Analysis of Policies related to the Protection of Coral Reefs

Analysis of global and regional policy instruments and governance mechanisms related to the protection and sustainable management of coral reefs

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Duke
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Contributing Authors

Rachel Karasik, Amy Pickle, Stephen A. Roady, Tibor Vegh and John Virdin, Duke University Nicholas Institute for Environmental Solutions; Charles Di Leva, former Chief Counsel, Environmental and International Law Unit, the World Bank Group.

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Abbreviations/Acronyms

BPOA	Barbados Programme of Action
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CMS	Convention on Migratory Species
COBSEA	Coordinating Body on the Seas of East Asia
CoP	Conference of the Parties
CTI	Coral Triangle Initiative
DFI	Development Finance Institute
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GPA	Global Program of Action for the Protection of the Marine Environment from Land-based Activities
ICRI	International Coral Reef Initiative
ICT	Information and Communications Technology
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported and Unregulated fishing
LME	Large Marine Ecosystem
MARPOL	International Convention for the Prevention of Pollution from Ships
MEA	Multilateral Environmental Agreement
MPA	Marine Protected Area

NBSAP	National Biodiversity Strategy and Action Plan
NCTF	National Conservation Trust Fund for Natural Resources
POP	Persistent Organic Pollutant
SAP	Strategic Action Programme
SDG	Sustainable Development Goal
SES	Socio-Ecological Systems
SIDS	Small Island Developing States
SPREP	South Pacific Regional Environment Program
SSF	Small-Scale Fisheries
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNEA	United Nations Environment Assembly
UNEP	United Nations Environment Programme
UNEP-WCMC	UN Environment World Conservation Monitoring Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
VMS	Vessel Monitoring System
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature

Summary

Rationale for the Analysis

Warm-water coral reef ecosystems worldwide have undergone rapid and accelerating changes over recent decades. This has been driven by increasing concentrations of greenhouse gases in the atmosphere and subsequent sea surface temperature increases, as well as multiple other pressures associated with human activity. The Intergovernmental Panel on Climate Change projected in 2018 that the world's coral reefs will decline by a further 70 to 90 percent with a 1.5 degree Celsius increase in the global mean temperature from pre-industrial levels (with losses greater than 99 percent with a 2 degree Celsius increase). This pattern is not expected to be uniform and some reefs may be more resilient than others to such stress, while others may be degraded at a lower global mean temperature increase. For these reasons, the Intergovernmental Panel on Climate Change states with high confidence that coral reefs are one of the world's most vulnerable marine ecosystems to climate change.

Additional anthropogenic drivers of coral reef change, such as overfishing and pollution, affect a large portion of the world's reefs. In addition to causing widespread reef degradation, these locally-generated drivers reduce the resilience of coral reefs to climate change, exacerbating the response of coral ecosystems to elevated sea surface temperatures. Reductions in the cumulative impacts of multiple locally-generated stressors can help enhance the integrity and resilience of coral reef ecosystems in the face of bleaching events.

The international community has committed on numerous occasions to coordinated policy responses to the changes observed and projected in coral reef ecosystems. Even as many states work to translate these commitments into local action, the intensity of the drivers of change and the estimated rates of change in coral reef ecosystems have only increased. Mindful of this challenge, in 2016 the United Nations Environment Assembly passed Resolution 2/12 Sustainable Coral Reef Management, reiterating the need for international cooperation for the protection of coral reef ecosystems, and calling for national governments to prioritize this effort, drawing upon technical and financial support from donors when necessary. Specifically, the resolution called on the United Nations Environment Program, in cooperation with the International Coral Reef Initiative and other relevant organizations and partners, to prepare an analysis of global and regional policy instruments and governance mechanisms related to the protection and sustainable management of coral reefs.

The design of the current body of international policy was assessed in comparison to the intensifying anthropogenic drivers of change affecting coral reefs. The analysis focused on gaps in the design of international instruments to address the drivers, including the governance mechanisms they created, and possible options for addressing these gaps. As a first step, the written agreements of relevant global and regional instruments were identified and compiled into an inventory that served as the data set for analysis. The content of the written agreements describing these instruments was then analyzed to identify the commitments made in each document, and assess any gaps between these commitments and the various drivers of change, the strength of these commitments, and the governance mechanisms established to deliver them.

