comprehensive, science-based, and participatory foundation for addressing environmental pollution. Their integration into international, regional, and national policy is essential for ensuring the health and resilience of both terrestrial and marine ecosystems.

In 1972, the United Nations Conference on the Human Environment¹⁴² held in Stockholm, recommended that national governments work towards the development of a comprehensive framework for controlling ocean dumping¹⁴³, as marine pollution emerged as a primary concern. In this regard, specific issues have been raised, including natural disasters at sea, oil discharges, excessive use of pesticides, and atmospheric pollution, all of which contribute to the contamination of the oceans and seas¹⁴⁴. Many speakers emphasised the pervasive impact of land-based marine pollution, affecting populations globally, including communities situated thousands of miles from the pollution sources. In addition to marine pollution, representatives at the United Nations Conference on the Human Environment raised concerns about the exploitation of marine resources by developed countries, which directly impacts on developing States¹⁴⁵. Discussions also focused on the adoption of specific legislative measures to protect marine and

¹⁴¹ Rio Declaration on Environment and Development (adopted 14 June 1992) UN Doc A/CONF.151/26 (Vol. I) Annex I.

¹⁴² UNITED NATIONS GENERAL ASSEMBLY, 'United Nations Conference on the Human Environment' (15 December 1972) A/RES/2994 (XXVII).

¹⁴³ UNITED NATIONS GENERAL ASSEMBLY, *Report of the United Nations Conference on the Human Environment, Stockholm 5-16 June 1972* (1972) A/CONF.48/14/Rev.1, 28

¹⁴⁴ *Ibid.* 50.

¹⁴⁵ *Ibid.* 49.

freshwater fisheries within national boundaries¹⁴⁶. Annex III titled ‘General Principles for Assessment and Control of Marine Pollution’ of the ‘Report of the United Nations Conference on the Human Environment’ has provided essential guidelines that have influenced the drafting of UNCLOS, particularly Part XII titled ‘Protection and Preservation of the Marine Environment’.

Reflecting the concerns expressed at the United Nations Conference on the Human Environment, UNCLOS incorporates measures to prevent marine pollution and fosters international cooperation to achieve this aim. UNCLOS defines marine pollution as:

Introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries which results or is likely to result in such deleterious effects as harm to living resources and marine life hazard to human health, hindrance to marine activities, including fishing, and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.¹⁴⁷

One of the most important regulations is found in Article 192, which outlines that ‘States have the obligation to protect and preserve the marine environment’. This obligation sets out a core environmental principle, reflecting a universal responsibility to the stewardship of the oceans and seas. It establishes a foundational and broad commitment, emphasising the duty of all States, both developed and developing, to act in ways that safeguard the marine environment.

Article 192 does not exist in isolation but is the first provision of Part XII of UNCLOS that focuses on the prevention, reduction, and control of marine pollution from various sources, including land-based sources, seabed activities, dumping, vessel-source pollution, and atmospheric pollution. Part XII underscores the importance of international cooperation at both regional and global levels and mandates States to enact laws and regulations to combat marine pollution. According to Article 193, in the exploitation of their natural resources, States have a duty to preserve and protect the marine environment within their national jurisdictions. Article 194 outlines the means necessary to fulfil this duty, such as

¹⁴⁶ *Ibid.* 59.

¹⁴⁷ UNCLOS 1883 UNTS 3, art 1(4).

the adoption of measures to prevent, reduce, and control pollution from any source. These pollution-sources include the release of toxic, harmful, or noxious substances from land-based sources, through the atmosphere, or by dumping, as well as pollution from vessels. These obligations of prevention include the adoption of measures necessary “to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life”¹⁴⁸. Although UNCLOS does not explicitly mention marine protected areas (MPAs) or other area-based conservation measures, this provision has been interpreted as an early step toward the establishment of area-based management tools (ABMTs) aimed at safeguarding particularly vulnerable marine ecosystems (VMEs). It reflects the recognition of the need to afford heightened protection to sensitive habitats and species facing ecological pressure or risk of degradation.

In a regional context, the Barcelona Convention and its Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) have operationalized this approach through the designation of Specially Protected Areas of Mediterranean Importance (SPAMIs). This mechanism provides a concrete legal and institutional framework for the conservation of ecologically significant areas, contributing to the prevention of marine pollution and the preservation of biodiversity in the Mediterranean Sea. SPAMIs exemplify how regional agreements can enhance the global marine protection regime by tailoring protective measures to the specific vulnerabilities and ecological characteristics of a given marine region¹⁴⁹.

A key provision of UNCLOS is Article 195, which establishes the obligation of States to prevent the transfer of pollution from one medium to another (e.g., from water to air) or from one geographic area to another. This principle underscores the need for a holistic and integrated ecosystem approach to pollution prevention, ensuring that measures to mitigate environmental harm do not inadvertently exacerbate problems elsewhere.

This obligation is further operationalized and reinforced by the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and

¹⁴⁸ UNCLOS 1883 UNTS 3, art 194(5).

¹⁴⁹ M GRBEC, T SCOVAZZI, and I TANI, *Legal Aspects of Marine Protected Areas in the Mediterranean Sea: An Adriatic and Ionian Perspective* (Routledge 2023).

Their Disposal (Basel, 22 March 1989) (Basel Convention), which strictly regulates the international transfer of hazardous waste. The Basel Convention aims to prevent the export of hazardous wastes, particularly from developed to developing countries. This framework ensures that environmental harm is not simply relocated, and that waste is managed in an environmentally sound manner.

In addition, Article 202 of UNCLOS emphasizes the importance of international cooperation in scientific research and information exchange. It requires States to collaborate in developing and disseminating scientific knowledge relevant to the protection and preservation of the marine environment. This includes joint research initiatives aimed at establishing scientific baselines and standards, which are essential for the formulation and implementation of effective pollution prevention measures. Article 203 reiterates the importance of international cooperation in ensuring that developing States are supported in enhancing their scientific and technical capacity. This can include assistance in preparing assessments of the state of the marine environment, such as through the development and implementation of environmental impact assessments and other monitoring tools essential for informed decision-making.

Particularly relevant to the production and transfer of hazardous substances, Article 204 imposes an obligation on States to maintain surveillance over activities they conduct or authorize, in order to evaluate their potential impacts on the marine environment. This provision can be interpreted as the need for continuous environmental monitoring and early detection of harmful effects, thereby reinforcing the precautionary principle in practice.

An estimated three-quarters of marine pollution originates from land-based sources, including industrial discharges, agricultural runoff, and untreated sewage¹⁵⁰. Notably, 207 of UNCLOS requires States to adopt laws and regulations to prevent, reduce, and control pollution from land-based sources.

Article 207

Pollution from land-based sources

¹⁵⁰ FAO (n. 108).

1. States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures.
2. States shall take other measures as may be necessary to prevent, reduce and control such pollution.
3. States shall endeavour to harmonize their policies in this connection at the appropriate regional level.
4. States, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment from land-based sources, taking into account characteristic regional features, the economic capacity of developing States and their need for economic development. Such rules, standards and recommended practices and procedures shall be re-examined from time to time as necessary.
5. Laws, regulations, measures, rules, standards and recommended practices and procedures referred to in paragraphs 1, 2 and 4 shall include those designed to minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment.

Article 207 of UNCLOS underscores the imperative for both global and regional cooperation to prevent, reduce, and control marine pollution originating from land-based sources. It further mandates the establishment of internationally recognized standards and practices, which are to be periodically reviewed and updated ‘from time to time as necessary’ to reflect evolving scientific knowledge and environmental conditions.

While UNCLOS does not specifically address the discharge of individual contaminants, the international legal framework is much broader, and a number of treaties has been established to regulate more stringently the release of waste and harmful substances into both terrestrial and aquatic environments. The Maldives, as a party to several of these agreements, demonstrates its commitment to preventing the disposal of solid waste and harmful contaminants into the marine environment.

TABLE 2.1 INTERNATIONAL CONVENTIONS ON WASTE AND HAZARDOUS CHEMICAL MANAGEMENT

<p><i>Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London, 1972) and its Protocol (1996)</i></p>	<p>They primarily address the prevention of marine pollution resulting from the disposal of waste at sea, with a particular focus on land-generated waste, including dredged material. These instruments establish a comprehensive regulatory framework that prohibits the deliberate dumping of waste streams containing plastics and other synthetic materials into the marine environment.</p>
<p><i>Not yet ratified by the Maldives</i></p>	
<p><i>International Convention for the Prevention of Pollution from Ships (MARPOL) (London, 2 November 1973)</i></p>	<p>MARPOL is a key international treaty designed to minimize pollution from ships, including pollution from oil, noxious liquid substances, sewage, garbage, and air pollution. MARPOL provides for inspections and enforcement measures, including port State control inspections to ensure compliance by ships visiting foreign ports.</p>
<p><i>Not yet ratified by the Maldives</i></p>	
<p><i>Vienna Convention for the Protection of the Ozone Layer (Vienna, 22 March 1985)</i></p>	<p>Even the Vienna Convention for the Protection of the Ozone Layer does not contain specific legally binding targets on ozone-depleting substances, it serves as a framework for the development of such measure to protect human health and the environment from the adverse effects of the depletion of the ozone layer.</p>
<p><i>Accessed by the Maldives on 26 April 1988.</i></p>	
<p><i>Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 16 September 1987)</i></p>	<p>The Montreal Protocol on Substances that Deplete the Ozone Layer designed to phase out the production and consumption of substances that deplete the ozone layer, including chlorofluorocarbons, and halons.</p>
<p><i>Ratified by the Maldives on 16 May 1989</i></p>	
<p><i>Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 22 March 1989) (Basel Convention)</i></p>	<p>The Basel Convention ensures the environmentally sound management and disposal of hazardous and other wastes. Particularly, it aims to reduce the movement of hazardous waste between States, particularly from developed to developing countries, providing Prior Informed (PIC) Procedure and export/import restrictions.</p>
<p><i>Accessed by the Maldives on 28 Apr 1992</i></p>	
<p><i>Stockholm Convention on Persistent Organic Pollutants (Stockholm, 22 May 2001) (Stockholm Convention)</i></p>	<p>Persistent Organic Pollutants (POPs) are chemicals that remain intact in the environment in the long period, become widely distributed</p>

<p><i>Accessed by the Maldives on 17 October 2006</i></p>	<p>geographically, and have harmful impacts on human health and the environment. The Stockholm Convention aims to restrict the production and use of POPs, fostering research, monitoring, information exchange, and public awareness.</p>
<p><i>Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam, 10 September 1998) (Rotterdam Convention)</i></p>	<p>The Rotterdam Convention aims to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals and pesticides. A list of chemicals and pesticides subjected to the PIC Procedure is included in the Convention.</p>
<p><i>Accessed by the Maldives on 17 October 2006</i></p>	
<p><i>Minamata Convention on Mercury (Kumamoto, 10 October 2013)</i></p>	<p>The Minamata Convention on Mercury aims at protecting human health and the environment from the adverse effects of mercury promoting environmentally sound management of mercury-containing waste.</p>
<p><i>Since 2017, the Maldives has been working on the ratification of the Minamata Convention on Mercury. To date, just policy directions have been implemented for health care.</i></p>	

Regarding marine pollution impacting the Maldives, primarily originating from land-based sources, the relevant international legal framework encompasses the Basel Convention, the Stockholm Convention, and the Rotterdam Convention.

2.2.1 Implementing the Basel Convention: Challenges and contradictions in waste management practices

The Basel Convention, which came into force on 5 May 1992, aims to protect human health and the environment from the adverse effects associated with the generation, improper management, transboundary movement, and disposal of hazardous and other wastes. The Basel Convention recognizes that the most effective strategy for mitigating these dangers is to cut down waste generation and

transboundary movements in both quantity and hazardous potential. Specifically, it seeks to:

- Minimize the generation and transboundary shipments of hazardous waste and other wastes, ensuring their environmentally sound and efficient management¹⁵¹.
- Encourage the treatment and disposal of hazardous waste as close as possible to their points of origin¹⁵².
- Prohibit the export of hazardous wastes and other wastes to developing countries that have banned such imports, or where there is a reason to believe the wastes will not be managed in an environmentally sound manner¹⁵³.
- Classify the illegal traffic of hazardous wastes as a criminal act¹⁵⁴.
- Promote international cooperation to achieve environmentally sound management of wastes, through improved technologies, technical capacities, monitoring programs, and enhanced public awareness, particularly in developing countries¹⁵⁵.

The principal impetus behind the drafting of the Basel Convention was the emergence of hazardous wastes produced in developed countries in Europe and North America being transported to other regions, particularly territories of developing States, without adequate assurances of safe handling and disposal. Illegal dumping of these wastes at sea was also a common practice. One of the most widely publicised incidents occurred in 1986 involving the Liberian-flagged ship *Khian Sea*, which was carrying 14,000 tons of municipal incinerator ash from Philadelphia (United States). After being rejected by the Bahamas, the ship attempted to discard the waste in Haiti, where it was intended to be used as ‘fertiliser’ on the beaches by unscrupulous Haitian military officials. After approximately three to four thousand tons had already been discharged, Greenpeace

¹⁵¹ Basel Convention 1673 UNTS 57, art 4(2.a) and 4(2.d).

¹⁵² Basel Convention 1673 UNTS 57, art 4(2.b).

¹⁵³ Basel Convention 1673 UNTS 57, art 4(2.e).

¹⁵⁴ Basel Convention 1673 UNTS 57, art 4(4).

¹⁵⁵ Basel Convention 1673 UNTS 57, art 10.

activists alerted the community, which resulted in public outcry and intervention that halted further dumping. In the following eighteen months, the *Khian Sea* navigated through various ports in search of a destination willing to accept its hazardous cargo. A vigilant campaign by Greenpeace activists around the world prevented the ship from entering ports without prior announcement. Despite this, the ship later appeared off the coast of Singapore with empty cargo holds, and toxic ash was suspected to have been dumped in international waters of the Indian Ocean¹⁵⁶.

The Indian Ocean is presently among the most polluted marine regions globally, surpassed only by the Pacific Ocean. Coastal States bordering the Indian Ocean, many of which are developing countries, must accord high priority to the implementation of the Basel Convention to avert further environmental degradation caused by waste and potential hazardous cross-regional movements.

The Maldives ratified the Basel Convention on 28 April 1992 and incorporated its principles into national law through the Environment Protection and Preservation Act (Law No. 4/93). Relevant provisions include:

Waste Disposal, Oil and Poisonous Substances

7. (a) Any type of waste, oil, poisonous gases or any substances that may have harmful effects on the environment shall not be disposed within the territory of the Maldives.
- (b) In cases where the disposal of the substances stated in paragraph (a) of this clause becomes absolutely necessary, they shall be disposed only within the areas designated for the purpose by the government. If such waste is to be incinerated, appropriate precaution should be taken to avoid any harm to the health of the population.

Hazardous/ Toxic or Nuclear Wastes

8. Hazardous/ Toxic or Nuclear Wastes that is harmful to human health and the environment shall not be disposed anywhere within the territory of the country. Permission should be

¹⁵⁶ MA MONTGOMERY, 'Traveling Toxic Trash: An Analysis of the 1989 Basel Convention' (1990) 14(2) Fletcher Forum of World Affairs 313; Greenpeace, 'Toxic Ash Haiti' (13 December 2011) <https://media.greenpeace.org/archive/Toxic-Ash-in-Haiti-27MZIFV6D4H0.html> accessed 23 July 2025.

obtained from the Ministry of Transport and Shipping at least 3 months in advance for any transboundary movement of such wastes through the territory of the Maldives.

Despite these regulations, the Maldives continues to face substantial challenges in waste management. Recent initiatives, including the Waste Management Act (Law No. 24/2022) and planned infrastructure improvements, are intended to address these issues. In particular, these initiatives include the planned separation of waste streams, the use of closed containers for waste transport between islands, the establishment of a 13-megawatt waste-to-energy incinerator, and a biodigester for organic waste¹⁵⁷.

Conversely, the latest amendment to the Waste Management Act, signed in December 2022, authorizes the importation of waste from third States. Despite strong opposition from environmental groups, the Maldivian Parliament hurriedly amended the bill without any public consultation¹⁵⁸. David R. Boyd, in his capacity as Special Rapporteur on the human right to a clean, healthy, and sustainable environment, has emphasised that ‘given the significant waste challenges in the Maldives, this provision should be revoked.’¹⁵⁹ The Maldivian government justified the import policy by underscoring the potential benefits of waste-to-energy conversion. This practice, adopted in several countries employing advanced technology, is intended to mitigate health risks and enhance waste management efficacy¹⁶⁰. At present, waste-to-energy infrastructures or thermal valorisation is indeed widely adopted across the globe. For instance, China operates 225 waste incineration plants, Japan has 210, and other countries in Asia collectively maintain 62 such facilities¹⁶¹. In contrast, the European Union (EU) positions waste-to-

¹⁵⁷ D R BOYD, (n. 67).

¹⁵⁸ R NEWTON, 'Don't Turn Maldives Into World's Garbage Dump' (Human Rights Watch, 19 December 2022).

¹⁵⁹ D R BOYD (n. 67).

¹⁶⁰ Joint Press Statement, 'Concern about the inclusion of a last-minute amendment to allow waste importation into the Maldives for waste-to-energy: President must not ratify this bill' (7 December 2022) <https://zerowastemaldives.com/wp-content/uploads/2022/12/Press-Statement-Inclusion-of-an-Article-to-allow-Waste-Importation-into-the-Maldives-for-Waste-to-Energy.pdf> accessed 23 July 2025.

¹⁶¹ Data from Germany, the US, and the UK reveal that the installation of suitable filters reduced the emission of heavy metals by 90% and dioxins by more than 99%. E DE TITTO and A SAVINO, 'Environmental and health risks related to waste incineration' (2019) 37(10) *Waste Management & Research* 957.

energy technologies at the lower end of its waste hierarchy, reflecting a policy orientation that discourages investment in such facilities. This is due to their comparatively lower effectiveness in achieving circular economy objectives when measured against alternatives such as waste prevention, reuse, and recycling¹⁶².

Nonetheless, as highlighted by multiple non-governmental organizations active in the Maldives, the adoption of waste-to-energy technologies must not serve as a pretext for the importation of foreign waste. Given the existing constraints in managing national waste streams, such practices risk further burdening the already limited national waste management infrastructure and undermining environmental sustainability goals¹⁶³.

In contrast to the policy direction adopted by the Maldives, several other developing countries within the Asian region have enacted bans on the importation of waste, primarily as a measure to safeguard public health and protect the environment. For many years, China was the largest importer of waste from the United States. In 2018, however, it banned solid waste imports, triggering a global shift in waste trade flows. As a result, waste exports previously directed to China were redirected to other countries, particularly in Asia. This shift has placed considerable pressure on States with weaker regulatory frameworks and limited technical capacity to manage the increasing volumes of imported waste.

After China banned solid waste imports, Malaysia has emerged as a global hub for plastic waste exports, with Japan being the leading nation exporting plastic waste to Malaysia. From January to July 2018, 754,000 tonnes of plastic waste was imported into Malaysia. As reported by Wong Pui Yi, on behalf of the Centre to Combat Corruption and Cronyism, the massive influx of waste to Malaysia led to a sharp rise in illegal recycling facilities as well as illegal dumpsites, causing land, water and air pollution that has affected several communities nationwide¹⁶⁴. Several dumpsites have been found along the Muda River, polluting the main water source for millions of people in north Malaysia. By September 2019, Malaysian authorities

¹⁶² EUROPEAN COMMISSION, 'Communication from the Commission to the European Parliament, the Council the European Economic and Social Committee and the Committee of the Regions. The role of waste-to-energy in the circular economy' (26 January 2017) COM(2017) 34 final.

¹⁶³ See n.142.

¹⁶⁴ W PUI YI, 'Malaysia is not a "Garbage Dump"' (C4 Center, 2021).

shut down 170 illegal recycling factories and announced a phased elimination of plastic waste imports by 2021¹⁶⁵.

Following China's implementation of its waste ban in January 2018, other South Asian developing countries experienced a significant increase in imported waste from developed States, resulting in an exponential rise in the illegal pollution trade¹⁶⁶. An analysis of free-range chicken eggs sampled at Tropodo and Bangun - two sites in Indonesia where imported waste is dumped, used as fuel, or burned to reduce volume - revealed significant levels of highly hazardous chemicals, including dioxins, PCBs, polybrominated diphenyl ethers, short-chain chlorinated paraffins, and perfluoro octane sulfonate. These substances are globally regulated under the Stockholm Convention¹⁶⁷.

In response to the environmental and human health damage caused by the increased waste imports since 2018, Southeast Asian countries have swiftly enacted regulations. Thailand introduced a ban on plastic waste imports in 2018, aiming to phase them out by 2021. Viet Nam temporarily halted plastic waste imports in 2018 and has been working to strengthen regulations governing waste material imports. India addressed its plastic waste crisis by announcing a ban on solid plastic waste imports, including PET bottles and preforms, in 2019. Similarly, in 2021, Türkiye in the Middle East enforced a ban on the import of most plastic waste types¹⁶⁸.

It is important to acknowledge that these bans and restrictions vary in scope and enforcement; however, they collectively represent a broader trend of developing countries within the Asian region tightening regulations on waste imports in the wake of China's ban.

Contrary to these trends, the recent amendment in the Maldives allowing the import of waste markedly diverges from the actions taken by other developing countries which have grappled with inadequate waste management and environmental challenges. Without an effective waste management system in place,

¹⁶⁵ *Ibid.*

¹⁶⁶ INTERPOL, *Strategic Analysis Report Emerging criminal trends in the global plastic waste market since January 2018*, (August 2020).

¹⁶⁷ J PETRLIK et al., *Plastic waste flooding Indonesia leads to toxic chemical contamination of the food chain* (IPEN, Nexus3 Foundation, Ecotoxic and ARNIKA 2019).

¹⁶⁸ A C BOURTSALAS, I M YEPES and Y TIAN, 'U.S. plastic waste exports: A state-by-state analysis pre- and post-China import ban', (2023) 344 *Journal of Environmental Management*.

the Maldives risks becoming the new dumping ground for developed States, mirroring the situations previously witnessed in China, Malaysia, and other affected countries.

However, the issue of transboundary movements of waste is not confined to the Asian region; developing States in other parts of the world have likewise encountered similar challenges. In recognition of the environmental and developmental vulnerabilities of least developed countries and SIDS, two regional approaches have been developed to support the implementation of the provisions and objectives of the Basel Convention. These are the Bamako Convention on the Ban of the Import to Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa (Bamako, 30 July 1991) (Bamako Convention) and the Convention to ban the importation into Forum Island Countries of hazardous and radioactive wastes and to control the transboundary movement and management of hazardous wastes within the South Pacific Region (Waigani, 16 September 1995) (Waigani Convention).

In the nineties, the Bamako Convention was negotiated by twelve States of the African Union and currently endorsed by 29 signatory States. This regional agreement, enacted on 22 April 1998, aims to reduce and eliminate the transboundary movements of hazardous waste, minimise the production of hazardous and toxic wastes in Africa, and support the implementation of the Basel Convention within the African continent. Notably, the Bamako Convention imposes stricter regulations than the Basel Convention, prohibiting all imports of hazardous waste without exceptions, including those for radioactive materials. Additionally, it forbids the import of hazardous waste from non-party States to the African continent, thereby addressing the issue of hazardous waste exports from Organisation for Economic Co-operation and Development (OECD) States. Within Africa, it establishes a partial ban on the movement of hazardous waste among member States, ensuring that the necessary facilities for the environmentally sound management of hazardous wastes are available.

Particularly, the Bamako Convention encompasses a broader range of wastes than the Basel Convention, including radioactive materials and any waste with hazardous characteristics or constituents.

Despite the adoption on both the Basel and Bamako Conventions¹⁶⁹, incidents of hazardous waste imports have been reported in Africa, even in States that have ratified both conventions. Notable examples include the illegal dumping of toxic waste by the Panama-flagged ship *Probo Koala* in Côte d'Ivoire in April 2006¹⁷⁰, and the disposal of toxic waste in Koko, Nigeria, in March 2017¹⁷¹. These cases, among others, underscore the persistent issue of illegal toxic waste imports and harmful disposal, revealing the limitations of regional approaches in the absence of robust international enforcement. Although the Basel Convention, Rotterdam Convention, and Stockholm Convention establish clear and strong commitments, illicit practices by developed countries have continued unabated. This ongoing problem highlights the need for more stringent international oversight and compliance to effectively address and prevent such activities.

The Waigani Convention, like the Bamako Convention, is a regional agreement concluded pursuant to Article 11 of the Basel Convention. Despite the Convention Area comprises the land territory, internal waters, territorial seas, continental shelf, archipelagic waters, EEZ and adjacent high seas of all Pacific States¹⁷², just ten States have ratified the Waigani Convention (Australia, Cook Islands, Fiji, Kiribati, Federated States of Micronesia, New Zealand, Papua New Guinea, Samoa, Solomon Islands, and Tuvalu). It aims to reduce and eliminate the transboundary movements of hazardous and radioactive waste, and to minimize the production of hazardous and toxic wastes in the Pacific region. The Waigani Convention mandates that waste disposal within its jurisdiction is conducted in an environmentally sound manner and emphasizes the reduction of hazardous waste generation at its source. Particularly, it extends the stringent controls of the Basel

¹⁶⁹ The Basel Convention has been ratified by 52 African States.

¹⁷⁰ 'Multinational oil trading company Trafigura produced the toxic waste on board the ship as a result of refining a dirty petroleum product called coker naphtha to mix with gasoline and sell it on as petrol. Trafigura tried and failed to get rid of the waste in five countries: Malta, Italy, Gibraltar, The Netherlands and Nigeria. Its attempt to dispose of the waste in Amsterdam sparked an environmental incident when residents complained of the overwhelming smell and experienced nausea, dizziness and headaches after some of the waste was unloaded. Trafigura rejected an offer from a disposal company to deal with the waste safely in The Netherlands for the equivalent of US\$620,000. Instead, the toxic waste was finally dumped illegally in Côte d'Ivoire by a local company that Trafigura hired to dispose of it for just US\$17,000 – a fraction of the price quoted in the Netherlands. To this day it is still not known where all the waste was dumped'. AMNESTY INTERNATIONAL, 'Trafigura: A Toxic Journey' (11 April 2016).

¹⁷¹ REUTERS, 'Toxic waste dumped in community in southeast Nigeria's Delta' (1 March 2017).

¹⁷² Waigani Convention 2161 UNTS 91 art 1.

Convention to the South Pacific Region ensuring that hazardous waste cannot be transported from New Zealand or Australia to Forum Island Countries¹⁷³.

Both the Bamako and Waigani Conventions are constrained by the inherent limitations of regional agreements, which cannot impose obligations on States outside the region that are not parties to the respective legal instruments. However, the Waigani Convention has partially addressed this limitation by allowing for potential future ratification by States beyond the region. This provision is particularly significant, given that the sources of hazardous or nuclear waste are likely to be located outside the South Pacific region. Despite this, as of now, no non-Pacific States have ratified the Convention. However, at the time of writing, no official reports or journalistic investigations have documented instances of hazardous waste disposal from developed countries outside the region.

2.2.2 Implementing the Rotterdam Convention: Legally binding PIC and the controversial shared responsibility

The substantial rise in chemical production and trade has intensified public and governmental concern over the potential risks associated with hazardous chemicals and pesticides. These concerns are particularly acute in States that lack the infrastructure to effectively monitor the importation and use of such substances, making them especially vulnerable. In response to these concerns, the UNEP and the FAO developed and promoted voluntary information-exchange programs in the mid-1980s. The FAO introduced its ‘International Code of Conduct on the Distribution and Use of Pesticides’ in 1985, while UNEP established the ‘London Guidelines for the Exchange of Information on Chemicals in International Trade’ in 1987. Subsequently, in 1989, the two international organizations introduced a voluntary PIC procedure aimed at enabling importing countries to make informed decisions and, where appropriate, refuse future imports of hazardous chemicals that

¹⁷³ As defined in Article 1 of the Waigani Convention, ‘Forum Island Countries’ means members of the South Pacific Forum with the exception of Australia and New Zealand. So, the designated countries are: Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

had been banned or severely restricted in other countries¹⁷⁴. Jointly managed by the FAO and the UNEP, this procedure ensured that governments have the necessary information about hazardous chemicals to assess risks and make informed decisions regarding chemical imports.

Chapter 19 of Agenda 21, adopted at the 1992 Rio Summit, called for the establishment of a legally binding instrument on the PIC procedure by the year 2000. Consequently, the FAO Council and the UNEP Governing Council were authorized to initiate negotiations, which culminated in the finalization of the text for the Rotterdam Convention, adopted on 10 September 1998, and entered into force on 24 February 2004.

The Rotterdam Convention aims to:

(P)romote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties¹⁷⁵.

The Maldives acceded to the Rotterdam Convention on 17 October 2006, thereby becoming legally bound to implement the PIC procedure. Notably, any domestic chemical industry is located in the archipelago; as such, there is no production or export of hazardous chemicals within the territory. Consequently, the obligations of the Maldives under the Rotterdam Convention pertain exclusively to the importation of hazardous chemicals¹⁷⁶.

Article 10 of the Rotterdam Convention imposes obligations on Parties regarding the importation of chemicals listed in Annex III titled 'Chemicals subject to the Prior Informed Consent Procedure'. It requires that each Party adopt the

¹⁷⁴ P BARRIOS, 'The Rotterdam Convention on Hazardous Chemicals and Pesticides: A meaningful step toward environmental protection?' (Master Thesis, University of British Columbia 2003).

¹⁷⁵ Rotterdam Convention 2244 UNTS 337 art 1.

¹⁷⁶ The Designated National Authority of the Maldives responded to the Questionnaire on Exports, Exports Notification and on Information Exchange for the period 1 January 2022- 31 December 2022. REPUBLIC OF MALDIVES, 'Party Response to the Questionnaire on Exports, Export Notifications and on Information Exchange (Relevant period: 1 January 2022 to 31 December 2022)' (Rotterdam Convention Secretariat, 2022) https://www.pic.int/Portals/5/download.aspx?d=UNEP-FAO-RC-Export_ExpNotif_IE-SUBM-Maldives-2022.En.pdf accessed 23 July 2025.

necessary legislative or administrative measures to ensure that timely and well-informed decisions are made and communicated to the Secretariat consenting the import of such chemicals. Specifically, Article 10(2) mandates that Parties must transmit their import responses no later than nine months after receiving the relevant decision guidance document. These responses must indicate whether the Party consents to import the chemical, consents subject to conditions, or does not consent to its import. The obligation to respond is not merely procedural but is integral to the implementation of the overarching objective of the Rotterdam Convention on ‘shared responsibility’.

As of 30 April 2025, the ‘PIC Circular’ (Appendix IV, Part 3) published by the Secretariat of the Rotterdam Convention indicated that the Maldives not consent the import of thirty-four chemicals listed in Annex III, but consent the import of ‘dustable powder formulations containing a combination of benomyl at or above 7%, carbofuran at or above 10% and thiram at or above 15%’ which are classified by the same Convention as ‘severely hazardous pesticide formulation’¹⁷⁷. Among these consented formulations, only pesticides containing thiram are subject to prior approval by the Ministry of Fisheries, Agriculture and Marine Resources before importation or use within the national territory. The ‘PIC Circular’ also indicates that the Maldives has failed to transmit import responses for twenty-one chemicals listed in Annex III. These omissions are officially categorized as ‘cases of failure to transmit a response’¹⁷⁸.

The failure to fulfil this core obligation can have significant implications for domestic chemical safety. In practical terms, it creates a regulatory vacuum wherein hazardous chemicals may be imported into the Maldives without any formal governmental oversight, undermining the preventing procedures of the Rotterdam

¹⁷⁷ In Article 2(d), the Rotterdam Convention defines severely hazardous pesticide formulation as ‘a chemical formulated for pesticidal use that produces severe health or environmental effects observable within a short period of time after single or multiple exposure, under conditions of use’. *Thiram fungicide* is defined as a dustable powder formulation containing a combination of benomyl at or above 7%, carbofuran at or above 10% and thiram at or above 15%. Despite its toxicity at high concentration for the human health, the final decision of the Maldives has been to consent the import into the country. The full list of consent and no-consent chemicals and pesticides in the Maldives (based on Annex III of the Rotterdam Convention) is available at: <https://pic.int/Countries/CountryProfiles>.

¹⁷⁸ The PIC Circular appendix IV part 3 presented a list of cases of failure to transmit a response, available at: <https://pic.int/Countries/CountryProfiles>.

Convention. As confirmed by the designated national authority in 2022, the Maldives lacks a comprehensive regulatory framework necessary for the effective implementation of the Basel, Rotterdam, and Stockholm Conventions. Moreover, public authorities currently do not have access to systematic information regarding the importation of chemicals listed in Annex III¹⁷⁹.

At the national level, the Law on Importation of Prohibited Items to the Maldives (Law No. 4/75) should regulate the import of hazardous chemicals. According to Article 5, the Ministry of Defence and National Security is responsible for regulating the importation of dangerous chemicals, acids and other toxic substances, requiring prior written permission and approval. Although the Ministry of Defence has formulated the Hazardous Chemical Regulation (No. 2019/R-1057) under Law No. 4/75, recent documents indicate that it has yet to be implemented. The delay in implementation is attributed to a lack of trained personnel and necessary equipment¹⁸⁰. In accordance with the Hazardous Chemical Regulation, owners must request the Ministry of Defence and National Security to dispose of their hazardous chemicals, including agrochemical wastes. However, there is no designated facility in the entire archipelago that meets environmental and safety criteria for chemical disposal. In the current conditions with improper staff and facilities, it is reported that the Ministry of Defence and National Security usually proceed with the dilution and draining of hazardous chemicals into the ground or sea. Furthermore, it is common practice on smaller outer islands not to engage in waste segregation, resulting in the indiscriminate disposal of all waste types, including agrochemical wastes, which is often burned, or discarded into the ocean¹⁸¹.

Some progress has been made in pesticide regulation, which falls under the authority of the Ministry of Fisheries and Agriculture. The Agricultural Pesticide Control Act (No. 21/2019) and the Agricultural Pesticide Control Regulation (No. 2021/R-12), adopted in 2019 and 2021 respectively, regulate the agricultural pesticide use, manufacture, import, export, sale and disposal. Under this legislation, a list of ‘Approved Pesticide Registry’ has been established, including 188

¹⁷⁹ REPUBLIC OF MALDIVES (n. 177).

¹⁸⁰ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of the Maldives (n. 125) 14.

¹⁸¹ AM HAMEED and H NIMSHA, (n. 111).

pesticides with low-risk and 174 biopesticides. Additionally, precautionary matters and laboratories to test pesticides will be implemented once it has been ratified. Finally, the Regulation 2021/R-12 includes fines between United States dollar 324.52 and 6,490.39 against those who breach the act¹⁸².

The Ministry of Fisheries and Agriculture has also initiated efforts to disseminate information to farmers and other consumers regarding the recommended use of pesticides and best practices for their effective and safe application. Information sheets of imported pesticides are re-written in the local language, giving instruction and precautions in handling and application of pesticides¹⁸³.

These measures were recently adopted, and their outcomes have not yet been documented. It remains essential to evaluate whether they will contribute to mitigating pollution in the Maldives, particularly in light of expert findings that underscore several systemic deficiencies, including limited public awareness regarding the impacts of agrochemicals, inadequate technical capacity for agrochemical analysis, and the absence of sufficient infrastructure for the safe management and disposal of agrochemical waste¹⁸⁴.

These forthcoming measures are essential to enhance community safety and protect the health of the soil, water reservoirs, and the surrounding marine environment. If successfully implemented, it could demonstrate that, with appropriate regulatory mechanisms and institutional oversight, the Maldives can establish and maintain structured chemical management systems, from the importation to the disposal.

The Rotterdam Convention emphasizes the principle of ‘shared responsibility’ among States in the international trade of hazardous chemicals. Specifically, Article 11(1), states: ‘Each exporting Party shall (...) advise and assist

¹⁸² PSMNews, 'Parliament approves Pesticide Bill' (28 November 2019) <https://psmnews.mv/en/60623> accessed 23 July 2025.

¹⁸³ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of the Maldives, (n. 125) 8.

¹⁸⁴ M AJILA, 'Impact of Agricultural Chemical Inputs on Human Health and Environment in Maldives' in Md Nasiruddin and others (eds), *Agricultural Chemical Inputs: Impact and Management Strategies in South Asia* (SAARC Agriculture Centre 2021); M SHAJUA AND W LAOHASIRIWONG, 'Patterns of Chemical Pesticide Use and Determinants of the Use of Personal Protective Equipment to Minimize Chemical Exposure in Vegetable Farming, Maldives' (2021) 21(2) *Medico-legal Update* 774.

importing Parties, upon request and as appropriate (...) to strengthen their capacities and capabilities to manage chemicals safely during their life-cycle'. The use of the modal verb 'shall' clearly indicate a legal obligation for exporting States to support importing countries, such as the Maldives which currently face challenges due to a lack of trained personnel and adequate equipment, in strengthening their capabilities to manage chemicals safely during the entire life cycle. However, this obligation is triggered only 'upon request' by the importing State - a conditionality that has been the subject of debate¹⁸⁵. The vagueness of this provision weakens its enforceability. To ensure that importing States can make informed decisions and manage hazardous chemicals effectively, support from exporting States should be made mandatory, particularly when the importing country lacks the necessary resources and infrastructure.

Under Articles 12 and 13, the importing Party must provide PIC before importing listed chemicals, thereby controlling hazardous substances entering the territory. Clearly, the effectiveness of this mechanism depends heavily on the ability of the importing country to assess risks and enforce regulations. These responsibilities require a combination of scientific expertise, regulatory coherence and institutional coordination, which are factors that the Maldives lack as other developing countries. In this regard, Article 14 of the Rotterdam Convention obliges Parties to facilitate the exchange of scientific, technical, economic, and legal information relevant to the chemicals covered by the Convention.

In the context of potential marine pollution, this obligation is further reinforced by Articles 194 and 197 of UNCLOS, which require States to cooperate in protecting and preserving the marine environment, including through measures to prevent pollution from hazardous substances. Notably, Article 31(3)(c) of the Vienna Convention on the Law of Treaties (Vienna, 23 May 1969) supports the harmonization of treaty obligations by promoting the integration of relevant rules of international law applicable between the Parties.

Despite these international commitments, neither the Rotterdam Convention nor UNCLOS provides practical or enforceable mechanisms to ensure their effective implementation. As a result, the exchange of critical information and

¹⁸⁵ P BARRIOS (n. 174) 734.

technical assistance often remains limited. This shortfall disproportionately affects vulnerable States like the Maldives, which are left without the necessary tools to fulfil their international obligations or to adequately protect their environment¹⁸⁶.

The limited infrastructure and technical capacity of the Maldives underscore the critical need for international cooperation and targeted technical assistance. Such support is essential to ensure the compliance with the PIC procedure and to facilitate the environmentally sound management of hazardous chemicals across all relevant sectors. In this regard, exporting Parties should be obligated, without any other condition, to provide proactive assistance to importing countries, particularly when structural and institutional constraints impede effective implementation. Without such international support, the Maldives is likely to remain unable to meet its obligations under the Rotterdam Convention, thereby compromising its ability to safeguard human health and the environment from the risks associated with hazardous chemicals.

2.2.3 Implementing Stockholm Convention: Eliminate the use of POPs

The Stockholm Convention, adopted on 22 May 2001 and entered into force on 17 May 2004, was ratified by the Maldives on 17 October 2006. Its preamble draws attention to the serious health risks posed by exposure to POPs, particularly for developing countries, Arctic ecosystems, and Indigenous Peoples, due to the biomagnification of these substances and the contamination of traditional food sources.

POPs are known to have ‘toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems’¹⁸⁷. Among the substances classified as POPs are PCBs, hazardous chemicals commonly found in transformers, capacitors and other equipment containing liquid stocks. PCBs, along with other POPs, are listed in

¹⁸⁶ P BARRIOS (n. 174) 737.

¹⁸⁷ Stockholm Convention 2256 UNTS 119 Preamble.

Annex A of the Stockholm Convention, which requires Parties to take measures to eliminate their production and use. Given the persistent and far-reaching nature of POPs, a coordinated international response is essential to effectively address the risks they pose to human health and the environment.

The approach of the Stockholm Convention differs significantly from that of the Rotterdam Convention. While the Rotterdam Convention focuses on regulating the trade of hazardous chemicals through PIC, the Stockholm Convention aims to eliminate the production and import/export of hazardous chemicals, specifically, POPs listed in Annex A, and to restrict, with a view toward elimination, those listed in Annex B¹⁸⁸. Nevertheless, the import of chemicals listed in both annexes is still permitted for the purpose of environmentally sound disposal¹⁸⁹.

Additionally, each Party is required to take measures to reduce or eliminate total releases from anthropogenic sources of the chemicals listed in Annex C of the Stockholm Convention. These chemicals are unintentionally produced POPs that are generated as by-products of industrial processes or combustion. Under Article 5, Parties must develop a national action plan, or, where appropriate, a regional or subregional action plan, to address and control these releases¹⁹⁰.

Pursuant to Article 7 of the Stockholm Convention, each Party is required to develop and make efforts to implement a plan to meet its obligations under the Convention. In accordance with this provision, the Ministry of Environment and Energy of the Maldives released its most recent National Implementation Plan (NIP) in 2017¹⁹¹. Although the Maldives does not have industries that manufacture POPs, these toxic chemicals are still present in the archipelago due to direct importation, and incidental imports, where POPs are contained in products such as electrical equipment. Additionally, the transboundary movement of POPs through atmospheric deposition and marine currents further contributes to their

¹⁸⁸ Stockholm Convention 2256 UNTS 119 art 3. Annex A listed POPs destined to ‘elimination’. Annex B listed POPs destined to ‘restriction’. However, such as for the DDT, listed in Annex B, the Stockholm Convention regulates the use of DDT ‘with the goal of reducing and ultimately eliminating the use of DDT’.

¹⁸⁹ Stockholm Convention 2256 UNTS 119 art 3(2.a).

¹⁹⁰ Stockholm Convention 2256 UNTS 119 art 5.

¹⁹¹ MINISTRY OF ENVIRONMENT AND ENERGY (n. 125).

accumulation in the Maldivian environment. The NIP outlines the need of national strategies to monitor, manage, and eventually eliminate the presence of POPs in accordance with the obligations of the Stockholm Convention¹⁹².

Trace amounts of PCBs were detected in sampled islands of the Maldives during a study conducted in 2014¹⁹³. Under the Stockholm Convention, a key priority in the effort to eliminate PCBs in equipment by 2025 is the identification, labelling, and removal from use of all receptors containing these hazardous substances. However, if such equipment must remain in operation, measures should be taken to mitigate exposure risks. These includes ensuring that the equipment is intact and free from leaks and placing it only in locations where the risk of environmental release can be effectively minimized and swiftly managed¹⁹⁴. The NIP highlights equipment potentially containing PCBs distributed across five of the most populous islands in the Maldives (Hithadhoo, Feydhoo, and Gan in Addu Atoll, and Fuvahmulah in Gnaviyani Atoll). This equipment includes 15 electric transformers and 3 oil-filled circuit breakers. The total volume of oil potentially containing PCBs amounts to 6,100 litres, comprising 5,819 litres of transformer oil and 282 litres used in the oil-filled circuit breakers¹⁹⁵. Unfortunately, the NIP also reports that there are contaminated sites in the Maldives where PCB oil could potentially seep into the soil.

TABLE 2.2 PCB CONTAMINATED SITES IN THE MALDIVES

Island	Number of contaminated sites	Volume of PCB contaminated oil that could seep into soil (litres)
<i>S. Hithadhoo</i>	2	1,113
<i>S. Feydhoo</i>	1	521
<i>S. Gan</i>	1	521
<i>GN. Fuvahmulah</i>	6	2,540

The NIP outlines the need of national strategies to monitor, manage, and eventually eliminate the presence of POPs in accordance with the obligations of the Stockholm Convention¹⁹⁶.