Summary of Key Findings

The current body of international instruments related to coral reefs is vast and broad, with commitments corresponding to almost every anthropogenic driver of change in coral reef ecosystems. There are at least 232 international instruments considered to directly or indirectly support conservation and sustainable management of coral reef ecosystems, and/or address common anthropogenic drivers of change in these systems. This body of international coral reef-related instruments has developed incrementally since the 1960s, and includes 150 global instruments, of which 29 are legal instruments (i.e. binding), under which most of the rest are 'nested' as voluntary instruments (i.e. non-binding). In addition, there are 82 regional instruments, 44 of which are legal. This includes a total of 32 Regional Seas instruments. The body of international reef-related instruments includes at least 591 discrete commitments to address the wide range of anthropogenic drivers of change in coral reef ecosystems.

This international policy framework includes a large number of targets to achieve specific outcomes relevant to coral reef ecosystems or the anthropogenic drivers of change affecting them. The instruments include 79 discrete global targets that are time-bound and measurable (14 percent of which have expired), as well as 59 regional targets. More than half (53 percent) of these are found in just nine instruments: the Global Program of Action for the Protection of the Marine Environment from Land-based Activities, the Convention on Biological Diversity Strategic Action Plan 2011-2020, the Paris Agreement and the 2030 Agenda for Sustainable Development (global instruments); the Coral Triangle Initiative Regional Action Plan, the Secretariat of the Pacific Regional Environment Program Action Plan 2011-2015, Bay of Bengal Strategic Action Program, Arafura Timor Seas Strategic Action Program and the Western Indian Ocean Strategic Action Program (regional instruments). Taken together, the international reef-related instruments provide a comprehensive if broad set of measurable, global targets to address most of the anthropogenic drivers of change in coral reef ecosystems. For example, these targets include commitments to hold the increase in the global average temperature to well below 2 degrees above pre-industrial levels; to end overfishing and illegal fishing and effectively regulate harvesting; to prevent and reduce marine pollution of all kinds; to conserve at least 10 percent of coastal and marine areas; and the now overdue Aichi target 10 to minimize the multiple anthropogenic pressures on coral reefs by 2015, so as to maintain their integrity and functioning.

This broad body of international reef-related instruments is focused on action by states, who have the primary responsibility for some 75 percent of the commitments. Within this body of international instruments, the United Nations Convention on the Law of the Sea treaty provides the legal framework within which all activities in the oceans and seas must be carried out, and establishes the rights and commitments of States within different maritime zones. In the territorial sea, coastal states exercise sovereignty over their natural resources. In the exclusive economic zone, coastal states have the sovereign rights to explore, exploit, conserve and manage natural resources, whether living or non-living. On the continental shelf, coastal states exercise sovereign rights for the purpose of exploring it and exploiting its natural resources, which consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species. In both the exclusive economic zone and on the continental shelf, coastal States also have jurisdiction with regard to marine scientific research. The United Nations Convention on the Law of the Sea treaty also establishes the general obligation for states to protect and preserve the marine environment.

By virtue of the maritime zones established under the United Nations Convention on the Law of the Sea Treaty, some 85 percent of the world's warm-water coral reefs are under the jurisdiction of 25 countries. These 'coral reef states' essentially function as quasi-trustees of the world's warm-water reefs.

The majority (over 85 percent) of international reef-related policy commitments are planning and process-oriented. These focus on various forms of planning that states should or are required to conduct in order to develop rules and responses to locally-generated anthropogenic pressures on coral reef ecosystems. Some of the most common objectives of the commitments include: (i) stabilizing atmospheric concentrations of greenhouse gases and reducing emissions, while supporting adaptation in developing states and particularly SIDS; (ii) regulating harvesting of fish resources to conserve and manage stocks at targeted levels through science-based limits and measure to protect associated ecosystems, with a priority on support to small-scale fisheries; (iii) conducting integrated planning processes to prevent, reduce and control various sources of ocean pollution, together with environmental impact assessments and particularly an emphasis on waste treatment capabilities; (iv) regulating oil pollution from offshore oil and gas extraction, as well as shipping; and (v) addressing physical restructuring of the coastline together with multiple anthropogenic pressures on coral reef ecosystems or coastal and marine ecosystems more broadly, typically through area-based planning and regulation, such as integrated coastal zone management and marine spatial planning, and networks of marine protected areas.

***While the breadth of international coral reef-related instruments is vast, the 'depth' is less so – i.e. the nature of the commitments by states are quite general, and largely voluntary*.** Many of the commitments are focused on "marine and coastal ecosystems" in general or on the various economic sectors of human activity that may drive changes in coral reef ecosystems, rather than on coral reef ecosystems themselves. These commitments are nonetheless applicable to coral reefs even if not focused on them. For the majority of these broad commitments (52 percent), the 'strength' or robustness of the commitment could be considered weak (i.e. the commitment is not required, and contained in a voluntary instrument), while only 17 percent were considered as strong (i.e. required, in a binding instrument). Of course, simply because the strength of a commitment is characterized as the weakest possible, does not mean that it would not be met by states or deliver impact, but simply that the requirement upon states to do so is relatively weak.

Although states have the primary responsibility to deliver the vast majority of the international commitments, relatively few governance mechanisms have been established by the instruments to support them to do so. The efficiency of the international instruments depends upon the mechanisms through which they function, such as enforcement mechanisms and financing mechanisms. Of the 591 reef-related commitments, only 13 percent were linked to references of enforcement mechanisms. Of these, one sixth were commitments in the United Nations Convention on the Law of the Sea treaty. These typically require states to 'adopt and enforce' the measures needed to deliver the commitments in the instrument, and in some cases the global, legal instruments require states to report to the conferences of the parties to monitor progress. In addition to the United Nations Convention on the Law of the Sea, another third of the reef-related commitments matched to references of enforcement were contained in Regional Seas instruments. With relatively few enforcement mechanisms or penalties specified in the body of international reef-related instruments, many states may not have incentive to comply with commitments, particularly in low and lower-middle-income economies with competing demands for scarce public resources. Hence, more of the instruments emphasize 'the carrot' rather than 'the stick', i.e. economic incentives rather than penalties and enforcement.

Most of the instruments are not linked to financial mechanisms to help fund the associated costs, presenting a challenge for the many low-income and lower-middle-income states with responsibility for delivering reef-related commitments. Of the 591 reef-related commitments, roughly 25 percent make reference to financing provisions or mechanisms. The proportion is much higher among commitments related to climate change. However, few of these references actually describe the establishment or enhancement of financial mechanisms, but rather most can be characterized as general calls for developed

states and development finance institutions to provide additional financing as needed to support delivery by developing states. The few financial mechanisms created by the reef-related international instruments were established in response to global, binding conventions such as the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the Stockholm Convention. These mechanisms share common features that include: (i) generation of new and additional resources, (ii) provision of financing on a grant or concessional basis, (iii) governance by the Conference of the Parties, and (iv) operation by a development finance institution, e.g. the Global Environment Facility.

Coordination across the 232 international reef-related policy instruments and the 591 commitments they contain presents a particular challenge. Few mechanisms have been established or designated by the instruments to explicitly promote coordination, though in practice financial mechanisms may contribute to this. The state-centric nature of the commitments requires flexibility for governments to craft locally-appropriate responses, with focus on integrated national and in some cases regional-level planning processes. However, given both global targets to reduce anthropogenic pressures on reefs and differentiated capacity to address them across states with jurisdiction over reefs, coordination of efforts at regional and global levels will likely be required.

Conclusions and Recommended Action

While most of the world's warm-water coral reef ecosystems are under the jurisdiction of just twenty-five states, the existential threat to these systems is globally widespread, beyond the reach of any one state or other entity. The Paris Agreement is the primary international instrument for responding to climate change, aiming to hold the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels (at which a further 70 to 90 percent of the world's coral reefs are projected to decline). Achieving this target depends on voluntary, non-binding actions by states.