¹⁹² *Ibid.*

¹⁹³ A COLOMBO et al. (n. 125).

¹⁹⁴ Stockholm Convention 2256 UNTS 119 Annex A, Part II.

¹⁹⁵ MINISTRY OF ENVIRONMENT AND ENERGY (n. 125) 20.

¹⁹⁶ *Ibid.*

Currently, there are no national guidelines and public awareness in the Maldives for the disposal of equipment containing PCBs. Decommissioned electrical transformers are often sold as scrap metal, and island communities sometimes purchase PCB-contaminated oil for use on wooden furniture and boats. The NIP has also reported that, in some instances, PCB-contaminated oil has been mixed and boiled with naphthalene to create a chemical mixture intended to make wood termite-resistant. Last but not least, the combustion of solid and chemical waste materials also constitutes a significant contributor to the generation of POPs in the Maldives¹⁹⁷.

As emphasized in the NIP, the Maldives does not have a single authority responsible for the overall management of chemical substances, including POPs. Instead, this responsibility is spread across multiple ministries, agencies, and institutions, resulting in a fragmented and ineffective system¹⁹⁸ (see Table 2.4). The lack of coordination among these bodies hinders the effective implementation of government policies.

TABLE 2.3 AUTHORITIES IN THE MALDIVES WHICH ARE INVOLVED IN THE MANAGEMENT OF HAZARDOUS CHEMICALS (INCLUDING POPs).

Authority	Responsibilities and duties
<i>Ministry of Defence</i>	It handles chemical weapons, oversees chemical imports and disposal, and coordinates related activities across relevant ministries and institutions. Prior approval from this Ministry of Defence is required before importing chemicals into the country.
<i>Ministry of Agriculture and Animal Welfare</i>	It implements agricultural policy, oversees pesticide storage and treatment, regulates their import and distribution, and enforces usage rules. It also promotes alternative pest control methods and educates farmers on the safe use of pesticides through information sheets in the local language.
<i>Ministry of Environment and Tourism</i>	It should set solid waste management policies, while the Environmental Protection Agency should formulate and enforce guidelines and standards for safe waste management procedures.

Source: MINISTRY OF ENVIRONMENT AND ENERGY (n. 125).

¹⁹⁷ A COLOMBO et al. (n. 125).

¹⁹⁸ MINISTRY OF ENVIRONMENT AND ENERGY (n. 125) 5.

2.2.4 The development of a coherent legal framework on plastic pollution at international level

On 25 September 2015, the United Nations General Assembly adopted Resolution 70/1 titled ‘Transforming our World: the 2030 Agenda for Sustainable Development’, a landmark outcome document that outlines a global strategy comprising seventeen Sustainable Development Goals (SDGs) and 169 associated targets. Although not legally binding, these goals represent a unified international commitment to sustainable development and global cooperation. Among these, SDGs 6, 11, 12, and 14 are particularly relevant to tackling marine pollution, with eleven specific targets across these goals directly addressing the reduction of marine plastic pollution.

TABLE 2.4 SDG TARGETS RELATED TO MARINE LITTER

6.3	By 2030, the proportion of untreated wastewater should be halved.
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
12.1	Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.
12.2	By 2030, achieve the sustainable management and efficient use of natural resources.
12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
12.b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.
14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
14.7	By 2030, increase the economic benefits to SIDS and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

-
- 14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine to the development of developing countries, in particular SIDS and least developed countries.
-
- 14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.
-
- 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species
-

Source: UNEP, Marine plastic debris and microplastics, Global lessons and research to inspire action and guide policy change, 2016, Nairobi.

Since 1950 to 2017, approximately 9.2 billion tonnes of plastics have been produced, amounting to some 400 million tonnes per year. As of 2017, only about 30 per cent of these plastics remain in use, while the remaining 70 per cent has become waste, generating some 6.9 billion tonnes of primary plastic litter around the world. Of all this plastic discarded so far, less than one-quarter has been incinerated and recycled. The vast majority has been discarded and ended up in landfills, dumps, uncontrolled or mismanaged waste streams, or leaking into the natural environment, including oceans¹⁹⁹.

The volume of plastics in the oceans is estimated to be between 75 and 199 million metric tons, and emissions of plastic waste into aquatic ecosystems are projected to nearly triple by 2040 without meaningful action²⁰⁰. Plastic debris has been found at the greatest depths of the ocean floor²⁰¹, as well as in the shallow bright waters surrounding even the most remote islands of the Maldivian archipelago²⁰².

¹⁹⁹ R GEYER, 'Production, use, and fate of synthetic polymers' (Academic Press 2020) 13; UNEP, *Drowning in Plastics – Marine Litter and Plastic Waste Vital Graphics* (2021).

²⁰⁰ UNEP (n. 199); THE PEW CHARITABLE TRUST AND SYSTEMIQ, *The Plastic Wave: A comprehensive assessment of pathways towards stopping ocean plastic pollution* (2020).

²⁰¹ S CHIBA ET AL., 'Human footprint in the abyss: 30 year records of deep-sea plastic debris' (2018) 96 *Marine Policy* 204.

²⁰² F SALIU et al. (n. 121).

Marine plastic litter comes mainly from land-based sources²⁰³, among which are agriculture, wastewater treatment plants, construction activities, and transportation systems. Significant contributors also include problematic plastic products and polymers, such as straw, packaging (e.g., plastic shopping bags and water bottles), as well as a wide variety of personal and healthcare products²⁰⁴. Uncollected waste is thought to be the major source, with lesser amounts coming from collected waste re-entering the system from poorly operated or located formal and informal dumpsites. In general, sources of marine litter can be correlated with the efficiency of solid waste management and wastewater treatment²⁰⁵.

The links between climate change and the plastic life cycle have also been underscored. Using a life cycle analysis, in 2015 GHG emissions from plastics were 1.7 gigatonnes of CO₂ equivalent (GtCO₂e) and are projected to increase to approximately 6.5 GtCO₂e by 2050, or 15 per cent of the global carbon budget²⁰⁶. Plastic pollution also undermines marine ecosystem services that contribute to climate change mitigation. It can interfere with the global carbon cycle by impacting plankton and primary production, especially in vital carbon sinks such as mangroves²⁰⁷, coral reefs²⁰⁸ and salt marshes²⁰⁹.

All plastic products contain chemical additives, which serve various functions. Common additives include stabilizers, fillers, plasticizers, colourants, as well as functional agents such as flame retardants and curing compounds. While these substances enhance the performance of plastics, some pose risks to human health and the environment²¹⁰. A 2018 study identified 3,377 chemicals potentially

²⁰³ W C LI, H F TSE and L FOK, 'Plastic waste in the marine environment: A review of sources, occurrence and effects' (2016) 566 *Science of the total environment* 333.

²⁰⁴ UNEP (n. 199).

²⁰⁵ J R JAMBECK et al., 'Plastic waste inputs from land into the ocean' (2015) 347(6223) *Science* 768.

²⁰⁶ WORLD ECONOMIC FORUM, *The New Plastics Economy - Rethinking the Future of Plastics* (Ellen MacArthur Foundation, McKinsey & Company, 2016); J ZHENG and S SUH, 'Strategies to reduce the global carbon footprint of plastics' (2019) 9 *Nature Climate Change* 374

²⁰⁷ C E VAN BIJSTERVELDT et al., 'Does plastic waste kill mangroves? A field experiment to assess the impact of macro plastics on mangrove growth, stress response and survival' (2021) 756 *Science of the Total Environment* 143826

²⁰⁸ J B LAMB et al., 'Plastic waste associated with disease on coral reefs' (2018) 359 *Science* 460.

²⁰⁹ W ZHAO et al., 'Effects of plastic contamination on carbon fluxes in a subtropical coastal wetland of East China' (2023) 345 *Journal of Environmental Management* 118654.

²¹⁰ UNEP (n. 199); H WIESINGER, Z WANG and S HELLWEG, 'Deep dive into plastic monomers, additives, and processing aids' (2021) 55(13) *Environmental Science & Technology* 9339.

associated with plastic packaging, and 906 chemicals are likely associated. Among of these, 148 were classified as particularly hazardous²¹¹.

The United Nations Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes has underscored the urgent challenges posed by plastic pollution, highlighting a number of thematic concerns that collectively underscore the critical importance of international cooperation, policy coherence, and legally binding global measures²¹². Through an analysis on the production, consumption, and disposal of plastics, the United Nations Special Rapporteur draws attention to the disproportionate influence of a limited number of corporate actors, the inadequacy and risks of current recycling systems, and the far-reaching human rights implications of plastic pollution across its entire life cycle²¹³.

Despite widespread belief in recycling as a viable solution to plastic pollution, the United Nations Special Rapporteur emphasizes that this perception has been shaped largely by sustained industry-led disinformation. Only around 9 per cent of all plastic waste ever produced has been successfully recycled. Additionally, current recycling practices not only fail to address the problem but also introduce new health and environmental risks, including the release of volatile organic compounds and the concentration of toxic additives in recycled materials. The technologies required to eliminate these hazards are prohibitively expensive, making safe, large-scale recycling unfeasible. As such,

the recycling practices implemented to date are more of a mirage, an optical illusion that perpetuates the severe human rights impacts of plastics²¹⁴.

In light of these realities, the United Nations Special Rapporteur emphasizes that only the adoption of legally binding limits on global plastic production, restricted strictly to essential uses, can meaningfully address the scale and severity

²¹¹ K J GROH et al., 'Overview of known plastic packaging-associated chemicals and their hazards' (2019) 651 *Science of the Total Environment* 3253.

²¹² UNITED NATIONS GENERAL ASSEMBLY, *Implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes* (22 July 2021) A/76/207.

²¹³ *Ibid.*

²¹⁴ *Ibid.*

of the plastic pollution crisis and its far-reaching implications for human rights. It underscores the polluter-pays principle as one of the foundational pillars for effective policy development²¹⁵. The polluter-pays principle was first introduced on the international stage by the OECD in 1972:

This principle means that the polluter should bear the expenses of carrying out the [above-mentioned] measures decided by public authorities to ensure that the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption. Such measures should not be accompanied by subsidies that would create significant distortions in international trade and investment²¹⁶.

Then, it is reaffirmed in Principle 16 of the Rio Declaration on Environment and Development in 1992:

[n]ational authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

While the polluter-pays principle offers a theoretically attractive framework rooted in the internalization of environmental externalities, its practical implementation, particularly at the international level, remains problematic. The principle's neo-liberal character, which allows polluters to offset environmental harm through monetary compensation, risks legitimising pollution rather than preventing it. By reducing environmental responsibility to a financial transaction, it may enable wealthier actors to continue harmful practices with minimal behavioural change, while less-resourced States lack the capacity to enforce or apply the principle effectively. Moreover, its limited ability to address intergenerational harm and cumulative environmental impacts undermines its effectiveness in tackling complex global issues such as marine plastic pollution²¹⁷.

²¹⁵ *Ibid.*

²¹⁶ OECD, *Recommendation of the Council on Guiding Principles concerning International Economic Aspects of Environmental Policies*, OECD/LEGAL/0102 (26 May 1972) (abrogated on 8 November 2023).

²¹⁷ N DE SADELEER, *Environmental Principles* (Oxford University Press 2002) 21.

In relation to another global challenge, climate change and related issues, the ICJ, in its 2024 Advisory Opinion on the obligations of States in respect of climate change, concluded that the polluter-pays principle does not form part of the applicable law. However, it acknowledged the possible emergence of strict liability for hazardous activities not currently prohibited under international law²¹⁸. Instead, the Court affirmed the relevance of the precautionary approach and the principle of intergenerational equity in the fulfilment of States' obligations under relevant treaties and customary international law concerning climate change²¹⁹.

To date, the only legally binding international instrument addressing plastic pollution is the Plastic Waste Amendments adopted in 2019 by the COP to the Basel Convention²²⁰.

These amendments revised three annexes of the Basel Convention:

- Annex II titled 'Waste requiring special consideration' now covers plastic waste and other mixtures.
- Annex VIII titled 'Hazardous substances' now includes hazardous plastic wastes, subjecting them to the PIC procedure. This should ensure importing countries can manage such waste in an environmentally sound manner and empower them to refuse shipments if they lack the technical capacity.
- Annex IX on non-hazardous substances identifies non-hazardous plastic waste, such as PET, which are designated to environmentally sound recycling and exempt from the PIC procedure.

The Plastic Waste Amendments are expected to deliver significant benefits across the core objectives of the Basel Convention by strengthening control over transboundary movements through a binding legal framework that enhances transparency and regulation of plastic waste trade, promoting environmentally sound management by encouraging the development of national infrastructure for

²¹⁸ *Obligations of States in respect of Climate Change* (Advisory Opinion) (23 July 2025) ICJ Rep, para [159-160].

²¹⁹ *Ibid.* para [155-158].

²²⁰ Basel Convention, *Decision BC-14/12: Amendments to Annexes II, VIII, and IX to the Basel Convention*, COP 14, 29 April - 10 May 2019.

proper collection, recycling, and disposal, and supporting increased waste prevention and minimization²²¹.

Under the obligations of the CBD, Article 14 requires Parties to assess and minimize adverse impacts on biodiversity. In alignment with this mandate, Decision XIII/10 adopted in 2016 provides voluntary practical guidance on preventing and mitigating the effects of marine debris on marine and coastal biodiversity²²². Key recommended measures include enhancing recycling and reuse through capacity-building, regulatory frameworks, and stakeholder cooperation; promoting research and technology transfer to reduce the environmental impacts of plastics; encouraging the adoption of best practices throughout the plastic value chain to prevent leakage; and improving national waste management systems by sharing best practices and addressing upstream sources of marine debris. Further reinforcing these efforts, Decision XIV/10 of 2018 called upon Parties to intensify their actions, recognized the need for expanded research on biodiversity impacts, and underscored the importance of marine debris removal where feasible²²³.

Earlier, the Aichi Biodiversity Targets, adopted in 2010, included Target 8, which aimed to reduce pollution, including plastic pollution, to levels that are not harmful to biodiversity by 2020. As this target was not achieved, at its fifteenth meeting the COP to the CBD adopted Target 7 under the Kunming-Montreal Global Biodiversity Framework²²⁴. This target aims to reduce pollution from all sources by 2030, considering cumulative impacts, through:

- (a) by reducing excess nutrients lost to the environment by at least half, including through more efficient nutrient cycling and use;
- (b) by reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management, based on science, taking into account food security and livelihoods; and
- (c) by preventing, reducing, and working towards eliminating plastic pollution.

²²¹ *Ibid.*

²²² CBD COP, *Decision XIII/10: Addressing impacts of marine debris and anthropogenic underwater noise on marine and coastal biodiversity* (10 December 2016).

²²³ CBD COP, *Decision 14/10: Other matters related to marine and coastal biodiversity* (30 November 2018).

²²⁴ CBD COP, *Decision 15/4: Kunming-Montreal Global Biodiversity Framework* (19 December 2022).

Building upon the emergent frameworks of the CBD and Basel Convention and other international initiatives, and reflecting growing scientific concern, the United Nations Environment Assembly (UNEA) adopted a historical resolution on 2 March 2022 entitled ‘End Plastic Pollution: Towards a legally binding instrument’²²⁵, mandating the Executive Director to convene an Intergovernmental Negotiating Committee (INC). This Committee, expected to complete its work by the end of 2024²²⁶, aims to develop an international legally binding instrument on plastic pollution, including in the marine environment. The resolution emphasised the necessity for both legally binding measures and voluntary approaches to establish an effective and feasible legal framework to combat plastic pollution. The UNEA acknowledges the varying national circumstances, allowing for flexibility in provisions where appropriate, and highlights the importance of utilising the best available science, Indigenous and local knowledge systems where available. Additionally, it promotes the adoption of best practices and the integration of policy-relevant scientific and socioeconomic information and related assessment mechanisms for preventing plastic pollution and developing a cohesive and successful international strategy.

Pending the entry into force of a legally binding international treaty on plastic pollution, several States, including the Maldives, have begun adopting regulatory measures and promoting initiatives to address the growing plastic crisis.

Plastic pollution represents a serious and escalating environmental issue for the Maldives. Numerous scientific studies have documented high concentrations of

²²⁵ UNEA, *Resolution 5/14, End Plastic Pollution: Towards an International Legally Binding Instrument* (7 March 2022) UNEP/EA.5/14.

Before that, the UNEA, established in 2012, has adopted a few resolutions concerning marine pollution before the historical one: *Resolution 1/6 : Marine plastic debris and microplastics : report of the Executive Director* (8 March 2016) UNEP/EA.2/5;

Resolution 2/11, Marine plastic litter and microplastics (4 August 2016) UNEP/EA.2/RES.11;

Resolution 4/6. Marine plastic litter and microplastics (30 January 2018) UNEP/EA.4/RES.6;

Resolution 3/7. Marine litter and microplastics (28 March 2019) UNEP/EA.3/RES.7;

Resolution 4/9, Addressing single-use plastic products pollution (28 March 2019) UNEP/EA.4/Res.9.

²²⁶ Actually, it was expected that the plastic treaty would have been ready to be presented at the sixth meeting of the UNEA, on 26 February to 1 March 2024 in Kenya. As of July 2025, the plastic treaty is not ready and, thus, does not meet the expectations. S M DENTA, 'Preventing Plastic Pollution with a Global Plastic Treaty and Public-Private Partnership for the Climate' (2022) 17(4) *European Procurement & Public Private Partnership Law Review* 216.

plastic debris in the inner reef ecosystems. Even remote areas such as Magoodhoo have shown significant levels of plastic contamination²²⁷. Alarming, elevated levels of microplastics have also been detected within coral tissues in the same region, indicating the extent of pollution infiltrating fragile coral reef ecosystems²²⁸. Microplastics have been found in fish species commonly consumed by the local population. Specifically, contaminants were identified in 80% of *Selar crumenophthalmus* and 76.2% of *Decapterus macarellus* samples collected in Maldivian waters²²⁹.

One of the most alarming studies on plastic contamination in the Maldives identified Naifaruu, an island in the Lhaviyani Atoll with a population of 5,408 residents in an area of just 0.55 kilometres square, as having one of the highest recorded plastic densities worldwide²³⁰. This highlights the urgency of establishing effective and enforceable waste management practices across the archipelago.

In response, the Waste Management Act (Law No. 24/2022) was enacted to define national standards and procedures for sustainable waste management. As part of its measures to curb plastic consumption, the Act imposes a fee of Maldivian Rufiyaa 2,00 on plastic bags, with exemptions granted to those sold or supplied by duty-free shops, unsealed plastic used for packaging fresh meat, and ‘bin liners’ used solely for waste disposal by authorized providers.

The Maldives has also pursued collaborative and community-based strategies to address plastic pollution. A notable example is the long-term partnership established with Parley for the Oceans, a global environmental organization known for its creative, multidisciplinary approach to marine plastic pollution. Through this partnership, the Maldives supports the collection of ocean-bound plastics, which are then recycled into yarn or fabric for sustainable use²³¹.

The Maldives has begun to develop monitoring mechanisms to better understand and manage marine litter. Supported by foreign-funded projects, certain aspects of marine litter, particularly ghost nets, are now systematically recorded. One of the key organizations engaged in this effort is the Olive Ridley Project,

²²⁷ F SALIU et al. (n. 121).

²²⁸ C RAGUSO et al. (n. 132).

²²⁹ F SHIYANA et al. (n.133).

²³⁰ T B PATTI et al. (n. 134).

²³¹ SACEP, *Regional Marine Litter Action Plan for South Asian Seas Region* (2019) 15.

which actively implements a marine debris monitoring programme across the country. Their data collection focuses on the geographic distribution of ghost nets and records attributes such as net construction, twine diameter, knot spacing, flotation elements, materials used, and any attachments. These baseline datasets enable the Maldives to assess ghost net abundance and trace potential points of origin, contributing to a more evidence-based approach to marine litter management²³².

Finally, local island councils have also taken proactive steps to combat plastic waste. Islands such as AA. Bodufolhudhoo, AA. Ukulhas, and V. Keyodhoo have independently instituted bans on single-use plastic bags²³³.

However, marine pollution is inherently transboundary in nature, it does not respect national borders. As already reiterated in the analysis on the Basel, Rotterdam and Stockholm Conventions, international cooperation and regional approaches are essential to effectively addressing such shared environmental challenges. In this context, the Barcelona Convention establishes a comprehensive legal and institutional framework for the protection of the marine and coastal environment in the Mediterranean region. Its membership extends to all Mediterranean coastal States, encompassing countries from Europe, Africa, and Middle East. Over the decades, the Barcelona Convention has functioned as a significant case study in regional environmental governance, demonstrating both achievements and persistent challenges. The purpose of the following analysis is to assess the extent to which the legal and institutional framework of the Barcelona Convention may be adapted to the context of the North-West Indian Ocean region, where India, the Maldives, and Sri Lanka are the relevant coastal States.

2.2.5 Addressing marine pollution through a regional convention-protocols approach

The Barcelona Convention is a multilateral environmental agreement adopted on 16 February 1976 and entered into force on 12 July 1978. It was

²³² *Ibid.* 18

²³³ *Ibid.* 24.

amended in 1995 and renamed as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.

The Barcelona Convention and its seven Protocols, adopted in the framework of the Mediterranean Action Plan, represent the principal legally binding multilateral environmental agreement in the Mediterranean region. As of now, all Mediterranean coastal States, and the EU, are Contracting Parties, apart from Palestine²³⁴. Article 4 of the Barcelona Convention sets out the general obligations of the Contracting Parties, requiring them to take all appropriate measures, individually or jointly, to protect and preserve the marine environment and coastal areas. This provision encapsulates the core principles of contemporary environmental governance. Specifically, Article 4(1) emphasizes the prevention, reduction, and control of marine pollution from any source. Article 4(2) further mandates that Parties ensure sustainable and equitable development, aiming to safeguard the marine environment and natural resources for the benefit of present and future generations. Article 4(3) enshrines several foundational environmental principles, including the precautionary approach, the polluter pays principle, the requirement to conduct EIAs, the promotion of international cooperation, and the adoption of integrated coastal zone management. Finally, Article 4(4) underscores the obligation to base all measures on the best available scientific knowledge and technological developments. Collectively, these provisions reflect a holistic and forward-looking approach to ocean governance.

The Barcelona Convention establishes comprehensive regulations for the implementation of measures aimed at preventing, mitigating, and, to the maximum extent possible, eliminating pollution in the Mediterranean region. This encompasses pollution resulting from the dumping of waste from ships and aircraft or incineration at sea²³⁵, discharges from ships²³⁶, activities related to the

²³⁴ The State of Palestine is recognized by 145 of the 193 member States of the United Nations, or just over 75 per cent of all United Nations members. Since 2012, Palestine has been a non-member observer State of the United Nations General Assembly. Since Palestine is not formally recognized as a United Nations State, it cannot take part in the Barcelona Convention, neither as an observer. Article 20 of the Barcelona Convention enacts that the quality of observers is reserved to (formally recognized) States which are not contracting Parties to the Convention, and any international governmental organization or non-governmental organizations which are related to the issues provided by the Convention. Palestine does not fall into any of the definitions.

²³⁵ Barcelona Convention 1102 UNTS 27 art 5.

²³⁶ Barcelona Convention 1102 UNTS 27 art 6.

exploration and exploitation of the continental shelf and the seabed and its subsoil²³⁷, as well as from land-based sources²³⁸. It also mandates collaborative efforts among States in managing pollution emergencies²³⁹ and requires the establishment of monitoring programmes²⁴⁰. Furthermore, it stipulates the need for the exchange of scientific and technological information between States to enhance cooperation and effective environmental management²⁴¹.

Pursuant to the provisions of the Barcelona Convention, the Parties are required to submit periodic national reports to the UNEP, which serves as the Secretariat²⁴². These reports provide detailed information on the legal, administrative, and other measures adopted at the national level to implement the Barcelona Convention. On the basis of these submissions, the meeting of the Parties assesses the degree of compliance and, where necessary, issues recommendations to ensure full and effective implementation²⁴³.

An important feature of the Barcelona Convention is its flexible and dynamic structure, particularly through the adoption of additional protocols. This convention–protocol approach enables States to progressively deepen their commitments and enhance regional cooperation in response to evolving environmental challenges. Initially, States agree on a framework convention that sets out the institutional architecture, decision-making processes, mechanisms for information exchange, and a preliminary set of substantive obligations. Subsequently, more specific and often more stringent obligations are introduced through additional protocols or annexes. This incremental approach results in a series of interconnected legal instruments that collectively form a comprehensive cooperative regime²⁴⁴.

The Barcelona Convention System represents the application of a convention-protocol approach specifically aimed at addressing regional marine

²³⁷ Barcelona Convention 1102 UNTS 27 art 7.

²³⁸ Barcelona Convention 1102 UNTS 27 art 8.

²³⁹ Barcelona Convention 1102 UNTS 27 art 9.

²⁴⁰ Barcelona Convention 1102 UNTS 27 art 12.

²⁴¹ Barcelona Convention 1102 UNTS 27 art 13.

²⁴² Barcelona Convention 1102 UNTS 27 art 17.

²⁴³ Barcelona Convention 1102 UNTS 27 art 27.

²⁴⁴ S-Y CHUNG, 'Is the Convention-Protocol Approach Appropriate for Addressing Regional Pollution?: The Barcelona Convention System Revisited' (2004) 13(1) Penn State Environmental Law Review 85.

pollution. Each protocol within this system outlines the legal obligations of States regarding the reduction of specific sources and types of pollution and the adoption of area-based protective measures.

TABLE 2.5 BARCELONA CONVENTION SYSTEM

The Barcelona adopted on 16 February 1976 and entered into force on 12 July 1978. It was amended in 1995 and renamed as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.

The Protocol for the prevention of pollution of the Mediterranean Sea by dumping ships and aircraft was adopted on 16 February 1976 and amended on 10 June 1995 and renamed as the Protocol for the prevention and elimination of pollution of the Mediterranean Sea by dumping from ships and aircraft or incineration at sea.

The Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency was adopted on 16 February 1976 and amended on 25 January 2022 and renamed as Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea.

The Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources was adopted on 17 May 1980. It was subsequently amended and renamed the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources and Activities (Land-based Pollution Protocol) on 7 March 1996, with the amendments entering into force on 11 May 2008.

The Protocol on the prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (Hazardous Waste Protocol) was adopted on 1 October 1996 and entered into force on 19 December 2007.

The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from the Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil was adopted on 14 October 1994 and entered into force on 24 March 2011.

The Protocol on Integrated Coastal Zone Management in the Mediterranean was adopted on 21 January 2008 and entered into force on 24 March 2011.

The Protocol Concerning Mediterranean Specially Protected Areas was adopted on 3 April 1982 and entered into force on 23 March 1986. The Protocol was replaced by the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) which was adopted on 10 June 1995 and entered into force on 12 December 1999.

The Barcelona Convention and its associated protocols complement and reinforce the objectives of the Basel, Rotterdam, and Stockholm Conventions within the Mediterranean region, particularly in the areas of hazardous substances, waste management, and pollution prevention. While the Barcelona Convention does not formally implement these global treaties, it provides a regional legal and institutional framework that facilitates their coordinated application among Mediterranean States. This is particularly evident through the adoption of protocols such as the Land-based Pollution Protocol and the Hazardous Wastes Protocol. These instruments operationalize key principles and objectives of the global conventions at the regional level, thereby contributing to a more coherent and integrated approach to environmental governance in the Mediterranean basin.

The Land-Based Pollution Protocol specifically aims to reduce and, where possible, eliminate the discharge of substances that are toxic, persistent, and capable of bioaccumulating in marine organisms, in order to protect the Mediterranean Sea from land-based sources of pollution. Targeted substances include, *inter alia*, POPs, mercury compounds, and radioactive materials²⁴⁵. To this end, Parties are required to implement, individually or collectively, the necessary programmes and measures, including the establishment of common emission limit values and standards for the use and discharge of such substances²⁴⁶. Moreover, the Protocol obliges Parties to adopt measures aimed at reducing inputs of substances listed in Annex II, considered less harmful but still of environmental concern, such as phosphorus compounds, which are predominantly derived from agricultural runoff.

This issue is not unique to the Mediterranean region. For instance, along the coasts of the Maldives in the North-West Indian Ocean, similar agricultural inputs have been identified as significant contributors to nutrient loading. In Mediterranean coastal areas, where agriculture is much intensive, monitoring has revealed elevated concentrations of phosphorus and nitrogen in seawater, contributing to anthropogenic eutrophication. This phenomenon, now widely

²⁴⁵ Barcelona Convention 1102 UNTS 27, Land-Based Pollution Protocol Annex I.

²⁴⁶ Barcelona Convention 1102 UNTS 27, Land-Based Pollution Protocol art 5.

recognised as a serious threat to aquatic ecosystem health, has been linked to the increasing occurrence of HABs, particularly in densely populated coastal zones²⁴⁷.

Unlike the North-west Indian Ocean region, the advantage of the Barcelona Convention can be also attributed to the substantial influence of the EU system, both in terms of policy development and implementation efforts. The implementation of EU legislation, such as Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive)²⁴⁸ and Directive 91/271/EEC concerning urban wastewater treatment (Urban Wastewater Directive)²⁴⁹, has played a pivotal role in reducing agricultural nutrient inputs and controlling wastewater discharges, thus mitigating some of these environmental pressures.

Furthermore, science-based management strategies have been implemented *in situ* to mitigate eutrophication caused by agricultural runoff and wastewater discharge (Table 2.6).

TABLE 2.6 MANAGEMENT STRATEGIES APPLIED IN THE MEDITERRANEAN SEA TO ADDRESS EUTROPHICATION DERIVED FROM AGRICULTURAL AND WASTEWATER SEWAGE

<i>Advanced aquaculture facilities</i>	The separation of fish and harmful algal blooms, providing oxygen to prevent anoxia.
<i>Algicides</i>	The use of copper sulphate (CuSO ₄) to induce the death of algae. However, the application of such chemicals should be avoided due to their potential indirect impacts on the ecosystems.
<i>Physical-chemical methods</i>	The use of sands or clay to induce coagulation-flocculation and sedimentation of harmful microalgae.
<i>Biological methods</i>	The use of biological agents acting as controllers of HABs through feeding (predators), infecting, or decomposing (parasites, bacteria, fungi, viruses) HAB species. However, this could have potential indirect effects on the ecosystem. Further studies are necessary.

²⁴⁷ C TSIKOTI and S GENITSARIS, 'Review of Harmful Algal Blooms in the Coastal Mediterranean Sea, with a Focus on Greek Waters' (2021) 13(8) Diversity 396.

²⁴⁸ Council Directive 91/676/EEC of 12 December 1991 Concerning the Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources (OJ L 375/1, 31 December 1991).

²⁴⁹ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135/40, 30 May 1991).

Source: C TSIKOTI and S GENITSARIS (n. 247)

In support of the implementation of its substantive obligations, the Barcelona Convention has established a number of operational mechanisms and strategic frameworks. One of the most significant is the Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL), the first operational programme developed under the Mediterranean Action Plan. MED POL plays a central role in assisting Contracting Parties in meeting their commitments under several protocols of the Convention, most notably the Land-Based Pollution Protocol²⁵⁰. Through a combination of regional, sub-regional, and national activities, including monitoring, assessment, and capacity-building, MED POL provides essential technical and policy support.

To operationalize the Land-Based Pollution Protocol, both Regional Action Plans and National Action Plans have been developed, setting out specific measures and implementation timelines. A notable example is the Regional Plan on Marine Litter Management in the Mediterranean, adopted by the Parties to the Barcelona Convention and its Land-Based Pollution Protocol²⁵¹. This plan, which became legally binding on 8 July 2014, marked a pioneering step in addressing marine litter from land-based sources, with an implementation timeframe spanning from 2016 to 2025 and most measures targeted for completion by 2020²⁵².

Significant progress had been achieved under the regional plan. Nineteen Mediterranean countries had established National Action Plans and Programmes to

²⁵⁰ The other two protocols which the MED POL aims to assist are the Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft and the Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal.

²⁵¹ UNEP/MAP, *Regional Plan for the Marine Litter Management in the Mediterranean*, UNEP (DEPI)/MED WG. 379/5 (28 May 2013).

²⁵² The 2008 Assessment on the Status of Marine Litter in the Mediterranean in the framework of UNEP/MAP identified that most of the marine litter in the region originated from land-based sources, with inadequate solid waste management being a key contributing factor. It also highlighted significant data gaps and inconsistencies at the national, sub-regional, and regional levels, as well as the need for substantial improvements in the monitoring of marine litter. On the other hand, the assessment emphasized the high potential for the implementation of recycling and prevention measures to address the issue. UNEP/MAP, *Assessment of the status of marine Litter in the Mediterranean Sea*, UNEP(DEPI)/MED WG.357/Inf.4 (12 April 2011).

A new Marine Litter Assessment for the Mediterranean, launched in 2015, reaffirmed that marine litter remains a critical concern. This issue has been further exacerbated by densely populated coastal areas, the extensive development of tourism, and the impacts of maritime traffic. UNEP/MAP, *Marine Litter Assessment in the Mediterranean 2015* (2015) 9.

combat marine litter. Furthermore, seventeen countries had adopted measures to reduce the use of single-use plastic bags, eight countries had introduced legislation and policies to encourage recycling, and more than twenty pilot projects had been launched across nine non-EU Mediterranean States to test and scale up innovative approaches to marine litter reduction. These outcomes reflect the capacity of the Barcelona Convention system to promote coordinated, legally binding action on region-wide environmental threats²⁵³.

In parallel, the Barcelona Convention System also addresses the issue of hazardous waste through the Hazardous Waste Protocol. It aligns closely with the principles and provisions of the Basel Convention, aiming to protect human health and the marine environment from the adverse effects of hazardous waste disposal and transboundary movements within the Mediterranean. It empowers Parties to ban the import of hazardous waste and obliges all other Parties to respect such sovereign decisions by prohibiting exports to those States²⁵⁴. Furthermore, the Hazardous Waste Protocol mandates the adoption of legal, administrative, and other measures to prevent the export and transit of hazardous waste to developing countries and to States that are not members of the European Community (now the EU)²⁵⁵. Notably, under the same protocol, transboundary movements of hazardous wastes are permitted only when environmentally sound disposal is not feasible in the country of origin.

Despite its potential, the effectiveness of the Hazardous Waste Protocol has been limited by low ratification rates. As of today, only seven Mediterranean States - namely Albania, Malta, Montenegro, Morocco, the Syrian Arab Republic, Tunisia, and Türkiye - have ratified it. Importantly, none of the principal waste-exporting countries in the Mediterranean, such as France and Italy, are Parties to the Hazardous Waste Protocol, raising concerns about its ability to ensure comprehensive regional oversight.

Last but not least, the SPA/BD Protocol calls for measures to ‘protect, preserve and manage in a sustainable and environmentally sound way areas of

²⁵³ More information about the progress of the Regional Plan on Marine Litter Management in the Mediterranean: UN, 'Partnership Progress 2020-01-27-0' (SDGs, 27 January 2020) <https://sdgs.un.org/partnership-progress/partnership-progress-2020-01-27-0> accessed 24 July 2025.

²⁵⁴ Barcelona Convention 1102 UNTS 27, Hazardous Waste Protocol art 5(3).

²⁵⁵ Barcelona Convention 1102 UNTS 27, Hazardous Waste Protocol art 5(4).

particular natural or cultural value, notably by the establishment of specially protected areas’²⁵⁶, introducing the concept of biological diversity²⁵⁷, with particular regards to threatened²⁵⁸ and endangered species^{259, 260}. Annexes of SPA/PD Protocol are periodically updated with new endangered categories. The Parties to the SPA/BD Protocol ‘shall identify and compile inventories of the components of biological diversity important for its conservation and sustainable use’ and adopt strategies, plans and programmes to this end²⁶¹. The SPA/BD Protocol introduces forms of geographically area-based conservation measure: Specially Protected Areas (SPAs) and the Specially Protected Areas of Mediterranean Importance (SPAMIs). While SPAs are a broader designation, SPAMIs are specifically recognized for their importance to the Mediterranean region. The first section of the SPA/BD Protocol provides the framework for defining and establishing SPAs as part of its conservation measures.

Article 4

Objectives

The objective of specially protected areas is to safeguard:

- a. representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity;
- b. habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area;
- c. habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna;

²⁵⁶ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art Article 3(1.a).

²⁵⁷ ‘Biological diversity’ is defined in Article 1(b) of the SPA/BD Protocol as ‘the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.’

²⁵⁸ ‘Threatened species’ is defined in Article 1(e) of the SPA/BD Protocol as ‘any species that is likely to become extinct within foreseeable future throughout all or part of its range and whose survival is unlikely if the factors causing numerical decline or habitat degradation continue to operate.’

²⁵⁹ ‘Endangered species means any species that is in danger of extinction throughout all or part of its range’ as outlined in Article 1(c) of the SPA/BD Protocol.

²⁶⁰ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art 3(1.b).

²⁶¹ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art 3(3)(4).

- d. sites of particular importance because of their scientific, aesthetic, cultural or educational interest.

Among the protection measures outlined in Article 6 of the SPA/BD Protocol, special attention would be given to provisions related to waste management and the prevention of marine pollution. The Protocol explicitly requires that, in the designation of SPAs, Parties must adopt measures to strengthen the application of other protocols under the Barcelona Convention, including the prohibition of the dumping or discharge of waste and other substances that may directly or indirectly compromise the integrity of SPAs. Additional measures include the regulation of ship passage and restrictions on stopping or anchoring within these areas, the regulation or prohibition of fishing, hunting, the taking of animals, and the harvesting or destruction of plants, as well as controls on trade in animals and plants originating from SPAs. This represents an advanced legal approach to addressing waste management and marine pollution. The SPA/BD Protocol significantly enhances regional waste management efforts by establishing a critical connection between marine pollution and marine area-based protection.

Regarding the long-term effectiveness of SPAs, Article 7 mandates that Parties adopt comprehensive measures for the planning, management, supervision, and monitoring of these areas. It also emphasizes the need for the active involvement of local communities and populations and the training of managers and qualified technical personnel.

The SPA/BD Protocol defines the SPAMI List, which may include sites characterized by uniqueness²⁶², natural representativeness²⁶³, diversity²⁶⁴, naturalness²⁶⁵, the presence of critical habitats for endangered, threatened, or endemic species, and cultural representativeness²⁶⁶.

²⁶² 'The area contains unique or rare ecosystems, or rare or endemic species', Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art 8 a.

²⁶³ 'The area has highly representative ecological processes, or community or habitat types or other natural characteristics. Representativeness is the degree to which an area represents a habitat type, ecological process, biological community, physiographic feature or other natural characteristic', *ibid.* art 8 b.

²⁶⁴ 'The area has a high diversity of species, communities, habitats or ecosystems', *ibid.* art 8 c.

²⁶⁵ 'The area has a high degree of naturalness as a result of the lack or low level of human-induced disturbance and degradation', *ibid.* art 8 d.

²⁶⁶ 'The area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations', *ibid.* art 8 f.

Additionally, the common criteria for the selection of marine and coastal areas eligible for inclusion in the SPAMI List are set out in Annex I of the SPA/BD Protocol. These criteria encompass key provisions related to protection, planning, and management measures. The establishment of standardized criteria strengthens the regional approach to conservation by facilitating the coordinated management and monitoring of these areas, while providing uniform guidelines for all contracting Parties. This approach is particularly innovative and effective in addressing marine pollution, given that its impacts often transcend national borders, making regional cooperation crucial. By fostering collaboration among multiple States to protect shared marine areas, the SPA/BD Protocol significantly amplifies collective responsibility for implementing protection measures. To confirm this, the decision to include a site in the SPAMI List is made by consensus among the Parties, who also approve the applicable management measures. Additionally, Article 20 of the SPA/BD Protocol requires Parties to promote scientific and technical research on the sustainable use and management of SPAMIs, with an obligation to share acquired knowledge with other Parties.

It is also important to emphasize the distinct geographical characteristics of SPAMIs. While they may include coastal and marine areas, as in the case with SPAs, SPAMIs possess a unique feature: they can encompass zones that are partially or entirely located in areas beyond national jurisdiction²⁶⁷. If so, proposals for inclusion in the SPAMI List may be submitted ‘by two or more neighbouring Parties concerned’²⁶⁸. This transboundary dimension of SPAMIs, allowing for protection of areas beyond national jurisdiction, aligns with the BBNJ Agreement. Notably, Part III of the Agreement provides for the establishment of area-based management tools (ABMTs), including MPAs, as a key mechanism for conserving and sustainably using marine biodiversity in areas beyond national jurisdiction.

²⁶⁷ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art 9. Together with the Barcelona Convention, other four UNEP Regional Seas Programmes include areas beyond national jurisdiction within their geographical coverages: The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), the Convention on the Conservation of Antarctic Marine Living Resources (CAMLAR Convention), the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea Convention) and the Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima Convention). UNITED NATIONS ENVIRONMENT, *Regional Seas Programmes Covering Areas Beyond National Jurisdictions*, in *Global Environmental Law Annual* (2017).

²⁶⁸ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol art 9(2.b).

A notable example within the Mediterranean context is the Pelagos Sanctuary for Mediterranean Marine Mammals, a SPAMI jointly designated by France, Italy, and Monaco in 1999, and entering into force in 2002. To date, the Pelagos Sanctuary is the only SPAMI to include areas of the high seas. The Sanctuary spans an area of 87,500 square kilometres, encompassing zones within and beyond the national jurisdiction of the contracting Parties, and includes 2,022 kilometres of coastline within one of the most biologically productive pelagic regions of the Mediterranean Sea.

In this context, the SPA/BD Protocol has been regarded as a pioneering instrument for the potential establishment of a network of internationally relevant MPAs in areas beyond national jurisdiction²⁶⁹. In this perspective, a global agreement on a high seas MPA network could also serve as an effective means to harmonize the diverse protection and conservation criteria currently applied under various well-established regional conventions worldwide.

In addition, the mandate by the SPA/BD Protocol for the creation of SPAMIs includes sites that harbour significant biocomponents in need of protection, endangered habitats or species, or areas of special scientific, aesthetic, cultural, or educational interest²⁷⁰. This interdisciplinary feature aligns closely with the concept of OECMs, which aim to achieve long-term conservation through religious, social, cultural, or spiritual purposes²⁷¹. However, Annex I of the SPA/BD Protocol clarifies that the primary aim of a SPAMI must be the conservation of natural heritage, although other objectives, such as cultural heritage conservation and the promotion of scientific research and education, are highly encouraged as long as they are compatible with conservation goals. Therefore, SPAMIs cannot be classified as OECMs, as their principal aim must remain the marine and coastal protection and preservation. Nonetheless, the integration of cultural and social dimensions makes SPAMIs an advanced form of protected area,

²⁶⁹ I TANI, 'Le aree naturali protette marine e costiere e il diritto internazionale' (PhD Thesis, University of Milano-Bicocca 2010) 251; T SCOVAZZI, 'Marine Protected Areas on the High Seas: Some Legal and Policy Considerations' (2004) 17.

²⁷⁰ The Barcelona Convention system has developed MAPAMED, a database of marine protected areas in the Mediterranean: MAPAMED Viewer, <https://www.mapamed.org/index.php?language=en> accessed 24 July 2025.

²⁷¹ CBD COP, *Decision 14/8: Protected areas and other effective area-based conservation measures* (20 November 2018) CBD/COP/DEC/14/8.

extending beyond purely ecological assessments. In this context, Article 18 of the SPA/BD Protocol emphasizes the social dimension by allowing the integration of traditional activities of the local population, if they do not harm the ecosystem that the SPAMI aims to protect. Where necessary, they must also provide for the issuance of exemption measures from regulatory restrictions to ensure the continuation of such activities, informing all other Parties of the measures adopted²⁷².