Because the effects of multiple anthropogenic drivers of change on coral reef ecosystems are cumulative, efforts to address the locally-generated drivers can enhance the integrity and resilience of these ecosystems in the face of climate change. For example, heat-stress induced bleaching is a stress response in corals, the impacts of which may be exacerbated by localized stresses (e.g. extraction of reef fish, input of pollutants, physical loss, etc.). As such, commitments aiming to address locally-generated drivers of change in coral reef ecosystems have become even more urgent as the climate changes.

Given the urgency, this analysis attempts to answer the question: what role can international policy play in helping states to address the locally-generated anthropogenic drivers of change in coral reef ecosystems, in order to enhance their resilience and potential for survival in the face of globally-widespread climate change? To answer this question, an analysis was conducted of the design of international reef-related instruments. The results of the analysis suggest that instruments have been broadly designed to address the known drivers of change. However, given the ecological outcomes measured (e.g. continued decline in reefs and a projected acceleration in this decline under climate change), the key gap is assumed to be in the effectiveness of delivery at the national level (given that an estimated 85 percent of warm-water coral reefs are under the jurisdiction of 25 states). Potential pathways for international policy to help enhance national-level delivery have been identified on the basis of this assumption.

Bearing in mind that ***policy makers are encouraged to collect sex-disaggregated data which is essential towards policy implementation, and to conduct gender-sensitive vulnerability assessments for the coastal water resources***. Vulnerability analyses examine how climate change impacts on the coral reefs and seafood species that are harvested locally alongside other products such as seaweed, as well as

examining how any changes impact both genders, and across economic classes and by household headship, using locally defined criteria.

This analysis identifies at least four potential pathways by which international policy responses can help coral reef states address local drivers of reef loss and enhance coral reef resilience (and potential for survival) in the face of climate change. These potential pathways provide distinct but not mutually exclusive strategic approaches to support discussion and agreement on a way forward by the Environment Assembly. Given the large body of international reef-related instruments and commitments that already exists for almost all known locally-generated drivers, all potential pathways entail accelerating delivery of existing commitments (i.e. implementation). This may be further augmented by revising the existing policy and governance framework with a view to strengthen it, and/or establishing new instruments or mechanisms. ***Business as usual, which could be considered a fifth distinct potential pathway, is not a viable option for sustainable coral reef management.***

1. ***Option One: Maintain the current international reef-related policy framework as designed, but with a focus on accelerated implementation at the national level.*** This would be based on a renewed commitment from states to address drivers of change in coral reef ecosystems, and could include the following actions:
    i. conducting analysis or review of reef-related policies at the national and sub-national level, drawing on the analytical framework and methods used for this analysis, to assess the extent to which current international commitments have been translated into national policy, strategic and institutional frameworks. This would enable identification of gaps, including a self-audit by states of national policies to deliver the current commitments in international instruments; and
    ii. states develop integrated implementation plans for delivering the international commitments, with an emphasis on supporting national and sub-national implementation of policies, analyzing, articulating and taking into account the social and economic benefits from implementation, utilizing existing management tools, and identifying any technical and financial support needed.

2. ***Option Two: Strengthen the existing international policy framework.*** In addition to efforts towards accelerated implementation, the current policy framework may be further revised to strengthen mechanisms and incentives for states to implement their commitments. This could also include ensuring that the mandate and means of relevant international organizations enable them to effectively assist states to accelerate implementation. The following actions may be considered:
    i. the United Nations Environment Assembly could invite states to ratify those global, binding international policy instruments where further support is needed, and to report regularly on progress toward national delivery of international commitment;
    ii. regional policy instruments may be amended, including to expand the mandate of existing mechanisms such as Regional Seas Conventions and Action Plans and associated instruments;
    iii. states participating in the International Coral Reef Initiative may task it with an expanded role e.g. in relation to monitoring progress in implementing international commitments at the national level;
    iv. development finance institutions, such as the World Bank, regional development banks and infrastructure investment banks may adopt ‘coral reef safeguards’, e.g. coral reef-specific guidance for implementation of the existing environmental safeguards applying to all projects that they finance, ensuring consideration of potential impacts on coral reef ecosystems; and

v. states could agree on a new global coral reef target, that would be quantifiable and ambitious in order to address the various drivers, as part of the post-2020 global biodiversity framework following the Aichi targets.

3. ***Option Three: Introduce new international instruments and/or governance mechanisms.*** Options one and two focus on the existing international body of policy. This may be further augmented through the introduction of new instruments and/or mechanisms addressing key challenges and gaps. As mentioned previously, existing commitments are largely considered to be 'weak' in terms of the requirements placed on states, and mechanisms to support delivery are often missing. This suggests an option for either a new global legal instrument focused solely on coral reefs, and/or a new international mechanism to support national-level implementation of reef-related commitments. Options include the following:
    i. states agree on a new global instrument specific to coral reefs, for example a treaty or convention on coral reefs, with specific targets for different drivers of change and governance mechanisms to support delivery (including monitoring and reporting);
    ii. states agree on a new instrument nested under an existing or emerging instrument (such as a target and associated plan specifically on coral reefs in the post-2020 global biodiversity framework under the Convention on Biological Diversity, specific instruments in the context of the 2030 Agenda for Sustainable Development and/or under the United Nations Framework Convention on Climate Change; and/or
    iii. states agree to create a new mechanism to support national-level delivery of existing reef-related policy commitments, including a new financing mechanism specifically for coral reef ecosystems, such as a global fund for coral reefs (e.g. a 'Coral Environment Fund') to provide grant or concessional financing to low-income states to advance progress towards existing targets and international policy commitments, and/or a new global monitoring and reporting mechanism, e.g. in the form of a coral reef commission or forum under the United Nations.

4. ***Option Four (consolidated from the three previous): Rapid support to states for policy implementation, i.e. "the coral reef-state solution".*** Importantly, the three options described above are not mutually exclusive, and could be combined into various packages. As one example, a fourth option is presented, consolidating from the three pathways above, to focus on policy delivery in the relatively small states with jurisdiction over the world's warm-water coral reefs (e.g. 85 percent of these reefs are under the jurisdiction of twenty-five states), including the following actions:
    i. coral reef states conduct a self-audit of national policies to deliver the current commitments in international instruments and develop implementation plans for policy delivery, identifying any technical and financial support needed;
    ii. states may create a new overarching international monitoring group (e.g. a 'coral reef policy observatory'), or task the International Coral Reef Initiative with the role (in consultation and cooperation with competent international organizations), to be responsible for monitoring progress in implementing international commitments at the national level in coral reef states; and
    iii. states agree to create a new financing mechanism specifically for coral reef ecosystems, such as a global fund for coral reefs to provide grant or concessional financing to low-income and lower-middle-income coral reef states through an existing institution such as the Global Environment Facility.

Considerations in advancing along a pathway (as described above or some combination of them, as illustrated by the example in the fourth option) depends upon the nature of the main constraint on

states' delivery of international instruments. For example, reefs may not be prioritized in national agendas because they are lost among all of the other commitments and objectives in the current body of international reef-related instruments. If national prioritization is the main constraint, then perhaps a new international instrument may be introduced to help strengthen states' efforts, or reef-specific commitments could be featured prominently in a new treaty. If capacity to effectively translate internationally adopted provisions into national action is a primary constraint, a new mechanism and/or strengthening of existing instruments to accelerate delivery may be considered.

Addressing human and financial capacity challenges is crucial, irrespective of what coral reef policy pathway is pursued. Limited capacity is a key obstacle to meeting international reef-related commitments in many countries, including in particular Least Developed Countries, Small Island Developing States and other developing countries. Efforts to build capacity that supports effective coral reef policy development and implementation at international as well as national levels need to be strengthened. In this regard, it should be noted that mobilization of additional resources and providing for exchange of information, experiences and lessons learned are among one of the biggest advantages associated with adoption of international instruments.

A new financial mechanism to provide additional resources could help states fill the capacity gap. The urgent need to increase and diversify funding for coral reefs has been recognized. A new financing mechanism specifically for coral reef ecosystems, such as a global fund providing grant, concessional and/or investment financing to advance progress towards international targets and commitments, could deliver significant socio-economic and marine biodiversity benefits, and is a key pillar of the third and fourth pathways identified above.