Annex I of the SPA/BD Protocol also promotes public engagement to raise awareness among local communities, encouraging their involvement in planning and managing the protected area. Through interdisciplinary and transdisciplinary approaches, the establishment of SPAMIs offers significant opportunities for the effective protection and preservation of marine ecosystems. Simultaneously, such approaches contribute to the support the socio-economic wellbeing of local communities that are directly dependent upon the ecosystem services furnished by these protected marine environments.

For SPAMIs to fully achieve their legal *status* as protected areas with meaningful conservation outcomes, it is essential to establish a long-term protection²⁷³. Such as it should include the designation of official management and control bodies, management plans, as well as the allocation of adequate human and financial resources²⁷⁴. To support the implementation of the SPA/BD Protocol, several Regional Action Plans have been adopted, aimed at the protection, preservation, and management of key species and habitats²⁷⁵. The Specially Protected Areas Regional Activity Centre (SPA/RAC), based in Tunisia, plays a central role in this process by providing technical assistance and coordination

²⁷² Criticism may be raised regarding the provision whereby decisions on the granting of such exemptions are made exclusively at the national level, without prior consultation with the other Parties to the Protocol. This situation may lead to national authorities granting exemptions based on highly variable criteria, sometimes influenced more by political considerations than by genuine cultural or subsistence needs of local communities. I TANI (n. 269).

²⁷³ Barcelona Convention 1102 UNTS 27, SPA/BD Protocol Annex I, C, para. 1.

²⁷⁴ *Ibid.* Annex I, D, para. 1 and 4.

²⁷⁵ These include plans for cartilaginous fishes (*Chondrichthyans*), cetaceans, marine turtles, marine birds, marine vegetation, the Mediterranean monk seal, and coralligenous and other calcareous bio-concretions. In addition, the Protocol's implementation is reinforced by Action Plans addressing cross-cutting issues such as the introduction of non-indigenous species, the management of invasive species, and the conservation of dark habitats.

support to help Parties meet their obligations under the SPA/BD Protocol and ensure the effective implementation of its measures.

The structural and legal characteristics of SPAMIs make them an effective model for addressing environmental challenges such as marine pollution and biodiversity loss in other regions protecting threatened species and habitat. For instance, in the Maldives, where fragmented institutional responsibilities and the absence of integrated waste management systems hinder effective marine conservation, the Barcelona Convention and the Land-based Pollution and SPA/BD Protocols could serve as a valuable framework. However, adopting a similar model in the Maldives would require regional collaboration with neighbouring countries such as India and Sri Lanka. This poses significant challenges, particularly in securing the financial, institutional and technical capacity needed for long-term implementation. Establishing a legal and institutional framework akin to the Barcelona Convention involves high costs related to governance, monitoring, planning, and enforcement, costs that may be unsustainable for developing countries. In general, SIDS and other least developed countries face broader structural challenges in implementing international environmental agreements. For instance, limited financial resources often restrict their ability to participate in international negotiations and to engage meaningfully in the treaty-making process. In the case of highly technical agreements, such as those addressing marine pollution, the lack of in-country expertise further hinders compliance and enforcement. This results in a gap not only in adoption and implementation, but also in essential functions like monitoring, reporting, and accountability²⁷⁶.

The governance structure of the Barcelona Convention could offer valuable insights into overcoming some of these challenges. The designation of the UNEP as the Secretariat plays a key role in ensuring effective coordination, technical support, and consistency across Parties. UNEP convenes meetings, facilitates communication among Parties, and coordinates with other international bodies²⁷⁷.

²⁷⁶ A critical analysis on the difficulties of developing countries in the implementation, compliance and enforcement of international environmental agreements, is provided by K Saiful who considers one of the most technically demanding conventions in the law of the sea, the MARPOL Convention. K SAIFUL, 'Implementation of the MARPOL Convention in Developing Countries' (2010) 79(2) *Nordic Journal of International Law* 303.

²⁷⁷ Barcelona Convention 1102 UNTS 27 art 13.

Importantly, financial rules are established in consultation with the Secretariat, ensuring a structured and cooperative approach to funding²⁷⁸. This model could inform similar efforts in other regions, provided adequate financial and technical support mechanisms are in place to assist developing States.

Notably, the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena, 24 March 1983) (Cartagena Convention) draws significantly upon the structural and normative principles established by the Barcelona Convention. Both instruments employ a convention-protocol approach, whereby the overarching legal agreement is supplemented by specific protocols addressing distinct sources and types of marine pollution.

The Cartagena Convention is of particular relevance in demonstrating the viability and effectiveness of a legally binding regional framework in a socioeconomically and environmentally diverse context. Its Contracting Parties include a significant number of SIDS such as: Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago. Despite facing acute development challenges, the active engagement of these States in the implementation of the Convention underscores the adaptability of the Barcelona model to regions with varying capacities and needs.

However, in addition to SIDS and least developed countries, the Cartagena Convention also includes major maritime powers such as France, the Netherlands, the United Kingdom, and the United States, reflecting a broad geopolitical commitment to marine environmental governance in the Caribbean Sea.

The Cartagena Convention covers a substantial marine area, encompassing both the Caribbean Sea and the Gulf of Mexico, with a combined surface area of approximately 5.3 million square kilometres and a total of 28 Contracting Parties.

In contrast, a hypothetical legally-binding convention under UNEP Regional Seas Programme in the North-west Indian Ocean, encompassing only India, Sri Lanka, and the Maldives, would involve just three developing States, yet

²⁷⁸ Barcelona Convention 1102 UNTS 27 art 18.

cover an extensive marine area of approximately 3 million square kilometres²⁷⁹ nearly 70% of the surface area under the Cartagena Convention, but with far fewer Parties and without the direct engagement of developed States. This discrepancy in scale and composition raises significant questions regarding institutional design, burden-sharing, and implementation capacity.

TABLE 2.7 THE CARTAGENA CONVENTION SYSTEM

Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) adopted in 1983 and entered into force in 1986.
The Protocol Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region adopted in 1983 and entered into force in 1986.
The Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region adopted in 1990 and entered into force in 2000 ²⁸⁰ .
The Protocol Concerning Pollution from Land-Based Sources and Activities adopted in 1999 and entered into force in 2010.

As of the time of writing, thirty-five protected area sites are listed under the SPAW Protocol, forming a network that contributes to the effective conservation of the natural heritage of the wider Caribbean Region. As for the Barcelona Convention, the Cartagena Convention is administered by UNEP, specifically the so-called Regional Coordinating Unit, based in Kingston, Jamaica.

Notably, the UNEP Regional Seas Programmes also include plans not administered by UNEP (see Annex II). The Maldives is part of the South Asian Seas Programme (SASP) together with Bangladesh, India, Pakistan, and Sri Lanka.

²⁷⁹ The estimated area of approximately 3 million square kilometres is derived from the sum of the EEZs of India (around 1,629,607 million km²), the Maldives (916,011 km²), and Sri Lanka (530,945 km²). Data from Sea Around Us Project.

²⁸⁰ The protection measures stipulated in the SPAW Protocol of the Cartagena Convention include provisions aimed at minimizing the causes of marine pollution, similar to those outlined in the Barcelona Convention for the Mediterranean Sea. Additionally, Article 5 of the SPAW Protocol introduces protective measures such as the regulation or prohibition of industrial activities and other activities deemed incompatible with the intended uses for specific areas, as determined by national regulations and/or environmental impact assessments (Article 5(k)), as well as the regulation on tourism and recreational activities that may jeopardize the ecosystems within protected areas (Article 5(l)). Notably, these latter provisions are not included in the SPA/BD Protocol of the Barcelona Convention.

This region is physically divided by the Indian subcontinent into three distinct areas: the Arabian Sea to the west, the Bay of Bengal to the east, and a vast expanse of the Open Indian Ocean to the south of India and Sri Lanka and Maldivian atolls. The overarching objective of the SASP is to protect and manage the marine environment and associated coastal ecosystems of the region in an environmentally sound and sustainable manner. In contrast with the Barcelona and Cartagena Conventions, the SASP is underpinned by an action plan, and not a convention-protocol system, adopted on 24 March 1995 in New Delhi, India, by the five coastal States. The action plan addresses integrated coastal zone management and the protection of the marine environment from land-based activities among others. Funding for the programme is provided through annual contributions from member countries, supplemented by donor support for specific projects.

As a non-UNEP administrated programme, the South Asia Co-operative Environment Programme (SACEP) serves as the Secretariat for the SASP. Formally established as an intergovernmental organization, SACEP aims to promote and facilitate the protection, management, and enhancement of the environment in the South Asian region.

Over the years, several projects and programmes have been implemented under the SASP, particularly focusing on minimizing pollution impacts. A few notable initiatives include the Regional Oil and Chemical Pollution Contingency Plan for South Asia, which is a collaborative project funded jointly with the IMO to develop a regional oil spill contingency plan. The Ballast Water Management and GloFouling Project, led by IMO as well, enhances biosecurity management in the region, as the South Asian Seas lie within one of the busiest shipping lanes globally, constituting a crucial oil transport route from the Gulf to East Asia; thus, ballast water poses significant economic and ecological risks.

The most recent initiative is the Plastic Free Rivers and Seas for South Asia (PLEASE) Project, which aims to enhance innovation and coordination of circular economy solutions to address plastic pollution entering South Asian Seas. The project is financed through a regional grant from the International Development Association of the World Bank, along with parallel financing and investments from Parley for the Oceans Foundation, totalling United States' dollars 50 million.

In 2019, the SACEP published the Regional Marine Litter Action Plan for South Asian Seas Region under the framework of the UNEP Regional Seas programme²⁸¹. The report offers a comprehensive overview of the marine litter situation in SASP countries.

TABLE 2.8 KEY FINDINGS OF THE REGIONAL MARINE LITTER ACTION PLAN FOR SOUTH ASIAN SEAS REGION (2019)

Key finding	Description and further discussion
<i>Lack of quantitative data</i>	None of the SASP Member States currently maintain reliable, quantitative datasets on marine litter, impeding the development of science-based policies and management frameworks.
<i>Data Deficiencies on Waste Generation and Reduction</i>	The lack of comprehensive data on total waste generation and reduction across SASP countries makes it difficult to assess how much waste ultimately reaches marine and coastal environments.
<i>Information deficiency on the impact of marine pollution on the ecological, social and economic systems.</i>	In general, it is recognized that marine pollution is an emerging issue, but there are no specific data on the magnitude of marine pollution related issues.
<i>None or weak implementation of international conventions, laws and agreements.</i>	National regulatory efforts have largely remained confined to beach zones, with limited applicability in marine areas. Among the Member States, the Maldives has demonstrated relatively greater proactivity through the adoption of the Waste Management Regulation (WMR 2013/R-58). Nevertheless, the implementation of this regulatory framework remains limited.
<i>Lack of separate Act, agency and regulations specifically made for marine litter management</i>	Within the framework of SAS, Member States are encouraged to establish dedicated institutional mechanisms responsible for the development of guidelines, regulatory instruments, and enforcement plans aimed at controlling marine litter. Only Sri Lanka has established a dedicated legal act, and a specialized agency focused on the prevention and management of marine litter.
<i>Absence of monitoring programmes</i>	Systematic marine litter monitoring programmes are virtually non-existent across the region, severely limiting the ability of governments to track progress, identify sources, or evaluate policy effectiveness. “This will give very clear evidence that most of the policies developed by these countries to mitigate marine litter are basically arbitrary.” ²⁸²

²⁸¹ SACEP (n. 231).

²⁸² *Ibid.* 18.

Source: SACEP (n. 231)

The Regional Marine Litter Action Plan for South Asian Seas Region (2019) identifies critical regulatory and institutional deficiencies within South Asian countries that hinder the prevention and mitigation of marine pollution.

Chief among these is the absence of a comprehensive scientific knowledge base. There exists a substantial lack of data collection on the quantity of waste generated, the proportion of waste entering the marine environment, the geographical distribution of litter, and the ecological, social and economic impacts of such pollution²⁸³.

The absence of scientific evidence is particularly concerning in light of the vulnerability of key marine ecosystems in the region, such as coral reefs and mangrove forests. These ecosystems are not only biodiversity hotspots but also serve essential climate-regulatory functions as carbon sinks. Their degradation due to marine pollution exacerbates climate change impacts, to which the South Asian region is already acutely exposed. Beyond environmental concerns, the socio-economic implications of marine pollution are profound. The tourism sector, for example, is critically dependent on healthy marine environments and constitutes a significant share of the GDP in island States, such as the Maldives. Marine pollution undermines such economic sectors, jeopardizing both national income and local livelihoods.

In the legal and policy contexts, the lack of scientific evidence has far-reaching consequences. Making-decision processes that are not grounded in empirical data risk being ineffective. This renders the integration of science into policy, commonly referred to as the science-policy interface, a prerequisite for the development of legally robust and effective regulatory frameworks²⁸⁴. Without empirical grounding, the formulation of law and policies is compromised as well as the capacity of implementation, compliance monitoring, and evaluation of regulatory effectiveness.

²⁸³ *Ibid.*

²⁸⁴ S ANDRESEN, 'The role of scientific expertise in multilateral environmental agreements: influence and effectiveness' in E Hey and others (eds), *The Role of 'Experts' in International and European Decision-Making Processes: Advisors, Decision Makers or Irrelevant Actors?* (Cambridge University Press 2014) 105.

The action plan urged South Asian States to strengthen their ocean governance frameworks by developing comprehensive regional and national policies, and strategies²⁸⁵. So far, the SACEP recommends the identification and rectification of structural gaps in the engagement with MEAs at regional level. This includes revising existing mechanisms to ensure better alignment with evolving international legal standards²⁸⁶.

A comparative analysis of other regional legal instruments may offer valuable insights. Notably, the Barcelona and Cartagena Conventions have adopted a convention–protocol approach. This model establishes general legal obligations through the parent convention and addresses specific sources or types of marine pollution through subsidiary protocols. It also facilitates the incorporation of international norms, such as the Basel, Rotterdam and Stockholm Conventions, into regionally adapted legal frameworks.

Both the conventions have further adopted protocols on ABMTs, namely SPAMIs and SPAWs under the Barcelona Convention and Cartagena Convention respectively. These legal tools enable States to designate and manage ecologically sensitive areas through enforceable restrictions on human activities and targeted monitoring programmes. Their relevance for the South Asian Seas region is particularly strong, given the vast maritime areas under the jurisdiction of these States and the difficulty of uniformly regulating such expansive zones. By establishing regionally recognised marine areas of ecological or biological significance, South Asian countries could focus regulatory and enforcement efforts on critical ecosystems, such as VMEs, and species that are especially threatened by marine pollution. These spatially explicit designations would allow for the deployment of monitoring systems and pollution controls in priority areas, making regulatory interventions more feasible and cost-effective. They would also enhance regional cooperation by aligning countries around the protection of shared resources and transboundary ecosystems²⁸⁷.

²⁸⁵ SACEP (n. 231).

²⁸⁶ *Ibid.*

²⁸⁷ A similar conclusion has been drawn by K. Konasinghe and D. Seethawaka in relation to the protection of wildlife and habitats in South Asia from illegal poaching, habitat destruction, and wildlife trafficking. In their analysis, the absence of a robust regional legal framework similarly raised concerns about the efficacy of wildlife conservation efforts. As part of their research, regional

Similarly, regional legal instruments in the EU, particularly those addressing industrial chemical pollutants, illustrate how legally binding regional cooperation can effectively reduce the sources of marine pollution. These instruments underscore the necessity of harmonising environmental standards and enabling cross-border enforcement.

In conclusion, the inherently transboundary nature of marine pollution necessitates a coordinated and legally structured regional response. Such a response must be grounded in scientific evidence and supported by institutional mechanisms that enable data sharing, joint monitoring, and harmonised policy development. Establishing shared scientific databases accessible to all regional States is fundamental to achieving this objective. Only through the integration of scientific research into legal and policy frameworks can South Asian countries develop the regulatory capacity needed to address the environmental, social, and economic threats posed by marine pollution.

2.3 Annex I: National regulations and strategies for waste and hazardous chemical management

TABLE 2.9 NATIONAL REGULATIONS FOR WASTE MANAGEMENT

<i>Environmental Protection and Preservation Act (Law No. 4/93)</i>	enacted on 19 March 1993 is the first national legal regulation on the protection and preservation of the natural environment and its resources for the sustainable development of the country.
<i>Decentralization Act (07/2010), and its last amendment (24/2019)</i>	mandates island and city council to provide adequate waste management services.
<i>Waste Management Regulation (2013/R-58)</i>	provides the main regulatory framework for waste management. Article 32 requires data collection on the amount of waste generated at island and national level. Article 33 stipulates that an annual report on waste management based on the database described in Article 32 must be submitted to the Ministry of Environment and Energy. The implementing agency for the Waste

agreements within the European Union were examined as a potential model for developing comparable frameworks in South Asia, offering insights into how regional cooperation could be strengthened for the effective protection of biodiversity. K KONASINGHE and D SEETHAWAKA, 'A Legal Proposition for a Regional Agreement to Protect Wildlife and Habitats in South Asia' (2021) 2(2) University of Colombo Review (New Series III) 32.

	Management Regulation is the Environmental Protection Agency.
<i>National Waste Management Policy 2015</i>	aims to implement guidelines and means for solid waste management, including waste reduction, formulation and implementation of a waste management plan for all islands. It defines the Regional Waste Management Policy, encompassing the introduction of regional waste collection services, within seven zones, education and awareness and training as well as the establishment of a trust fund for waste management. The Ministry of the Environment and Energy is the deputy authority for the implementation of the National Waste Management Policy.
<i>Strategic Action Plan 2019-2023</i>	There are four key policies with targets related to waste as follows: <ul style="list-style-type: none"> - Policy 1: Promote waste as a valuable resource for income generation. - Policy 2: Improve chemical and hazardous waste management practices to ensure protection of people and the environment. - Policy 3: Reduce plastics pollution by phasing out single use plastics. - Policy 4: Instil environmental values in the society and promote environmentally friendly lifestyle.
<i>National Policy on Healthcare Waste Management 2016</i>	stipulates that all health facilities must be responsible for the safe management of health care waste in an environmentally sound manner that minimises risk to the community and the staff involved in its management.
<i>Regulation on the Protection and Conservation of the Environment in the Tourism Industry 2000</i>	under the umbrella Maldives Tourism Act (2/99), was formulated to protect the environment related to the tourism industry. Section 5 of the Regulation details provisions for the management of solid waste in the tourism sector. In addition, the Ministry of Tourism conducts inspections of the resorts regularly. Conditions of the waste management area and waste management practices are assessed during the inspection.
<i>Utility Regulatory Authority Act (26/2020)</i>	under which the Utility Regulatory Authority has been established as the official authority to regulate and oversee the proper management of public utility services in the country.
<i>Waste Management Standards: General Standards and Operational Requirements for Waste Management Facilities (URA 3002:2022)</i>	Endorsed by the Utility Regulatory Authority, it emphasises the importance of the environmental and public health protections.
<i>Waste Management Act (Law No. 24/2022)</i>	specifies the standards and procedures for sustainable waste management. The Waste Management Act governs the implementation and enforcement of practices and regulations designed to mitigate the harmful effects of waste and safeguard public health. The objectives include reducing waste-related environmental pollution and health risks,

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minimising waste generation, and promoting waste recycling and reuse. Additionally, it aims to provide a mechanism to reduce single-use plastic by imposing a fee of Maldivian Rufiyaa 2 for plastic bags, with exceptions for plastic bags sold or supplied by duty-free shops, unsealed bags used for fresh meat, and “bin liner” sold exclusively for waste disposal by waste management service providers or by other relevant agencies. Violations, such as illegally importing waste or exporting hazardous waste, can incur fines of up to Maldivian Rufiyaa 5 million (approximately 30,000 Euro). The Waste Management Act also allows waste importation from third countries.

has introduced a more sustainable and integrated approach to waste management. This approach prioritizes waste reduction and reuse, followed by recycling, energy recovery, and, as the least preferred option, landfill disposal. The policy also incorporates the Polluter Pays Principle, which stipulates that the costs of waste management must be borne by the waste producer or the legal entity managing waste on behalf of others. Furthermore, it includes extended producer responsibility, whereby the producer or importer of a product is responsible for managing their product once it is no longer usable and has been discarded. The Polluter Pays Principle and producer responsibility in waste management significantly impact islands used exclusively as tourist resorts, which generate substantial amounts of waste. While the local community in Malé produces over 120 tons of solid waste daily, tourists contribute an average of 3.5 kilograms of waste per person each day. The most recent official data, published in 2015, indicate that 1.2 million tourists visited the Maldives, staying for an average of 8 days and generating an estimated 33,600 tons of solid waste. More recent figures are not publicly available.

Table edited from L MOOSA (n. 106)

2.4 Annex II: Regional Seas Conventions and Action Plans

In order to address marine pollution and degradation of oceans and coastal areas among countries sharing common bodies of waters, the UNEP Regional Seas Programme has demonstrated a great value of a regional approach to environmental action. Founded in 1974, the Regional Seas Programme is an action-oriented Programme that implements region-specific activities, bringing together stakeholders including governments, scientific communities, civil society, local

communities and Indigenous Peoples. To date, the Regional Seas Programme consists of three types of Regional Seas Conventions and Action Plans (RSCAPs), across eighteen different regions. While some of these are directly administered by UNEP, others operate with varying degrees of independence.

TABLE 2.10 REGIONAL SEAS CONVENTION AND ACTION PLANS

RSCAPs	Region	Protocols and projects on land-based marine pollution and area-based conservation
RSACPs ADMINSTRATED BY UNEP, WHICH IS DEPUTED TO CARRY OUT THE SECRETARIAT FUNCTIONS		
<i>The Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West and Central Africa Region²⁸⁸</i> <i>(Abidjan, 23 March 1981)</i> <i>(Abidjan Convention)</i>	West, Central, and South Africa regions.	The Grand Bassam Protocol on Pollution from Land-based Sources and Activities.
<i>The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region</i> <i>(Cartagena Convention)</i>	Wider Caribbean Region ²⁸⁹ .	The Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (SPAW Protocol). The Protocol Concerning Pollution from Land-Based Sources and Activities to the

²⁸⁸ The Convention changed title in 2008, new official title is ‘Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region’.

²⁸⁹ The Wider Caribbean Region (WCR) comprises the insular and continental States and Territories, with coasts on the Caribbean Sea and Gulf of Mexico, as well as waters of the Atlantic Ocean adjacent to these States and Territories.

Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region.

Ongoing projects include the Global Environment Facility-funded (GEF) projects ‘An integrated approach to water and wastewater management in the Wider Caribbean Region using innovative solutions and sustainable financing mechanisms’ and ‘Reduce marine plastics and plastic pollution in Latin American and Caribbean cities through a circular economy approach’.

Finally, the project titled ‘Prevention of Marine Litter in the Caribbean Sea project’ (PROMAR).

East Asian Seas.

The COBSEA Strategic Directions 2023-2027 include marine pollution, reduction and control as one of the three thematic programmes.

The COBSEA Regional Action Plan on Marine Litter (RAP MALI) provides a regional framework for tackling marine litter. ‘SEA circular’ is an implementer project for improve the litter value chain.

The COBSEA Marine and Coastal Ecosystems Framework adopted in 2023 for achieving the relevant targets from the SDGs and Kunming-Montreal Global Biodiversity Framework.

The Coordinating Body on the Seas of East Asia²⁹⁰ (COBSEA)

The Mediterranean Action Plan (MAP) and the Convention for the Mediterranean Sea.

The Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources.

²⁹⁰ COBSEA is a regional intergovernmental agreement.

<i>Protection of the Mediterranean Sea Against Pollution (Barcelona, 16 February 1976) (Barcelona Convention)</i>	The Protocol Concerning Mediterranean Specially Protected, replaced by the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol).
<i>The Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean (Nairobi Convention)</i>	<p>Western Indian Ocean Region. The Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region.</p> <p>The GEF WIOSAP project for the protection from land-based sources and activities.</p> <p>The Protocol for the Protection of the Marine and Coastal Environment of the Western Indian Ocean from Land-Based Sources and Activities.</p>
<i>The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP), launched in September 1994</i>	Northwest Pacific Region
<i>The Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran, 4 November 2003) (Tehran Convention).</i>	<p>Caspian Sea. The Protocol on the Protection of the Caspian Sea against Pollution from Land based Sources and Activities.</p> <p>The Protocol for the Conservation of Biological Diversity.</p>
NON-UNEP ADMINISTRATED RSCAPS	

<p><i>The Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific (Antigua, 18 February 2022) (Antigua Convention) not entered into force.</i></p>	<p>Central American coastline of the North-East Pacific.</p>	
<p><i>The Convention on the Protection of the Black Sea Against Pollution (21 April 1992) (Bucharest Convention).</i></p>	<p>Black Sea.</p>	<p>The Protocol on the Protection of the Black Sea Marine Environment Against Pollution from the Land Based Sources.</p> <p>The Black Sea Biodiversity and Landscape Conservation Protocol.</p>
<p><i>Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (14 February 1982) (Jeddah Convention).</i></p>	<p>Red Sea and Gulf of Aden.</p>	
<p><i>Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution (23 April 1978) (Kuwait Convention)</i></p>	<p>Persic Gulf, Gulf of Oman, and southern coasts of Yemen and Oman.</p>	<p>The Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources.</p> <p>The Protocol on the Control of Marine Trans-boundary Movements and Disposal of Hazardous Wastes and Other Wastes.</p>
<p><i>Convention for the Protection of the Marine Environment and Coastal Areas in the South-East Pacific (12 November 1981) (Lima Convention)</i></p>	<p>South-East Pacific Region.</p>	<p>The Action Plan for the Protection of the marine environment and coastal areas of the Southeast Pacific.</p> <p>The Protocol for the Conservation and Administration of the Marine and Coastal Areas of the Southeast Pacific.</p>

		The Protocol for the Protection of the Southeast Pacific against Pollution from Land Sources.
<i>South Asia Co-operative Environment Programme (1982) (SACEP)</i>	South Asian Seas.	The World Bank and Parley for the Oceans funded 'Plastic free Rivers and Seas for South Asia Project'.
<i>Secretariat of the Pacific Regional Environment Programme (Apia, 16 June 1993) (SPREP Convention)²⁹¹</i>	Pacific Region.	Co-funded EU 'PacWastePlus' project assisting Parties by building capacity and enhancing sustainability into waste management practices.
INDEPENDENT		
<i>Convention for the Conservation of Antarctic Marine Living Resources (7 April 1982) (CCAMLR Convention)</i>	Antarctic Region.	The world's largest high seas marine MPA to date is in Antarctica's Ross Sea, safeguarding one of the last unspoiled ocean wilderness areas on the planet.
<i>Convention on the Protection of the Marine Environment of the Baltic Sea Area (22 March 1974)²⁹² (Helsinki Convention)</i>	Baltic Sea.	
<i>Convention for the Protection of the Marine Environment of the North-East Atlantic (22 April 1992) (OSPAR Convention)</i>	North-east Atlantic Region.	OSPAR's network MPAs comprises of 583 MPAs, including 8 MPAs collectively designated in areas beyond national jurisdiction (ABNJ).

²⁹¹ SACEP is registered with the United Nations Secretariat as a multilateral organization. However, it is designated as an intergovernmental organization established by the South Asia countries. The Secretariat covering the five marine States of South Asia namely Bangladesh, India, Maldives, Pakistan and Sri Lanka.

²⁹² Replaced in 1992.

OSPAR Contracting Parties fulfilled the regional action plan on marine litter, and work has started on a new one.

Protection of the Arctic Marine Environment (PAME) established under the 1991 Arctic Environmental Protection Strategy and was continued by the 1996 Ottawa Charter that established the Arctic Council. Arctic Polar Region. Plan for the Regional Action Plan on Marine Litter in the Arctic (ML-RAP)

3 The Maldives in climate mitigation: ecosystem restoration and emerging legal protections

3.1 Introduction

Established in 1988, as a collaboration between the World Meteorological Organization and the UNEP, the IPCC is the primary United Nations body for assessing climate science. It plays a pivotal role in advancing and consolidating scientific knowledge on climate change and related phenomena²⁹³, with comprehensive assessment reports which are widely regarded as the gold standard in climate science, drawing on extensive data and research to offer an authoritative synthesis of the climate's current state. Over the decades, these findings have become increasingly alarming, pointing to the undeniable impact of human activities on the Earth's systems, with the plight of small islands States standing as stark evidence²⁹⁴.

As a successful institute within the broader field of science-policy interface, the IPCC brings together hundreds of leading scientists who volunteer their expertise to provide rigorous, up-to date, and balanced scientific information for decision-makers. The IPCC's structure and working groups are designed to ensure transparency and independence from political influence. Indeed, while the IPCC's assessments are intentionally policy-relevant, they remain explicitly non-prescriptive. These reports present future climate projections under various scenarios, outline the risks associated with climate change, and discuss possible response implications, without advocating specific policy actions and measures²⁹⁵. To enhance accessibility for non-specialist audiences, the IPCC accompanies each assessment report with synthesis reports, including a Summary for Policymakers

²⁹³ The work of the IPCC is grounded in the most reliable and up-to-date scientific evidence, drawing exclusively on scientific publications rather than conducting original research. This aspect, together with multiple rounds of drafting and review, is crucial to the transparency that characterized the IPCC's assessments. IPCC, 'Fact Sheet - What is the IPCC?' (2024).

²⁹⁴ M MYCOO et al., 'Small Islands' in H-O PÖRTNER et al. (eds), *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2022) 2043.

²⁹⁵ IPCC, 'Fact Sheet' (n. 293).

distilling key scientific findings critical for developing a science-based climate policy agenda²⁹⁶.

The latest IPCC reports, particularly the Sixth Assessment Report (IPCC AR6)²⁹⁷, provide unequivocal evidence that human influence has warmed the atmosphere, ocean, and land. GHG concentrations, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), have been rising since the pre-industrial era, and human activities are the dominant cause²⁹⁸. Since 2011²⁹⁹, these concentrations have continued to increase, with CO₂ levels reaching an average of 410 parts per million by 2019³⁰⁰. The oceans, which absorb a significant proportion of CO₂, have also warmed, with devastating impacts on marine ecosystems. This ocean warming, along with acidification, is primarily driven by human-caused CO₂ emissions, which have been shown to be the main factor behind the degradation of natural habitats, e.g., coral reefs, and economic sectors, e.g., fisheries, which are crucial resources for human population, especially for island communities³⁰¹.

The impacts of climate change are disproportionately severe for SIDS. These countries, though responsible for only a small fraction of global GHG

²⁹⁶ Given that one of the primary objectives of this doctoral thesis is to propose an approach for establishing a legal framework for marine conservation in the Maldives, it is intended not only for an academic audience but also for stakeholders outside academia, particularly Maldivian policymakers. To enhance coherence and accessibility, the decision was made to reference the IPCC Summaries for Policymakers rather than the full assessment reports, ensuring that the information is more comprehensible and the resources more practical for all readers. However, where a focused analysis on small island developing States is required, the author will cite the relevant chapter from the full assessment report.

²⁹⁷ During the sixth assessment cycle (October 2015 to July 2023) the IPCC produced the Sixth Assessment Report (AR6) with contributions by its three Working Groups and a Synthesis Report, three Special Reports, and a refinement to its latest Methodology Report. The Working Group I contribution to the Sixth Assessment Report, *Climate Change 2021: The Physical Science Basis* was released on 9 August 2021. The Working Group II contribution, *Climate Change 2022: Impacts, Adaptation and Vulnerability* was released on 28 February 2022. The Working Group III contribution, *Climate Change 2022: Mitigation of Climate Change* was released on 4 April 2022. The Synthesis Report, *Climate Change 2023: Synthesis Report* was released on 20 March 2023 to inform the 2023 Global Stocktake under the UNFCCC.

²⁹⁸ IPCC 'Summary for Policymakers' in Core Writing Team and others (eds), *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC 2023).

²⁹⁹ Based on the previous measurements published in the IPCC Fifth Report Assessment (AR5) in 2011.

³⁰⁰ IPCC, 'Summary for Policymakers' (n. 298).

³⁰¹ *Ibid.* 5.

emissions³⁰², are among the most vulnerable to climate change due to their geography, limited resources, and dependence on climate-sensitive sectors, such as agriculture, fisheries and tourism. For these countries the risks associated with climate change (e.g., rising temperatures, the increased intensity and frequency of extreme weather events, and sea-level rise) are not merely hypothetical but they are immediate and existential³⁰³.

The observed rise in global sea levels, driven by the accelerated melting of polar ice and the thermal expansion of seawater, is one of the most pressing concerns for small islands States. The global mean sea level has increased by about 0.20 meters between 1901 and 2018, with the rate of increase accelerating over recent decades. From 2006 to 2018, sea levels were rising at approximately 3.7 millimetres per year, and human activity is very likely the dominant driver behind this trend since at least 1971³⁰⁴. For low-lying island countries, even modest sea-level rise can have devastating consequences, such as salinization of freshwater resources, loss of arable land, and destruction of critical infrastructure. This is particularly critical for the Maldives, the flattest and lowest-lying country globally, with an average elevation of 1.5 meters and a maximum natural elevation of just 2.4 meters above sea level. Under these conditions, groundwater salinization is already occurring and poses a serious threat to the water security³⁰⁵.

Several SIDS are particularly susceptible to the increased frequency and intensity of extreme weather events, such as hurricanes, typhoons, and tropical cyclones. These storms, fuelled by rising sea surface temperatures, have become more destructive, often overwhelming the already fragile infrastructure of these States. Alongside these storms, marine heatwaves have become more frequent, doubling their frequency since the 1980s, with the IPCC AR6 reporting that human

³⁰² 'SIDS account for less than 1% of global greenhouse emissions, yet they are home to some of the world's most climate-vulnerable populations'. IRENA, *Small island states at a crossroads: The socio-economics of transitioning to renewables* (International Renewable Energy Agency 2024). See UNFCCC, *Climate change, small island developing States* (Climate Change Secretariat (UNFCCC) 2005) 5.

³⁰³ M MYCOO et al. (n. 294).

³⁰⁴ B FOX-KEMPER et al., 'Ocean, cryosphere, and sea level change' in V MASSON-DELMOTTE et al. (eds), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2021).

³⁰⁵ 'An 11-36% reduction is estimated in the volume of fresh groundwater lens of the small atoll islands (area <0.6 km²) of the Maldives due to sea level rise.' M MYCOO et al. (n. 294).

influence has very likely contributed to most of these since at least 2006. This increase in extreme weather events poses significant threats to the lives and livelihoods of island populations, leading to displacement, economic losses, and heightened vulnerability to future disasters³⁰⁶. One stark example of such devastation is the Sumatra tsunami, which struck the Maldives on 26 December 2004, causing widespread destruction across the archipelago. The disaster led to considerable loss of human lives in the Maldives - eighty-two people - and extensive damage to the environment and infrastructure of numerous islands. Although the total damage was estimated at United States dollar 470 million, this figure does not account for the substantial environmental degradation and severe soil erosion experienced on many affected islands. These impacts have ongoing economic consequences, particularly for those islands heavily reliant on agriculture and small-scale, home-based gardening, emphasizing the need for additional financial resources to address environmental recovery³⁰⁷.

The impacts of climate change on food security are profound and far-reaching. As the frequency and intensity of extreme events increase, so do the risks of crop failure, food scarcity, and disruptions to fishing industries which are vital to the economies of many island States. The IPCC has high confidence that climate change has slowed the growth of agricultural productivity over the past 50 years, with negative effects particularly pronounced in low-latitude regions, where many SIDS are located. Ocean warming and acidification have similarly taken a toll on fisheries and aquaculture, leading to declines in shellfish production and threatening the food security of vulnerable communities, including island populations³⁰⁸.

As these vulnerabilities grow, the issue of climate justice becomes increasingly critical. SIDS are among the least responsible for global emissions, yet they are experiencing some of the most severe consequences of climate change. As articulated by the IPCC, the concept of climate justice includes distributive and procedural justice, and recognition. Distributive justice emphasizes the need for a

³⁰⁶ M MYCOO et al. (n. 294).

³⁰⁷ Republic of the Maldives, *Tsunami: Impact and recovery*, Joint Needs Assessment by World Bank-AADB-UN System (2005) 3.

³⁰⁸ IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2022) 9.

fair allocation of the burdens and benefits of climate action, ensuring that vulnerable States, such as SIDS, receive adequate support in adapting to and mitigating the impacts of climate change. Procedural justice ensures that these countries have a voice in international climate negotiations and decision-making processes, while recognition involves respecting and valuing the diverse cultures and perspectives of communities, particularly Indigenous Peoples who have long adapted to changing environmental conditions³⁰⁹.

The IPCC highlights the importance of diverse forms of knowledge in developing effective climate adaptation strategies. Indigenous knowledge, local traditions, and scientific understanding must work in concert to build resilience in small island communities³¹⁰. This is particularly important as SIDS face unique challenges in adapting to climate change. Their geographic isolation, limited natural resources, and dependence on climate-sensitive sectors make adaptation a complex and urgent priority. At the same time, remote communities have already developed and continue to rely on nature-based solutions that are essential for their livelihoods and resilience. Building adaptive capacity, protecting ecosystems, and safeguarding critical infrastructure are essential components of these efforts. However, local knowledge and scientific evidence alone are insufficient unless complemented by substantial international cooperation and financial support³¹¹.

Despite the grim outlook, there are pathways to reduce the risks facing small island States. The IPCC emphasizes that limiting global warming to 1.5°C, the target set in the Paris Agreement (Paris, 12 December 2015), would significantly reduce the risks of extreme weather events, sea-level rise, and ecosystem degradation. Achieving this goal requires rapid and sustained reductions in GHG, including reaching net-zero CO₂ emissions by the middle of the twenty-first century. Additionally, reducing methane emissions and other GHGs could slow the

³⁰⁹ *Ibid.* 7.

³¹⁰ *Ibid.* 7.

³¹¹ M LAI et al., 'Climate justice for small island developing states: identifying appropriate international financing mechanisms for loss and damage' (2022) 22 *Climate Policy* 1213.

rate of warming and improve air quality, offering a measure of relief to the most vulnerable regions³¹².

The evidence presented by the IPCC underscores the urgency of addressing climate change, particularly for SIDS. The rising seas, intensifying storms, and increasing food and water insecurity faced by these countries are clear signs that the international community must act quickly and decisively to limit global warming. Without immediate global action to curb emissions and promote climate justice, the future of many islands and archipelagos remains uncertain, with some facing the very real possibility of becoming uninhabitable within the coming decades.

This chapter will examine recent developments in international climate change law, with particular emphasis on their impact on the protection and preservation of the marine environment in island States, as well as the enhancement of its resilience to the effects of ocean warming and acidification. As the oceans face increasing pressures from rising temperatures and acidification due to GHG emissions, international legal frameworks have become essential in addressing these challenges.

A primary focus will be placed on the Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law to ITLOS. This request represents a significant legal development, as it seeks to clarify the obligations of States under international law regarding the protection of marine environments in the context of climate change. The implications of this request, particularly for small island States, which are disproportionately affected by climate-related ocean changes, will be thoroughly explored.

Additionally, this chapter will evaluate the Maldives' compliance with its international climate commitments, acknowledging that the challenges faced by the archipelagic State are not primarily due to domestic inaction, but rather the global failure of developed countries to reduce their GHG emissions. However, the

³¹² H-O PÖRTNER et al., 'Technical Summary' in H-O PÖRTNER et al. (eds), *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2022) 100.

Maldives is at the frontline of climate change impacts, and its legal framework for climate action will be critically analysed.

Particular attention will be devoted to ecosystem restoration as a nature-based solution, specifically the international community's establishment of timeframes for achieving environmental restoration goals. Special focus will also be placed on the Maldives' mitigation and adaptation strategies, particularly on coral reef restoration. Artificial reefs play a crucial role in enhancing marine resilience, and the chapter will explore how such initiatives can be legally managed and protected to ensure the long-term sustainability of marine environments in the context of climate change.

3.2 The role of small island States in shaping climate change law

In 1987, an unusually high tide caused significant flooding in Malé, resulting in millions of dollars in damages and raising urgent concerns about the vulnerability of the Maldives to climate impacts. In response to this alarming event, the Maldives convened leaders from other island States in 1989 for the first Small States Conference on Sea Level Rise (Malé, 14-18 November 1989). The summit addressed the growing global concerns about record flooding in small island States and the role of climate change in exacerbating these events. This high-level meeting issued one of the earliest global calls to climate action, encapsulated in a six-page document, the Malé Declaration on Global Warming and Sea Level Rise (1989) (Malé Declaration), a foundational document in the history of global efforts to address climate change. The Malé Declaration stated:

In light of the scientific consensus regarding the likelihood of climate change and global warming and deeply concerned over the changing global environment and its possible adverse effects, particularly the threat of sea level rise, the Small Island States gathered here declare their intent to work, collaborate and seek international cooperation to protect the low-lying small coastal and island States of the world from the dangers posed by climate change, global warming and sea level rise.”

It also called for the establishment of a framework convention on climate change within the United Nations system.

Just one year later, this initiative led to the formation of the Alliance of Small Island States (AOSIS), which have been and continue to be a leading voice for climate action on behalf of small island States³¹³.

As a vigorous voice in the fight against climate change, AOSIS campaigned intensely within the international community to convene a high-level summit where the United Nations could foster global cooperation to tackle the fundamentally shared challenge of climate change. This advocacy culminated in the United Nations Conference on Environment and Development (Rio de Janeiro, 3-14 June 1992), where States adopted the United Nations Framework Convention on Climate Change (New York, 9 May 1992) (UNFCCC). Entered into force on 21 March 1994 in accordance with Article 23(1), the UNFCCC represents a non-legally binding agreement shaped by a delicate compromise between the interests of industrialized and developing countries – especially most vulnerable States to climate change³¹⁴.

During the initial negotiations for the UNFCCC, oil-producing States, such as Saudi Arabia and other members of the Organization of the Petroleum Exporting Countries (OPEC)³¹⁵ were quite reluctant to embrace any controls that would limit fossil fuel extraction and consumption, which form the backbone of their economies. On the other side, a coalition of both developed and developing countries championed the protection of the global climate for current and future generations demanding control measures and decisive cutbacks of GHG emissions³¹⁶. Essential differences hung over this coalition, developed States were divided by a river of ideological and economic lines: a faction led by EU-countries

³¹³ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of the Maldives, *What you do for small islands, you do for the world 2015-2018* (2018) 7.

³¹⁴ A JOHNSSON, 'Climate Change in International Environmental Law' (2013) 17(2) Central European Journal of Environmental Law 5.

³¹⁵ OPEC was founded in Baghdad, Iraq, with the signing of an agreement in September 1960 by five countries namely Islamic Republic of Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. These countries were later joined by Qatar (1961), Indonesia (1962), Libya (1962), the United Arab Emirates (1967), Algeria (1969), Nigeria (1971), Ecuador (1973), Gabon (1975), Angola (2007), Equatorial Guinea (2017) and Congo (2018). In accordance with its Statute, the OPEC aims to coordinate and unify the petroleum policies of its member and ensure the stabilization of oil markets. More information: OPEC, https://www.opec.org/opec_web/en/index.htm accessed 24 July 2025.

³¹⁶ UNITED NATIONS GENERAL ASSEMBLY, *Protection of global climate for present and future generations of mankind : draft resolution / Canada, Chile, Czechoslovakia, Iceland, Japan, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Morocco, Nepal, Norway, Papua New Guinea, Romania, Saint Lucia, Samoa, Sweden, Togo, Ukrainian Soviet Socialist Republic, Union of Soviet Socialist Republics, Uruguay, Vanuatu* (4 December 1990) A/C.2/45/L.66. 5.

advocated for stringent regulatory measures, while the other contingent, primarily represented by the United States, favoured a process-oriented approach without specific commitments of phase-out timetables³¹⁷. However, climate change is a convoluted issue, and even among developing countries, which typically present a united front in international negotiations, divisions emerged. Forest-rich countries, such as Brazil, hesitated to commit to reducing deforestation rates, viewing their forest resources as crucial to economic development, conversely, low-lying coastal and small islands States stands as the most unyielding voice, pressing for more rigorous measures to stabilize or reduce emissions³¹⁸.

As a result of the negotiations, the UNFCCC concluded with the allocation of obligations across States, based on the common but differentiated responsibilities principle and the precautionary approach. The UNFCCC recognizes the specific needs of developing countries, including small island States, emphasizing the need for financial, technical, and capacity-building support to enable these vulnerable countries to address the severe impacts of climate change. The commitments outlined in Article 4 of the UNFCCC require Parties to develop national inventories of GHG emissions and undertake measures to mitigate climate change. However, these obligations are not uniformly applied. Developed countries, which are historically responsible for the majority of GHG emissions, bear a greater responsibility for reducing emissions and supporting vulnerable States in their adaptation efforts.

³¹⁷ A JOHNSON (n. 314) 5.

³¹⁸ UNITED NATIONS GENERAL ASSEMBLY, *Adverse effects of a sea-level rise on islands and low-lying coastal areas: draft resolution / Australia, Austria, Bahamas, Bangladesh, Barbados, Bulgaria, Canada, Czechoslovakia, Denmark, Fiji, Finland, Haiti, Jamaica, Malaysia, Malta, Mauritius, Myanmar, Netherlands, New Zealand, Norway, Papua New Guinea, Saint Vincent and the Grenadines, Samoa, Singapore, Solomon Islands, Sweden, and Vanuatu* (14 November 1989) A/C.2/44/L.38.

About the Maldives: REPUBLIC OF MALDIVES, *Letter dated 20 November 1989 from the Permanent Representative of Maldives to the United Nations addressed to the Secretary-General* (22 November 1989) A/C.2/44/7.



FIGURE 3.1 AOSIS MEMBERS

AOSIS Members can be divided into three regional areas: the Caribbean region (Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago), the Pacific region (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu), and the African Indian Ocean and South China Sea (AIS) (Cabo Verde, Comoros, Guinea Bissau, Maldives, Mauritius, Sao Tome and Principe, Seychelles, Singapore, and Timor Leste).

(Source image: AOSIS website).

Within the negotiating committee to develop the UNFCCC, AOSIS sought to consolidate a unified position among its members, underscore the unique vulnerabilities faced by small island States, and advocate for the inclusion and protection of their interests within the relevant international framework.³¹⁹ Its efforts successfully led to the incorporation of these considerations across multiple areas of the UNFCCC, both in the preambular section and the operational paragraphs. Particularly, Article 3 of the UNFCCC outlines the general principles, emphasizing the implementation of its provisions with due consideration for ‘the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate’.

³¹⁹ J W ASHE, R V LEROP and A CHERIAN, 'The role of the Alliance of Small Island States (AOSIS) in the negotiation of the United Nations Framework Convention on Climate Change (UNFCCC)' (1990) 23 *Natural Resources Forum* 209, 210.

In its mandate, AOSIS aimed to establish funding mechanisms to support developing countries in fulfilling the obligations outlined in the UNFCCC. It advocated for a unified fund, emphasizing that priority should be given to low-lying, coastal, and vulnerable island States when disbursing resources. This fund was intended to compensate developing countries for sacrificing development opportunities in order to undertake critical actions against climate change, such as preserving vital carbon sinks and adopting appropriate technologies. In support of the AOSIS' proposal, the UNFCCC established financial mechanisms detailed in Article 11, addressing the agreed full costs associated with the implementation of the UNFCCC by developing Parties as outlined in Article 4(3). In this case, the UNFCCC significantly exceeded AOSIS' expectations by providing for the costs of adaptation and mitigation in Article 4(4)³²⁰.

AOSIS also called for the inclusion of obligations for Parties to facilitate the transfer of environmentally sound technologies to enable a prompt and effective response to climate change. As a result, Article 4(3,5) requires developed Parties to either provide financial resources for technology transfer or to 'take all practicable steps to promote, facilitate, and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to [...] developing country Parties'. Article 4(8) designates small island States for special consideration, while Article 11 specifies the necessary financial mechanisms to support technology transfer from developed to developing Parties.

AOSIS' advocacy yielded notable successes, as the provisions of these Articles extend well beyond existing international instruments, particularly regarding the linkage between technology transfer and financial mechanisms³²¹.

Notably, the AOSIS also specifically requested the application of the polluter-pays principle to address the causes and consequences of climate change. Although AOSIS did not achieve a direct reference to this principle in the UNFCCC, Articles 3(1) and 4(4) implicitly reflect this principle by assigning greater responsibilities to developed countries, acknowledging their role as the primary polluters³²².

³²⁰ *Ibid.* 214.

³²¹ *Ibid.* 214.

³²² *Ibid.* 215.

Article 3(1). The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Article 4(4). The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

With considerable ambition, AOSIS also proposed the establishment of a compensation fund for victims of sea-level rise, to be financed through mandatory contributions from industrialised countries based on their GDP and GHG emissions. This proposal did not gain traction at the time, however, the AOSIS remained a steadfast advocate, consistently warning that unchecked fossil fuel emissions would push ecosystems, food security, and economic stability in vulnerable regions toward a critical tipping point³²³. It is undeniable that the persistence of the AOSIS played a pivotal role in shaping the subsequent development of climate law.

In 1994, the Global Conference on the Sustainable Development of Small Island Developing States³²⁴ adopted the Barbados Programme of Action for the Sustainable Development (BPoA). Recognizing the acute vulnerabilities of SIDS, particularly their limited capacity to respond to and recover from environmental disasters, the BPoA emphasized that these countries and their communities required targeted support under the UNFCCC, including adaptation strategies and mitigation measures³²⁵. Inheriting the wisdom of the sustainable development principles of Agenda 21, the BPoA meticulously crafted them into tangible policies and measures for SIDS to embrace, bolstered by the international community³²⁶.

³²³ MINISTRY OF ENVIRONMENT AND ENERGY (n. 313) 25.

³²⁴ UNITED NATIONS GENERAL ASSEMBLY, *Resolution 47/189, Convening of a global conference on the sustainable development of small island developing States* (22 December 1992).

³²⁵ UNITED NATIONS GENERAL ASSEMBLY, *Report of the Global Conference on the Sustainable Development of Small Island Developing States, Bridgetown, Barbados, 25 April-6 May 1994* A/CONF.167/9 (1994) Part One.

³²⁶ *Ibid.* Annex I. The BPoA presented fourteen priority areas: (I) Climate change and sea level rise; (II) Natural and environmental disasters; (III) Management of wastes (IV) Coastal and marine

Beyond the initial light of the UNFCCC, the next chapter in climate legislation unfolded with the Kyoto Protocol (Kyoto, 11 December 1997), which set specific targets and timetables for the reduction of GHG by industrialized countries. Yet, the convoluted core of climate change, coupled with a challenging ratification odyssey, kept its full potential tethered until 16 February 2005. The Kyoto Protocol comprises 192 Parties placing binding obligations solely on developed countries, in accordance with the principle of common but differentiated responsibility and respective capabilities.

Throughout the negotiations of the Kyoto Protocol, AOSIS persistently advocated for the highest possible emissions reductions targets. A particularly noteworthy initiative in this context was the AOSIS Protocol presented to the interim Secretariat of the UNFCCC during the tenth session of the INC³²⁷. This proposal called for Annex I Parties³²⁸ to reduce CO₂ emissions by at least 20 per cent below 1990 levels by 2005 and to establish timetables for controlling emissions of other GHGs³²⁹. However, within the INC, the AOSIS Protocol did not garner sufficient support – nor interest – from other negotiating participants, with the United States particularly resistant to accepting any new commitments. OPEC also opposed AOSIS’ stance³³⁰.

resources; (V) Freshwater resources; (VI) Land resources; (VII) Energy resources; (VIII) Tourism resources; (IX) Biodiversity resources; (X) National institutions and administrative capacity; (XI) Regional institutions and technical cooperation; (XII) Transport and communication; (XIII) Science and technology; and (XIV) Human resources development.

³²⁷ H GNAS, 'The Kyoto Protocol as a Determinant of International Cooperation' (2014) 43 *Polish Political Science Yearbook* 251.

³²⁸ 'Annex I Parties include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States'. UNFCCC, 'Parties & Observers' <https://unfccc.int/parties-observers> accessed 24 July 2025.

³²⁹ 'The CO₂ target and timetable that would be established by the Protocols referred to loosely as the 'Toronto Target' after the influential recommendations of the World Conference on the Changing Atmosphere held in Toronto, June 1988. The Toronto Statement declared that stabilising atmospheric concentrations of CO₂ is imperative real and estimated that this would require reductions of more than 50% from 1988 emission levels. The Toronto Statement recommended a 20% reduction from 1988 levels by 2005 as an initial global goal'. See Briefing paper on the AOSIS Protocol, retrieved from <https://aosis.chair.sharepoint.com/sites/aosiscontentpublishing/Published Documents/Forms/AllItems.aspx?id=%2Fsites%2Faosiscontentpublishing%2FPublished%20Documents%2F1995%2E2%2E6%20%2D%20Submission%20%2D%20Briefing%20Paper%20on%20the%5FWebsite%20User%2Epdf&parent=%2Fsites%2Faosiscontentpublishing%2FPublished%20Documents&p=true&ga=1> accessed 29 October 2024.

³³⁰ H GNAS (n. 327) 255.

Consequently, the final Kyoto Protocol set a collective emissions reduction commitment for thirty-seven industrialized countries and economies in transition, along with the EU, to reduce emissions by an average of 5 per cent below 1990 levels during the first commitment period from 2008 to 2012. The Kyoto Protocol specifically targeted six key GHGs: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

To ensure flexibility in meeting these targets, the Kyoto Protocol introduced market-based mechanisms, including International Emissions Trading, the Clean Development Mechanism, and Joint Implementation. These mechanisms enabled countries to meet their emission targets through trading, investment in green technologies, and emission reduction projects, particularly in the developing world³³¹. The design of these mechanisms promotes GHGs abatement where it is most cost-effective, thereby stimulating green investments in developing countries and involving the private sector in efforts to stabilize emissions at safe levels. Additionally, the protocol facilitates ‘leapfrogging’ allowing States to bypass outdated, polluting technologies in favour of newer, cleaner infrastructure, yielding long-term environmental benefits – and surely economic gains.

The Kyoto Protocol established a monitoring and compliance framework to ensure transparency and accountability. Parties were required to submit emission inventories, while the United Nations Climate Change Secretariat monitored transactions under the emissions trading system. This rigorous compliance mechanism helped ensure that countries adhered to their commitments and provided assistance when necessary to help them meet their targets³³².

The year 2005 dawned with dual significance: the Kyoto Protocol’s long-awaited entry into force, mirrored by the emergence of the Mauritius Strategy for the Further Implementation of the BPOA (Mauritius Strategy) pursuant to the mandate of the United Nations General Assembly³³³. This strategy acknowledged the persistent challenges faced by SIDS expanding upon the original fourteen

³³¹ A JOHANSSON (n. 314) 6.

³³² *Ibid.*

³³³ UNITED NATIONS GENERAL ASSEMBLY, *Resolution 57/262, Further implementation of the Programme of Action for the Sustainable Development of Small Island Developing States* (28 February 2003), A/RES/57/262.

thematic areas of the BPoA by introducing five additional priority areas³³⁴. In 2010, the United Nations General Assembly conducted a five-year review of the Mauritius Strategy identifying the need for a preventive approach to natural disasters, including through the further implementation of the internationally agreed framework for disaster risk reduction, the Hyogo Framework for Action 2005-2015^{335,336}.

In 2012, the United Nations Conference on Sustainable Development concluded with the adoption of the resolution *The Future We Want*³³⁷. This document emphasized the unique vulnerabilities of SIDS, citing their limited resources, geographic isolation, and vulnerability to environmental and economic challenges, including the impacts of climate change and natural disasters. Recognizing the slow pace of economic advancement in SIDS, it expressed concerns about poverty reduction efforts and the sustainability of debt levels. The document further reaffirmed the commitment to assist SIDS in implementing the BPoA and the Mauritius Strategy, calling on the United Nations System to strengthen its support.

In December of the same year, a further step in the climate regime occurred with the adoption of the Doha Amendment to the Kyoto Protocol at the eighteenth session of the COP to the UNFCCC. This amendment extended the Kyoto Protocol into a second commitment period, from 2013 to 2020. The amendment introduced

³³⁴ UNITED NATIONS GENERAL ASSEMBLY, *Report of the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, Port Louis, Mauritius, 10-14 January 2005*, A/CONF.207/11 (2005). The Mauritius Strategy presented nineteen priority areas: (I) Climate change and sea-level rise; (II) Natural and environmental disasters; (III) Management of wastes; (IV) Coastal and marine resources; (V) Freshwater resource; (VI) Land resources; (VII) Energy resources; (VIII) Tourism resources; (IX) Biodiversity resources; (X) Transport and communication; (XI) Science and technology; (XII) Graduation from least developed country status; (XIII) Trade: globalization and trade liberalization; (XIV) Sustainable capacity development and education for sustainable development; (XV) Sustainable production and consumption; (XVI) National and regional enabling environments; (XVII) Health; (XVIII) Knowledge management and information for decision-making; and (XIX) Culture.

³³⁵ UNITED NATIONS GENERAL ASSEMBLY, *Report of the World Conference on Disaster Reduction, Kobe, Hyogo, Japan, 18-22 January 2005*, A/CONF.206/6 (16 March 2005).

³³⁶ UNITED NATIONS GENERAL ASSEMBLY, *Outcome Document of the High-Level Review Meeting on the Implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States*, A/RES/65/2 (15 October 2010).

³³⁷ UNITED NATIONS GENERAL ASSEMBLY, *Resolution adopted by the General Assembly: The future we want*, A/RES/66/288 (11 September 2012).

new, more ambitious emission reduction targets for Annex I Parties, while also revising the list of GHGs to be monitored and reported by Parties during this second period. Under the amendment, each Annex I Party committed to specific GHG reduction targets aimed at achieving an overall reduction of at least 18 per cent below 1990 levels by 2020³³⁸. Though it set a valuable rhythm, the Doha Amendment navigated a prolonged and winding path to ratification, its full force only granted on 31 December 2020, as its designated period of application reached its very end.

Furthermore, as part of *The Future We Want*, the United Nations Conference on Sustainable Development endorsed the convening of the Third International Conference on Small Island Developing States in 2014, aiming to address the pressing climate issues in a more comprehensive and targeted manner. It took place in Apia in 2014, marking a significant milestone in establishing a renewed framework for sustainable development in SIDS. The conference produced the SIDS Accelerated Modalities of Action Pathway (SAMOA Pathway), which recognized - once again - the severe impacts of climate change, rising sea levels, food insecurity, and disaster risks on the sustainable development of SIDS. Centred on the theme ‘The Sustainable Development of Small Island Developing States through Genuine and Durable Partnerships’, the SAMOA Pathway stressed the critical need for robust support to help SIDS achieve their sustainable development goals, emphasizing partnerships grounded in national ownership, mutual trust, transparency and accountability³³⁹.

The SAMOA Pathway highlighted the essential role of oceans, seas, and coastal areas in advancing sustainable development in islands and archipelagos and laid out key priorities for collaborative action to address urgent environmental challenges. Pivotal among these priorities was the robust implementation of UNEP Regional Seas Programmes, coupled with a clarion call for swift measures to protect coral reefs and other VMEs. Beyond this, the SAMOA Pathway also beckoned for

³³⁸ Doha Amendment to the Kyoto Protocol art 3, para. 1 bis

³³⁹ UNITED NATIONS GENERAL ASSEMBLY, *Resolution adopted by the General Assembly: SIDS Accelerated Modalities of Action (SAMOA) Pathway*, A/RES/69/15 (15 December 2014). <https://digitallibrary.un.org/record/785270?ln=en&v=pdf>

amplified global unity, strengthening the resilience of marine ecosystems against the effects of ocean acidification. A major goal was:

to conserve by 2020 at least 10 per cent of coastal and marine areas in small island developing States, especially areas of particular importance for biodiversity and for ecosystem services, through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures in order to reduce the rate of biodiversity loss in marine environment³⁴⁰.

Remarkably, the SAMOA Pathway, a true visionary, wove in key conservation principles like OECMs nearly a decade before the world's formal commitments under the Kunming-Montreal Global Biodiversity Framework. Yet, despite these forward-looking efforts from SIDS, a silent testament to their foresight, these crucial conservation measures lingered in the shadows, denied the international recognition they so richly merited at the time. Only with the dawn of the Kunming-Montreal Framework, policymakers and the scientific community began to grapple with OECMs, giving them place to the global conservation canvas.

Financial constraints have presented a significant challenge to the implementation of the SAMOA Pathway. Limited access to adequate financing, compounded by restricted availability of international funding mechanisms and high debt burdens, has severely hindered the allocation of resources essential for advancement. Even more, a scarcity of technical expertise and a constrained institutional capacity have slowed progress across critical sectors: climate change adaptation and mitigation, disaster risk reduction, renewable energy, and water and sanitation³⁴¹.

Adding to these challenges, a persistent barrier remains the lack of reliable, current data and statistics - resources that are pivotal for effective policymaking and data-driven decision-making. This void, for example, has demonstrably curtailed the Maldives' power to make informed national decisions and reduced its contributions to global datasets, leaving its unique experiences and challenges

³⁴⁰ *Ibid.*

³⁴¹ Republic of the Maldives, *Statement by Hassan Adam, Minister - Counsellor At the Regional Preparatory Meeting for the Atlantic, Indian Ocean and South China Sea (AIS) SIDS for the 4th International Conference on SIDS 24 July 2023, "Gaps and Challenges: Implementation of the SAMOA Pathway: National and Regional Perspectives"*.

underrepresented³⁴². Enhancing data collection, analysis, and reporting capacity is crucial for tracking sustainable development progress, identifying priority areas for intervention, and supporting effective, evidence-based policy creation.

In 2015, the United Nations Second Committee adopted the Resolution A/C.2/70/L.47, which established the Small Island Developing States Partnership Framework in accordance with paragraph 101 of the SAMOA Pathway. Among its key functions is organizing an annual Global Multi-stakeholder Small Island Developing States Partnership Dialogue - a major step forward for enhancing the representation of SIDS on the international stage.

That same year marked a historic milestone in international climate law with the Paris Agreement (Paris, 12 December 2015). Unlike the Kyoto Protocol, which only imposed binding commitments on developed countries, the Paris Agreement brought together both developed and developing States under a single legally binding treaty. The agreement's overarching goal is to limit the increase in global temperatures to well below 2°C above pre-industrial levels, with efforts to restrict warming to 1.5°C to prevent the most catastrophic impacts of climate change.

A critical element of the Paris Agreement is the concept of nationally determined contributions (NDCs). These no-mandatory contributions represent each country's self-determined commitments to reduce emissions and adapt to climate impacts, which are reviewed and updated every five years. Within this framework, the Paris Agreement also established mechanisms for financial, technological, and capacity-building support for developing States, reaffirming the need for developed countries to lead in providing climate finance. Importantly, the agreement set in place an Enhanced Transparency Framework, which will ensure that countries regularly report transparently on their progress toward meeting their NDCs starting in 2024. The information gathered through the Enhanced Transparency Framework will feed into the Global Stocktake which will assess the collective progress towards the long-term climate goals. This will lead to recommendations for countries to set more ambitious plans in the next round.

³⁴² H ADAM (Minister-Counsellor, Republic of the Maldives), ‘Statement at the Regional Preparatory Meeting for the Atlantic, Indian Ocean and South China Sea (AIS) SIDS for the 4th International Conference on SIDS 24 July 2023, “Gaps and Challenges: Implementation of the SAMOA Pathway: National and Regional Perspectives”’ (24 July 2023).

The evolution of climate law – from the foundational UNFCCC through the Kyoto Protocol, the Doha Amendment, and finally to the Paris Agreement - reflects the ongoing challenge of reconciling national interests with the global imperative of addressing climate change. While progress has been made in fostering cooperation, the complex landscape of conflicting economic priorities, technological disparities, and climate vulnerabilities means that much work remains. The UNFCCC established the groundwork, the Kyoto Protocol provided operational mechanisms, the Doha Amendment extended the commitment, and the Paris Agreement set ambitious global goals.

Climate treaties have been a subject of significant debate, particularly due to challenges posed by developed States in reducing GHG emissions. Under the Kyoto Protocol, the United States refused to ratify the agreement, while major emerging economies such as China and India were exempt from mandatory emission reduction targets. The Protocol's goals were widely criticized as inadequate for significantly curbing global warming. Despite the modest targets, some States failed to fulfil their commitments, and the trading schemes and enforcement mechanisms were criticized for lacking robustness³⁴³. While the Paris Agreement set forth ambitious goals, it has been criticized for notable weaknesses, including the absence of legally binding outcome duties and the lack of enforcement mechanisms to sanction non-complying Parties. In June 2017, the United States announced its withdrawal from the Paris Agreement, further undermining its effectiveness. In a resolute stance response, the Environment and Energy Minister of the Maldives, in their capacity as AOSIS Chair, asserted the Paris Agreement non-negotiable, firmly countering United States' demands for renegotiation³⁴⁴. Within the bounds of the Paris Agreement, Parties are not allowed to submit a notice of withdrawal until three years after its entry into force (4 November 2016). Even then, the formal severing of ties would take a full year to become effective, meaning the United States' initial withdrawal would only truly materialize on 4 November

³⁴³ C NAPOLI, 'Understanding Kyoto's Failure' (2012) 32(2) SAIS Review of International Affairs 183.

³⁴⁴ AOSIS, 'Paris Agreement is not 'renegotiable'' (Press Release, 1 June 2017). *See also* AOSIS, 'President of Maldives Reacts to US Paris Withdrawal' (Press Release, 2 June 2017).

2020³⁴⁵. Yet, in January 2021, the United States officially rejoined the Paris Agreement. However, as the political tides turned with the election of the forty-seventh President, a fresh withdrawal began to cast its shadow, consistent with promises made upon the campaign trail³⁴⁶. Indeed, on the very first day of his second term, with a series of executive orders, the President sealed the United States' renewed departure from the Paris Agreement.³⁴⁷

Through extensive and complex negotiations, AOSIS formally succeeded in ensuring that the unique challenges of SIDS were also embedded within the United Nations General Assembly Resolution A/RES/70/1 titled Transforming our World: the 2030 Agenda for Sustainable Development adopted on 25 September 2015, particularly through the inclusion of SDG 14 (Life below water). This goal aims to improve the conservation and sustainable use of the oceans, seas and marine resources for sustainable development. It provides a target framework to strengthen the resilience of the marine ecosystems and economies surrounding SIDS. A few targets of the SDGs address the needs and challenges of these island countries:

- Target 13.b: Seeks to “promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, with a focus on women, youth, and marginalized communities.”
- Target 14.a: Aims to “increase scientific knowledge, develop research capacity, and transfer marine technology,” in line with the Intergovernmental Oceanographic Commission’s Criteria and Guidelines. This target supports improved ocean health and enhances the role of marine biodiversity in the sustainable development of developing nations, especially SIDS and least developed countries.
- Target 14.b: Set out to “increase economic benefits to Small Island Developing States and least developed countries from the sustainable use of marine resources,” particularly through the sustainable management of fisheries, aquaculture, and tourism by 2030.

³⁴⁵ COLUMBIA LAW SCHOOL, Columbia Climate School, Sabin Center For Climate Change Law, 'President Trump Announces Withdrawal From Paris Agreement' COLUMBIA LAW SCHOOL, Columbia Climate School, Sabin Center For Climate Change Law, *President Trump Announces Withdrawal From Paris Agreement* (n.d.).

³⁴⁶ A J BLINKEN (US Secretary of State), 'The United States Officially Rejoins the Paris Agreement' (Press Statement, US Department of State, 19 February 2021); S SCHONHARDT, 'Why Trump's 2nd withdrawal from the Paris Agreement will be different' (Politico, 11 October 2024).

³⁴⁷ The White House, 'Putting America First in International Environmental Agreements' (January 2025)

While UNCLOS was adopted in 1982, prior to the mainstreaming of climate change in international law, it remains a cornerstone framework for ocean governance and is highly relevant to contemporary climate litigations. UNCLOS does not explicitly address climate change. Nevertheless, its provisions on the protection and preservation of the marine environment can be interpreted as indirectly addressing climate change impacts. UNCLOS obligates States to take “all measures necessary to prevent, reduce, and control pollution of the marine environment”, which some scholars argue extends to GHG emissions linked to climate change. This opens the door for interpreting UNCLOS provisions in the context of climate-related harm to oceans. Regarding its implementing agreement, the BBNJ Agreement recognizes climate change, ocean acidification and marine pollution as stressors for marine ecosystems³⁴⁸. However, its substantive provisions remain unenforced, as the BBNJ Agreement has yet to enter into force.

The faltering implementation of climate treaties by prominent developed and emerging economies, coupled with a discernible oversight within the broader panorama of international law, has inexorably propelled vulnerable countries, particularly low-lying coastal and islands States, to champion the cause of climate justice with heightened vigor. Consistent with the IPCC AR6, climate justice revealed through three interconnected dimensions: distributive justice, procedural justice, and recognition.

Distributive justice underscores the fair allocation of the burdens and benefits of climate action, reflecting the difference principle firstly provided for in Article 3 of the UNFCCC. This principle is not intended to close the economic gap between developed and developing countries but rather strengthen global climate ambition and enhance the capacity of less developed countries to address the climate crisis³⁴⁹. The current climate injustice lies in the fact that developing countries, such as SIDS, while being the least responsible for climate change, bear

³⁴⁸ BBNJ Agreement art 17(c). Also, regarding capacity building and of the transfer of marine technology, the BBNJ Agreement in Annex II refers that initiatives should include plans aims to cope ‘the adverse effects of climate change, such as warming and ocean deoxygenation, as well as ocean acidification’.

³⁴⁹ E O BABATUNDE, 'Distributive Justice in the Age of Climate Change' (2020) 33(2) Canadian Journal of Law and Jurisprudence 263.

the greatest burden of its impacts and generally lack the resources for effective adaptation and mitigation.

Procedural justice highlights the importance of fairness and inclusivity, ensuring that all States have an equal and meaningful role in international climate negotiations and decision-making processes. It encompasses transparent decision-making and non-discrimination among States. In recent years, climate change litigation has grown, amplifying the voices of marginalized and vulnerable communities in addressing climate change, both at the national and international levels.

Recognition entails respecting and valuing the unique cultures, knowledge systems and perspectives, particularly Indigenous Peoples and local communities who have long demonstrated resilience and adaptability to environmental changes. The full recognition of sea-rights of Indigenous People is still in progress since UNCLOS does not explicitly refer to them. However, the BBNJ Agreement recognizes Indigenous People and local communities as active stakeholders in the conservation and use of marine biological diversity in areas beyond national jurisdiction³⁵⁰.

In pursuit of procedural climate justice, small island States have taken critical steps, including the significant Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law to the ITLOS in 2023. This request centres on two pivotal questions:

What are the specific obligations of State Parties to the United Nations Convention on the Law of the Sea (the “UNCLOS”), including under Part XII:

(a) to prevent, reduce and control pollution of the marine environment in relation to the deleterious effects that result or are likely to result from climate change, including through ocean warming and sea level rise, and ocean acidification, which are caused by anthropogenic greenhouse gas emissions into the atmosphere?

(b) to protect and preserve the marine environment in relation to climate change impacts, including ocean warming and sea level rise, and ocean acidification?

³⁵⁰ BBNJ Agreement art 7.

Small island States, particularly vulnerable to sea-level rise and the degradation of marine ecosystems, were seeking legal clarification on whether UNCLOS imposes responsibilities on States whose actions contribute to climate-related damage to their marine environment and natural resources.

In its written statement, the Commission of Small Island States (COSIS) has expressed support for diverse initiatives aimed at clarifying States obligations regarding climate change – which are contributing to the panorama of climate procedural justice. Notably, COSIS has endorsed the adoption of Resolution 77/276 by the United Nations General Assembly in March 2023. This resolution seeks an Advisory Opinion from the ICJ on the obligations of States under international law to address climate change.³⁵¹ Additionally, COSIS has backed a request for an Advisory Opinion from the Inter-American Court of Human Rights, submitted by the Republic of Chile and the Republic of Colombia. This request addresses the scope of State obligations in responding to the climate emergency, specifically referencing the harm caused by sea-level rise and ocean acidification as consequences of climate change³⁵².

The Request for an Advisory Opinion submitted by COSIS to ITLOS is of relevance to this doctoral thesis. It has the potential to establish a critical precedent for integrating climate change considerations into the interpretation of the law of the sea, thereby advancing the interests of small island States and contributing to the evolution of international law in the context of climate change.

3.2.1 Procedural justice: Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law

*The ocean is our mother, the source of life. Yet it is being
destroyed by the failure of major greenhouse gas emitters to take
seriously their obligation to protect and preserve the marine*

³⁵¹ UNITED NATIONS GENERAL ASSEMBLY, *Resolution adopted by the General Assembly: Request for an Advisory Opinion of the International Court of Justice on the Obligations of States in Respect of Climate Change* (4 April 2023), A/RES/77/276.

³⁵² See Republic of Colombia and Republic of Chile, *Request for an Advisory Opinion on the Climate Emergency and Human Rights* (9 January 2023) 3.

environment. Catastrophic climate change cannot be averted by empty promises. The peoples of small island States cannot be expected to sit silently as the homes of both their children and ancestors are being destroyed. The natural world is out of balance and a great injustice is being committed against us.

Mr Arnold Kiel, Attorney General of the Republic of Vanuatu
11 September 2023, Hamburg, Germany

COSIS was established on 31 October 2021 by Antigua and Barbuda and Tuvalu, following the signing of the Agreement for the Establishment of COSIS (COSIS Agreement) during the twenty-sixth meeting of COP to the UNFCCC, held in Glasgow, Scotland. Shortly thereafter, on 5 November 2021, the Republic of Palau became the first State to formally accede to the COSIS Agreement by depositing its instrument of accession. This is followed, in chronological order, by Niue, the Republic of Vanuatu and Saint Lucia, Saint Vincent in the Grenadines, Saint Kitts and Nevis and the Commonwealth of the Bahamas.

COSIS's mission is grounded in the recognition of the 'fundamental importance of oceans as sinks and reservoirs of greenhouse gases and the devastating impact for Small Island States of related change in the marine environment'³⁵³. COSIS is mandated to 'promote and contribute to the definition, implementation, and progressive development of rules and principles of international law concerning climate change, including as they relate to the marine environment'³⁵⁴.

In light of the existential threats facing small island States, some of which may potentially disappear in the foreseeable future due to rising sea levels, and given the unequivocal scientific evidence attributing this situation to the failure of major polluters to effectively mitigate GHGs, COSIS resolved at a duly convened meeting on 26 August 2022, to refer the following legal questions to ITLOS for an Advisory Opinion: 'What are the specific obligations of State Parties to UNCLOS, including under Part XII: (a) to prevent, reduce and control pollution of the marine environment in relation to the deleterious effects that result or are likely to result

³⁵³ COSIS Agreement preamble.

³⁵⁴ COSIS Agreement art 1.

from climate change, including through ocean warming and sea level rise, and ocean acidification, which are caused by anthropogenic greenhouse gas emissions into the atmosphere? (b) to protect and preserve the marine environment in relation to climate change impacts, including ocean warming and sea level rise, and ocean acidification?’

According to the COSIS Written Statement submitted to ITLOS, the primary distinction between the first and second questions lies in the fact that the second one extends beyond the concept of marine pollution to encompass the more general obligation to protect and preserve the marine environment outlined in Article 192 of UNCLOS³⁵⁵. Both questions call on ITLOS to apply the settled science of climate change to States Parties’ obligations under the Convention³⁵⁶.

COSIS asserted that ITLOS could assist States Parties by identifying obligations that are legally binding rather than discretionary, and by providing clarification on specific obligations under UNCLOS concerning climate change, based on established scientific evidence. The IPCC have already clearly estimated that a global average temperature increase of 1.5°C above pre-industrial levels represents a critical threshold, beyond which the catastrophic effects of climate change escalate from moderate to high. In response to this, the Paris Agreement established a global standard aimed at limiting the increase in global average temperature to well below 2°C above pre-industrial levels, while also pursuing efforts to restrict the temperature rise to 1.5°C. However, this framework allows States some degree of discretion in implementing measure³⁵⁷.

The challenges posed by climate change, along with their potential solutions, are fundamentally scientific in nature. Therefore, COSIS requested that ITLOS should base its decisions on the best available scientific evidence to clearly and precisely define the specific obligations of UNCLOS States Parties³⁵⁸. In this regard, COSIS effectively calls upon ITLOS to integrate contemporary scientific knowledge into its interpretation of UNCLOS, advocating for a more adaptive, forward-thinking approach to legal interpretation within the climate change context.

³⁵⁵ COSIS Written Statement (16 June 2023) Part I, Chapter 2, para. 28.

³⁵⁶ *Ibid.* Part I, Chapter 2, para. 29.

³⁵⁷ *Ibid.* Part I, Chapter 1, para 5.

³⁵⁸ *Ibid.* Part I, Chapter 1, para 6.

Such an approach not only enhances the relevance of international law in addressing critical environmental challenges but also establishes foundational principles for other judicial bodies, fostering the incorporation of scientific insights and projections into the interpretation and application of international legal standards.

This strategy can revitalize a treaty like UNCLOS that entered into force three decades ago, ensuring its provisions resonate with present-day environmental imperatives. By embedding scientific rigor into its interpretative process, ITLOS could reinforce the foundational importance of science in international environmental law, thereby ensuring that legal standards adapt responsively to evolving understandings of climate risk and responsibility³⁵⁹. This recognition underscores that science is not peripheral to governance but is instead foundation to it. As the challenges posed by climate change become more intensive, the integration of scientific knowledge within the frameworks of international law and environmental policy will become increasingly pivotal in determining the effectiveness of global responses, particularly regarding the protection of fragile marine ecosystems. The insights of Phoebe Okowa, professor and a member of the COSIS delegation, resonated throughout the oral proceeding of the Advisory Opinion:

interpreting UNCLOS in light of the accepted science on climate change is not an aberration at all; it is, in fact, a logical continuation of how the law of the sea has always had to adapt to accommodate scientific and technological change. To properly tackle such problems, the UNCLOS regime cannot remain ossified or static. This is borne out by the text of UNCLOS itself, which contains several mechanisms that allow it to adapt to an ever-changing operational landscape³⁶⁰.

However, merely embracing scientific understanding proves insufficient in the crucible of climate change. This epochal challenge demands, with equal urgency, profound cooperation between sovereign States. The President of Tuvalu, representing COSIS and hailing from one of the Pacific islands most severely impacted by sea level rise, emphasized that the Advisory Opinion would serve to

³⁵⁹ A KORiat, 'How Do We Know That We Know? The Accessibility Model of the Feeling of Knowing' (1993) 100(4) *Psychological Review* 609.

³⁶⁰ *Oral Hearings on Request for Advisory Opinion, Verbatim Record of the Public Sitting* (International Tribunal for the Law of the Sea, 11 September 2023 p.m.), ITLOS/PV.23/C31/2/Rev.1, 2.

facilitate international cooperation and promote a broader dialogue among world leaders regarding State obligations related to climate change. The Advisory Opinion is expected to provide clarity on the existing obligations that States, particularly major polluters, should have fulfilled over the years. These obligations remain legally binding and constitute an urgent imperative to prevent further environmental degradation³⁶¹.

Drawing upon the wellspring of written submissions and the compelling oral arguments advanced by COSIS, complemented by those offered by various States and relevant international organizations, ITLOS has issued its pivotal judgment.

3.2.1.1 The request is admissible and within the jurisdiction of ITLOS

First, ITLOS determined that the questions posed by COSIS were sufficiently precise to enable it to render an Advisory Opinion. It concluded that the request was supported by adequate information and evidence to justify both the inquiry and its final findings. ITLOS further held that the request was consistent with its judicial functions, as it sought to clarify and provide guidance on the specific obligations of States Parties under UNCLOS. This involved interpreting and applying relevant provisions, particularly those in Part XII, as well as other applicable rules of international law³⁶².

3.2.1.2 GHGs are defined as pollution of the marine environment within the meaning of Article 1(1) of UNCLOS

“pollution of the marine environment” means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other

³⁶¹ *Ibid.* 14.

³⁶² *Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law* (Advisory Opinion, ITLOS Case No 31, 21 May 2024) 48.

legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities³⁶³;

The definition of marine environment pollution, rather than itemizing specific contaminants, delineates its scope through three crucial criteria: it requires the presence of a substance or energy, its direct or indirect introduction by human agency into the marine realm, and the demonstrable presence of an actual or potential harmful effect. These criteria are cumulative, meaning all must be met to qualify as pollution of the marine environment.

The definitions of GHGs articulated by the IPCC and the UNFCCC, confirm that these atmospheric constituents qualify as ‘substances’ within the relevant legal framework^{364, 365}. The second pivotal criterion, concerning the introduction of such substances into the marine environment by human agency, finds its affirmation in the same authoritative texts. Based on the IPCC’s definitions of both ‘anthropogenic’ and ‘anthropogenic emissions’, and the UNFCCC’s definition of ‘emissions’³⁶⁶. It becomes clear that harmful GHGs, originating from human activities, fall within the expansive scope of ‘pollution’ as delineated by UNCLOS³⁶⁷. The term ‘marine environment’, though omnipresent throughout UNCLOS for self-evident reasons, nonetheless eludes precise definitional delineation within the Convention itself. The ICJ acknowledged the environment as encompassing ‘living space, the quality of life and the very health of humans, including generations unborn’³⁶⁸. This expansive vision, fortified by ITLOS,

³⁶³ UNCLOS 1833 UNTS 3 art 1.

³⁶⁴ IPCC defines GHGs as ‘gaseous constituents of the atmosphere, both natural and anthropogenic, which absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth’s surface, by the atmosphere itself, and by clouds. This property causes the greenhouse effect [...]’. *Source*: IPCC, ‘Glossary of terms’ in C B FIELD et al. (eds), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (Cambridge University Press 2012) 560. In Article 1, UNFCCC defines GHGs as ‘those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation’.

³⁶⁵ Advisory Opinion, ITLOS Case No 31 (n. 362) 61.

³⁶⁶ IPCC defines ‘anthropogenic’ as resulting from or produced by human beings, similarly ‘anthropogenic emissions’ are described as emissions of GHGs, GHGs precursors, and aerosols associated with human activities which result in a net increase in emissions. *Source*: IPCC (n. 363) 556. Also, Article 1 of the UNFCCC defines ‘emissions’ as the release of GHGs and their precursors into the atmosphere [...].

³⁶⁷ Advisory Opinion, ITLOS Case No 31 (n. 362) 61.

³⁶⁸ *Legality of the Threat or Use of Nuclear Weapons* (Advisory Opinion, ICJ Reports 1996) 226, 241 [29].

reveals that the ‘marine environment’ within Article 1(1) of UNCLOS holds both spatial breadth and tangible physical dimensions³⁶⁹.

Considering these definitions, ITLOS concluded that GHGs are directly introduced by human beings into the marine environment. These gases trap heat, which the ocean absorbs, thereby indirectly introducing energy into the marine environment³⁷⁰. Anthropogenic GHG emissions drive climate change, including ocean warming, sea level rise, and ocean acidification. These effects, compounded by other climatic and non-climatic factors, cause multiple harmful impacts on the marine environment and beyond³⁷¹. The adverse outcomes of climate change and ocean acidification meet the deleterious effects criterion in Article 1(1) of UNCLOS.

Therefore, ITLOS further concluded that the introduction of ‘GHG emissions into the atmosphere constitute pollution of the marine environment within the meaning of Article 1, paragraph 1, subparagraph 4 of the Convention’³⁷².

3.2.1.3 States should take all necessary measures to prevent, reduce and control pollution of the marine environment derived by GHG emissions

What are the specific obligations of State Parties to the United Nations Convention on the Law of the Sea (the "UNCLOS"), including under Part XII:

- (a) to prevent, reduce and control pollution of the marine environment in relation to the deleterious effects that result or are likely to result from climate change, including through ocean warming and sea level rise, and ocean acidification, which are caused by anthropogenic greenhouse gas emissions into the atmosphere?³⁷³

In its response to the question (a), ITLOS focused on the obligations under Article 194(1)(2) of UNCLOS.

Given that anthropogenic GHG emissions are definitely considered pollution of the marine environment, the mandate of Article 194(1) of UNCLOS is

³⁶⁹ Advisory Opinion, ITLOS Case No 31 (n. 362) 63.

³⁷⁰ *Ibid.* 64.

³⁷¹ *Ibid.* 65.

³⁷² *Ibid.* 66.

³⁷³ COSIS Written Statement, 16 June 2023.

engaged³⁷⁴. In the view of ITLOS, science emerges as a vital compass, guiding the understanding of caused of pollution and far-reaching effects from GHG emissions, thereby informing the measures required for its prevention and control. However, ITLOS underscored that scientific certainty is not a prerequisite for action; indeed, in the face of uncertainty, States bear the expectation to apply a precautionary approach when regulating marine pollution driven by anthropogenic GHGs. While this principle is not explicitly stated in UNCLOS, it is inherent in the concept of potential deleterious effects arising from marine pollution³⁷⁵.

ITLOS also clarified that fulfilling Paris Agreement obligations does not satisfy UNCLOS obligations, as these are separate international agreements. While complementary, the Paris Agreement does not override UNCLOS, nor does it modify or limit its obligations. States are thus required by Article 194(1) of UNCLOS to take all necessary measures to prevent and control marine pollution from GHG emissions, including emissions reduction, and may incur international responsibility if they fail to do so³⁷⁶.

While Article 194(1) does not specifically mention the principle of common but differentiated responsibilities, ITLOS noted that it contains elements that are consistent with this principle³⁷⁷. The scope of measure to reduce GHG emissions causing marine pollution may vary between developed and developing States. Nevertheless, a universal expectation remains: all States are called upon to mitigation efforts, each in accordance with their respective capacities and unique circumstances^{378,379}.

ITLOS concluded that, under Article 194(2) of UNCLOS, States are specifically obligated to ensure that anthropogenic GHG emissions within their jurisdiction or control do not harm other States or their environments, and that pollution from these emissions does not extend beyond areas where they hold sovereign rights. This obligation, which applies in transboundary contexts, complements the general duty under Article 194(1) and is one of due diligence, with

³⁷⁴ *Ibid.* 71.

³⁷⁵ *Ibid.* 77.

³⁷⁶ *Ibid.* 80.

³⁷⁷ *Ibid.* 81.

³⁷⁸ *Ibid.* 82.

³⁷⁹ *Ibid.* 87.

a potentially stricter standard given the nature of transboundary pollution as marine pollution from GHG emissions may originate from land-based sources, vessels, or the atmosphere.

Additionally, ITLOS determined that Articles 197, 200, and 201, in conjunction with Articles 194 and 192 of UNCLOS, impose specific obligations on States Parties to cooperate - either directly or through competent international organizations - to prevent, reduce, and control marine pollution from anthropogenic GHG emissions. Importantly, ITLOS concluded that Parties must establish appropriate scientific criteria to guide the formulation of rules, standards, and recommended practices to combat marine pollution from these emissions, emphasizing once again the crucial role of scientific evidence as a foundation for marine policies³⁸⁰.

In the view of ITLOS, Articles 202 and 203 of UNCLOS establish specific obligations to support developing States, especially vulnerable ones, in tackling marine pollution from anthropogenic GHG emissions³⁸¹. Article 202 outlines the obligation to provide appropriate assistance - either directly or through competent international organizations - focusing on capacity-building, scientific expertise, technology transfer, and other related areas. ITLOS also concluded that Article 203 further emphasises support for developing States, particularly those at risk from the adverse effects of climate change, by ensuring they receive preferential treatment in funding, technical assistance, and relevant specialized services from international organizations³⁸².