Because coral reefs are transboundary and a global priority, international policy continues to be a critical tool for sustainable coral reef management. Most coral reefs are under national jurisdiction and while it is difficult to characterize them as global public goods as a basis for collective action, they do have characteristics of common pool resources (or quasi-public goods). Interdependence on a shared resource is typically the rationale for collective action and new investment. There is also a rationale for collective action for a 'common concern of humankind'. Such a shared concern, even if not a shared resource, can be a basis for collective action and was part of the rationale for the Convention on Biological Diversity. More specifically, a common concern of humankind can be a rationale for international cooperation and aid to lower income states, under whose jurisdiction much of the warm-water coral reefs are located. The pathways and actions proposed are not mutually exclusive, and should be seen as part of a package to meet relevant Sustainable Development Goals. As the post-2020 global biodiversity framework is developed, and the 2020 ocean conference approaches to assess the status of implementation of SDG 14, these options or some combination of them would likely be a central piece of any coordinated action by states.

[[تحليل للصكوك السياساتية وآليات الحوكمة العالمية والإقليمية المتعلقة بحماية الشعاب المرجانية وإدارتها على نحو مستدام]]

الأساس المنطقي للتحليل

شهدت النظم الإيكولوجية للشعاب المرجانية في المياه الدافئة في شتى أرجاء العالم تغيرات سريعة ومتزايدة على مدى العقود الأخيرة. وحدثت هذه التغيرات بفعل ارتفاع تركيزات غازات الاحتباس الحراري في الغلاف الجوي وما تلاه من زيادات في درجة حرارة سطح البحر، فضلاً عن العديد من الضغوط الأخرى المرتبطة بالنشاط البشري - وتوقعت الهيئة الحكومية الدولية المعنية بتغير المناخ في عام ٢٠١٨ أن تتقلص الشعاب المرجانية في العالم بنسبة ٧٠ إلى 90 في المائة مع حدوث زيادة قدرها 1,5 درجة مئوية في متوسط درجة الحرارة العالمية عن مستويات ما قبل العصر الصناعي (وحدوث فاقد يزيد عن ٩٩ في المائة عند زيادة قدرها 2 درجة مئوية). ومن غير المتوقع أن يكون هذا النمط منتظماً حيث أن بعض الشعاب المرجانية قد تكون أقدر من غيرها على الصمود في وجه هذا الإجهاد، بينما قد تتدهور شعاب أخرى عند زيادة أقل في متوسط درجة الحرارة العالمية. ولهذه الأسباب فإن الهيئة الحكومية الدولية المعنية بتغير المناخ تؤكد بثقة كبيرة أن الشعاب المرجانية هي واحدة من أكثر النظم الإيكولوجية هشاشةً في مواجهة تغير المناخ.

وتؤثر محركات تغيير الشعاب المرجانية الإضافية البشرية المنشأ، مثل الصيد المفرط والتلوث، على جزء كبير من الشعاب المرجانية في العالم - إضافةً إلى التسبب في تدهور الشعاب المرجانية على نطاق واسع فإن هذه المحركات المولدة محلياً تحد من قدرة الشعاب المرجانية على الصمود في وجه تغير المناخ، مما يؤثر سلباً على استجابة النظم الإيكولوجية المرجانية لارتفاع درجات حرارة سطح البحر. ومن شأن الانخفاض في الآثار التراكمية لعوامل الإجهاد المتعددة المتولدة محلياً أن يساعد في تعزيز سلامة النظم الإيكولوجية للشعاب المرجانية وقدرتها على الصمود في وجه الابيضاض.