ITLOS also finds that Articles 204, 205, and 206 of UNCLOS impose specific obligations on States Parties to monitor, report, and assess the environmental impact of marine pollution from anthropogenic GHG emissions³⁸³.

³⁸⁰ *Ibid.* 111.

³⁸¹ As outlined by COSIS in its written statement submitted to ITLOS on 16 June 2023, ‘UN practice leaves no doubt that the category of ‘developing States’ includes at least the least developed countries, developing Small Island States, and coastal African States’.

³⁸² Advisory Opinion, ITLOS Case No 31 (n. 362) 116.

³⁸³ Advisory Opinion, ITLOS Case No 31 (n. 362) 124.

3.2.1.4 States should take appropriate measures to protect and preserve rare or fragile ecosystems from climate change impacts, including restoring damaged habitats and ecosystems.

What are the specific obligations of State Parties to the United Nations Convention on the Law of the Sea (the "UNCLOS"), including under Part XII:

- (b) to protect and preserve the marine environment in relation to climate change impacts, including ocean warming and sea level rise, and ocean acidification?

COSIS Written Statement, 16 June 2023

As COSIS described, the second question before ITLOS is independent, yet complementary to the first. It extends beyond defining marine pollution to address the broader obligation under UNCLOS and customary international law for States to protect and preserve the marine environment, specifically in regulating activities that contribute to climate change impacts. This could serve as an additional basis for imposing specific obligations on Parties³⁸⁴.

In the oral statement before ITLOS, Nilüfer Oral, in quality of director of the Centre for International Law (National University of Singapore) and member of the delegation of COSIS, emphasized that ITLOS may consider the CBD in evaluating States' obligations to implement climate adaptation measures. Article 8(d) of the CBD obligates Parties to protect ecosystems and maintain species populations applying equally to marine and terrestrial environments. Additionally, Article 8(f) calls for the rehabilitation of degraded ecosystems and recovery plans for threatened species. Notably, in 2010, CBD Decision X/29 addressed the impact of climate change on marine and coastal biodiversity, highlighting threats like sea level rise, ocean acidification, and coral bleaching, and underscoring the role of marine biodiversity in climate mitigation and adaptation^{385,386}. This decision, adopted by consensus, references UNCLOS over twenty times, affirming the complementary relationship between the CBD and UNCLOS and aligning with Article 31(3)(c) of

³⁸⁴ COSIS Written Statement, 16 June 2023, Part III, Chapter 8, para. 367.

³⁸⁵ CBD COP, *Decision X/29, Marine and coastal biodiversity* (29 October 2010), UNEP/CBD/COP/DEC/X/29.

³⁸⁶ See ILC, *Subsequent agreements and subsequent practice in relation to the interpretation of treaties* (11 May 2018) A/CN.4/L.907, Conclusion 11.

the Vienna Convention on the Law of Treaties (Vienna, 23 May 1969), which supports integrating compatible obligations across treaties^{387,388}.

In response to the question (b), ITLOS concluded that Article 192 of UNCLOS establishes a general obligation for States to protect and preserve the marine environment across all maritime areas. This duty encompasses combating any form of marine degradation, including climate change impacts like ocean warming, sea level rise, and ocean acidification, and may include restoring damaged habitats and ecosystems.

Ecosystem restoration is then recognized as a key component of fulfilling the obligations under Article 192, particularly in the face of widespread environmental degradation. Restoration efforts may involve rehabilitating coral reefs, replanting mangroves, or restoring seagrass beds, all of which serve critical ecological functions such as supporting biodiversity, protecting coastlines, and enhancing carbon sequestration. The obligation under Article 192 thus not only entails preventing further harm but also actively engaging in measures that repair and recover marine ecosystems that have been damaged or degraded. ITLOS also underscores the serious and irreversible harm posed by climate change and requires a stringent standard of due diligence³⁸⁹ with emphasis on specific duties on States Parties ‘to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life from climate change impacts and ocean acidification’³⁹⁰. In this regard, ITLOS highlighted the importance of strengthening conservation measures, in line with the mandate of the BBNJ Agreement which introduces ABMTs under the umbrella of UNCLOS³⁹¹.

In its final judgment, ITLOS went beyond merely identifying GHG emissions as a form of marine pollution and acknowledging their harmful effects on marine environment. It emphasized that in fulfilling their obligations under UNCLOS, States are not restricted to the minimum standards set forth in UNCLOS. Instead, ITLOS clarified that Part XII of UNCLOS allows States to adopt more

³⁸⁷ CBD COP (n. 385) para. 15.

³⁸⁸ Oral hearings, Advisory Opinion, ITLOS Case No. 31 (n. 362) 5.

³⁸⁹ Advisory Opinion, ITLOS Case No 31 (n. 362) 133.

³⁹⁰ Advisory Opinion, ITLOS Case No 31 (n. 362) 136.

³⁹¹ Advisory Opinion, ITLOS Case No 31 (n. 362) 146.

stringent measures for marine protection, provided these measures are consistent with the provisions of the Convention and other applicable rules of international law. Furthermore, ITLOS cast a revealing light upon the imperative of fortifying the global architecture for the conservation and protection of the marine biodiversity emphasizing the pivotal role of restoration and protection measures of degraded habitats.

Finally, and of paramount importance, ITLOS champions the pressing of cooperation between States in the fight against climate change. This call for cooperation is tempered with the crucial acknowledgment of common but differentiated responsibilities, and a pragmatic consideration of capacities and unique circumstances of each State.

The ICJ, in its recent landmark Advisory Opinion on the Obligations of States in respect to Climate Change (23 July 2025), underscored the impetus of cooperation among States in confronting the climate crisis. This fundamental duty to cooperate, embedded within the Charter of the United Nations (San Francisco, 26 June 1945), finds further articulation in foundational documents such as the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States³⁹². The ICJ noted that that the adoption of such texts ‘affords an indication of their *opinion juris* as to customary international law.’ This observation, the ICJ affirmed, extends to the duty to cooperate, particularly as it is echoed across numerous binding and non-binding instruments specifically concerning environmental protection. Given the consistent practice of States, the Court considers the duty of States to cooperate for environmental protection to be an established rule of customary international law recognizing that ‘uncoordinated individual efforts by States may not lead to a meaningful result’³⁹³.

³⁹² UNITED NATIONS GENERAL ASSEMBLY. Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States (24 October 1970) A/RES/2625(XXV).

³⁹³ *Obligations of States in respect of Climate Change* (Advisory Opinion, ICJ, 23 July 2025) paras 113–173.

3.3 The Maldives in International Climate Law: Advocacy, Commitments, and Progression

In 2009, then-President of the Maldives, Mohamed Nasheed, captured international attention by leading the world's first underwater cabinet meeting to advocate for stronger climate action ahead of the fifteenth meeting of the COP to the UNFCCC³⁹⁴. President Nasheed, along with the Vice President and cabinet ministers, donned scuba gear and convened four meters underwater off Girifushi Island, where they signed the 'SOS from the Frontline' declaration. This document urgently called for substantial global cuts in carbon emissions, specifically advocating for atmospheric CO₂ levels to be reduced to 350 parts per million. 'We want the world to see what is happening and what will happen to the Maldives if climate change isn't stopped,' President Nasheed stated, 'if we can't save the Maldives today, you can't save the rest of the world tomorrow.'³⁹⁵ In a further demonstration of commitment, President Nasheed announced that same year the ambition of the Maldives to become the world's first carbon-neutral nation by 2020, underscoring the country's dedication to climate leadership and the urgency of collective global action³⁹⁶.

From 2015 to 2018, the Maldives led the AOSIS with a determined focus on securing critical climate responsibilities and obligations within the Paris Agreement. Central to this mission was the inclusion of the commitment to limit global temperature rise to below 1.5°C - an imperative for the survival of small islands States³⁹⁷.

The Maldives also supported the operationalization of the SDGs through the creation of the Small Island Developing States Partnership Framework, an initiative designed to foster sustainable development in these island States by promoting new

³⁹⁴ The Copenhagen Summit took place from 7 to 18 December 2009 in the Danish capital and served as the fifteenth session of COP to the UNFCCC as well as the fifth session of the COP to the Kyoto Protocol. Retrieved from <https://unfccc.int/conference/copenhagen-climate-change-conference-december-2009> accessed 24 July 2025.

³⁹⁵ President's Office, Republic of the Maldives, 'Maldives holds world's first underwater Cabinet meeting' (Press Release, 17 October 2009) Ref: 2009-778.

³⁹⁶ However, this promise has not been satisfied. So far, the Maldives adopted a conditional emissions reduction target of 26 per cent by 2030 compared to business as usual, and the country also aspires to achieve net zero by 2030 depending on the international support received.

³⁹⁷ MINISTRY OF ENVIRONMENT AND ENERGY (n. 313) 18.

partnerships across public, private, and civil society sectors. Serving as co-chair of the Partnership Framework Steering Committee alongside Italy, the Maldives provides crucial leadership that sustained political momentum and helped operationalize the SDGs³⁹⁸.

The international commitments chaired by the Maldives underscore the critical role played by this archipelagic State in advancing the establishment of effective regulatory frameworks to combat the climate crisis.

Demonstrating its strong commitment to international climate action, the Maldives signed and deposited its instrument of ratification of the Paris Agreement on 22 April 2016, the first day the Agreement was open for signature. As regulated in Articles 3 and 4(2) of the Paris Agreement, Parties shall prepare, communicate, and maintain successive nationally determined contributions (NDCs) to the global response to climate change that they intend to achieve. NDCs are central to the Paris Agreement, encapsulating each national commitment to reduce GHG emissions and adapt to the impacts of climate change. Parties shall submit their NDCs to the UNFCCC Secretariat every five years, with each iteration expected to be more ambitious than the last, representing the highest possible commitment based on the latest scientific understanding and national capabilities.

In 2015, the Ministry of Environment and Energy of the Maldives submitted the Intended National Determined Contribution. Under a business-as-usual (BAU) scenario, fossil fuel use in the Maldives was projected to drive emissions to approximately 3.3 million tonnes of CO₂ equivalent by 2030. The Maldives pledged to mitigate this by unconditionally reducing its emissions by 10 per cent below BAU levels by 2030. Moreover, the Maldives set a conditional target to reduce emissions by up to 24 per cent, contingent on the availability of international financial support, technology transfer, and capacity building from developed countries³⁹⁹.

In 2020, the Ministry of Environment submitted the update NDC where the government recognizes that the COVID-19 pandemic, combined with limited external support, have hindered the full realization of its previous targets. The long-

³⁹⁸ MINISTRY OF ENVIRONMENT AND ENERGY (n. 313) 22.

³⁹⁹ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of the Maldives, *Intended Nationally Determined Contribution (INDC)* (September 2015).

term emission reduction and green recovery goals remains uncertain without adequate financial assistance, technology transfer, and capacity-building support⁴⁰⁰. Despite these constraints, the Maldives committed to new ambitious climate goals, pledging a 26 per cent reduction in emissions by 2030 (with emissions in 2030 under a BAU as 3.284 million tonnes of CO₂ equivalent), contingent on the availability of necessary international support. Furthermore, the Maldives set a conditional target to reach net-zero emissions by 2030, provided it receives sufficient global assistance⁴⁰¹. To advance toward these targets, the Maldives intends to increase its renewable energy share through multiple initiatives, including the controversial waste-to-energy projects. This included the installation of two facilities, one in Thilafushi and another in Addu City, aimed at optimizing grid connection and enhancing electricity generation⁴⁰².

A section of the updated NDC focuses on ‘Safeguarding Coral Reef Biodiversity’, emphasizing the vulnerability of coral reefs to climate change impacts and pollution from land-based sources, both of which threaten their critical role in providing food security and livelihoods to island communities. The Maldives committed to addressing these threats by supporting research to fill knowledge gaps on climate change impacts on coral reefs and marine ecosystems, enhancing coral reef monitoring programs with stakeholder engagement, and strengthening national conservation initiatives. These conservation efforts are to include various levels of protection, local and community-led management, and ecosystem-based approaches, all contributing to the resilience of marine and coastal biodiversity in the face of climate change. The Maldives also committed to implementing policy tools and best practices that mitigate pollution sources impacting coral reefs, reinforcing its dedication to preserving these essential ecosystems⁴⁰³.

Aligned with the ambitions outlined in the NDC, the Maldives adopted the Climate Change Policy Framework in 2015, charting the inaugural course in climate governance within the archipelago. The Framework outlines five main policy goals:

⁴⁰⁰ *Ibid.* Foreword

⁴⁰¹ *Ibid.* 3.

⁴⁰² *Ibid.* 2.

⁴⁰³ *Ibid.* 16.

1. Ensuring and integrating sustainable financing into climate change adaptation opportunities and low emission development measures.
2. Strengthening a low emission development future and ensuring energy security for the Maldives.
3. Strengthening adaptation actions and opportunities and building climate-resilient infrastructure and communities to address current and future vulnerabilities.
4. Inculcating a national, regional, and international climate change advocacy role in leading international negotiations and awareness in cross-sectoral areas in favour of the most vulnerable and SIDS.
5. Fostering sustainable development while ensuring security, economic sustainability, and sovereignty from the negative consequences of the changing climate⁴⁰⁴.

Following these foundational steps, the Maldives adopted the Climate Emergency Act (Act. n. 9/2021) in 2021, marking a definite legislative response to the climate crisis⁴⁰⁵. The Climate Emergency Act requires the President of the Maldives to appoint a special envoy for climate change, who will serve as the global advocate, fostering diplomatic ties, strengthening multilateral relations aligned with climate goals, and seeking foreign aid for climate-related projects, including those focused on environmental sustainability and renewable energy. It also mandates the Minister deputed for the environment to establish a dedicated Climate Change Directorate within the relevant Ministry, which will lead the national climate interests and represent the Maldives in international forums. Furthermore, the Minister must set a regulatory framework for the target of achieving net-zero carbon emissions by 2030, and submit an annual national carbon budget to the Parliament for approval three months before the end of each year⁴⁰⁶.

In 2025, the Ministry of Tourism and Environment, designated as the lead agency for environmental governance under the administration of President Mohamed Muizzu established in 2023, submitted the Maldives' 'Third Nationally

⁴⁰⁴ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of Maldives, *Maldives Climate Change Policy Framework* (2015).

⁴⁰⁵ Climate Emergency Act available in Divehi. Retrieved from <https://gazette.gov.mv/gazette/6115> accessed 24 July 2025.

⁴⁰⁶ An English translation of the Climate Emergency Act is not available; however, Climate Change Laws of the world website provides a summary of this regulation. CLIMATE CHANGE LAWS OF THE WORLD, 'Climate Emergency Act (Act no. 9/2021) (2021). Retrieved from https://climate-laws.org/document/climate-emergency-act-act-no-9-2021_706a accessed 24 July 2025.

Determined Contribution: National Climate Action Plan Towards Resilience and Low-Carbon Development’. The emissions reduction target outlined in the NDC is set relative to a projected BAU emissions scenario of 6.03 million tonnes of CO₂ equivalent by 2035. Under this framework, the Maldives has committed to reducing emissions by 1.52 million tonnes of CO₂ equivalent by 2035, contingent upon the receipt of adequate international support, including financial resources, technology transfer, capacity building, and other means of implementation. The realization of this target is critically dependent on substantial external assistance to enable the effective implementation of the mitigation measures identified⁴⁰⁷.

Table 3.1 presents a comparative overview of the targets determined in 2015, 2020, and 2025 NDCs.

TABLE 3.1 TARGETS DETERMINED IN NDCs OF THE MALDIVES

Year	Target year	BAU (million tonnes CO ₂ equivalent)	Target (million tonnes equivalent)	Reduction (million tonnes CO ₂)	% Reduction
2015	2030	3.300	0.792		24.0%
2020	2030	3.285	0.854		26.0%
2025	2035	6.030	1.52		25.2%

While the 2025 NDC reflects the largest absolute emissions reduction to date - 1.52 million tonnes of CO₂ equivalent compared to 0.854 million tonnes of CO₂ equivalent in 2020 - this increase is primarily attributable to the extended time horizon (2035) and the higher projected BAU emissions. When measured in relative terms, the per centage reduction has in fact declined slightly, from 26.0% in 2020 to 25.2% in 2025. This suggests a continuation, rather than a clear escalation of ambition, proportionate to anticipated economic development and emission growth.

This raise concerns under Article 4(3) of the Paris Agreement, which expressly provides that ‘successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition’. This principle of progression

⁴⁰⁷ MINISTRY OF TOURISM AND ENVIRONMENT, *Maldives’ Third Nationally Determined Contribution: National Climate Action Plan Towards Resilience and Low-Carbon Development* (2025).

is designed to ensure that global climate ambition increases over time, in accordance with evolving scientific and technological understanding and principles of equity. Although the Maldives has significantly increased the absolute volume of emissions reductions it seeks to achieve, this does not automatically demonstrate a progression in ambition under the terms of Article 4(3). Given that the per centage reduction relative to BAU is a standard metric for comparability and ambition assessment, the decline from 26.0% to 25.2%, albeit minor, may be interpreted as a regression or at least a stagnation, especially in the absence of new unconditional elements or strengthened sectoral targets.

However, the Paris Agreement also recognizes the diversity of the circumstances and capacities of each State. In particular, Article 4(4) provides that ‘[d]eveloping country Parties should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances’.

Moreover, Article 4(5) underscores the obligation of developed countries to support developing countries in implementing their NDCs through financial resources, technology transfer, and capacity-building.

From both a legal and policy perspective, the sustained reliance of the Maldives on conditional targets, while not optimal in terms of demonstrating unqualified progression, is arguably consistent with the differentiated responsibilities framework. The Maldives is a SIDS with minimal historical emissions, limited domestic capacity, and disproportionate exposure to climate impacts. Its consistent emphasis on international cooperation as a precondition to increased ambition aligns with the principle of common but differentiated responsibilities and respective capabilities, enshrined in Articles 4(3), 4(4), and 4(5) of the Paris Agreement.

Therefore, while the 2025 NDC does not clearly surpass the ambition level of the 2020 submission in per centage terms, it may still be regarded as defensible within the broader framework of equity and capacity-based differentiation. Nevertheless, the case of the Maldives illustrates the practical limitations of the progression principle when unaccompanied by robust international support and

highlights the continuing tension between ambition and capacity in the evolving architecture of global climate governance.

In 2019, the Government of the Maldives promulgated its Strategic Action Plan (SAP 2019-2023) for the period 2019–2023, serving as the principal policy document guiding national development over the specified five-year timeframe. The SAP 2019-2023 delineates the developmental priorities and objectives of the Government, outlining a comprehensive framework of strategic goals intended to facilitate the attainment of critical national milestones. These targets are designed to advance the vision of a *Jazeera Raajje*, which translates to ‘Island Nation’ (*Jazeera* in Divehi means island, and *Raajje* means nation or country). The SAP reflects a pragmatic approach, setting forth actionable and measurable outcomes to ensure effective governance, socio-economic progress, and environmental sustainability within the context of the unique geographical and socio-economic landscape of the Maldives⁴⁰⁸. The SAP 2019-2023 was formally integrated into the daily operations of line ministries beginning in October 2019 and is structured into five main sectors and thirty-three subsectors.

- Blue Economy: outlines economic priorities and how it will be delivered in a sustainable manner. Subsectors: Tourism | Small and Medium Enterprises | Fisheries and Marine Resources | Agriculture | Labour | Employment and Migration | Economic Diversification.
- Caring State: outlines priorities relevant to social progress. Subsectors: Health | Education | Higher Education | Social Protection | Prevention of Narcotics and Drug Rehabilitation.
- Dignified Families: outlines priorities relevant to social progress. Subsectors: Housing | Youth | Community Empowerment | Islamic Faith | Sports | Family.
- *Jazeera Dhirilhun*: outlines priorities relevant to community infrastructure and services. Subsectors: Clean Energy | Waste as a Resource | Environment Protection and Preservation | Resilient Communities | Information, Communication and Technology | Water and Sanitation | Transport Network | Arts, Culture and Heritage | Decentralization.
- Good Governance: outlines key governance reforms. Subsectors: National Security and Public Safety | Accountable State | Independent Institutions and

⁴⁰⁸ Republic of Maldives, *Strategic Action Plan (SAP) 2019-2023* (2019).

The SAP 2019-2023 places equal emphasis on the health of marine ecosystems, addressed within the Blue Economy sector and the well-being of communities, as reflected in the Caring State, Dignified Families and *Jazeera Dhiriulhun* sectors.

The concept of *Jazeera Dhiriulhun*, which translates literally as ‘island life’ encompasses a broader philosophy that lacks a direct equivalent in English.

It conceptualises a development model in which citizen engagement, inclusivity, and sustainability are at the core. The ideology behind ‘Jazeera Dhiriulhun’ centres around living in harmony with the island environment, where citizen’s livelihoods, economies, cultural identity, and well-being are derived sustainably through connectivity and management of natural resources. Citizen’s voice and agency is recognised as a fundamental aspect of the Jazeera Dhiriulhun concept⁴¹⁰.

At its core, *Jazeera Dhiriulhun* represents a development model rooted in sustainability, inclusivity, and harmony with the natural environment. It reflects a departure from conventional models of development that aligns with the *biopolitical encaring* approach discussed in Chapter I, which marks the shift from twentieth-century development frameworks to twenty-first-century models premised on care, resilience and interdependence. It integrates livelihoods, cultural identity, and natural resource management within a holistic framework that prioritizes both community well-being and ecosystem health. Within SAP, *Jazeera Dhiriulhun* is operationalized through key components, such as Decentralisation, Transport Network, Environmental Protection and Preservation, Clean Energy, Waste as a Resource, Water and Sanitation, Resilient Communities, Information, Communication and Technology, and Arts, Culture and Heritage. These elements underscore the commitment to fostering a sustainable and interconnected approach to development that aligns ecological preservation with socio-economic progress.

⁴⁰⁹ *Ibid.* 10.

⁴¹⁰ *Ibid.* 243.

While international commitments, such as the NDCs, typically focus on discrete issues like climate targets, the SAP 2019-2023 encompass a broader spectrum. This holistic approach reflects the interdependent nature of environmental, economic, and cultural dimensions within the country.

Robin Wall Kimmerer, in her seminal work ‘Braiding Sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants’ (2013), presents a profound and thought-provoking perspective on the relationship between humans and the natural world⁴¹¹. R. W. Kimmerer challenges the conventional dichotomy that places human exploitation of natural resources in opposition to conservation. Instead, the author argues that thoughtful and respectful human use of natural resources can, in fact, be an integral part of conservation and the broader cycles of nature. Drawing from her background as a scientist and member of the Citizen Potawatomi Nation⁴¹² R. W. Kimmerer illustrates that human interactions with the environment, when conducted with reciprocity and mindfulness, can enhance and sustain ecological systems rather than deplete them. The author reframes the concept of exploitation, suggesting that it typically used to be synonymous with harm or degradation but can instead reflect a more harmonious engagement that helps maintain the balance and resilience of ecosystems. R. W. Kimmerer’s argument stems from an understanding of the interconnectedness of all living systems, where human activity is not separate from nature but inherently embedded within it. By participating in natural processes, whatever through harvesting, cultivating, or stewarding, humans contribute to the cycles of regeneration and renewal that define healthy ecosystems. Additionally, this perspective invites a shift away from viewing conservation as merely the preservation of untouched wilderness and toward recognizing the active role humans can play in fostering biodiversity and ecological stability. For example, the author highlights practices such as sustainable harvesting and traditional ecological knowledge, which embody a respectful give-and-take relationship with nature. These practices demonstrate that human engagement, guided by principles of care and reciprocity, can serve as a form of conservation that allows nature to thrive. In

⁴¹¹ Robin Wall Kimmerer, *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants* (Milkweed Editions 2013)

⁴¹² Potawatomi are native American people of the Great Lakes Region.

this view, human exploitation is not an external or disruptive force but a natural and even necessary component of life cycles that helps ecosystems achieve and maintain balance.

Māori perspectives in Aotearoa/New Zealand embody a similar holistic worldview, where the symbiotic relationship between humans, nature, and the spiritual world is central to their understanding of well-being. Māori customary knowledge emphasizes the interconnectedness of natural environments, heritage, human resources, and ocean ecosystems, rejecting the idea of human dominance over nature. Instead, it integrates these elements as equally important parts of a cohesive system⁴¹³. As Loomis (2000) argues, the segmentation of services such as health, education, and economic development by bureaucrats and development planners has caused fragmentation at the tribal and community levels, wasting resources and undermining holistic progress. Tribes and local communities recognize that sustainable development requires integrating employment, environmental conservation, culture, and social institutions rather than addressing them separately. Loomis highlights that achieving sustainability demands a fundamental shift from fragmented approaches to one that reintegrates economy, society, and ecology creatively⁴¹⁴.

The Maldivian perspective aligns with these Indigenous approaches though the concept of *Jazeera Dhirilhun*, rejecting the strict divisions found in conventional institutional framework. The SAP 2019-2023 embodies this approach, weaving together social progress, infrastructure development for community well-being, the blue economy, and sustainable practices. It highlights the necessity of unified policy frameworks that address interconnected challenges.

Saint Lucia, a SIDS in the Caribbean, offers a practical example of how integrated climate policy structures can work effectively. The country's National Adaptation Plan 2018–2028 established a National Climate Change Committee comprising representatives from various ministries and sectors, including agriculture, health, education, tourism, and infrastructure. This institutional

⁴¹³ T M LOOMIS, 'Indigenous Populations and Sustainable Development: Building on Indigenous Approaches to Holistic, Self-Determined Development' (2000) 28(5) *World Development* 898.

⁴¹⁴ *Ibid.* 902. See also K POLANYI, *The Great Transformation – The Political and Economic Origins of Our Time* (Beacon Press 1957).

framework fosters collaboration across diverse interests, illustrating how an island State can navigate complex, intersecting challenges through coordinated governance⁴¹⁵.

Nonetheless, the development and implementation of collaborative policy frameworks may yield long-term cost efficiencies for the public treasury. This is particularly salient for SIDS, which operate under severe and often compounding economic constraints. These include acute vulnerability to global market fluctuations, persistent food and energy insecurity, and unsustainably high levels of national debt. Moreover, many developing countries experience entrenched poverty and socio-economic inequality, further exacerbated by the disproportionate impacts of climate change and a persistent deficit in international financial assistance⁴¹⁶.

The economic constraints facing the Maldives have played a pivotal role in shaping the policy priorities of the current administration under President Mohamed Muizzu, who assumed office in 2023. In a marked departure from the sustainability-oriented development model advanced under former President Ibrahim Mohamed Solih (2018–2023), the current administration has abandoned the *Jazeera Dhirilhun* framework, viewing it primarily as a political manifesto of the preceding government rather than a binding or institutionalised development paradigm. Under the present administration, there has been a discernible shift toward an economic growth-centric model, characterised by a reduced emphasis on interdisciplinary frameworks. This reorientation is evident in the launch of several targeted SAPs, notably the Maldives Creative Economic Strategic Action Plan 2024–2028⁴¹⁷, and the Strategic Action Plan 2024–2028 of the Privatization and Corporatization Board⁴¹⁸. These instruments place significant focus on enhancing the performance and governance of State-Owned Enterprises as a means of bolstering economic productivity.

⁴¹⁵ DEPARTMENT OF SUSTAINABLE DEVELOPMENT, Ministry of Education, Government of Saint Lucia, Innovation, Gender Relations and Sustainable Development, Saint Lucia's National Adaptation Plan (NAP): 2018–2028 (2018) 206.

⁴¹⁶ C KLÖCK, H DEBELTS and M FINK, 'Conference report: 'Dealing with Climate Change on Small Islands– Towards Effective and Sustainable Adaptation?'' (2019) 51 *Pacific Geographies* 23.

⁴¹⁷ MINISTRY OF ECONOMY DEVELOPMENT & TRADE, Republic of Maldives, *Maldives Creative Economy Strategic Action Plan 2024-2028* (2024).

⁴¹⁸ PRIVATIZATION AND CORPORATION BOARD, Republic of Maldives, *Strategic Action Plan 2024-2028* (2024).

While it may be premature to definitively assess the long-term developmental orientation of the administration of President Mohamed Muizzu (elected in 2023), early policy signals suggest a departure from the interdisciplinary and sustainability-centred model previously articulated under President Ibrahim Mohamed Solih (2018–2023). Although the full implications of this shift remain to be seen, the NDC of 2025 under the Paris Agreement already provides an initial indicator of reduced ambition.

3.4 Ecosystem restoration as a pillar of climate change mitigation and ocean governance

The IPCC has emphasized the importance of ecosystem restoration as a core component of climate mitigation options within its most recent assessments. The IPCC AR6, particularly the contributions of Working Group II - Impacts, Adaptation, and Vulnerability, underscores the critical role of restoration, together with conservation and protection, in supporting biodiversity, and facilitating climate-resilient development pathways⁴¹⁹.

This recognition has increasingly been reflected in environmental governance, which acknowledges the significant function of nature restoration in achieving biodiversity conservation, emissions reduction objectives, and protection of coastal communities⁴²⁰. At its thirteen meeting in 2016, the COP to the CBD articulated, for the first time, a legal definition of ecosystem restoration.

the process of managing or assisting the recovery of an ecosystem that has been degraded, damaged or destroyed as a means of sustaining ecosystem resilience and conserving biodiversity. Degradation is characterized by a decline or loss of bio-diversity or ecosystem

⁴¹⁹ IPCC, 'Summary for Policymakers' in Core Writing Team, H Lee and J Romero (eds), *Climate Change 2023: Synthesis Report* (IPCC 2023) 29.

⁴²⁰ R P SAPKOTA, P D STAHL and K RIJAL, 'Restoration governance: An integrated approach towards sustainably restoring degraded ecosystems' (2018) 27 *Environmental Development* 83.

functions. Degradation and restoration are context-specific and refer to both the state of ecosystems and to ecosystem processes.⁴²¹

Notably, the definition adopts a functional approach, as it does not limit restoration solely to visibly degraded habitats, but also extends its scope to ecosystems that have lost their capacity to perform essential ecological functions and deliver key services.

In 2022, the Kunming-Montreal Global Biodiversity Framework articulates ambitious and measurable objectives for the protection and restoration of biodiversity across terrestrial, freshwater, and marine environments. Of relevance are Goal A and Target 2. Goal A aims to ‘maintain, enhance, or restore the integrity, connectivity, and resilience of all ecosystems, substantially increasing the area of natural ecosystems by 2050’. Meanwhile, Target 2 provides that ‘by 2030, at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity, and connectivity’.

The legal definition and subsequent objectives reflect a growing international consensus on ecosystem restoration as an essential pillar of environmental governance.

In the umbrella of the law of the sea, neither UNCLOS nor the United Nations Fish Stocks Agreement contain explicit references to ecosystem restoration. While both instruments establish important obligations for the protection and preservation of the marine environment and sustainable use of marine resources, the concept of ecosystem restoration is not expressly articulated within their provisions.

This lacuna has begun to be addressed through the development of subsequent legal instruments and jurisprudential advancements. Notably, the BBNJ Agreement, adopted in 2023 and about to enter into force, marks an evolution by including restoration as an objective within its framework for ABMTs⁴²².

⁴²¹ CBD COP, *Decision XIII/5, Ecosystem restoration: short-term action plan* (10 December 2016), CBD/COP/DEC/XIII/5.

⁴²² BBNJ Agreement art 17.

Of particular legal relevance, recent jurisprudence has recognized ecosystem restoration as a legal obligation incumbent upon States. In the Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law, ITLOS provided a comprehensive interpretation of Article 192 of UNCLOS, which establishes a general and binding obligation upon all Parties to protect and preserve the marine environment. ITLOS recognized that this obligation is applicable across all marine spaces, including areas beyond national jurisdiction, and extends to all forms of marine environmental degradation, including those resulting from anthropogenic climate change. Further, the obligation under Article 192 encompasses not only the prevention of environmental harm, but also the restoration of marine ecosystems that have already sustained damage or degradation. Specifically, ITLOS emphasized that climate change poses serious and potentially irreversible harm to marine ecosystems, necessitating a heightened standard of due diligence on the part of States⁴²³. This includes specific duties to protect and restore rare or fragile ecosystems, as well as the habitats of depleted, threatened, or endangered species, particularly in light of the compounded threats posed by climate change and ocean acidification⁴²⁴.

The Advisory Opinion of ITLOS sustains that the restoration of marine ecosystems is no longer a policy discretion but rather constitutes a substantive legal obligation incumbent upon Parties under Article 192 of UNCLOS. This development situates restoration as an integral element of the duty to protect and preserve the marine environment, particularly in the context of climate-induced degradation.

Now that ecosystem restoration has been recognized as a legal obligation, it is essential to clarify what the concept entails in operational terms. The definition of ecosystem restoration provided under the framework of the CBD represents a foundational step in formalizing the conceptual contours of what is, by nature, a complex and multifaceted conservation process. Ecosystem restoration measures are diverse and vary according to the specific habitat type, the ecosystem service or

⁴²³ Advisory Opinion, ITLOS Case No 31 (n. 362) 133.

⁴²⁴ Advisory Opinion, ITLOS Case No 31 (n. 362) 136.

function targeted for restoration, and the socio-economic context in which the restoration takes place. International and regional institutions have developed more refined and operational definitions, incorporating distinctions between active and passive restoration processes. Among the most influential is the definition advanced by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) which defines restoration as:

Any intentional activity that initiates or accelerates the recovery of an ecosystem from a degraded state. Active restoration includes a range of human interventions aimed at influencing and accelerating natural successional processes to recover biodiversity and ecosystem service provision. Passive restoration includes reliance primarily on natural processes of ecological succession to restore degraded ecosystems but may include measures to protect a site from processes that currently prevent natural recovery (e.g. protection of degraded forests from overgrazing by livestock or unintentional human-induced fire).⁴²⁵

The IPBES articulates the gradations of human involvement in restoration efforts. Active restoration involves direct human interventions designed to expedite the recovery of the ecosystem, whereas passive restoration includes measures, such as the removal of anthropogenic pressures, to allow natural regeneration recovery times.

At the regional level, the EU Nature Restoration Law⁴²⁶ offers a definition that further contextualizes restoration within the framework of biodiversity conservation and resilience-building. According to Article 3(3) of the EU Nature Restoration Law:

‘restoration’ means the process of actively or passively assisting the recovery of an ecosystem in order to improve its structure and functions, with the aim of conserving or enhancing biodiversity and ecosystem resilience, through improving an area of a habitat type to good condition, re-establishing favourable reference area, and improving a habitat of a species to sufficient quality and quantity in accordance with Article 4(1), (2) and (3) and Article 5(1), (2) and (3), and meeting the targets and fulfilling the obligations under

⁴²⁵ IPBES, ‘Glossary: Restoration’ <https://www.ipbes.net/glossary-tag/restoration#:~:text=Any%20intentional%20activity%20that%20initiates,recover%20biodiversity%20ecosystem%20service%20provision> accessed 24 July 2025.

⁴²⁶ Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869, OJ L, 2024/1991.

Articles 8 to 12, including reaching satisfactory levels for the indicators referred to in Articles 8 to 12.

The EU's definition is marked by its normative precision and its alignment with quantifiable ecological targets. It embeds restoration within a broader legal architecture of designated habitat types, species conservation, and measurable ecosystem resilience, thereby transforming restoration from a discretionary ecological activity into a mandatory policy instrument.

In scientific terms, active and passive restoration encompass a range of methods and techniques aimed at conserving biodiversity. Passive restoration is the natural recovery of an ecosystem after removing the sources of disturbance or pressure. Ecologically representative and well-connected networks of MPAs and OECMs integrated into wider seascapes may be the most common passive restoration approach⁴²⁷. *De facto*, as outlined by the European Commission, restored areas can contribute towards the EU target on protected areas⁴²⁸.

Another practice of passive restoration may occur in areas closed to bottom-contact fishing gears compelling benthic habitats. For example, in the Mediterranean Sea, the General Fisheries Commission for the Mediterranean (GFCM) has established Fisheries Restricted Areas (FRAs), where specific fishing activities are temporarily or permanently banned or restricted to enhance the conservation of targeted stocks as well as deep-sea benthic habitats⁴²⁹.

Furthermore, passive restoration would also involve limiting the nutrient loads from land-based areas leading to improved water quality⁴³⁰. Within the legal framework of a Site of National Interest, the Italian Falconara Marittima Site in the Mediterranean Sea demonstrates that the cessation of anthropogenic activities, following the decommissioning of an industrial chemical plant, enabled the natural recovery of a historically contaminated coastal ecosystem. The findings underscore

⁴²⁷ ICES, *Workshop on Nature Restoration and Recovery (WKREST)* (ICES Scientific Reports 7:46, 2025) 6.

⁴²⁸ EUROPEAN COMMISSION, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions – The European Green Deal*, COM/2019/640 final (11 December 2019).

⁴²⁹ GFCM, *Resolution GFCM/37/2013/1 on area based management of fisheries, including through the establishment of Fisheries Restricted Areas (FRAs) in the GFCM convention area and coordination with the UNEP-MAP initiatives on the establishment of SPAMIs* (2013).

⁴³⁰ ICES (n. 427) 6.

that, in the absence of human intervention, ecological conditions can return to reference levels, thereby supporting the role of passive restoration as a viable and legally relevant approach to environmental remediation and marine ecosystem resilience⁴³¹.

For certain ecosystems, such as coral reefs, natural recovery remains limited or unlikely, even following the implementation of passive restoration measures, thereby necessitating targeted active human intervention⁴³². Active restoration of coral reefs typically involves direct transplantation of coral fragments on the reef, coral gardening, larval propagation and the use of artificial structures with planted corals⁴³³. These interventions are designed to accelerate recovery and rebuild ecological functions that would otherwise remain impaired. However, for active restoration efforts to be effective and sustainable, they must be integrated within a broader framework of proactive conservation measures - or passive restoration - such as emission reductions to mitigate climate change impacts, no-take MPAs, fisheries regulation, waste and water quality management, and afforestation for erosion management. Furthermore, stakeholder engagement and the promotion of socio-economic benefits for local communities are essential to ensuring long-term success and equity in restoration outcomes⁴³⁴.

From a policy perspective, passive restoration is often supported by area-based management tools, such as MPAs and OECMs, which confer formal spatial protection. In contrast, active restoration projects, despite their ecological significance, are not currently recognized as area-based management tools under international or regional legal frameworks and thus do not benefit from the same spatial protection status. This legal disconnect underscores the need for the development of integrated regulatory approaches that explicitly incorporate active restoration within broader marine spatial planning and conservation regimes.

⁴³¹ E FANELLI et al., 'Positive effects of two decades of passive ecological restoration in a historically polluted marine site' (2023) 10 *Frontiers in Marine Science*.

⁴³² B RINKEVICH, 'Conservation of Coral Reefs through Active Restoration Measures: Recent Approaches and Last Decade Progress' (2005) 39 *Environmental Science & Technology* 4333.

⁴³³ M Y HEIN et al., *Coral Reef Restoration as a strategy to improve ecosystem services – A guide to coral restoration methods* (UNEP 2020) 10.

⁴³⁴ *Ibid.* 23.

3.4.1 The necessity of legal area-based measures for active restoration of tropical coral reefs

The impetus for ecosystem restoration has markedly accelerated in recent years, a momentum significantly catalysed by both binding legal instruments and aspirational non-binding commitments aimed at fostering restoration of marine ecosystems and enhancing ecological integrity and connectivity. As discussed in the previous chapter, foremost among the binding obligations are those stemming from the law of the sea and the CBD. These foundational legal instruments are robustly complemented by comprehensive global policy initiatives, notably the SDGs, with emphasis on SDG 14 (Life below water), the United Nations Decade on Ecosystem Restoration (2021-2030), and the Kunming-Montreal Global Biodiversity Framework.

In the context of coral reef restoration, the International Coral Reef Initiative (ICRI), while not a treaty-based body, has played a significant role in shaping international discourse and action. Although it does not adopt legally binding decisions, ICRI's resolutions, supported by acknowledgments in United Nations General Assembly resolutions, have significantly influenced the development and implementation of coral reef restoration policies and practices worldwide⁴³⁵.

Coral reefs provide indispensable ecosystem services to over one billion people, particularly vulnerable coastal populations. These benefits encompass food security, sustainable fisheries, tourism-derived income, biomedical resources, coastal protection from extreme weather events, and invaluable cultural heritage. The estimated annual global value of these ecosystem services is approximately United States dollar 9.9 trillion per year⁴³⁶. However, coral reef systems are experiencing rapid degradation. Large-scale coral bleaching events represent the most significant and widespread disturbance affecting coral reef ecosystems globally. The first recorded global bleaching event in 1998 alone resulted in the loss

⁴³⁵ UNITED NATIONS GENERAL ASSEMBLY 2024 (n. 34) para. 277.

⁴³⁶ R COSTANZA et al., 'Changes in the global value of ecosystem services' (2014) 26(1) Global Environmental Change 152.

of approximately 80 per cent of the global coral cover, equating to an estimated 6,500 square kilometres of coral mortality with the most severe impacts were recorded in the Indian Ocean, Japan, and the Caribbean⁴³⁷. Subsequent global bleaching events were recorded in 2010 and from 2014 to 2017, contributing to a continued decline in coral cover⁴³⁸. Since 2009 to 2018, approximately 14 per cent of coral cover has been lost globally⁴³⁹. Most recently, on 15 April 2024, the United States' National Oceanic and Atmospheric Administration (NOAA) and the ICRI officially confirmed the onset of the fourth global coral bleaching event, which began in the Caribbean during the Northern Hemisphere summer of 2023⁴⁴⁰.

Future projections paint an increasingly dire outlook. According to the IPCC, without urgent and coordinated global mitigation efforts, between 70 and 90 per cent of remaining coral reefs are projected to be lost by 2050 under a global warming scenario of 1.5°C above pre-industrial levels (high confidence). At 2°C of warming, the projected losses increase to over 99 per cent, with very high confidence, effectively signalling the near-total collapse of coral reef ecosystems under higher-emissions pathways⁴⁴¹.

In response to this crisis, the ICRI, in collaboration with the United Nations Climate Change High-level Champions and the Global Fund for Coral Reefs, and with the support of the Government of Sweden and the Principality of Monaco, has launched the Coral Reef Breakthrough. This initiative seeks to secure the long-term viability of at least 125,000 square kilometres of shallow-water tropical coral reefs through an investment framework of no less than United States dollar 12 billion by 2030. Its objective is to enhance the resilience and adaptive capacity of coral reef systems, thereby supporting the well-being of more than 500 million people who depend directly on these ecosystems⁴⁴². The Coral Reef Breakthrough articulates

⁴³⁷ D SOUTER et al. (eds), *Status of coral reefs of the world: 2020 report* (GCRMN and ICRI 2021)

⁴³⁸ J D REIMER et al., 'The fourth global coral bleaching event: where do we go from here?' (2024) 43(4) *Coral Reefs* 1121.

⁴³⁹ D SOUTER et al. (n. 437)

⁴⁴⁰ ICRI, 'NOAA and ICRI Confirm Fourth Global Coral Bleaching Event' (Press Release, 15 April 2024, Washington D.C.).

⁴⁴¹ IPCC, Summary for Policymakers. In: *Global Warming of 1.5°C: IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-Industrial Levels in Context of Strengthening Response to Climate Change, Sustainable Development, and Efforts to Eradicate Poverty* (2022) Cambridge University Press.

⁴⁴² ICRI, *Resolution on the Coral Reef Breakthrough* (ICRI 37th General Meeting, 2023).

science-based, measurable, and achievable targets for both State and non-State actors. Its strategic vision seeks to catalyse coordinated actions from a broad array of stakeholders, including Indigenous Peoples, coastal communities, national governments, public and private financial entities, scientific institutions, philanthropic organizations, and private sector actors⁴⁴³.

The initiative is structured around four core action pillars:

1. Mitigation of local drivers of degradation including land-based pollution sources.
2. Doubling the extent of coral reefs under effective protection through resilience-based conservation, aligned with Kunming-Montreal Global Biodiversity Framework's commitment on protecting 30 per cent of marine and coastal areas by 2030.
3. Scaling up innovative, climate-resilient restoration techniques aimed at rehabilitating at least 30 per cent of degraded reefs by 2030 in alignment with Target 2 of the Kunming-Montreal Global Biodiversity Framework.
4. Securing a minimum of United States dollar 12 billion in funding from both public and private sectors⁴⁴⁴.

According to estimates of the Global Coral Reef Monitoring Network, approximately 35,000 square kilometres of coral reef have been lost since 2009, implying that the restoration of at least 10,500 square kilometres would be necessary to meet Target 2 of the Kunming-Montreal Global Biodiversity Framework⁴⁴⁵. Despite the critical need, as of 2020, less than 1 square kilometre of coral reefs had been restored globally⁴⁴⁶. The challenge is not solely a matter of spatial scale; the temporal scope and sustainability of coral restoration efforts also present significant limitations. Most existing coral reef restoration projects are short-term in nature, with a median monitoring duration of only 12 months,

⁴⁴³ *Ibid.*

⁴⁴⁴ *Ibid.*

⁴⁴⁵ *Ibid.*; D SOUTER et al. (n. 437).

⁴⁴⁶ L BOSTRÖM-EINARSSON et al, 'Coral restoration – A systematic review of current methods, successes, failures and future directions' (2020) 15(1) PLoS ONE.

undermining their capacity to deliver durable ecological benefits or inform long-term adaptive management⁴⁴⁷.

In response to these challenges, the Coral Reef Breakthrough emphasizes a comprehensive and strategic approach to restoration. Reef restoration programmes should integrate proactive measures such as local stressor mitigation (e.g. minimize land-based pollution) and enhance coral resilience to thermal stress and other climate-related impacts (e.g. propagation of thermally tolerant coralligenous species). Moreover, foster meaningful engagement with all the stakeholders through participatory governance, capacity building and equitable benefit-sharing⁴⁴⁸.

Lastly, special attention must be given to supporting restoration in biodiversity-rich, low-income countries, where coral reefs are essential for ecological integrity and local livelihoods. This imperative is firmly grounded in the principles of international environmental law, including provisions under legally binding instruments such as UNCLOS and the CBD. These frameworks underscore the obligation of the international community, particularly developed States, to facilitate the fair and equitable transfer of knowledge, technology, and technical capacity to developing countries, thereby enabling inclusive and effective participation in the conservation and restoration of marine biodiversity⁴⁴⁹. This imperative is also affirmed in the ICJ Advisory Opinion on Obligations of States in respect of Climate Change (23 July 2025). The Court considered that in case of climate change harm from GHG emissions restitution can involve reconstructing damaged infrastructure and restoring ecosystems and biodiversity. This interpretation has particular relevance in the context of ocean acidification, which results from the absorption of atmospheric CO₂ by the oceans. The resulting decline in ocean pH contributes to the degradation of marine ecosystems, including phenomena such as coral reef bleaching. Accordingly, restitution in such cases may entail measures aimed at reversing or mitigating the acidification process and rehabilitating or restoring vulnerable marine habitats. The ICJ also emphasizes that States have a dual obligation to cooperate on climate change: under the Paris

⁴⁴⁷ *Ibid.*

⁴⁴⁸ ICRI (n. 442).

⁴⁴⁹ *Ibid.*

Agreement (specifically Article 7, 9, and 12) and under customary international law. These two forms of obligation are mutually reinforcing, with the customary duty to protect the environment strengthening the cooperation mandates found in the Paris Agreement. The Court clarifies that States have discretion in how they cooperate, provided they act in good faith and with due diligence. However, it identifies financial assistance, technology transfers, and capacity-building as the primary forms of cooperation outlined in the Paris Agreement.

Within this crucial domain, the Maldivian legal framework is principally anchored by the Environmental Protection and Preservation Act (Law No. 4/93) which serves as the foundational legal framework for the protection and preservation of the environment, encompassing marine ecosystems. Yet, the Environmental Protection and Preservation Act promulgated in 1993, notably omits explicit stipulations for the restoration of degraded ecosystems; nor does its subsequent amendment of 2014 introduce such restoration-related obligations or standards⁴⁵⁰. Notwithstanding this, it nonetheless incorporates provisions now regarded as passive restoration measures. Article 4, for instance, calls for the establishment of MPAs and natural reserves, while Articles 7 and 8 focus on the management of waste harmful to human health and the environment.

In 2007, the Ministry of Environment, Energy, and Water of the Maldives implemented the Environmental Impact Assessment Regulations to operationalize Law No. 4/93 and promote environmentally sound development through mitigation measures. The general provisions of these regulations define mitigation as measures aimed at avoiding and minimizing negative impacts, optimizing positive outcomes, and most critically, ‘rectifying the impact by repairing, rehabilitating or restoring the affected environment’⁴⁵¹. In 2012, these regulations were repealed and replaced by the Regulation on the Preparation of Environmental Impact Assessment Report, which provides detailed guidance on obtaining EIA approvals in the Maldives⁴⁵².

⁴⁵⁰ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of Maldives, *1st Amendment to Environment Protection and Preservation Act of Maldives* (1 January 2014).

⁴⁵¹ MINISTRY OF ENVIRONMENT, ENERGY AND WATER, Republic of Maldives, *Environmental Impact Assessment Regulations* (2007).

⁴⁵² MINISTRY OF HOUSING AND ENVIRONMENT, Republic of Maldives, *Regulation on the Preparation of Environmental Impact Assessment Report 2012* (2012) Regulation No 2012/R-27.

The most recent amendment to Law No. 4/93 introduced the Protected Areas Regulation, which establishes the framework for area-based conservation measures in the Maldives⁴⁵³. Under this regulation, the Environmental Protection Agency is tasked with implementing these measures on behalf of the Ministry of Environment. The Protected Areas Regulation adopts a classification system for protected areas in line with internationally recognized categories developed by the International Union for Conservation of Nature (IUCN), comprising seven distinct types of protected areas. Notably, Category VI: Habitat/Species Management Area is particularly relevant to marine ecosystem restoration, as it is specifically designed to protect key species and habitats with the aim to ‘maintain, conserve, and restore’ their ecological integrity, while also permitting environmentally sustainable economic activities within these areas⁴⁵⁴.

As of now, 31 protected areas in the Maldives - representing approximately 33 per cent of the designated protected areas - fall under Category VI. However, despite the existence of this regulatory mechanism, MPA coverage in the Maldives remains critically low. According to the World Database on Protected Areas (WDPA), as of the latest reporting, the total MPA coverage is less than one per cent of the country’s marine jurisdiction, amounting to only 531 square kilometres out of a total EEZ of approximately 923,881 square kilometres⁴⁵⁵. This illustrates a significant disparity between regulatory intent and spatial implementation, further underscoring the urgent need to expand and operationalize area-based management tools to meaningfully support coral reef conservation and restoration at scale.

The SAP 2019–2023 places significant emphasis on the conservation and sustainable management of marine ecosystems, recognising their foundational role in both environmental stability and national economic resilience. Within the Blue Economy sector, specifically under the sub-sector Fisheries and Marine Resources, Policy 2 articulates a clear objective to safeguard the integrity and ecological well-being of marine ecosystems, with particular attention to the protection and regeneration of coral reefs.

⁴⁵³ MINISTRY OF ENVIRONMENT, Republic of Maldives, *Protected Areas Regulation* (2018) Regulation No: 2018/R-78.

⁴⁵⁴ *Ibid.* art 6.

⁴⁵⁵ UNEP-WCMC, 'Protected Area Profile for Maldives from the World Database on Protected Areas'

Target 2.1 aims to monitor and publish the status of coral reef ecosystems across at least seven of the fifteen designated National Coral Reef Monitoring Sites by 2023. This target is supported by specific strategies and actions, such as expanding reef health assessment, rehabilitation, and restoration efforts.

The Maldives began the National Coral Reef Monitoring Programme in 1998 following the mass bleaching event⁴⁵⁶. The Programme is governed, financed and implemented by Maldives Marine Research Institute. As part of this Program sixteen sites from six atolls were established as long-term monitoring sites. Additional sites and atolls were included over the years and by the end of 2021, thirty-one sites from the atolls Haa Dhaal, Noonu, Raa, Baa, Lhaviyani, Kaafu, Alif Alif, Gaaf Alif and Addu (Seenu) have been selected for long term monitoring in the National Coral Reef Monitoring program as reported by the Maldives to the ICRI in 2023⁴⁵⁷. The model showed coral cover declines matched with stress events such as minor and major bleaching, with varying magnitudes of decline observed for each event. Following each stress episode, overall, the reefs showed capacity for recovery at a national scale⁴⁵⁸.

In 2019, the Maldives has established a National Coral Reef Restoration and Rehabilitation Program to develop coral restoration techniques throughout the country. According to the ICRI Maldives' report of 2023, at a small scale, fragmentation-based restoration is the most common method employed in the country. These projects often led by resort marine biologists are short lived and poorly monitored partially due to high turnover of resort staff and partially because some projects function as means of making money. In a concerted effort to counteract these inconsistencies and to foster more systematic monitoring and knowledge exchange across the archipelago, a dedicated coral reef restoration

⁴⁵⁶ H ZAHIR, I ABID and A RASHEED, 'Status of the Coral Reefs of Maldives: recovery since 1998 mass bleaching and the impacts of the Indian Ocean tsunami 2004' in D SOUTER and O LINDÉN (eds), *Coral reef degradation in the Indian Ocean* (CORDIO 2005) 109.

⁴⁵⁷ ICRI, *Maldives' Report to the 37th Meeting* (19-23 September 2023, Hawaii, United States).

⁴⁵⁸ H AMIR, *Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives 1998-2021* (Maldives Marine Research Institute 2022).

monitoring manual has been developed by the MaRHE Center and Maldives Marine Research Institute⁴⁵⁹.

Despite the articulation of broad policy-level commitments to environmental protection at the national level, the Maldives currently lacks strong binding legal obligations specifically addressing ecosystem restoration. In addition, no explicit legal protections exist for coral reef restoration projects implemented outside of the few formally designated MPAs, rendering such initiatives susceptible to regulatory uncertainty and potential conflicts with coastal development activities. As a result, the majority of restoration interventions in the Maldives are concentrated around resort islands for touristic purposes where the availability of financial and technical resources enables their implementation.

A significant exception to this trend is the active restoration project at Villimalé Island in North Malé Atoll. Villimalé is the last island in the Greater Malé Area that still has three natural beaches, making it a popular recreational spot for locals, especially on weekends and holidays. However, with nearly half of the Maldivian population living in the Greater Malé Area, the coastal waters around Villimalé face severe degradation from organic waste and chemical pollutants⁴⁶⁰. Unfortunately, the effectiveness of coral restoration activities at this site has been greatly undermined by the poor water quality and a lack of proactive, site-specific mitigation measures, such as controlling land-based pollution. This case clearly underscores the urgent need for integrated restoration planning. Such planning must include proactive strategies like reducing human-induced stress and implementing effective area-based management tools.

Granting OECM status to restoration sites presents a strategic solution, providing both robust area-based legal protection to restoration activities, and concurrently facilitating comprehensive marine spatial planning. In 2018, the Parties to the CBD agreed on the definition of OECM as a

geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of

⁴⁵⁹ S MONTANO, F SIENA and F H AMIR, *Coral Reef Restoration Monitoring Manual-Maldives* (University of Milano-Bicocca 2022).

⁴⁶⁰ I PANCRAZI et al., 'Active coral restoration to preserve the biodiversity of a highly impacted reef in the Maldives' (2023) 15(9) *Diversity* 1022.

biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socio-economic, and other locally relevant values⁴⁶¹.

While MPAs are established exclusively for conservation purposes, OECMs, while indirectly contributing to in-situ conservation, may be adopted also for other objectives comprising a broader concept. OECMs may be adopted for protecting cultural, spiritual, socio-economic and/or other relevant values, and secondarily contribute to the conservation of the environment.

The approach of OECM status to restoration sites has been already piloted in terrestrial sites, such as the Geombongsan National Recreational Forest in South Korea. although the site is not subject to formal legal protection, it underwent significant ecological restoration following a catastrophic wildfire in 2000⁴⁶². Managed by the Korea Forest Service, the site now supports rare and endemic species, provides forest-based educational programs, and features a form of participatory governance through engagement with local councils. Using site-level OECM evaluation criteria developed by the National Institute of Forest Science and the Korea National Arboretum, Geombongsan was assessed and found to meet the essential requirements of biodiversity significance, clearly defined boundaries, appropriate governance, and long-term sustainability potential⁴⁶³. These nationally tailored criteria exhibit a high degree of alignment with international standards on OECMs and demonstrate adaptability for application in marine ecosystems

The transposition of such insights to coral reef restoration initiatives in the Maldives presents considerable legal and practical advantages. Notably, the formal establishment of OECMs in restoration contexts could significantly enhance the financial feasibility and appeal of coral reef projects by affording heightened regulatory certainty and increased institutional recognition, both of which constitute critical considerations for investment by public and private actors. Furthermore, OECMs are predicated upon clearly delineated spatial boundaries, the implementation of enduring management frameworks, and governance structures

⁴⁶¹ CBD COP (n. 271).

⁴⁶² Y-J SHIM et al., 'Study on the Potential Identification of OECM in Ecological Restoration Sites-Focusing on National Geombongsan Natural Recreational Forest' (2025) 28(2) Journal of the Korean Society of Environmental Restoration Technology 25.

⁴⁶³ *Ibid.*

that inclusively engage local stakeholders. Consequently, the designation of restoration sites in the Maldives as OECMs could function as a paradigmatic practice of integrated conservation finance and adaptive governance. This, in turn, would facilitate the advancement of national marine conservation objectives whilst concurrently expediting the fulfilment of international biodiversity commitments. In particular, the establishment of OECMs for restoration sites directly supports Targets 2 and 3 of the Kunming-Montreal Global Biodiversity Framework, which mandate the effective protection of at least 30 per cent of marine and coastal areas, and the restoration of no less than 30 per cent of degraded ecosystems, respectively. Accordingly, the adoption of OECMs constitutes a strategically sound and scalable mechanism to secure the conservation and rehabilitation of vulnerable coral reef ecosystems in conformity with extant global environmental governance regimes.

3.4.2 First assessment of the coral reef restoration project conducted by the MaRHE Center for recognition as an OECM in the Maldives

The MaRHE Center, an outpost of the University of Milano-Bicocca located in Magoodhoo, Faafu Atoll, has actively contributed to environmental conservation, scientific research, and education in the Maldives since its inauguration in 2009⁴⁶⁴. In particular, the MaRHE Center has been a regional leader in coral reef restoration, contributing both to scientific understanding and to local community engagement in conservation efforts⁴⁶⁵.

In accordance with the CBD criteria, the coral reef restoration site managed by the MaRHE Center may be considered to fulfil the requirements for recognition as an OECM. The following assessment evaluates the extent to which the activities of the MaRHE Center are consistent with the four CBD criteria for OECMs.

⁴⁶⁴ MaRHE, 'Publications' <https://marhe.unimib.it/publications/> accessed 24 July 2025.

⁴⁶⁵ MaRHE, 'About MaRHE: Introduction' <https://marhe.unimib.it/about-marhe/introduction/> accessed 24 July 2025.

Recent publications I DEHNERT et al., 'Exploring the performance of mid-water lagoon nurseries for coral restoration in the Maldives' (2022) 30 Restoration Ecology; MONTANO et al. (n. 459).

3.4.2.1 Criterion A: The area is not currently recognized as a protected area

The marine area surrounding Magoodhoo Island, where the MaRHE Center conducts its coral restoration project, is not listed among the Maldives officially recognized MPAs. According to the Protected Area database of the Government of the Maldives, the only designated MPA in Faafu Atoll is Filithayo Kandu, situated away from the operational zone of MaRHE Center⁴⁶⁶. Thus, the area in question satisfies Criterion A by being outside the jurisdiction of formal protection, yet actively contributes to conservation outcomes.

3.4.2.2 Criterion B: The area is governed and managed (geographically defined space, legitimate governance authorities, and managed)

In line with the Decentralization of the Administration Divisions of the Maldives Act (Act No. 7/2010), governance at the atoll and island levels support environmental management. These local administrative structures, along with national institutions such as the Ministry of Fisheries and the Environmental Protection Agency, provide a framework for governance and permit authorization⁴⁶⁷.

Although there is no currently established geographically defined boundary for the restoration area, the MaRHE Center operates under formal agreements with the Government of the Maldives, including a Memorandum of Understanding (MoU) signed in 2022 with the Ministry of Environment, Climate Change, and Technology⁴⁶⁸. This agreement focuses on innovation in conservation practices across key central Maldivian atolls. Furthermore, the MaRHE Center, in partnership

⁴⁶⁶ MINISTRY OF ENVIRONMENT, Republic of the Maldives, 'Filithayo Kandu' (Protected Area Profile) <https://protectedareas.environment.gov.mv/en/protected-areas/filithayo-kandu> accessed 24 July 2025.

⁴⁶⁷ *Noo Raajje Legal & Policy Framework Assessment Report* (2021) 14.

⁴⁶⁸ *Memorandum of Understanding between the Ministry of Environment, Climate Change and Technology of the Maldives and University of Milano-Bicocca on Cooperation and Coordination to Undertake Ecological and Socio-Economic Assessments of Existing Protected Areas and Potential Protected Areas in the Maldives* (Lisbon, 28 June 2022).

with the Maldives Marine Research Institute, has developed a Coral Reef Restoration Monitoring Manual, offering a standardized monitoring protocol for national use and broader audience⁴⁶⁹.

Given its recognized technical capacity and long-standing engagement in marine research and conservation, the MaRHE Center may be considered a *de facto* deputy manager of the site, operating with both scientific legitimacy and operational competence. This role is comparable to other academic-led OECMs, such as the Wits Rural Facility in South Africa. Managed by the University of the Witwatersrand, the Wits Rural Facility encompasses 350 hectares within a designated Key Biodiversity Area and serves primarily as a site for academic research and education. Importantly, cultural values, such as the protection of ancestral grave sites, are also integrated into the management framework⁴⁷⁰.

This model demonstrates that academic institutions can act as legitimate governance authorities for OECMs, provided they ensure sustained *in situ* conservation. By analogy, the MaRHE Center, through its integrated approach combining scientific research, local community engagement, and active ecosystem management, can be considered a qualified deputy manager of a potential OECM in the Maldives. Such a designation would reflect both the operational reality of the research centre and its alignment with international OECM governance criteria.

3.4.2.3 Criterion C: The area achieves sustained and effective *in situ* conservation biodiversity

The methodology of the MaRHE Center to coral reef restoration is guided by evidence-based strategies, ecosystem-based approach, and potential long-term monitoring. While peer-reviewed mid- or long-term impact studies are not still available, the Coral Reef Restoration Monitoring Manual reflects a strong commitment to conservation outcomes. This manual provides a detailed framework for implementing ecologically sound and resilient restoration projects, structured

⁴⁶⁹ S MONTANO et al. (n. 459).

⁴⁷⁰ H D JONAS, P WOOD and S WOODLEY (eds), *Guidance on other effective area-based conservation measures (OECMs)* (IUCN WCPA Good Practice Series No 36, IUCN 2024) 13.

around four principal phases: planning, execution, monitoring, and communication⁴⁷¹.

Restoration activities begin with baseline ecological assessments to determine site suitability and ecological conditions prior to any intervention. These are followed by continuous monitoring of coral health, the performance of coral nurseries, and broader ecological interactions. The approach pays particular attention to the role of interspecies relationships, including beneficial associations between corals and certain invertebrates, such as hydrozoans of the genus *Zanclaea* and symbiotic shrimps like *Alpheus spp*, which are known to enhance coral resilience⁴⁷².

Moreover, the MaRHE Center's methodology explicitly accounts for medium- and long-term ecological changes, reinforcing the importance of sustained monitoring over multi-year timeframes. The Center also promotes stakeholder engagement as a means to enhance the scalability, social legitimacy, and long-term sustainability of restoration efforts⁴⁷³. Collectively, these practices fulfil Criterion C by ensuring that coral restoration projects produce measurable, sustained, and site-based conservation outcomes.

3.4.2.4 Criterion D: The area supports associated ecosystem functions, services, and locally relevant values

The initiatives of the MaRHE Center incorporate socio-economic and cultural dimensions as integral components of their research studies, thereby fulfilling Criterion D of the CBD framework. Beyond ecological outcomes, the MaRHE Center activities contribute to the enhancement of local livelihoods, the promotion of environmental education, the strengthening of climate resilience, and the empowerment of local communities. These broader benefits reflect a comprehensive understanding of ecosystem services and locally relevant values.

⁴⁷¹ S MONTANO et al. (n. 459).

⁴⁷² *Ibid.*

⁴⁷³ *Ibid.*

A central aspect of this contribution is the engagement of local stakeholders, including schools and community groups, through initiatives such as the Playing with Solar project. This initiative integrates environmental education with the principles of sustainable development and aligns with the competencies outlined in the Maldives National Curriculum Framework. It exemplifies a transformative pedagogical approach that fosters environmental awareness and active community participation⁴⁷⁴.

In addition, the MaRHE Center conducts ongoing research on community responses to environmental change, with particular attention to gendered knowledge systems and the functioning of local waste management practices. These studies underscore the Center's commitment to understanding and supporting the socio-cultural context in which conservation activities occur⁴⁷⁵.

The Center also incorporates socio-economic indicators into its monitoring manual framework, including reef-user satisfaction, outreach effectiveness, and financial sustainability. These metrics facilitate an evaluation of how ecosystem service benefits translate into improved human well-being, community support, and long-term viability of restoration efforts. Furthermore, the direct involvement of tourists, volunteers, local institutions, and schoolchildren in restoration activities serves to enhance public awareness, foster a sense of stewardship, and embed conservation within the social fabric of the community⁴⁷⁶.

Through these multidimensional contributions, the potential area associated with the MaRHE Center's restoration activities could support vital ecosystem functions and services, while also reflecting and reinforcing the cultural, educational, and socio-economic values of the local context, in accordance with Criterion D for the recognition of OECMs.

⁴⁷⁴ R DI BIASE, S MALATESTA and M SCHMIDT DI FRIEDBERG, 'Promoting education for sustainable development in the Maldives: Exploring the link between theory and practice' (2022) 52 *Prospects* 529.

⁴⁷⁵ S MALATESTA and M SCHMIDT DI FRIEDBERG, 'Environmental policy and climate change vulnerability in the Maldives: From the 'lexicon of risk' to social response to change' (2017) 12(1) *Island Studies Journal* 53; M SCHMIDT DI FRIEDBERG and S MALATESTA, 'La risposta sociale al cambiamento. Il ruolo delle donne in una comunità insulare: il caso di Faaf Magoodhoo (Rep. Maldives)' (2017) 53 *Geotema*.

⁴⁷⁶ S MONTANO et al. (n. 459).

3.4.2.5 Conclusion: Advancing OECM Designation for MaRHE Center Site

In light of the foregoing analysis, the coral reef restoration site managed and monitored by the MaRHE Center may be considered as meeting the CBD criteria for recognition as an OECM. Although not included within the national network of formally designated protected areas, the site demonstrates effective and legitimate management, delivers scientifically grounded and sustainable biodiversity outcomes, and supports a range of ecosystem services and locally relevant socio-cultural values. Recognition of this site as an OECM would not only affirm the conservation value of academic-led initiatives but would also contribute meaningfully to the Maldives' national and international biodiversity and climate resilience commitments.

It is therefore recommended that the potential marine area surrounding Magoodhoo Island, under the management of the MaRHE Center, be formally assessed, geographically delineated, and mapped as a candidate site for OECM designation. This process should be carried out in coordination with the competent Maldivian authorities and relevant local governance structures to ensure legal and institutional alignment.

At present, Maldivian national legislation permits the designation of OECMs only in areas leased for tourism operations⁴⁷⁷. Accordingly, to date, only two tourism-operated sites - Huravalhi Island and Six Senses Laamu - have submitted proposals for recognition as OECMs. While the MaRHE Center is not a tourism operator, its activities nonetheless fulfil the substantive criteria established under both the CBD framework and existing national guidelines. This indicates a need for the development of a more inclusive regulatory framework that allows for the recognition of OECMs beyond the tourism sector, including research and educational institutions.

Further analysis is required to define the precise geographic coordinates of the restoration site, and peer-reviewed publications assessing the ecological

⁴⁷⁷ MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND TECHNOLOGY, Republic of Maldives, *Guideline for Recognising Areas as Other Effective Area-based Conservation Measures (OECMs) in Areas Leased for Tourism Operations* (2022).

outcomes of the restoration activities are currently absent. Notwithstanding these gaps, the existing structure, monitoring protocols, and demonstrated conservation intent strongly support the eligibility of the MaRHE Center's site for future OECM designation, pending formal evaluation and regulatory adjustments.

4 Governance and Legal Foundations for MPAs in the Maldives: Toward a Representative Network in the Central Atolls

4.1 Introduction

First you have to know that you have a problem [...] and with knowing comes caring and with caring there is hope that we can find an enduring place for ourselves within the natural system that supports us. But first, we have to know.

Sylvia Earle, oceanographer

The marine ecosystems of the Maldives, characterized by extensive coral reef systems, are confronting a complex synergy of anthropogenic and climate-induced pressures. While global warming, rising sea temperatures, ocean acidification and associated coral bleaching events represent a primary existential threat, localized stressors such as unmitigated coastal development, large-scale land reclamation, unsustainable tourism and inadequate waste management significantly exacerbate the degradation of these vital habitats.⁴⁷⁸

The susceptibility of Maldivian coral reefs to thermal stress, leading to widespread bleaching and subsequent mortality, is well-documented. For instance, the 1998 and 2014-2017 mass bleaching events caused substantial coral mortality across the archipelago, undermining the resilience and recovery capacity of these ecosystem⁴⁷⁹. Beyond thermal anomalies, ocean acidification, a direct consequence of increased atmospheric CO₂ absorption by seawater, further impedes calcification processes critical for coral growth and reef structural integrity⁴⁸⁰.

Compounding these global climate impacts are intensified local anthropogenic activities. Coastal development, often involving extensive coral and sand mining, dredging and infilling infrastructure and resort expansion, directly destroys reef structures, critical nurseries and feeding grounds for numerous marine

⁴⁷⁸ MINISTRY OF ENVIRONMENT, ENERGY AND WATER, Republic of Maldives, *National Adaptation Programme of Action (NAPA)* (2007).

⁴⁷⁹ H ZAHIR, I ABID and A RASHEED (n. 456); J D REIMER et al. (n. 438).

⁴⁸⁰ J A KLEYPAS et al., 'Geochemical Consequences of Increased Atmospheric Carbon Dioxide on Coral Reefs' (1999) 284 *Science* 118.

species⁴⁸¹. This physical alteration of the seabed also increases sediments loads in the water column, leading to siltation that smothers corals, reduces light penetration essential for photosynthesis by symbiotic zooxanthellae, and impairs coral survival and growth⁴⁸². Land reclamation, particularly for the creation of artificial islands, further exacerbates these issues, causing irreversible negative impacts on marine flora and fauna, fundamentally altering natural hydrodynamic patterns, and leading to the destruction of critical coral reefs and seagrass meadows⁴⁸³.

The rapid growth of the tourism sector, while economically vital, introduces substantial environmental externalities. The heightened demand for fish due to the expansion of the tourism sector can lead to unsustainable fishing practices, including overfishing of reef fish, which are crucial for maintaining healthy algal balances on reefs and for the food security of local communities⁴⁸⁴.

Moreover, as extensively detailed in Chapter II of this thesis, marine pollution originating from land-based sources constitutes a critically important problem. The discharge of untreated or inadequately treated sewage and solid waste exacerbates marine degradation.

The cumulative effect of these interacting threats is a pronounced decline in coral reef health and associated biodiversity. This degradation has profound implications for the long-term resilience of the Maldivian national economy, which is heavily reliant on tourism and fisheries supported by healthy reef ecosystems.

In response to global marine degradation, area-based management has been the most widespread approach to protect marine ecosystems and their resources, primarily recognized through the implementation of MPAs. These designated zones, varying in their levels of protection, aim to conserve biodiversity, restore ecosystem function, and enhance the resilience of marine life. Although no universally binding definition of an MPA currently exists, the most widely accepted

⁴⁸¹ A J EDWARDS, 'The Implications of Sea-Level Rise for the Future of the Republic of Maldives: Report to the Commonwealth Expert Group on Climate Change and Sea Level Rise' (1989) Newcastle upon Tyne: Centre for Tropical Coastal Management Studies.

⁴⁸² P L A ERFTEMEIJER et al., 'Environmental impacts of dredging and other sediment disturbances on corals: A review' (2012) 64(9) *Marine Pollution Bulletin* 1737.

⁴⁸³ J CHASE-LUBITZ, 'The Maldives is racing to create new land. Why are so many people concerned?' (2024) 628 *Nature* 704.

⁴⁸⁴ S YADAV, et al., 'Shifting fish consumption preferences can impact coral reef resilience in the Maldives: a case study' (2021) 134 *Marine Policy*, 104773.

and authoritative definition of a protected area is that advanced by the IUCN through its World Commission on Protected Areas (WCPA). This definition is intended to apply across terrestrial, inland water, coastal, and marine environments.

A clearly defined geographical space recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values⁴⁸⁵.

Such areas play a critical role in supporting ecosystem resilience by minimizing local stressors and creating conditions that allow natural environments to better withstand and recover from climate-related impacts⁴⁸⁶. In particular, MPAs are widely acknowledged as one of the most effective adaptation strategies for marine ecosystems under increasing environmental pressure⁴⁸⁷. Research on coral reef ecosystems has shown that areas under highly protection tend to recover more rapidly from disturbances such as bleaching events, as they are buffered from many of the human-induced stressors that typically affect adjacent, unprotected zones⁴⁸⁸.

The Maldives currently protects less than 1 per cent of its marine area through formal MPAs. As of now, 93 protected areas are listed, though this number includes overlapping international and national designations. When national designations are considered alone, the number stands at 68, covering only 531 square kilometres out of a total 923,881 square kilometres of marine and coastal space. This limited spatial coverage presents a significant challenge, both for the conservation of marine biodiversity, which faces increasing pressures from anthropogenic and climate-related stressors, and for the coastal communities whose livelihoods and well-being are directly tied to the health and productivity of marine ecosystems.

⁴⁸⁵ N DUDLEY (ed), *Guidelines for Applying Protected Area Management Categories* (IUCN 2008).

⁴⁸⁶ J S LEVY and N C BAN, 'A method for incorporating climate change modelling into marine conservation planning: an Indo-west Pacific example' (2013) 38 *Marine Policy* 16; E SALA et al., 'Protecting the global ocean for biodiversity, food and climate' (2021) 592(7854) *Nature* 397; F MICHELI et al., 'Evidence that marine reserves enhance resilience to climatic impacts' (2012) 7(7) *PLoS One* e40832.

⁴⁸⁷ C M ROBERTS et al., 'Marine reserves can mitigate and promote adaptation to climate change' (2017) 114(24) *Proc. Natl. Acad. Sci. U.S.A.* 6167; G HOPPIT et al., 'Are marine protected areas an adaptation measure against climate change impacts on coastal ecosystems? A UK case study' (2022) 2 *Nature-Based Solutions* 100030.

⁴⁸⁸ C MELLIN, et al., 'Marine protected areas increase resilience among coral reef communities' (2016) 19(6) *Ecology Letters* 629.

As a Party to the CBD, the Maldives is subject to the commitments set forth in the Kunming-Montreal Global Biodiversity Framework. In particular, Target 3 of the Framework calls for the effective conservation and management of at least 30 per cent of terrestrial, inland water, and coastal and marine areas by 2030, with an emphasis on areas of particular importance for biodiversity and ecosystem functions and services. This target not only mandates an expansion of spatial coverage but also requires that protected and conserved areas be ecologically representative, well-connected, and equitably governed, including through the use of OECMs.

The requirement of ecological connectivity embedded in Target 3 reflects a growing recognition of the interdependent and dynamic nature of marine ecosystems. It may reinforce the need to move beyond isolated or fragmented MPAs towards integrated networks that embody the principles of ecosystem-based management. For the Maldives, this can represent both a policy obligation and an opportunity to develop a more coherent, resilient, and inclusive system of marine conservation that aligns with international biodiversity commitments.

A network of MPAs have been defined by the IUCN/WCPA as

A collection of individual marine protected areas operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels, in order to fulfil ecological aims more effectively and comprehensively than individual sites could alone. The network will also display social and economic benefits, though the latter may only become fully developed over long time frames as ecosystems recover⁴⁸⁹.

If well designed, MPA networks can be an effective strategy for achieving fisheries, biodiversity and climate change objectives in tropical marine ecosystems⁴⁹⁰. Several SIDS have already adopted this model, integrating traditional knowledge and local management systems into broader national frameworks. For instance, initiatives in the Pacific, such as Kimbe Bay in Papua New Guinea, have demonstrated how locally managed marine areas (LMMAs) can

⁴⁸⁹ WCPA/IUCN, *Establishing networks of marine protected areas: a guide for developing national and regional capacity for building MPA networks* (non-technical summary report, WCPA/IUCN 2007).

⁴⁹⁰ *Ibid.*

serve as building blocks for ecologically representative networks⁴⁹¹. Another notable initiative is the Protected Areas Network (PAN) in Palau, established under the PAN Act of November 2003. This legal framework facilitates collaboration between Palau's local and State governments to designate and manage a system of terrestrial and MPAs of ecological, cultural, and economic significance⁴⁹².

Similar practices can be observed in Southeast Asia and beyond, where countries such as the Philippines have moved from isolated MPAs to coordinated networks to address shared conservation challenges⁴⁹³. Furthermore, jurisdictions like California in the United States have implemented legal instruments that mandate the creation of a marine reserve network in Channel Islands, underscoring the growing global consensus on the importance of connectivity, biogeographic variations and representativeness⁴⁹⁴.

At the regional level, the Natura 2000 network, established under the EU Birds and Habitats Directives⁴⁹⁵, constitutes the world's largest coordinated network of protected areas, encompassing both terrestrial and marine sites across all 27 EU Member States⁴⁹⁶. It aims to safeguard Europe's most valuable and threatened species and habitats through an ecologically coherent and legally binding framework⁴⁹⁷. This network is further supported by longstanding Regional Seas Conventions, such as the Helsinki Commission (HELCOM) in the Baltic Sea, the OSPAR Commission in the North-East Atlantic, and the Barcelona Convention

⁴⁹¹ A GREEN et al., *Scientific Design of a Resilient Network of Marine Protected Areas. Kimbe Bay, West New Britain, Papua New Guinea* (TNC Pacific Island Countries Report No 2/07, 2007).

⁴⁹² D HINCHLEY et al., *Biodiversity Planning for Palau's Protected Areas Network: An Ecoregional Assessment* (TNC Pacific Island Countries Report No 1/07, 2007); R L GRUBY and X BASURTO, 'Multi-level governance for large marine commons: politics and polycentricity in Palau's protected area network' (2013) 33 *Environmental Science & Policy* 260.

⁴⁹³ V HORIGUE et al., 'Marine protected area networks in the Philippines: Trends and challenges for establishment and governance' (2012) 64 *Ocean & Coastal Management* 15.

⁴⁹⁴ S L HAMILTON et al., 'Incorporating biogeography into evaluations of the Channel Islands marine reserve network' (2010) 107(43) *Proc. Natl. Acad. Sci. U.S.A.* 18272.

⁴⁹⁵ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (1992) *Official Journal of the European Union*, L 206; Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (2009) *Official Journal of the European Union*, L 20.

⁴⁹⁶ EUROPEAN COMMISSION, 'Natura 2000' https://environment.ec.europa.eu/topics/nature-and-biodiversity/natura-2000_en accessed 24 July 2025.

⁴⁹⁷ M GRBEC, 'Marine Area-based Conservation under European Union Law' in M GRBEC, T SCOVAZZI, and I TANI (eds), *Legal Aspects of Marine Protected Areas in the Mediterranean Sea: An Adriatic and Ionian Perspective* (Routledge 2023).

in the Mediterranean Sea, and with the cooperation of intergovernmental agencies such as the International Council for the Exploration of the Sea (ICES) and RFMOs such as the General Fisheries Commission for the Mediterranean (GFCM). Together, these frameworks benefit from a dense institutional landscape, stable financial mechanisms, and a high degree of political integration, features that remain largely absent in regions such as the Northwestern Indian Ocean.

In this context, the lack of a regional coordinating body, the limited number of participating States, and the developmental status of most countries, including the Maldives, represent structural barriers to replicating the European model of marine governance. Nonetheless, similar regional efforts have emerged elsewhere. The Regional Network of Marine Protected Areas in West Africa (RAMPAO) offers a notable example of institutional collaboration among nine African countries (Benin, Cabo Verde, Gambia, Guinea-Bissau, Guinea, Côte d'Ivoire, Mauritania, Senegal, and Sierra Leone) aimed at enhancing MPA effectiveness through coordinated management, centralized data systems, and improved visibility of under-recognized protected areas. RAMPAO demonstrates that, even in regions with fewer resources and less institutional integration, regional cooperation frameworks for MPA governance can be developed and scaled⁴⁹⁸.

Against this backdrop, at the national level, the Maldives retains the capacity to enhance the effectiveness of its marine conservation efforts by increasing the spatial coverage of protected areas and laying the legal and scientific groundwork for the development of a coherent network of MPAs, particularly within smaller and ecologically significant regions of the archipelago. A first step in this direction was taken with the signing of a MoU between the Ministry of Environment, Climate Change and Technology of the Maldives and the University of Milano-Bicocca on 28 June 2022, during the United Nations Ocean Conference in Lisbon. The agreement provides a framework for cooperation in conducting ecological and socio-economic assessments of existing and potential MPAs, with particular focus on the central atolls of Dhaalu, Faafu, Meemu, and Thaa. Aligned with SDGs 14 (Life Below Water) and 17 (Partnerships for the Goals), the MoU

⁴⁹⁸ I SELKANI, 'Let's Talk about MPAs: Blue Spaces in Africa—Case of RAMPAO' (2022) 15(1) *Environmental Sciences Proceedings* 32.

supports the implementation of the Vertical Ocean project, which promotes an innovative, ecosystem-based approach to marine governance by conceptually integrating the seabed, the water column, and the airspace above as interdependent regulatory layers⁴⁹⁹.

Environmental monitoring activities undertaken by researchers from the MaRHE Center and the Maldives Environmental Protection Agency in the identified atolls have provided an initial scientific basis for evaluating ecosystem health and biodiversity. Although data on traditional knowledge systems and community engagement are not yet available, the surveys conducted thus far constitute an essential first step toward the articulation of the legal and policy foundations required to establish a representative and ecologically connected network of MPAs in the Maldives.

This chapter aims to provide a comprehensive analysis of the MPA system in the Maldives, with particular emphasis on its governance framework and institutional arrangements. It begins with an overview of the global momentum toward the expansion of MPAs, drawing from the evolving international legal and policy landscape, as well as the academic literature on MPA governance and effectiveness. The chapter then contextualises the governance of MPAs within the Maldivian legal and institutional setting, examining the typologies of MPAs currently in place and assessing their ecological and legal effectiveness. Building on this foundation, the final section evaluates the opportunities and challenges associated with the establishment of a representative and ecologically connected network of MPAs in selected central atolls (Dhaalu, Faafu, Meemu, and Tha) with scientific and technical support from the MaRHE Center. The analysis integrates environmental monitoring data, relevant legal instruments, and governance considerations, with the aim of identifying viable pathways for strengthening the conservation of marine biodiversity in the Maldives in line with international commitments.

⁴⁹⁹ MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND TECHNOLOGY OF THE MALDIVES and UNIVERSITY OF MILANO-BICOCCA (n. 468).

4.2 Global momentum and legal foundations from MPAs

The concept of protected areas, originally developed for terrestrial environments, emerged in the late nineteenth century with the establishment of national parks aimed at conserving landscapes and biodiversity. It was not until the 1920s that marine areas were incorporated into protected designations, initially to safeguard economically valuable species such as marine mammals that were experiencing unsustainable levels of exploitation. Scientific awareness of the growing threats to marine ecosystems catalysed the first proposals for dedicated MPAs in the mid-1950s, marking the beginning of a more systematic approach to ocean conservation⁵⁰⁰. A landmark moment in MPA history occurred in 1958 with the establishment of the Exuma Cays Land-and-Sea Park in the Bahamas, a SIDS in the Caribbean, widely regarded as one of the world's first formal MPAs. In 1974, the UNEP launched the Regional Seas Programme, introducing a cooperative framework for the management and protection of marine and coastal environments based on the recognition of ocean interconnectedness. The earliest was the Mediterranean Action Plan in 1975 and then the Barcelona Convention in 1976. By that time, approximately 125 MPAs had been established globally. In parallel, the 1980s witnessed the emergence of marine biosphere reserves under UNESCO's Man and the Biosphere Programme, further integrating marine ecosystems into international conservation frameworks⁵⁰¹. Currently, the Maldives has three UNESCO Biosphere Reserves: Baa Atoll, Fuvahmulah, and Adduu Atoll.

Stakeholder involvement has increasingly been recognised as a cornerstone of effective MPA governance. During the 1970s and 1980s, various forms of community-managed reserves began to take shape, often including no-take fishing zones. These initiatives laid the foundation for the later formalisation of LMMAs in the early 2000s, which emphasized participatory governance and respect for traditional knowledge systems⁵⁰². Further studies have confirmed that the early

⁵⁰⁰ S WELLS et al., 'Building the future of MPAs – lessons from history' (2016) 26 *Aquatic Conserv: Mar Freshw Ecosyst* 101.

⁵⁰¹ *Ibid.*

⁵⁰² D DIZ et al., 'Mainstreaming marine biodiversity into the SDGs: the role of other effective area-based conservation measures (SDG 14.5)' (2018) 93 *Marine Policy* 251.

involvement of all relevant actors in the design of MPAs significantly enhances their effectiveness and long-term success⁵⁰³.

The importance of marine ecosystems was further underscored in 1981 with the designation of the Great Barrier Reef as the first marine World Heritage Site⁵⁰⁴. So far, the World Heritage List includes 1,248 properties that the World Heritage Committee has recognized as forming part of the cultural and natural heritage of outstanding universal value. As of 2025, this comprises 972 cultural, 235 natural, and 41 mixed properties across 170 States Parties to the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)⁵⁰⁵. Despite its exceptional marine biodiversity and rich cultural traditions, the Maldives, having become a State Party to the World Heritage Convention in 1986, has yet to achieve the inscription of any site on the List. This stands in contrast to neighbouring small island States, such as Seychelles and Mauritius, each of which has successfully nominated and secured World Heritage status for two sites⁵⁰⁶. The absence of any Maldivian sites on the UNESCO World Heritage List may reflect a combination of institutional, procedural, and strategic challenges. These may include limitations in the preparation of nomination dossiers, insufficient institutional capacity, or difficulties in reconciling conservation objectives with national development priorities. This interpretation is substantiated by the Maldives' 2023 Periodic Report to the World Heritage Convention, in which the State explicitly acknowledged that there is currently 'no capacity to protect, conserve, present and manage World Heritage properties.' This admission underscores the structural constraints that hinder the effective implementation of the World Heritage Convention at the national level⁵⁰⁷.

⁵⁰³ E TAYLOR et al., 'Seaflower marine protected area: Governance for sustainable development' (2013) 41 *Marine Policy* 57

⁵⁰⁴ *Convention concerning the Protection of the World Cultural and Natural Heritage* (adopted 16 November 1972, entered into force 17 December 1975) 1037 UNTS 151; Great Barrier Reef UNESCO World Heritage Site: <https://whc.unesco.org/en/list/154/>

⁵⁰⁵ UNESCO WORLD HERITAGE CENTRE, 'World Heritage List' <https://whc.unesco.org/en/list/> accessed 24 July 2025.