وقد التزم المجتمع الدولي في مناسبات عديدة بتنسيق الاستجابات السياساتية للتغيرات الملاحظة والمتوقعة في النظم الإيكولوجية للشعاب المرجانية - ومع أن الكثير من الدول تسعى إلى ترجمة هذه الالتزامات إلى عمل على الصعيد المحلي إلا أن شدة محركات التغيير ومعدلات التغيير التقديرية في النظم الإيكولوجية للشعاب المرجانية زادت. وإدراكاً من جمعية الأمم المتحدة للبيئة لهذا التحدي فقد أقرت في عام ٢٠١٦ القرار ١٢/٢، الإدارة المستدامة للشعاب المرجانية، مؤكدةً مجددا على ضرورة التعاون الدولي لحماية النظم الإيكولوجية للشعاب المرجانية، وداعيةً الحكومات الوطنية إلى أن تعطي الأولوية لهذا الجهد، بالاعتماد على الدعم التقني والمالي من الجهات المانحة عند الاقتضاء. وعلى وجه التحديد، دعا القرار برنامج الأمم المتحدة للبيئة إلى أن يعد، بالتعاون مع المبادرة الدولية للشعاب المرجانية وغيرها من المنظمات والشركاء ذوي الصلة، تحليلاً لصكوك السياسات العالمية والإقليمية وآليات الحوكمة المتعلقة بالحماية والإدارة المستدامة للشعاب المرجانية.

وقد جرى تقييم تصميم السياسات الدولية الحالية بالمقارنة مع محركات التغيير البشرية المنشأ الآخذة في الازدياد التي تؤثر على الشعاب المرجانية - وركز التحليل على ثغرات في وضع الصكوك الدولية الرامية لمعالجة محركات التغيير، بما في ذلك آليات الإدارة التي أنشأتها، والخيارات الممكنة لمعالجة هذه الثغرات. وكخطوة أولى، جرى تحديد وتجميع الاتفاقات الخطية لصكوك عالمية وإقليمية ذات صلة في قائمة جرد شكلت مجموعة البيانات لأغراض التحليل. ومن ثم جرى تحليل مضمون الاتفاقات الخطية التي تصف هذه الصكوك لتحديد الالتزامات المتعهد بها في كل وثيقة، وتقييم الثغرات بين هذه الالتزامات ومختلف محركات التغيير، ونقاط القوة في هذه الالتزامات، وآليات الإدارة التي أنشئت للوفاء بها.

ملخص النتائج الرئيسية

المجموعة الحالية من الصكوك الدولية المتعلقة بالشعاب المرجانية هي مجموعة كبيرة وواسعة النطاق، مع وجود التزامات تجاه كل محرك تقريبا من محركات التغيير البشرية المنشأ في النظم الإيكولوجية للشعاب المرجانية - وهناك على الأقل ٢٣٢ صكاً دولياً يعتقد أنها تدعم بشكل مباشر أو غير مباشر حفظ النظم الإيكولوجية للشعاب المرجانية وإدارتها المستدامة، و/أو تعالج محركات التغيير الشائعة البشرية المنشأ في هذه النظم. وقد تطورت هذه المجموعة من الصكوك الدولية المتعلقة بالشعاب المرجانية تدريجيا منذ ستينيات القرن الماضي، وهي تشمل 150 صكاً عالمياً منها 29 صكاً قانونياً (أي ملزماً) 'ضُمِّنت' في إطارها معظم بقية الصكوك بوصفها صكوكاً طوعية (أي غير ملزمة). إضافةً إلى ذلك، يوجد ٨٢ صكاً إقليمياً، ٤٤ منها قانونية. ويشمل ذلك ما مجموعه ٣٢ صكاً من صكوك البحار الإقليمية. وتتضمن مجموعة الصكوك الدولية المتعلقة بالشعاب ما لا يقل عن 591 التزاماً منفصلاً بمعالجة المجموعة الكبيرة من محركات التغيير البشرية المنشأ في النظم الإيكولوجية للشعاب المرجانية.