⁵⁰⁶ *Ibid.* The Aapravasi Ghat and Le Morne Cultural Landscape in Mauritius have been inscribed on the World Heritage List for their cultural value, while the Aldabra Atoll and the Vallée de Mai Nature Reserve in Seychelles have been recognised for their natural significance.

⁵⁰⁷ UNESCO, 'World Heritage Convention, Maldives Periodic Reporting 2023' (2023).

In an archipelago where marine and coastal ecosystems underpin both ecological resilience and cultural identity, the future recognition of Maldivian sites under the World Heritage Convention could serve as a catalyst for enhancing international protection, fostering transboundary cooperation, and aligning national conservation efforts with global standards. Such recognition would not only contribute to the visibility and protection of the country's unique natural and cultural heritage but could also support broader conservation measures in line with the Maldives' international legal obligations.

A critical legal development in area-based conservation measures came in 1994 with the entry into force of UNCLOS which establishes sovereign rights for coastal States over their EEZs and imposed binding obligations for the conservation and sustainable use of marine resources. This legal framework reinforced the responsibility of States to establish conservation measures as part of their sovereign rights and duties under international law. While UNCLOS does not specifically mention MPAs, it implicitly refers to them in Article 194(5): 'The measures taken in accordance with this Part shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life'. This provision implicitly supports the creation of MPAs as a key tool to fulfil these obligations. MPAs are specifically designed to conserve biodiversity, fragile habitats, and vulnerable marine species by regulating or restricting certain human activities in designated ocean areas. Therefore, they are a direct and practical measure that aligns with the duty imposed by Article 194(5).

Despite the absence of a universally agreed definition under international law, the notion of MPAs has acquired a firm legal and scientific foundation as a central element of modern ocean governance forming part of States' obligations under customary international law⁵⁰⁸. In 2002, the Subsidiary Body on Scientific, Technical and Technological Advice of the CBD stressed out the rapidly increasing of MPAs that have been proven to protect biodiversity, ensure sustainable use of resources, alleviate conflict, enhance economic well-being, and improve the quality

⁵⁰⁸ M GRBEC, T SCOVAZZI, and I TANI (n. 149).

of life⁵⁰⁹. Moreover, the Subsidiary Body affirmed that the overarching goal for work under the CBD relating to marine and coastal protected areas should be:

The establishment and maintenance of marine and coastal protected areas that are effectively managed, ecologically based and contribute to a permanent representative global network of marine and coastal protected areas, building upon national networks, including a range of levels of protection, where human activities are managed, particularly through national legislation, regional programmes and policies, traditional and cultural practices and international agreements, to maintain the structure and functioning of the full range of marine and coastal ecosystems, in order to provide benefits to both present and future generations⁵¹⁰.

This overarching goal was notably reflected in the Aichi Biodiversity Targets adopted as part of the CBD Strategic Plan for Biodiversity 2011-2020⁵¹¹. Target 11 called for the conservation of at least 10 per cent of coastal and marine areas by 2020, ‘especially areas of particular importance for biodiversity and ecosystem services’, through ‘effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.’ The ambitions of the Aichi Biodiversity Targets, particularly Target 11, ultimately eluded the grasp of most Parties to the CBD⁵¹². This global endeavour, in its fervent pursuit of Target 11's quantitative aims, regrettably spawned a multitude of designated MPAs, often without the corresponding attention to effective management⁵¹³. This phenomenon, in turn, birthed the pervasive issue of ‘paper parks’, protected areas enshrined in law or policy, yet lacking in meaningful governance, implementation, or enforcement. For example, in 2019, just one year before the expiration of the Aichi Biodiversity Targets, approximately 12.4 per cent of the EU marine waters has been designated as MPAs. However, only 1.8 per cent

⁵⁰⁹ SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL, AND TECHNOLOGICAL ADVICE OF THE CONVENTION ON BIOLOGICAL DIVERSITY (UNEP/CBD/SBSTTA), *Recommendation VIII/3, Marine and Coastal Biodiversity: Review, Further Elaboration and Refinement of the Program of Work* (27 November 2002).

⁵¹⁰ *Ibid.*

⁵¹¹ CBD COP, *Decision X/2 The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets* (29 October 2010) UNEP/CBD/COP/DEC/X/2.

⁵¹² 'New biodiversity targets cannot afford to fail' (2020) 578 Nature 337.

⁵¹³ C J LEMIEUX et al., 'How the race to achieve Aichi Target 11 could jeopardize the effective conservation of biodiversity in Canada and beyond' (2019) 99 Marine Policy 312.

were covered by effective management plans, thereby revealing a significant implementation gap⁵¹⁴. This discrepancy reflects a systemic weakness in aligning formal designation with actual conservation outcomes and undermines the intended ecological and legal purpose of these areas. This shortfall also stands in stark contrast to the noble intent of another Aichi target, Target 10, which called for the urgent minimization of anthropogenic pressures on coral reefs and other vulnerable ecosystems by 2015, including through the enhancement of their resilience and the promotion of ecosystem-based approaches⁵¹⁵. This profound failure to adequately address both the extent and efficacy of conservation, coupled with a disregard for the unique vulnerabilities of marine ecosystems, illustrates the inherent limitations of an overly target-driven approach. Such an approach, divorced from robust legal commitments and unbuttressed by effective implementation and adaptive management, is ultimately destined to fall short of its aims⁵¹⁶.

Yet, underrated by past shortcomings, the Kunming-Montreal Global Biodiversity Framework has introduced another, even more ambitious, target-driven paradigm. Target 3 of the new adopted framework commits States to:

Ensuring and enabling that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures (OECMs).

As a State Party to the CBD, the Maldives is expected to contribute to achieving this global target by ensuring that at least 30 per cent of its coastal and marine areas are effectively protected by 2030. However, the country currently protects less than 1 per cent of its marine area through formal MPAs. As of now, 93 protected areas are listed, though this number includes overlapping international and national designations. When national designations are considered alone, the

⁵¹⁴ WWF, *Protecting our ocean: Europe's challenges to meet the 2020 deadlines* (2019).

⁵¹⁵ Annex to CBD COP Decision XII/23, *Priority Actions to achieve Aichi Biodiversity Target 10 for Coral Reefs and Closely Associated Ecosystems* (2014).

⁵¹⁶ E J GREEN et al., 'Relating characteristics of global biodiversity targets to reported progress' (2019) 33 *Conservation Biology* 1360.

number stands at 68, covering only 531 square kilometres out of a total 923,881 square kilometres of marine and coastal space⁵¹⁷.

However, the mere act of designating MPAs does not, in itself, guarantee effective conservation. A considerable proportion of these areas lack comprehensive management plans, raising profound concerns about the practical implementation and robust enforcement of conservation measures. In the absence of clearly defined objectives, robust regulatory frameworks, and rigorous monitoring mechanisms, the effectiveness of many existing MPAs remains highly questionable. If the Maldives is to meet its obligations under the CBD and contribute meaningfully to global biodiversity targets, significant efforts will be required not only to expand the spatial coverage of its MPAs but, crucially, to fortify their legal and institutional foundations to ensure long-term ecological effectiveness.

Indeed, globally, determining the precise conditions under which an MPA can be considered ‘effective’ remains a complex and multifaceted endeavour, a persistent challenge in the pursuit of conservation. In answer to this plexus, a range of interconnected factors have been identified as influencing the success or failure of MPAs, *inter alia*, ecological conditions, biogeographic isolation, socio-economic contexts, community engagement, spatial design, temporal continuity, and enforcement mechanisms⁵¹⁸.

According to J. S. Rossiter and A. Levine (2014), effective MPAs tend to demonstrate tangible ecological benefits, such as increases in the abundance of target species. They are also characterised by a general compliance with established rules and regulations, whether through formal legal enforcement or through social norms and local engagement. Local communities and stakeholder groups often perceive the outcomes of successful MPAs positively, particularly when they do

⁵¹⁷ UNEP-WCMC (n. 455).

⁵¹⁸ G EDGAR et al, 'Global conservation outcomes depend on marine protected areas with five key features' (2014) 506 Nature 216; J S ROSSITER and A LEVINE, 'What makes a “successful” marine protected area? The unique context of Hawaii’s fish replenishment areas' (2014) 44 Marine Policy 196; J M RAYNAL, A S LEVINE and M T COMEROS-RAYNAL, 'American Samoa’s Marine Protected Area System: Institutions, Governance, and Scale' (2016) 19(4) Journal of International Wildlife Law and Policy 301.

not result in significant losses of income and livelihood opportunities, or when such losses are offset by alternative benefits generated through the MPA⁵¹⁹.

While ecological features are inherently site-specific and require strong scientific capacity to guide environmental monitoring and inform management, the effectiveness of MPAs also depends heavily on the quality of governance structures and institutional arrangements. Avoiding the proliferation of paper parks demands adequate institutional capacity, sustained political commitment, and the allocation of sufficient financial resources to deliver meaningful and lasting conservation outcomes⁵²⁰. At its core, the governance of MPAs encompasses both the overarching legal framework that establishes institutional arrangements and the practical management systems entrusted with the long-term monitoring of conservation measures⁵²¹. This analysis focuses on the legal and policy dimension, which forms the foundation for effective MPA designation and operation.

Firstly, robust MPA governance often requires coordination across multiple levels of authority, including regional, national, and local institutions. These cross-scale institutional linkages strengthen legitimacy, promote coherence in decision-making, and enhance the resilience and functionality of MPA regimes over time⁵²².

Secondly, while participatory arrangements are essential, they must be complemented by sustained political commitment. The long-term sustainability of MPAs depends not only on inclusive governance but also on the consistent application of legal tools, including the use of enforcement technologies and effective prosecution mechanisms to deter and address non-compliance⁵²³.

These principles apply equally to the governance of networks of MPAs, where complexity is heightened and coordination across sites becomes even more critical⁵²⁴.

⁵¹⁹ J S ROSSITER and A LEVINE *supra note*.

⁵²⁰ J M RAYNAL, A S LEVINE and M T COMEROS-RAYNAL (n. 518).

⁵²¹ J S ROSSITER and A LEVINE (n. 518).

⁵²² J S ROSSITER and A LEVINE (n. 518); J M RAYNAL, A S LEVINE and M T COMEROS-RAYNAL (n. 518); E TAYLOR et al. (n. 503).

⁵²³ P J JONES, 'A governance analysis of the Galápagos Marine Reserve' (2013) 41 Marine Policy 65; E T SAARMAN and M H CARR, 'The California Marine Life Protection Act: A balance of top down and bottom up governance in MPA planning' (2013) 41 Marine Policy 41.

⁵²⁴ E T SAARMAN and M H CARR *supra note*.

4.2.1 International designations of MPAs in the Maldives

Beyond national efforts, a range of marine habitats, species, and ecosystems benefit from international recognition and protection via various global instruments. Among these, Biosphere Reserves, designated under UNESCO's Man and the Biosphere Programme, hold significant international recognition. The Maldives presently hosts three such Reserves: Baa Atoll, inscribed in 2011⁵²⁵; Fuvahmulah, designated in 2020⁵²⁶; and Addu Atoll, which also received its designation in 2020⁵²⁷. Additionally, Key Biodiversity Areas (KBAs), recognized as sites of global importance to the planet's overall biodiversity, further contribute to this international protective mosaic. For instance, Haa Alifu Atoll was specifically identified as a KBA in 2004, primarily due to its significant population of the lesser noddy (*Anous tenuirostris*)⁵²⁸.

Furthermore, Ecologically or Biologically Significant Marine Areas (EBSAs), identified under the CBD for their critical ecological functions, also encompass Maldivian waters. Baa Atoll, a world class area for reef manta rays (*Mobula alfredi*), received EBSA designation in 2016⁵²⁹, as did Rasdhoo Atoll Reef, the latter specifically noted for its globally significant coral areas and hammerhead shark aggregations⁵³⁰.

In addition, the entirety of the Maldives falls within the expansive Indian Ocean Whale Sanctuary, established in 1979 by the International Whaling Commission, which prohibits commercial whaling throughout the Indian Ocean south to 55°S.

⁵²⁵ UNESCO, 'Baa Atoll' <https://www.unesco.org/en/mab/baa-atoll> accessed 29 July 2025.

⁵²⁶ UNESCO, 'Fuvahmulah' <https://www.unesco.org/en/mab/fuvahmulah> accessed 29 July 2025.

⁵²⁷ UNESCO, 'Addu Atoll' <https://www.unesco.org/en/mab/addu-atoll> accessed 29 July 2025.

⁵²⁸ Key Biodiversity Areas Partnership, *Key Biodiversity Areas factsheet: Haa Alifu Atoll (2025)* Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society.

⁵²⁹ CBD COP, *Decision XIII/12: Marine and coastal biodiversity: ecologically or biologically significant marine areas* (17 December 2016) 7.

⁵³⁰ *Ibid.* 6.

While these various international designations enhance the visibility and recognition of the Maldives' key marine ecosystems, the domestic marine conservation framework regrettably remains limited in its scope and protective reach.

4.3 The legal framework for area-based marine conservation in the Maldives

The recently adopted 2008 Constitution of the Maldives establishes a robust normative bedrock for environmental protection, underscoring the profound importance placed on this imperative within the foundational legal document. Article 22 imposes a positive duty on the State to protect and preserve the natural environment, biodiversity, resources, and beauty of the country for the benefit of present and future generations. This obligation is coupled with a directive to promote sustainable development in an ecologically balanced manner.

Complementing this, Article 67 assigns a parallel, albeit more ambiguous, responsibility to its citizen, requiring them to protect the environment and refrain from causing pollution or ecological degradation. While this framework of shared responsibility is commendable, the explicit textual confinement of the duties expressed in Article 67 to 'Maldivian citizens' occasions a point of concern. However, while this shared-responsibility framework is commendable, Article 67 explicit references to 'Maldivian citizens' may raise concerns. Ideally, the imperative to shield the environment should extend comprehensively to all human beings operating within the sovereign territory of the Maldives, encompassing not only its citizens but also its tourism sector and foreign workforce. This expansive view is particularly pertinent given the archipelago's economic reliance on international tourism. By circumscribing constitutional environmental duties to its citizens, the existing formulation risks absolving or at least diminishing the accountability of those whose activities bear an impact on the fragile marine and coastal ecosystems within the country. A more comprehensive legal articulation

would fortify the collective responsibility indispensable for effective environmental protection.

Further reinforcing this constitutional mandate, the Environment Protection and Preservation Act (Law no. 4/93) stands as the principal legislative instrument governing environmental protection across the Maldives. It enjoins the Ministry responsible for the environment (currently the Ministry of Tourism and Environment) to identify and designate areas requiring protection, and to develop and enforce regulations to preserve such areas in their natural state⁵³¹.

Critically, this Act mandates that an Environmental Impact Assessment be conducted prior to the implementation of any development project likely to have harmful impacts on the marine environment⁵³². Further, it introduces important prohibitions and controls on pollution and waste, including the disposal of any type of waste, oil, poisonous gases, or other harmful substances within the territory of the Maldives, unless such disposal occurs in designated areas with appropriate safety precautions⁵³³.

In terms of enforcement, the Environment Protection and Preservation Act provides a tiered system of penalties. Minor offences may incur fines ranging from Maldivian rufiyaa 5 to 500, depending on the gravity of the infraction, while major offences are subject to fines of up to Maldivian rufiyaa 100 million⁵³⁴. This establishes both administrative discretion and deterrent capacity in addressing environmental violations. Moreover, the Government of the Maldives explicitly reserves the right to seek compensation for any environmental damage arising from unlawful activities, including those involving waste disposal or other environmentally harmful practices, whether or not such activities are linked to a project formally subject to environmental regulation⁵³⁵. Regrettably, the Environment Protection and Preservation Act does not introduce any aggravating factors or enhanced penalties when violation occurs within a designated protected area or natural reserve.

⁵³¹ Environment Protection and Preservation Act (Law no. 4/93) comma 1-3.

⁵³² *Ibid.* comma 5.

⁵³³ *Ibid.* comma 7.

⁵³⁴ *Ibid.* comma 9.

⁵³⁵ *Ibid.* comma 10.

The Protected Areas Regulation (Regulation No. 2018/R-78) operationalizes the provisions of the Environment Protection and Preservation Act with respect to protected area designation and management. The Regulation must be implemented by the Environmental Protection Agency on behalf of the Ministry responsible for the environment⁵³⁶. As part of its mandate, the Environmental Protection Agency has developed the Environmentally Sensitive Area List, a critical document for the identification and progression of MPAs in the Maldives⁵³⁷.

Once identified, each designated protected area should be accompanied by a formal declaration specifying boundaries, zonation details, permitted and prohibited activities, protected area category, and justification for protection⁵³⁸. The Regulation obliges the Ministry responsible for the environment to develop management plans for each designed protected area and allows for third-party management where appropriate⁵³⁹. However, in practice, the implementation of this requirement remains weak. Out of the 93 officially designated protected areas in the Maldives, only six currently have started a management plan process, illustrating a significant gap between legal provisions and enforcement. Of the protected areas established under this domestic framework, merely four currently possess a management plan: Hanifaru, Meendhuu Region, Addu Nature Park, and South Ari.

The case of Hanifaru MPA in Baa Atoll presents a commendable pattern, attributable to its specific legal instrument and robust, structured management framework. Hanifaru MPA was designated in 2009 under the Protection and Preservation of Baa Atoll Hanifaru Marine Protected Area Regulation (2012/R-23), issued pursuant to the Environment Protection and Preservation Act. It is one of the only three protected areas in the Maldives governed by a dedicated regulation, and the only marine site with such provision. Located within the Baa Atoll UNESCO Biosphere Reserve, Hanifaru Bay is internationally renowned for its seasonal feeding aggregations of megafauna, particularly the reef manta ray and the whale shark (*Rhincodon typus*). Unique oceanographic processes, particularly the

⁵³⁶ MINISTRY OF ENVIRONMENT (n. 453) comma 1-4.

⁵³⁷ MINISTRY OF CLIMATE CHANGE, ENVIRONMENT AND ENERGY, *Maldives National Framework for Management of Protected & Conserved Areas 2024-2029* (2024).

⁵³⁸ MINISTRY OF ENVIRONMENT (n. 453) comma 5-6.

⁵³⁹ MINISTRY OF ENVIRONMENT (n. 453) comma 12.

southwest monsoonal currents, create nutrient-rich conditions that lead to plankton blooms, funnelling marine megafauna into the bay for feeding. This phenomenon has made Hanifaru a global tourism hotspot, further increasing the need for careful ecological and visitor management⁵⁴⁰. The management plan divides the MPA into three zones: a core area where only limited recreational activities are allowed (such as snorkelling and terrestrial sightseeing), a buffer zone, and a transitional area. This zoning framework reflects the broader biosphere reserve model and seeks to balance ecological conservation with sustainable use⁵⁴¹. The Hanifaru MPA is managed by the Baa Atoll Biosphere Reserve Office under the oversight of the Environmental Protection Agency. Its management approach is grounded in key principles such as the ecosystem approach, adaptive and evidence-based management, the precautionary principle, and stakeholder engagement. A formal management plan (2025–2030) is currently in place, supported by international cooperation, including assistance from the United Kingdom⁵⁴².

These formal structures aim at improving the condition of Hanifaru MPA which has been affected by several challenges since its establishment. Bait fishing for anchovies and sprats, and tourism-related pressures have been reported. A 2022 stakeholder survey revealed that only 44 per cent of tourist-manta ray interactions complied with the recommended guidelines. Moreover, boat traffic has been identified as a major ecological stressor within the bay. While the area is patrolled by rangers, these personnel lack enforcement powers, and non-compliance incidents must be referred to the Environmental Protection Agency or the police for further action. Penalties for infractions are limited to those provided under the general Environment Protection and Preservation Act, without any aggravated sanctions for breaches occurring within a protected area. This undermines the effectiveness of legal deterrence, especially in high-value sites like Hanifaru Bay⁵⁴³.

⁵⁴⁰ MINISTRY OF TOURISM & ENVIRONMENT, Republic of Maldives, *Hanifaru Marine Protected Area Conservation Action Plan, Baa Atoll, Maldives 2025 to 2030* (2024).

⁵⁴¹ *Ibid.*

⁵⁴² *Ibid.*

⁵⁴³ OCEAN COUNTRY PARTNERSHIP PROGRAMME MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND TECHNOLOGY, Republic of Maldives, *Assessing the management effectiveness of three sites in the Maldives: stakeholder survey results* (2022) (Joint Nature Conservation Committee (eds)).

Despite these limitations, Hanifaru MPA demonstrates the potential of combining legal regulation, scientific understanding, and international cooperation to foster effective marine conservation. It also underscores the importance of developing site-specific management plans, zoning schemes, and enforceable regulatory frameworks. Without these elements, other protected areas risk remaining nominal paper parks, protected in name but not in practice.

The broader picture remains one of concern: the absence of management plans and clear enforcement mechanisms in the vast majority of protected areas represents a substantial gap in the Maldives' marine conservation framework. This situation challenges the country's ability to meet international obligations, such as those under the CBD and the Kunming-Montreal Global Biodiversity Framework, particularly the commitment to effectively conserve 30 per cent of marine areas by 2030.

While the Environmental Protection and Preservation Act and its regulations constitute the core framework for area-based conservation, other sectoral laws also contribute to spatial protection of marine resources. The Fisheries Act (Act No. 14/2019) empowers the Ministry of Fisheries to establish spatial restrictions aimed at conserving marine ecosystems. Notably, five grouper spawning aggregation sites have been designated under this Act to prevent fishing and disturbance during critical reproductive periods. These sites were initially protected in 2013 under the Regulation on Grouper Fishing and Exporting Groupers from Maldives (Reg. No. 2013/R-41), and their protection was extended for an additional ten years under the Regulation on Grouper Fishery Management (Reg. No. 2022/R-2). These sites are classified under IUCN Management Category IV (Habitat/Species Management Areas) and form part of a broader package of fisheries management measures designed to ensure a sustainable grouper fishery. National management objectives, regulatory measures, and site-specific activities are detailed within the Regulation.

Promulgated in 2021, the Protected Species Regulation (Reg. No. 2021/R-25) represents another important legislative development. It aims to ensure the protection and sustainable management of endangered species, their habitats, and

associated ecosystems. Habitat information derived from this Regulation is also used to inform the designation of protected areas.

In this context, the Maldives has also adopted specific legal instruments to safeguard vulnerable marine megafauna:

- sharks: A nationwide ban on shark fishing within the Maldives' Exclusive Economic Zone (EEZ) was enacted in 2010 through Directive No. 30-D2/29/2010/32 (15 March 2010), which also prohibits the retention of sharks in all Maldivian fisheries. As a result, all shark species were afforded full legal protection within Maldivian waters, positioning the Maldives, until recently, as one of only seventeen shark sanctuaries worldwide;
- rays and skates: Protected under Directive No. (IUL) 438-ECAS/438/2014/81 (9 June 2014); and
- sea turtles: Protected under Directive No. (IUL) 438-ECAS/438/2016/72 (4 April 2016).

These sectoral laws and directives, while not specifically designed as protected area legislation, play a complementary role in the national framework of spatial conservation, contributing to the development of *de facto* area-based measures within the jurisdiction of the Maldives.

Assessing the effectiveness of these measures, however, remains challenging. Long-term monitoring programmes capable of generating reliable data on conservation outcomes and management efficiency are constrained by limited financial, technical, and human resources in the Maldives, conditions typical of several SIDS. Consequently, it is difficult to determine the extent to which these sectoral instruments have successfully enhanced the conservation status of the species concerned⁵⁴⁴.

The situation of sharks has been further complicated by the introduction of a new regulatory measure effective from 1 November 2025, which permits the fishing of Gulper sharks (*Centrophorus granulosus* – listed as Endangered under the IUCN Red List), a deep-water species characterised by slow growth rates and

⁵⁴⁴ JA HUDGINS et al., 'A brighter future? Stable and growing sea turtle populations in the Republic of Maldives' (2023) PLoS ONE 18(4):e028397.

late sexual maturity. Historically, this species has been targeted for its liver oil, which commands a high market value due to its elevated squalene content. The authorisation of directed fishing for Gulper sharks represents a significant departure from the previous blanket prohibition on shark fishing. As a result, Maldivian waters can no longer be classified as a shark sanctuary in the strict legal sense from November 2025 onwards⁵⁴⁵.

4.4 Building a network of MPAs in the Maldives: Legal reflections from the Vertical Ocean Project

The establishment of a network of MPAs encompassing the central Maldivian atolls of Dhaalu, Faafu, Meemu, and Thaa stems from a concrete research collaboration between the University of Milano-Bicocca and the Government of the Maldives, formalized through the Vertical Ocean project. This initiative was developed under the framework of a MoU signed with the then Ministry of Climate Change, Environment, and Energy, now renamed as the Ministry of Tourism and Environment⁵⁴⁶. Responding to a national request, this effort aims to identify the legal underpinnings and governance pathways necessary to transform available ecological data into area-based conservation measures. Environmental monitoring conducted by researchers from the MaRHE Center and the Maldives Environmental Protection Agency in Dhaalu, Faafu, Meemu, and Thaa atolls provides an essential scientific foundation for assessing ecosystem health and biodiversity.

⁵⁴⁵ H MOOSA, 'Come November, Maldivian waters will no longer be a shark sanctuary', 2 September 2025, Maldives Independent.

⁵⁴⁶ MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND TECHNOLOGY OF THE MALDIVES and UNIVERSITY OF MILANO-BICOCCA (n. 468).

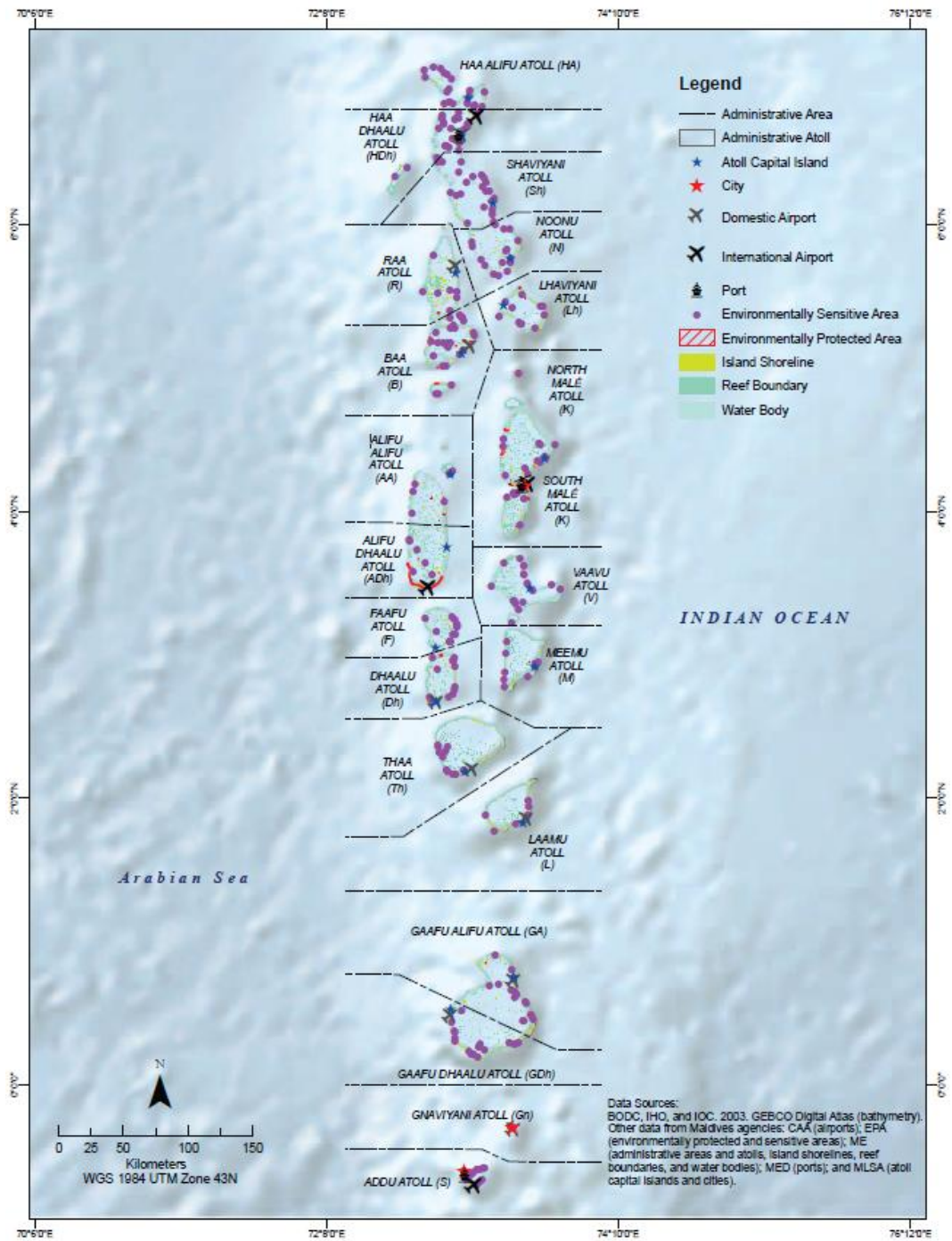


FIGURE 4.1 MALDIVES, ENVIRONMENTALLY PROTECTED AND SENSITIVE AREAS

Source: ASIAN DEVELOPMENT BANK, *Multihazard Risk Atlas of Maldives, Biodiversity - Volume IV* (March 2020).

4.4.1 Scientific justification

The surveys were conducted in ecologically sensitive areas previously identified by the Maldivian Environmental Protection Agency, where monitoring

activities were feasible. The assessment encompassed the analysis of benthic cover; the presence or absence of endangered scleractinian coral species according to the IUCN and the Maldives Red List; invertebrate abundance; recruit density; the presence or absence of IUCN-listed endangered fish species; and the diversity and distribution of fishes, turtles, and marine mammals. These assessments aimed to identify threatened habitats and species that require targeted protection measures in Dhaalu, Faafu, Meemu, and Thaa atolls⁵⁴⁷. The level of threat was determined primarily based on the IUCN Red List, which provides a globally recognized standard for assessing extinction risk. Where available, species status was also evaluated in accordance with the Maldives Red List, offering context-specific insight into national conservation priorities. The findings of this environmental monitoring represent a key step toward defining ecologically representative and legally coherent marine conservation strategies for the region⁵⁴⁸.

⁵⁴⁷ P GALLI et al., 'Baseline marine ecological assessment for the designation of Marine Protected Areas (MPAs) in the Maldives' (2024) (in press).

⁵⁴⁸ The comprehensive results of the environmental monitoring conducted under the Vertical Ocean Project are currently being compiled and have not been published for public access. Nevertheless, with the consensus of the authors, a summary of the relevant evidence is presented in the following subchapters.

4.4.1.1 Faafu Atoll

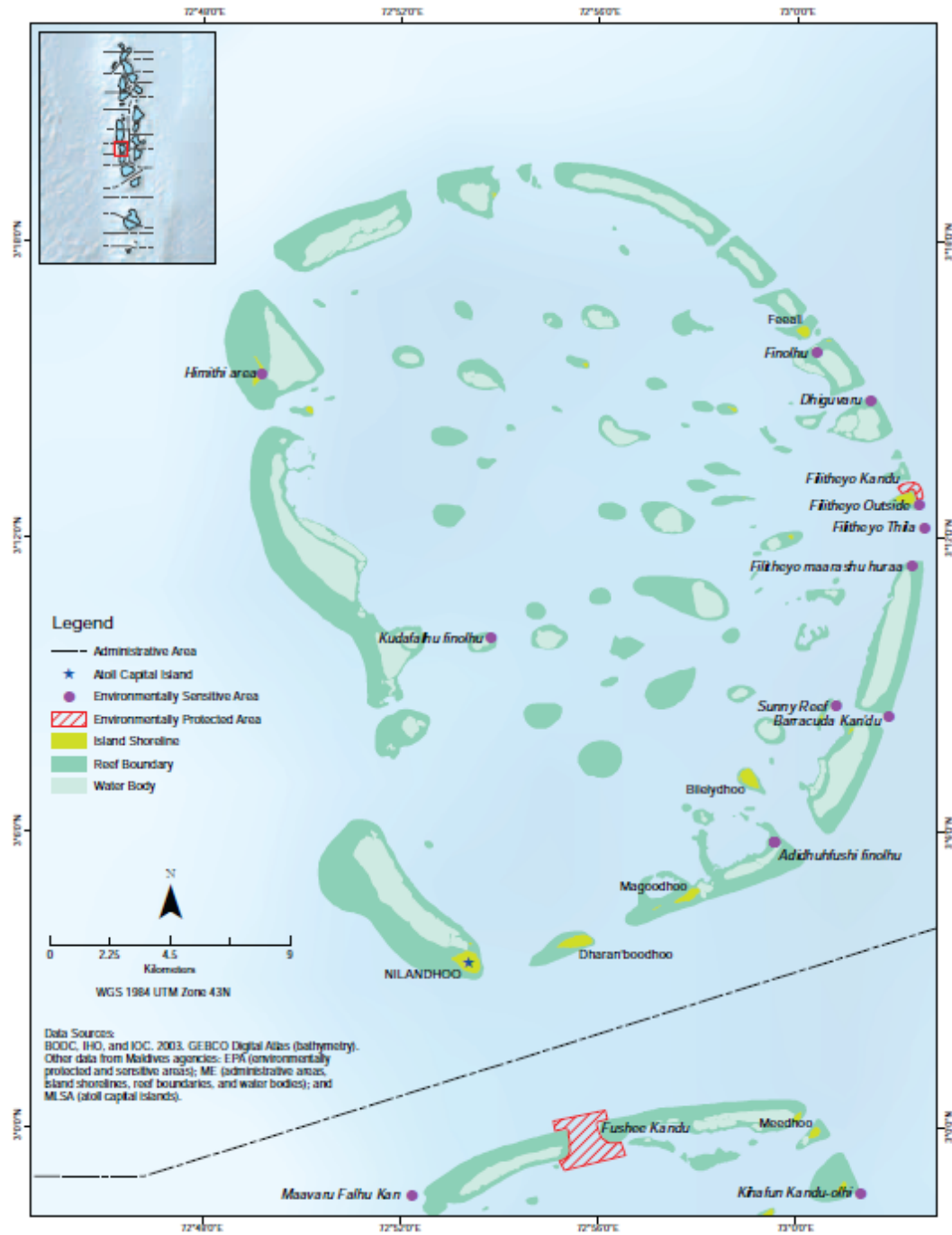


FIGURE 4.2 FAAFU ATOLL, ENVIRONMENTALLY PROTECTED AND SENSITIVE AREAS

Source: ASIAN DEVELOPMENT BANK, *Multihazard Risk Atlas of Maldives, Biodiversity - Volume IV* (March 2020).



FIGURE 4.3 FAAFU ATOLL, ECOLOGICAL SURVEY LOCATIONS

Ecological surveys across fifteen sites in Faafu Atoll highlight both the richness and vulnerability of local coral reef ecosystems. A total of thirty-six coral genera, equivalent to 62 per cent of total general considered as relevant for the coral biodiversity in the region, were recorded, indicating high biodiversity levels in several sites. The most biodiverse site was

Madivaru Huura (sixteen genera), and the lowest diversity was observed in Filitheyo Maarashu Hura (seven genera).

Hard coral cover is generally healthy, with an average of 33.9 per cent, though some sites, such as Bandidhunfushee Finolhu, showed significantly lower coverage (17.5 per cent). The highest coral cover was recorded at Kandumoonu Fushi (61.9 per cent), dominated by key reef-building genera such as *Acropora* and *Porites*. Importantly, the surveys identified thirty-two out of the thirty-five nationally-listed coral species classified as Near Threatened, Vulnerable, Endangered, or Critically Endangered under the IUCN Red List. Notably, species such as *Galaxea fascicularis* (Vulnerable under the Maldives Red List⁵⁴⁹, Least Concern under the IUCN Red List with a decreasing population trend⁵⁵⁰), *Pavona varians* (Endangered under the Maldives Red List⁵⁵¹, Least Concern under the IUCN Red List with a decreasing population trend⁵⁵²), *Acropora hyacinthus*

⁵⁴⁹ H AMIR, 'Galaxea fascicularis, Octopus coral, fluorescence grass coral' (The Maldives Red List of Threatened Species, 2022).

⁵⁵⁰ H GEGNER et al., 'Galaxea fascicularis' (The IUCN Red List of Threatened Species 2024: e.T133662A166001042, 2024).

⁵⁵¹ S MONTANO, 'Pavona varians, Leaf Coral' (The Maldives Red List of Threatened Species, 2022).

⁵⁵² C LEWIS et al., 'Pavona varians' (The IUCN Red List of Threatened Species 2024: e.T133398A165868649, 2024)

(Critically Endangered under the Maldives Red List⁵⁵³, Endangered under the IUCN Red List with a decreasing population trend⁵⁵⁴) were widespread, occurring in over 80 per cent of the sides. These findings reinforce the ecological significance of the monitored sites and their role as critical habitats for endangered coral species.

Additionally, the presence of coral recruits and juvenile corals has also been observed, as they provide a key indicator of reef recovery and resilience. Among the fifteen monitored sites, Kuda Falhu Finolhu stood out with the highest recruitment levels, recording 165 individuals, comprising 77 per cent coral recruits and 23 per cent juveniles. This may reflect favourable oceanographic conditions at this outer atoll location, where currents enhance larval dispersal without impeding coral settlement and growth.

However, recruitment composition revealed some concerns. While most juveniles were grouped into a broad 'Other' category (80 per cent), only 6 *Porites* and 2 *Pocillopora* juveniles were identified. Notably, no juvenile *Acropora*, a fast-growing and ecologically important genus, was recorded, which may point to local stressors, predation, or a lack of nearby adult *Acropora* colonies. Enbulufushi recorded the lowest coral recruitment, with just thirty-one recruits and nine juveniles, indicating limited natural regeneration capacity in that area.

Surveys revealed an extremely low density of reef invertebrates across the sites. The cushion star (*Culcita spp.*) was the most frequently observed, with an average density of 0.6 individuals per 100 m², slightly higher than previously reported in similar reef environments in the Maldives and other regions of the Indo-Pacific. *Drupella spp.*, coral-eating snails known to contribute to coral degradation, were present at very low densities (0.09 per m²), suggesting a limited current impact on coral health⁵⁵⁵. The crown-of-thorns starfish (*Acanthaster planci*), a major coral predator often responsible for severe reef damage⁵⁵⁶, was not recorded at any site,

⁵⁵³ I MOHAMED, '*Acropora hyacinthus*, Brush Coral' (The Maldives Red List of Threatened Species, 2022).

⁵⁵⁴ C I NUÑEZ LENDO, '*Acropora hyacinthus*' (The IUCN Red List of Threatened Species 2024: e.T218764304A165910938, 2024).

⁵⁵⁵ L SAPONARI et al., 'Assessing population collapse of *Drupella* spp. (Mollusca: Gastropoda) 2 years after a coral bleaching event in the Republic of Maldives' (2021) 848 *Hydrobiologia* 2653.

⁵⁵⁶ L SAPONARI et al., 'Monitoring and assessing a 2-year outbreak of the corallivorous seastar *Acanthaster planci* in Ari Atoll, Republic of Maldives' (2018) 190(6) *Environmental Monitoring and Assessment* 344.

a positive indicator of reef stability at present. These observations suggest a favourable balance in predator-prey dynamics on the reef, yet the low overall abundance of invertebrates may indicate underlying ecological stress or reduced ecosystem complexity⁵⁵⁷.

Surveys across seventeen sites revealed a diverse and well-structured fish community, with nearly 70,000 individuals recorded, belonging to nineteen families and forty-eight genera. The most abundant fish families included: *Pomacentridae* (28.8%), as well as, *Acanthuridae*, *Caesionidae*, and *Serranidae* with key for reef function and fisheries, and *Balistidae*, *Pomacanthidae*, *Labridae*, *Chaetodontidae* and *Scaridae*, including species often used as coral reef health indicators. Fish biomass was mainly composed of small- to medium-sized species forming large schools, especially along reef edges. Larger fish were observed in deeper channels (*kandu*)⁵⁵⁸ and specific reef areas. Species of ecological and fisheries interest (e.g., *Chaetodon*, *Scarus*, *Carangidae*, *Serranidae*) were present at several sites, supporting the value of these reefs for both ecosystem function and local livelihoods.

However, signs of imbalance in the broader ecosystem were observed. Elasmobranchs (sharks and rays) were poorly represented, with low abundance and diversity. The few sharks observed were mostly Whitetip Reef Shark (*Triaenodon obesus*, Vulnerable under the IUCN red list with a decreasing population trend⁵⁵⁹) and Blacktip Reef Sharks (*Carcharhinus melanopterus*, Vulnerable under the IUCN Red List with a decreasing population trend⁵⁶⁰). Only one sighting of the Grey Reef Shark (*Carcharhinus amblyrhynchos*, Endangered under the IUCN Red List with a decreasing population trend⁵⁶¹) was recorded, likely due to survey depth limitations. Rays were occasionally recorded, e.g., *Aetobatus ocellatus*

⁵⁵⁷ PW GLYNN and IC ENOCHS, 'Invertebrates and their roles in coral reef ecosystems' in Z DUBINSKY and N STAMBLER (eds) *Coral reefs: an ecosystem in transition* (Springer 2010) 273.

⁵⁵⁸ In the Divehi language, *kandu* means 'channel', specifically referring to a deep channel in the outer reef of an atoll.

⁵⁵⁹ C SIMPFENDORFER et al., '*Triaenodon obesus*' (The IUCN Red List of Threatened Species 2020: e.T39384A173436715, 2020).

⁵⁶⁰ C SIMPFENDORFER et al., '*Carcharhinus melanopterus*' (The IUCN Red List of Threatened Species 2020: e.T39375A58303674, 2020).

⁵⁶¹ C SIMPFENDORFER et al., '*Carcharhinus amblyrhynchos*' (The IUCN Red List of Threatened Species 2020: e.T39365A173433550, 2020).

(Endangered under the IUCN Red List with a decreasing population trend⁵⁶²), *Mobula kuhlii* (Endangered under the IUCN Red List with a decreasing population trend⁵⁶³), though overall numbers remained low. No sea turtles were observed during the surveys, which may signal a highly depleted local population, despite anecdotal sightings.

The MaRHE Centre is in Magoodhoo, in the south of the Faafu Atoll, established to conduct scientific research and higher education activities in the fields of environmental science, tourism studies, and human geography. It also aims to foster awareness and build local capacity for the protection of fragile ecosystems and biodiversity, while promoting the sustainable use and responsible management of natural resources. Since its inception, the MaRHE Centre has carried out extensive research on local biodiversity, implemented ecological restoration projects, and investigated emerging threats to marine ecosystems, particularly pollution-related impacts. Among these, microplastic contamination has emerged as a growing concern. Despite the remoteness of Faafu Atoll, its limited population, and low annual tourist influx, microplastics have been detected in both surface seawater and beach sediments across twelve sampling stations located inside and outside the reef rim. Polymer types identified included polyethylene, polypropylene, polystyrene, polyvinyl chloride, polyethylene terephthalate, and polyamide, alongside elastomeric residues and charred microparticles, the latter predominantly found near the inhabited island and likely linked to the local practice of burning plastic waste at the shoreline⁵⁶⁴.

Furthermore, recent studies have also documented the presence of phthalate esters, a class of contaminants commonly associated with microplastics, in scleractinian coral tissues sampled within the atoll. The highest concentrations of phthalate esters were observed in coral specimens collected near the inhabited island, coinciding with areas of elevated microplastic concentration in seawater. These findings raise important concerns about the potential bioaccumulation of microplastic-associated chemicals in reef-building corals and underscore the need

⁵⁶² B FINUCCI et al, '*Aetobatus ocellatus*' (The IUCN Red List of Threatened Species 2024: e.T42566169A124549514, 2024).

⁵⁶³ C L RIGBY et al., '*Mobula kuhlii* (amended version of 2020 assessment)' (The IUCN Red List of Threatened Species 2022: e.T161439A214405747, 2022).

⁵⁶⁴ F SALIU et al. (n. 121).

for further field-based research into the ecological consequences of microplastic pollution in coral reef ecosystems⁵⁶⁵.

4.4.1.2 Meemu Atoll

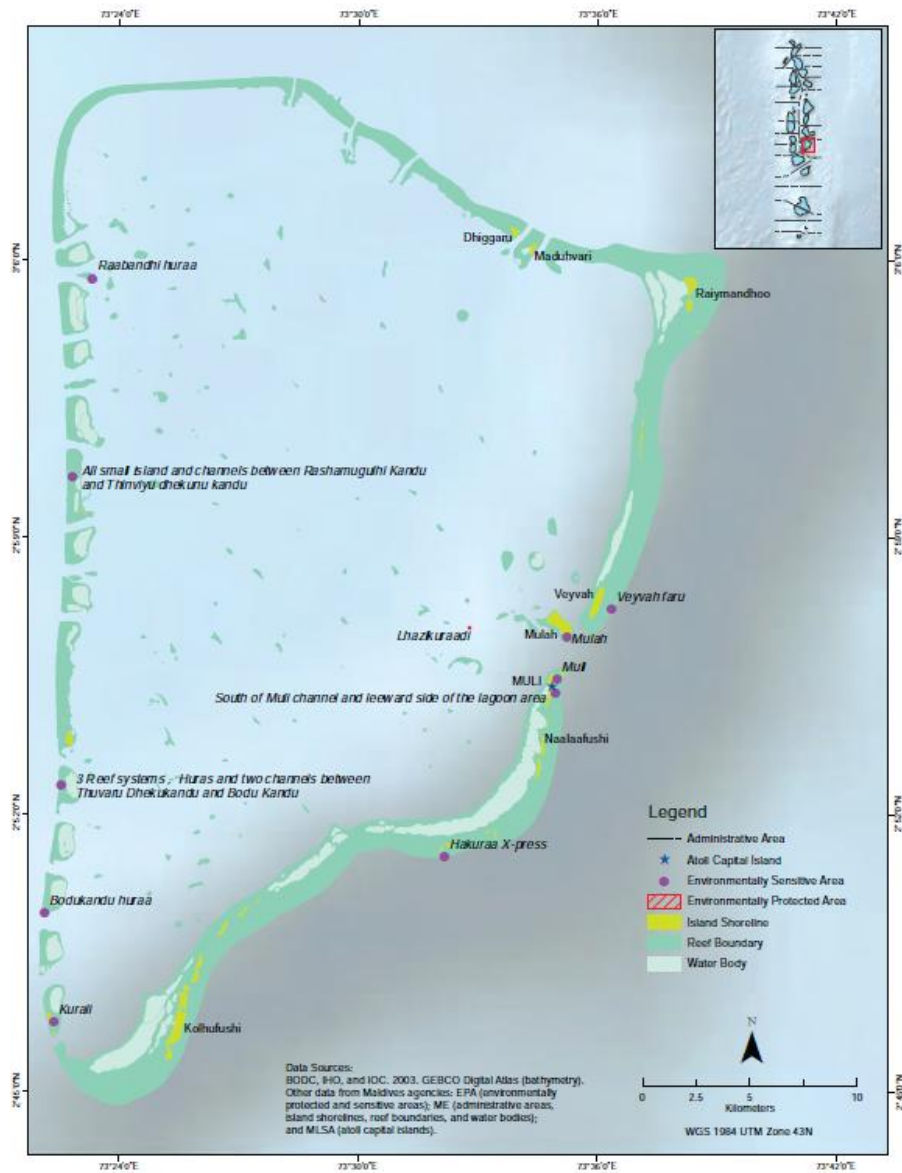


FIGURE 4.4 MEEMU ATOLL, ENVIRONMENTALLY PROTECTED AND SENSITIVE AREAS

Source: ASIAN DEVELOPMENT BANK, *Multihazard Risk Atlas of Maldives, Biodiversity - Volume IV* (March 2020).

⁵⁶⁵ F SALIU et al., 'Microplastics as a threat to coral reef environments: Detection of phthalate esters in neuston and scleractinian corals from the Faafu Atoll, Maldives' (2019) 142 *Marine Pollution Bulletin* 234.



FIGURE 4.5 MEEMU ATOLL, ECOLOGICAL SURVEY LOCATIONS

Surveys in Meemu Atoll were conducted using the rapid “quick survey” methodology across three sites⁵⁶⁶. While the limited scope prevents broad generalizations, key patterns emerged regarding benthic composition and fish communities that provide useful indicators of reef

condition. Benthic cover assessments revealed a predominance of non-living substrates across all sites, particularly rubble, sand, and dead coral. Among living components, hard corals exhibited the highest cover, with Kurali emerging as the site with the highest live coral presence. The lowest coral cover was recorded at Muli Corner, reinforcing its status as a potentially degraded site.

Fish community assessments showed relatively high species richness for such short-duration surveys. Across the three sites, an average of sixty-nine species was recorded. The community composition appeared homogeneous across sites, with several ecologically and economically significant species observed.

Notably, Kurali hosted a cleaning station used by a few individuals of the reef manta, *Mobula alfredi* (Vulnerable under the IUCN Red List with a decreasing population trend⁵⁶⁷). The other two sites displayed large aggregations of Grey Reef Shark, with occasional sightings of Whitetip Reef Shark. Furthermore, the presence of Hawksbill Turtles (*Eretmochelys imbricata*, Critically Endangered under the IUCN Red List with a decreasing population trend⁵⁶⁸) was confirmed on one site.

⁵⁶⁶ *Kandu* are often characterized by strong currents, not allowing a safe placement of transects, therefore a rapid assessment of the main features of the sites was performed, thereafter called ‘quick’ survey. Data were collected throughout the dives starting from the maximum depth (30m) and then following the contour of the channels to slowly ascend to surface.

⁵⁶⁷ A MARSHALL et al, '*Mobula alfredi* (amended version of 2019 assessment)' (The IUCN Red List of Threatened Species 2022: e.T195459A214395983, 2022).

⁵⁶⁸ J A MORTIMER and M DONNELLY, '*Eretmochelys imbricata*' (The IUCN Red List of Threatened Species 2008: e.T8005A12881238, 2008).

Despite the limited sampling effort, Meemu Atoll revealed key ecological features, including manta cleaning stations, shark aggregations, and occurrences of endangered turtle species. These findings underscore the importance of follow-up monitoring and the potential designation of ecological hotspots, particularly cleaning stations and shark channels, as sites for conservation attention.

In 2007, the island of M. Raiyamandhoo, located in the northeast of Meemu Atoll, drew attention due to a significant fish mortality event and the appearance of a red substance floating in the lagoon. Most of the deceased fish were identified as various species of surgeonfish (*kaalhu* in Dhivehi) and parrotfish (*landaa* in Dhivehi), which were found amid the red substance and exhibited early signs of decomposition⁵⁶⁹. Seawater samples collected by a team from the Environment Research Centre indicated the presence of a microorganism consistent with *Alexandrium* species, which are known to produce paralytic shellfish toxins. These toxins can accumulate in marine organisms and are associated with HABs, posing serious risks to marine biodiversity and human health⁵⁷⁰. This incident highlights the issue of environmental pollution and the potential release of agrochemicals into marine ecosystems, as further discussed in Chapter 2 of this thesis.

⁵⁶⁹ S NAEEM and S A SATTAR, *A compilation of reported fish kills in the Maldives* (Marine Research Centre of the Ministry of Fisheries, Agriculture and Marine Resources 2007).

⁵⁷⁰ B KARLSON et al., 'Harmful algal blooms and their effects in coastal seas of Northern Europe' (2021) 102 *Harmful Algae* 101989.

4.4.1.3 Thaa Atoll

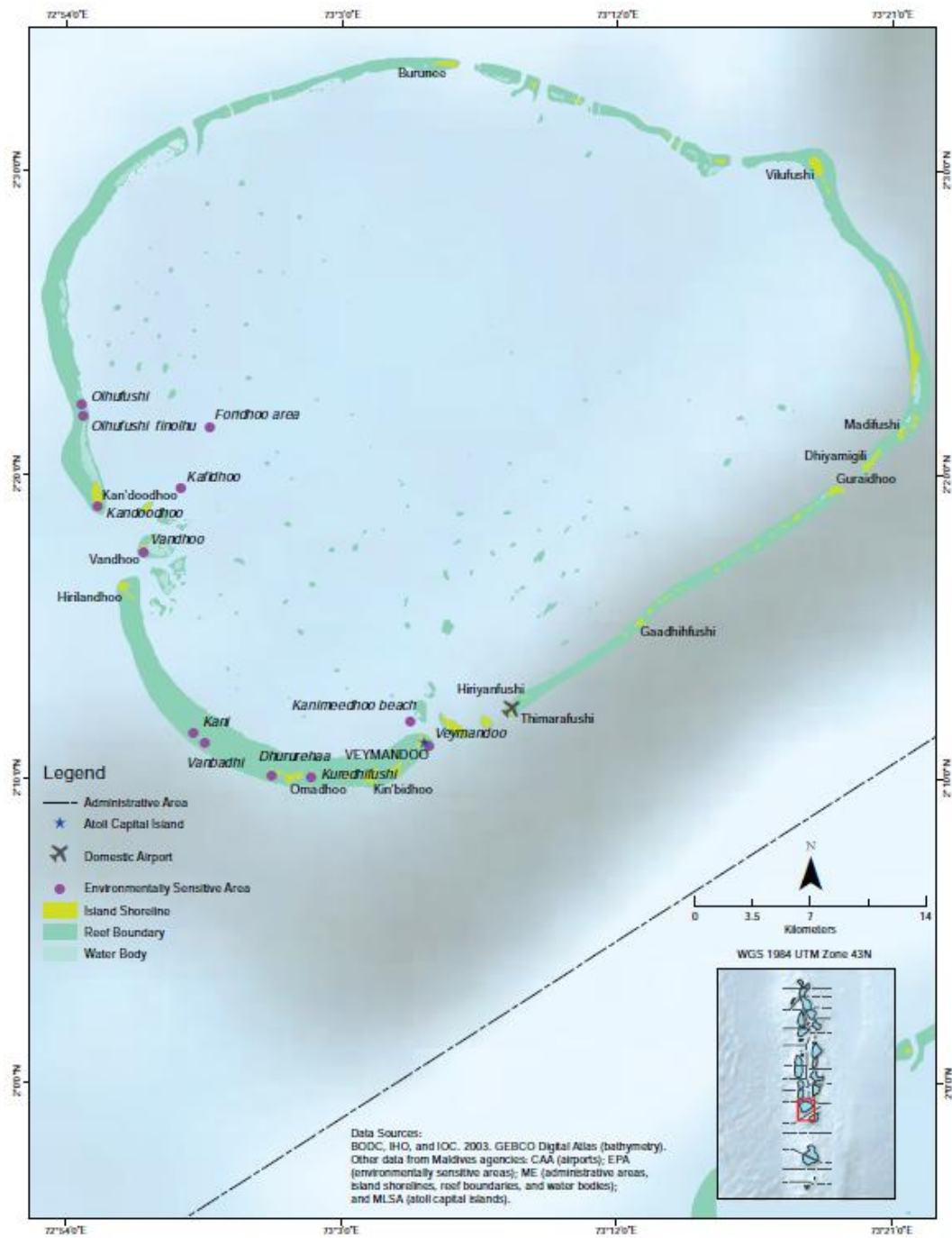


FIGURE 4.6 THAA ATOLL, ENVIRONMENTALLY PROTECTED AND SENSITIVE AREAS

Source: ASIAN DEVELOPMENT BANK, *Multihazard Risk Atlas of Maldives, Biodiversity - Volume IV* (March 2020).

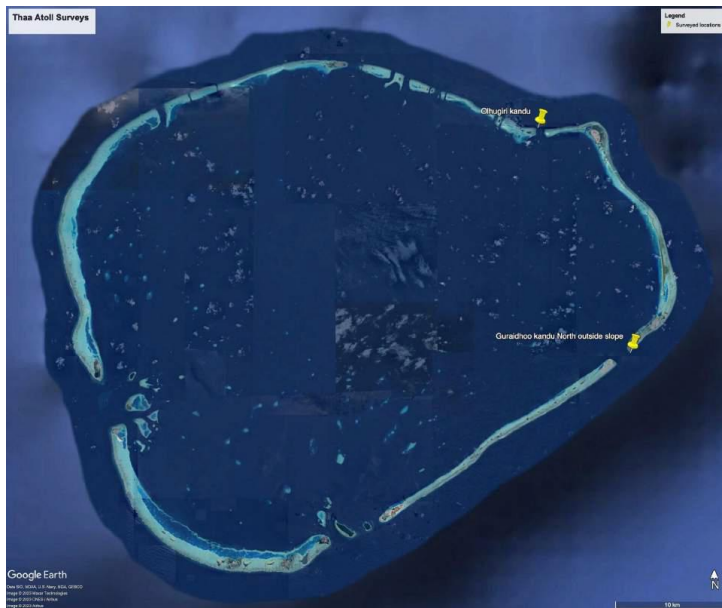


FIGURE 4.7 THAA ATOLL, ECOLOGICAL SURVEY LOCATIONS

Surveys in Thaa Atoll were conducted over two days using the quick assessment method across two *kandu* sites. Although the limited number of sites restricts comprehensive conclusions, key patterns emerged that signal important ecological functions and

conservation potential within the atoll. The benthic assessments revealed a high prevalence of non-living substrates at both sites, consistent with Meemu Atoll surveyed with rapid methodologies as well. Among the living components, hard corals represented the dominant substrate type. Olhugiri Kandu displayed the highest coral cover, with massive corals as the prevailing growth morphology. In contrast, Guraidhoo Kandu showed lower live coral cover. Across both sites, massive and encrusting corals were the most commonly recorded forms, indicating potential for long-term structural stability despite limited live coverage.

Fish biodiversity was notably high considering the rapid assessment approach. The two *kandu* sites hosted an average of eighty fish species. The community composition was relatively homogeneous and included several species of interest for both ecological monitoring and fisheries relevance.

Guraidhoo Kandu exhibited large aggregations of Grey Reef Shark, with occasional sightings of Whitetip Reef Shark, and a rare observation of Scalloped Hammerhead (*Sphyrna lewini*, Critically Endangered under the IUCN Red List with a decreasing population trend⁵⁷¹). Additionally, a few individuals of Green Turtle (*Chelonia mydas*, Endangered under the IUCN Red List with a decreasing

⁵⁷¹ C L RIGBY et al., '*Sphyrna lewini*' (The IUCN Red List of Threatened Species 2019: e.T39385A2918526, 2019).

population trend⁵⁷²) were observed, confirming the presence of megafauna in the area.

These observations highlight the potential role of Thaa Atoll as a functional habitat for reef-associated predators and endangered species. While broader surveys are needed for robust assessments, the presence of key elasmobranch and turtle species supports the consideration of site-specific protection measures, especially in *kandu* environments that may serve as migratory corridors or aggregation zones.

In regard to potential anthropogenic pressures in Thaa Atoll, large-scale land reclamation has been carried out on inhabited islands as part of post-disaster recovery and development planning, particularly in Vilufushi and Thimarafushi. A total of 40.2 hectares were reclaimed in Vilufushi, while 26.5 hectares were reclaimed in Thimarafushi⁵⁷³. Vilufushi, located in the northeast of the atoll near Olhugiri *kandu*, underwent extensive reconstruction and expansion following the devastation caused by the 2004 tsunami. The urgency of resettlement and the restoration of essential infrastructure in Vilufushi called for rapid intervention. Nonetheless, the project also required careful consideration of long-term environmental risks, including projected sea-level rise, population growth, and the potential impacts on nearby coral reef systems. Environmental assessments conducted prior to the works examined multiple options for sourcing the estimated one million cubic metres of sand required for the reclamation. The chosen solution involved dredging coral sand from the island's northern reef edge and transferring it directly into the reclamation zone. The operation was executed under strict environmental guidelines, including the use of protective bunds and suspended sediment basins to limit turbidity and safeguard adjacent reef habitats. Continuous monitoring of environmental parameters played a crucial role in ensuring compliance with these safeguards and minimising ecological harm. According to post-project assessments, damage to the surrounding coral reefs was minimal, largely due to the combination of mitigation measures and real-time oversight⁵⁷⁴.

⁵⁷² J A SEMINOFF, '*Chelonia mydas* (amended version of 2004 assessment)' (The IUCN Red List of Threatened Species 2023: e.T4615A247654386, 2023).

⁵⁷³ MINISTRY OF ENVIRONMENT AND ENERGY, Republic of Maldives, *State of the Environment 2016* (Maldives 2017).

⁵⁷⁴ C BOSSCHIETER, 'Environmental monitoring for the reconstruction of Vilufushi, Maldives' (2007) 109 *Terra et Aqua* 14.

4.4.1.4 Dhaalu Atoll

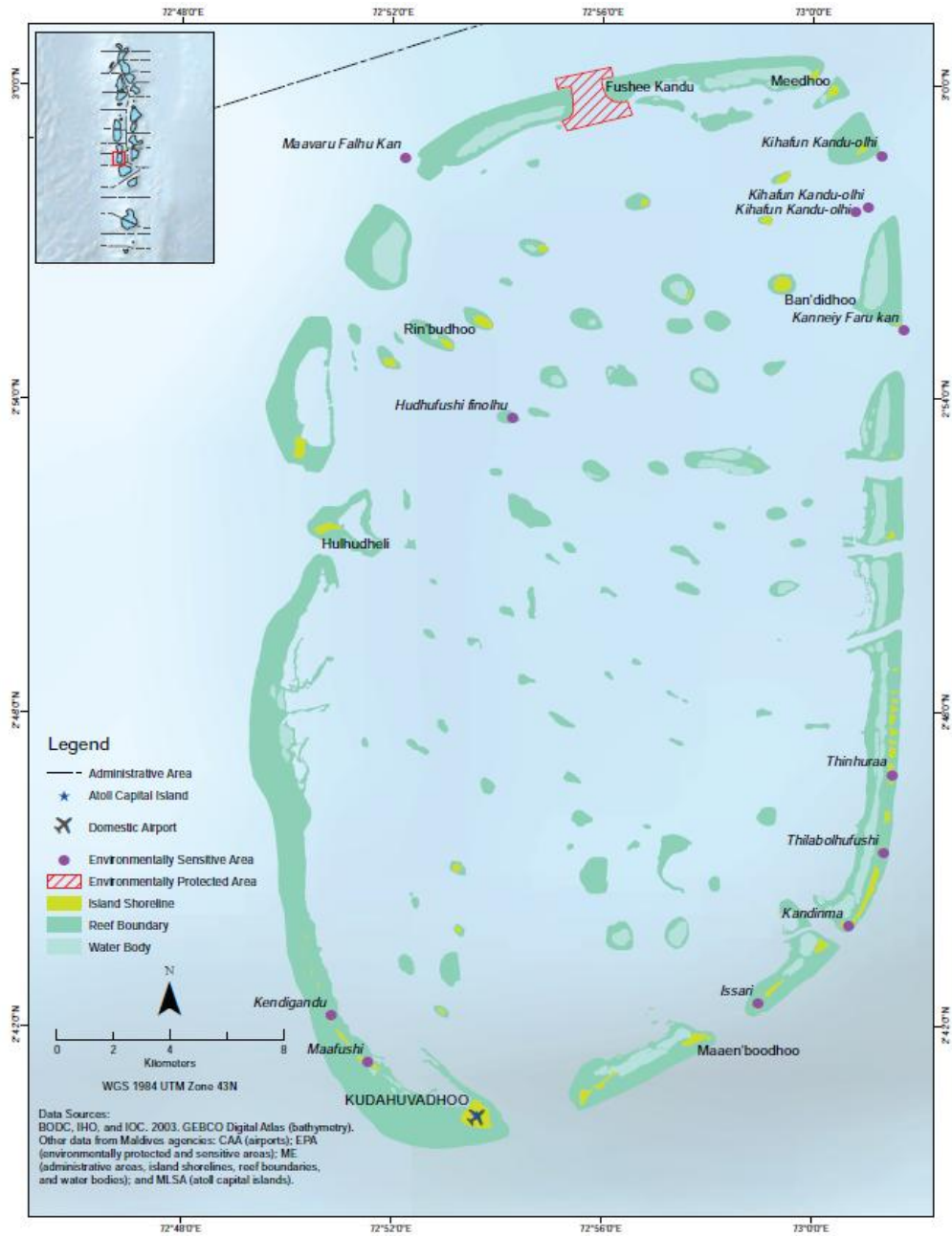


FIGURE 4.8 DHAALU ATOLL, ENVIRONMENTALLY PROTECTED AND SENSITIVE AREAS

Source: ASIAN DEVELOPMENT BANK, *Multihazard Risk Atlas of Maldives, Biodiversity - Volume IV* (March 2020).



FIGURE 4.9 DHAALU ATOLL, ECOLOGICAL SURVEY LOCATIONS

Dhaalu was surveyed across eleven sites, of which seven were assessed using standardized transects for detailed benthic and coral recruitment analysis. The findings highlight both areas of ecological strength and vulnerabilities requiring attention to support coral reef

resilience in the atoll. Across the seven sites surveyed in detail, a total of twenty-seven coral genera were recorded, representing 46.5 per cent of the known regional diversity. Overall, sites showed moderate coral health, with an average hard coral cover of 27.3 per cent, consistent with data from high human-pressure reefs. The highest coral cover was observed at Kuda Thila dominated by fast-growing *Acropora* and *Pocillopora*. In contrast, Valla presented the lowest coral cover and coral diversity (only four genera), indicating possible localized stress or degradation. Fushi Kandu (Giri) was the most biodiverse site, with sixteen coral genera identified.

Across all surveyed sites, *Acropora* emerged as the most abundant coral genus, followed by *Pocillopora*, *Porites*, and *Pavona*. A total of thirty-five coral species listed as Near Threatened to Critically Endangered under the Maldives Red List were recorded during the surveys.

Notably, *Acropora digitifera* (Endangered under the IUCN Red List with a decreasing population trend⁵⁷⁵) was observed consistently across sites. The Maldives Red List projects a significant population decline, more than 80 per cent, for this species within a 30-year timeframe (2022-2025)⁵⁷⁶, primarily due to the impacts of climate change and associated habitat degradation.

Similarly, *Acropora hemprichii* (Endangered under the IUCN Red List with a decreasing population trend⁵⁷⁷) was recorded. This species is known for its low capacity to recover from bleaching events, and the Maldives Red List anticipates an 80-90 per cent population reduction over the next three generations (2022-2052), attributed to a loss of habitat quality linked to climate-induced stressors⁵⁷⁸.

Observations also included *Diploastrea heliopora* (Least Concern under the IUCN Red List with a decreasing population trend⁵⁷⁹). Despite its global status as Least Concern species, the Maldives Red List similarly forecasts an 80-90 per cent reduction in population within Maldivian waters over the next three generations (2022-2052), again due to the deterioration of habitat quality caused by climate change⁵⁸⁰.

Finally, *Galaxea fascicularis* was also documented among the observed sites, underscoring the ecological richness and the presence of multiple conservation-relevant taxa within the atoll.

In most sites, juvenile corals outnumbered recruits, indicating past recruitment success, but possibly limited recent settlement. Additionally, the density of invertebrates was extremely low across all sites.

Surveys in seven sites across Dhaalu Atoll revealed a rich and diverse fish community, with approximately 14,438 individuals recorded, spanning thirty-nine genera. The overall composition indicates a well-structured and ecologically functional reef system, dominated by small to medium-sized reef-associated fish.

⁵⁷⁵ ZT RICHARDS and CI NUÑEZ LENDO, '*Acropora digitifera*' (The IUCN Red List of Threatened Species 2024: e.T254415453A165795607, 2024).

⁵⁷⁶ I MOHAMED, '*Acropora digitifera*' (The Maldives Red List of Threatened Species, 2022).

⁵⁷⁷ ZT RICHARDS, W DELLISANTI and CI NUÑEZ LENDO, '*Acropora hemprichii*' (The IUCN Red List of Threatened Species 2024: e.T132981A165659729, 2024).

⁵⁷⁸ H AMIR et al., '*Acropora hemprichii*' (The Maldives Red List of Threatened Species, 2022).

⁵⁷⁹ CI NUÑEZ LENDO et al., '*Diploastrea heliopora*' (The IUCN Red List of Threatened Species 2024: e.T133231A165784545, 2024).

⁵⁸⁰ P ROE and M MOHAMED, '*Diploastrea heliopora*, *Honeycomb coral*' (The Maldives Red List of Threatened Species, 2022).

The fish community was relatively homogeneous across sites. The most abundant and ecologically significant families included: *Pomacentridae*, *Acanthuridae*, *Serranidae*, *Labridae*, *Scaridae*, *Caesionidae*, *Chaetodontidae*, *Balistidae*, and *Pomacanthidae*. Medium-sized *Serranidae*, important for local fisheries, were commonly observed, reinforcing the reef's contribution to food security and livelihoods.

Despite strong reef fish presence, surveys revealed concerning trends in apex predators and megafauna. Sharks were rare, with only a few sightings of Whitetip Reef Shark, Grey Reef Shark, and Nurse Shark (*Nebrius Ferrugineus*, Vulnerable under the IUCN Red List with a decreasing population trend⁵⁸¹). Ray populations were similarly low, with repeated sightings only of *Pastinachus sephen* (Near Threatened under the IUCN Red List with a decreasing population trend⁵⁸²). Sea turtles were observed in just one site, with only isolated individuals of Hawksbill Turtle, and Green Turtle.

As for other Maldivian atolls, In Dhaalu Atoll land reclamation activities have been particularly pronounced, with significant interventions on the inhabited islands of Meedhoo - between Fushi *kandu* and Velavaru *kandu* field sites - and Kudahuvadhoo⁵⁸³ - south of Valla's field site. In Meedhoo, the Government initiated a land reclamation programme following post-disaster recovery efforts, initially framed as a 'defensive' measure to address vulnerability to sea-level rise and extreme events, such as tsunamis. The restricted land area available for settlement was identified as a key factor contributing to this vulnerability⁵⁸⁴. As of 2015, the emergency response evolved into an expanded land reclamation project, encompassing approximately twenty hectares. In Kudahuvadhoo, nearly seventy hectares were reclaimed⁵⁸⁵.

⁵⁸¹ C SIMPFENDORFER et al., '*Nebrius ferrugineus*' (The IUCN Red List of Threatened Species 2021: e.T41835A173437098, 2021).

⁵⁸² PM KYNE et al, '*Pastinachus sephen*' (The IUCN Red List of Threatened Species 2017: e.T70682503A109922153, 2017).

⁵⁸³ MINISTRY OF ENVIRONMENT AND ENERGY (n. 573).

⁵⁸⁴ M SCHMIDT DI FRIEDBERG, S MALATESTA and E DELL'AGNESE, 'Hazard, Resilience and Development: The Case of Two Maldivian Islands' (2020) 3(2) Bollettino della Società Geografica Italiana serie 14, 11.

⁵⁸⁵ MINISTRY OF ENVIRONMENT AND ENERGY (n. 573).

The stated objectives of these interventions in Medhuu included reducing the risk of overpopulation by creating space for future settlement and enhancing the resilience of the local fishing industry by establishing a protected harbour for what is one of the largest local fleets in the region. The reclaimed area serves as both a shipyard and a storage facility, supporting the island's strategic role as a supra-local fishing hub. This positioning is seen as a buffer against the risks of economic and social marginalisation, namely, the threat of isolation or peripheralization faced by smaller islands within the archipelago. However, critical concerns have been raised regarding both the governance and environmental implications of these land reclamation activities. Notably, the projects were carried out without consultation or participation from local inhabitants or the Island Council, raising issues of procedural fairness and legitimacy. In addition, the environmental and public health impacts of such large-scale modifications to the coastal and marine environment have been the subject of criticism⁵⁸⁶.

By contrast, the case of Rin'budhoo in Dhaalu atoll - north of Hudhufushi Finolhu' field site - offers an alternative model of island development, one grounded in small-scale, community-led tourism and cultural heritage valorisation. Rin'budhoo has not undergone major land reclamation projects, and its local Council has pursued a strategy focused on environmental protection, cultural preservation, and economic diversification. This includes support for local guesthouses, eco-tourism partnerships, community art initiatives, and the continuation of artisanal activities⁵⁸⁷.

The contrasting experiences of Meedhoo and Rin'budhoo, documented by social scientists affiliated with the MaRHE Center, provide important contextual evidence for conservation planning in Dhaalu Atoll. They highlight the importance of participatory governance, the risks posed by unregulated land reclamation, and the value of integrating local socio-economic priorities.

⁵⁸⁶ SCHMIDT DI FRIEDBERG, S MALATESTA and E DELL'AGNESE (n. 584).

⁵⁸⁷ *Ibid.*

4.4.2 A potential community-based network of MPAs

The Kunming-Montreal Global Biodiversity Framework sets forth an ambitious global conservation agenda through its adoption of Target 3. It reflects a legally non-binding but politically significant commitment, affirming the critical role of area-based conservation in halting biodiversity loss and promoting ecosystem resilience. The Vertical Ocean Project represents an important step forward in this direction. As one of the first initiatives aiming to provide scientific basis for a potential network of MPAs in four central atolls, the project offers an opportunity to explore the legal and institutional pathways needed for such a network.

The shift from isolated MPAs to ecologically coherent networks represents a significant evolution in marine conservation and governance. While small, site-specific MPAs have played a foundational role in safeguarding critical habitats and species, their fragmented nature often limits ecological connectivity and undermines broader conservation objectives. The development of MPA networks responds to the growing recognition that marine ecosystems operate across spatial and jurisdictional scales that exceed the capacity of individual protected sites. As such, networks of MPAs are increasingly endorsed in international legal and policy instruments as a more effective mechanism to maintain biodiversity, enhance ecosystem resilience, and ensure the delivery of essential ecosystem services. This transition reflects not only scientific advancements in marine ecology but also a normative shift in legal approaches, favouring integrated, ecosystem-based, and transboundary strategies to ocean governance.

If well designed, MPA networks can be an effective strategy for achieving fisheries, biodiversity and climate change objectives in tropical marine ecosystems⁵⁸⁸. To this end, the establishment of ecologically coherent and legally robust networks of MPAs must be guided by both biophysical and socioeconomic criteria. Internationally recognized scientific frameworks, including those advanced by the Commission for Environmental Cooperation, identify four core objectives

⁵⁸⁸ RJ BROCK, E KENCHINGTON and A MARTÍNEZ-ARROYO (eds), *Scientific Guidelines for Designing Resilient Marine Protected Area Networks in a Changing Climate* (Commission for Environmental Cooperation 2012).

for MPA network design intended to enhance ecological resilience in the context of climate change:

1. Protect species and habitats with crucial ecosystem roles, or those of special conservation concern
2. protect potential carbon sinks
3. protect ecological linkages and connectivity pathways for a wide range of species
4. protect the full range of biodiversity present in the target biogeographic area⁵⁸⁹.

The environmental monitoring activities undertaken within the framework of the Vertical Ocean Project confirm the applicability of these objectives to the central atolls of Meemu, Faafu, Dhaalu, and Thaa. The recorded presence of species listed under both the IUCN Red List and the Maldives Red List, such as reef-building corals, elasmobranchs, marine turtles, and reef-associated fish, demonstrates the ecological significance of the area for taxa of conservation concern and those with key functional roles. Furthermore, the documented occurrence of coral reef systems substantiates the relevance of these areas as potential blue carbon ecosystems meriting targeted protective measures. The geographic positioning of these atolls within the central reef system of the Maldives underscores their strategic importance in maintaining ecological connectivity, particularly for species with pelagic larval dispersal (e.g. corals) and migratory patterns (e.g. sharks and turtles). The observed diversity of habitats and taxonomic groups supports the principle of ecological representativity, in accordance with international best practices for MPA network design.

Nonetheless, a critical shortcoming remains in the absence of data pertaining to the socioeconomic context of the proposed area. At present, no comprehensive or publicly accessible information exists on anthropogenic pressures, patterns of resource use, or community interests within the four atolls. This data gap presents a significant challenge to the integration of socioeconomic considerations into spatial conservation planning. Given the foundational role of local engagement in the success and legitimacy of area-based management measures, it is essential that future efforts incorporate inclusive and participatory processes. This is particularly pertinent in view of the Maldives' evolving

⁵⁸⁹ *Ibid.*

decentralization framework, which envisages a greater role for local councils and communities in environmental governance.

The Decentralization Act (Act No. 7/2010) provides a significant institutional entry point. The Act introduced a three-tier local governance structure, comprising 187 island councils, nineteen atoll councils, and two city councils, with legal mandates encompassing environmental protection and sustainable development. For remote and less economically central atolls such as Dhaalu, Faafu, Meemu, and Thaa, this legal framework creates the potential for devolved management approaches that are more responsive to local ecological knowledge, cultural values, and governance capacities⁵⁹⁰.

One promising pathway under this framework is the establishment of Locally Managed Marine Areas (LMMAs) or community-based protected areas. LMMAs are defined as:

An area of nearshore waters and coastal resources that is largely or wholly managed at a local level by the coastal communities, land-owning groups, partner organizations, and/or collaborative government representatives who reside or are based in the immediate area⁵⁹¹.

They rely on adaptive management principles that incorporate local knowledge, iterative monitoring, and flexible governance mechanisms. The success of LMMAs across Southeast Asia and the Pacific, particularly in data-limited settings, demonstrates the feasibility and cost-effectiveness of bottom-up management approaches in contexts where conventional, top-down models may be financially or administratively unviable. The case of Southern Cebu in the Philippines illustrates the potential of LMMAs to enhance ecological outcomes, support community livelihoods, and strengthen local enforcement. Through participatory planning, community-based monitoring, and municipal coordination, the region has seen measurable improvements in coral cover, reef fish abundance, and compliance with marine conservation regulations. Key enabling factors included environmental user fees, foreshore management, legal registration of

⁵⁹⁰ MINISTRY OF CLIMATE CHANGE, ENVIRONMENT AND ENERGY (n. 537).

⁵⁹¹ H GOVAN et al., *Locally-Managed Marine Areas: A guide for practitioners* (The Locally-Managed Marine Area Network 2008).

fishers and vessels, and the creation of local enforcement groups with jurisdiction over municipal waters⁵⁹².

A relevant precedent in the Maldives is Hanifaru Bay in Baa Atoll, designated as an MPA under the UNESCO Biosphere Reserve framework. While not without limitations, Hanifaru provides a functioning example of co-management in practice. The Baa Atoll Biosphere Reserve Office oversees the implementation and enforcement of a Conservation Action Plan, including visitor management, ranger deployment, and reporting obligations. Its Board of Trustees includes representatives from government, civil society, and the tourism industry, thereby institutionalizing stakeholder participation and shared governance responsibilities⁵⁹³.

Based on these premises, a network of MPAs in the central Maldives, if grounded in both scientific evidence and community-based governance models, is a legally and institutionally feasible objective. However, such a network must be accompanied by a robust enabling framework that includes legal recognition of locally managed areas, mechanisms for capacity-building at the atoll and island levels, and sustainable financing tools.

Ultimately, the establishment of a resilient and effective MPA network in the Maldives will require harmonizing national biodiversity goals with local realities, integrating ecological knowledge with legal innovation, and moving from abstract targets to place-based action. The Vertical Ocean Project has provided a scientific foundation upon which these next steps can be built, but realizing the transformative potential of Target 3 will depend on sustained political will, legal clarity, and inclusive participation across all levels of governance.

⁵⁹² RJ BROCK, E KENCHINGTON and A MARTÍNEZ-ARROYO (n. 588).

⁵⁹³ MINISTRY OF CLIMATE CHANGE, ENVIRONMENT AND ENERGY (n. 537).

Brief conclusive note

This thesis has primarily employed a top-down analytical framework, beginning with the foundational principles of the international law of the sea and international environmental law and examining their implementation within the legal and institutional framework of the Maldives. It assessed regional best practices from other parts of the world and their potential applicability to the North-Western Indian Ocean region, in which the Maldives is situated. The analysis proceeded from the national government in Malé to the decentralized governance structures established under domestic law, namely the atoll and island councils tasked with local environmental management.

As a SIDS, the Maldives is among the most vulnerable countries to the impacts of sea-level rise induced by climate change. This vulnerability raises two significant legal challenges under the law of the sea: first, the shifting of baselines resulting from changes to the low-water line and other coastal features used in defining baselines; and second, in extreme scenarios, the implications for the statehood of a country that loses all its land territory to inundation. Contemporary legal scholarship and international jurisprudence are evolving toward the recognition of fixed baselines and the continuity of statehood, even in the face of permanent submersion. However, even with such developments, the issue remains unresolved in practical terms, particularly with regard to the human right to a clean, healthy, and sustainable environment.

This right is already compromised in the Maldives due to widespread environmental degradation, particularly in the form of marine and saltwater pollution, stemming largely from inefficient waste management systems. This issue is especially acute in the outermost islands, where infrastructure is limited and regulatory enforcement is weak. A further concern is the unregulated release of hazardous chemicals, often derived from imported goods, into the marine environment. To address this, the Maldives must strengthen its domestic legislation on the importation and management of hazardous substances, in line with its obligations under the Basel, Rotterdam, and Stockholm Conventions. Similarly, the responsibility of exporting States should be reinforced, particularly when waste is transferred to countries lacking adequate disposal capacity.

The Maldives has authorized the importation of waste from third countries under a ‘waste-to-energy’ framework. However, such policies may prove detrimental, especially given that the Maldives already struggles with national waste management, where open burning remains prevalent in remote islands. Exporting States also bear a responsibility to ensure that waste is not transferred to jurisdictions where environmentally sound disposal is not guaranteed - a concern already substantiated by cases in Malaysia and other South Asian States.

In line with its international commitments, the Maldives is obligated to enhance its environmental regulatory regime. Target 3 of the Kunming-Montreal Global Biodiversity Framework, adopted under the CBD, commits Parties to protect at least 30 per cent of marine and coastal areas by 2030 through effective, equitable, and well-connected area-based systems. This poses a unique challenge for an archipelagic State composed 99 per cent ocean, with limited enforcement capacity and financial resources. Currently, less than 1 per cent of Maldivian marine waters are legally protected, and most of these areas lack comprehensive management plans, falling short of the ‘effective protection’ required by the Kunming-Montreal Global Biodiversity Framework.

In this context, legally formalized partnerships such as the MoU signed between the Government of the Maldives and the University of Milano-Bicocca are crucial. These agreements facilitate scientific research and support the long-term protection of biodiversity-rich marine areas. The designation of protection in Faafu, Dhaalu, Meemu, and Thaa atolls could satisfy international protection criteria. However, the limited capacity to ensure enforcement remains a persistent challenge. International assistance continues to be essential to support conservation in sites that provide ecosystem services not only to local communities but to the global environment. To reduce dependency on external aid, the Maldives can turn to LMMAs as a cost-effective and community-driven conservation strategy. This approach aligns with ongoing decentralization reforms, which aim to strengthen the authority of atoll and island councils in environmental governance. However, formal legal recognition and integration into the national system of protected areas remain necessary to ensure long-term viability.

Alongside area-based protection, the Maldives has also undertaken reactive measures in response to climate change, including land reclamation, coastal defences, and ecosystem-based adaptation strategies. Special attention should be given to coral reef restoration projects, which are now being implemented across the archipelago. Nevertheless, limitations persist, particularly regarding the long-term legal and ecological sustainability of these initiatives.

The MaRHE Center, operating in Magoodhoo (Faafu Atoll), offers a notable example. The research centre has been actively engaged in coral reef restoration and marine research, involving both international scientists and local communities. To ensure the legal durability and institutional legitimacy of such initiatives, these sites should be designated as OECMs under international law. Such a designation would support the primary objectives of scientific and technological development, capacity-building, and the transfer of marine technologies, with the conservation of the site as a long-term ancillary goal. In this regard, the MaRHE Center could serve as the delegated entity for governance and management, representing a legal model of decentralized environmental governance where authority is conferred upon a scientific institution located in a remote island.

A recurring and foundational principle throughout this thesis has been the duty of international cooperation, which is not merely aspirational but legally binding across multiple environmental regimes. In particular, UNCLOS imposes clear obligations on States to cooperate, especially through capacity-building, scientific collaboration, and the transfer of marine technologies, to assist developing countries in the sustainable management and protection of marine environments. These duties are echoed in the CBD, UNFCCC and other multilateral frameworks.

International cooperation must go beyond technical assistance and capacity-building. It requires substantive action by developed States, particularly in reducing GHG emissions, which are the primary cause of climate change impacts disproportionately affecting vulnerable countries. While SIDS such as the Maldives contribute minimally to global emissions, they bear the brunt of climate-related threats, including sea-level rise, ocean acidification, and biodiversity loss. The

principle of common but differentiated responsibilities and respective capabilities enshrined in international climate law demands that developed States not only support adaptation and resilience efforts in developing countries but also lead in mitigation efforts, recognizing their historical and current contributions to global environmental degradation.

This legal imperative of cooperation, spanning climate law, biodiversity conservation, and the law of the sea, was emphatically reaffirmed in the 2024 Advisory Opinion of the International Court of Justice on the Obligations of States in respect of Climate Change, which underscores the binding nature of collective and equitable action in addressing the global climate crisis.

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List of acronyms

ABMT	Area-based management tool
ADB	Asian Development Bank
Basel Convention	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 22 March 1989)
BAU	Business-as-usual
BBNJ Agreement	Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (New York, 19 June 2023)
BIOT	British Indian Ocean Territory
CLCS	Commission on the limits of the continental shelf
COP	Conference of the Parties
EBM	Ecosystem-based management
EBSA	Ecologically or Biologically Significant Marine Area
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
FRA	Fisheries Restricted Area
GDP	Gross Domestic Product
GFCM	General Fisheries Commission for the Mediterranean
GHGs	Greenhouse Gases
GtCO _{2e}	Gigatonnes of CO ₂ equivalent
HABs	Harmful algal blooms
ICJ	International Court of Justice
ICRI	International Coral Reef Initiative
ILA	International Law Association
ILACommBaselines	ILA Committee on Baselines under the International Law of the Sea
ILACommSLR	ILA Committee on International Law and Sea Level Rise
ILC	International Law Commission
IMO	International Maritime Organization

INC	Intergovernmental Negotiating Committee
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPCC AR6	IPCC Sixth Assessment Report
ITLOS	International Tribunal of the Law of the Sea
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
MaRHE Centre	Marine Research High Education Centre
MED POL	Programme for the Assessment and Control of Marine Pollution in the Mediterranean
Montevideo Convention	Convention on Rights and Duties of States adopted by the Seventh International Conference of American States (Montevideo, 26 December 1933)
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
NDC	National Determined Contribution
NIP	National Implementation Plan
OECD	Organisation for Economic Co-operation and Development
OECM	Other Effective area based Conservation Measure
OPEC	Organization of the Petroleum Exporting Countries
PCBs	Polychlorinated biphenyls
PIC	Prior Informed Consent
Point T	Trijunction point
POPs	Persistent organic pollutants
Rotterdam Convention	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam, 10 September 1998)
SAP	Strategic Action Plan

SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SPA/BD Protocol	Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean.
SPAMI	Protected Area of Mediterranean Importance
Stockholm Convention	Stockholm Convention on Persistent Organic Pollutants (Stockholm, 22 May 2001)
The Maldives	The Republic of Maldives
UNCLOS	United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982)
UNEP	United Nations Environment Programme
VMEs	Vulnerable Marine Ecosystems
WDPA	World Database on Protected Areas

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