وهذا الإطار السياساتي الدولي يشمل عددا كبيراً من الأهداف لتحقيق نتائج محددة ذات صلة بالنظم الإيكولوجية للشعاب المرجانية أو عوامل التغيير البشرية المنشأ التي تؤثر عليها - وتشمل الصكوك العالمية ٧٩ هدفاً عالمياً منفصلاً محدداً زمنيا وقابلاً للقياس (١٤ في المائة منها انقضى أجلها)، فضلاً عن ٥٩ هدفاً إقليمياً. ويوجد أكثر من نصف هذه الأهداف (٥٣ في المائة) في تسعة صكوك فقط: برنامج العمل العالمي لحماية البيئة البحرية من الأنشطة البرية، وخطة العمل الاستراتيجية للفترة 2011-202 التابعة لاتفاقية التنوع البيولوجي، واتفاق باريس، وخطة التنمية المستدامة لعام ٢٠٣٠ (صكوك عالمية)؛ وخطة العمل الإقليمية التابعة لمبادرة مثلث الشعاب، وخطة العمل للفترة 2011-2015 التابعة لأمانة برنامج البيئة الإقليمي للمحيط الهادئ، وبرنامج العمل الاستراتيجي لخليج البنغال، وبرنامج العمل الاستراتيجي لبحري أرافورا وتيمور، وبرنامج العمل الاستراتيجي لغرب المحيط الهندي (صكوك إقليمية). وتنطوي الصكوك الدولية المتعلقة بالشعاب المرجانية، مجتمعةً، على مجموعة شاملة وواسعة النطاق من الأهداف العالمية القابلة للقياس من أجل معالجة معظم محركات التغيير البشرية المنشأ في النظم الإيكولوجية للشعاب المرجانية. وعلى سبيل المثال، تشمل هذه الأهداف التزامات بوقف الزيادة في متوسط درجة الحرارة العالمية إلى ما دون ٢ درجة فوق مستويات ما قبل العصر الصناعي؛ ووضع حد للصيد المفرط والصيد غير القانوني وتنظيم الصيد على نحو فعال؛ ومنع وخفض التلوث البحري بجميع أنواعه؛ وحماية ما لا يقل عن ١٠ في المائة من المناطق الساحلية والبحرية؛ وهدف آيتشي ١٠ الذي تأخر إنجازه حتى الآن والمتمثل في التقليل إلى أدنى حد ممكن من الضغوط المتعددة البشرية المنشأ على الشعاب المرجانية بحلول عام ٢٠١٥ حفاظاً على سلامتها وأدائها.

وتركز هذه المجموعة الواسعة النطاق من الصكوك الدولية المتعلقة بالشعاب المرجانية على إجراءات من جانب الدول التي تتحمل المسؤولية الأساسية عن زهاء ٧٥ في المائة من الالتزامات - وفي إطار هذه المجموعة من الصكوك الدولية، توفر معاهدة اتفاقية الأمم المتحدة لقانون البحار الإطار القانوني الذي يجب أن تنفذ ضمنه جميع الأنشطة في المحيطات والبحار، وتحدد حقوق والتزامات الدول في مختلف المناطق البحرية. وفي البحر الإقليمي تمارس الدول الساحلية السيادة على مواردها الطبيعية. أما في المنطقة الاقتصادية الخالصة فإن للدول الساحلية الحقوق السيادية في استكشاف الموارد الطبيعية واستغلالها وحفظها وإدارتها، سواء كانت حية أو غير حية. وعلى الجرف القاري تمارس الدول الساحلية حقوقا سيادية لأغراض استكشافه واستغلال موارده الطبيعية، التي تتألف من الموارد المعدنية وغيرها من الموارد غير الحية لقاع البحر والتربة التحتية إضافةً إلى الكائنات الحية المنتمية إلى الأنواع الآبدة. وفي كل من المنطقة الاقتصادية الخالصة والجرف القاري يكون للدول الساحلية أيضا ولاية فيما يتعلق بالبحث العلمي البحري. وتحدد اتفاقية الأمم المتحدة لقانون البحار أيضاً الالتزامات العامة للدول بحماية البيئة البحرية والحفاظ عليها.

وبموجب المناطق البحرية التي حُددت في إطار اتفاقية الأمم المتحدة لقانون البحار فإن زهاء ٨٥ في المائة من الشعاب المرجانية في المياه الدافئة بالعالم تخضع لولاية ٢٥ بلدا - وتعمل هذه 'الدول التي بها شعاب مرجانية' في الواقع بوصفها أشباه أمناء للشعاب المرجانية في المياه الدافئة في العالم.

إن أغلبية الالتزامات السياساتية الدولية ذات الصلة بالشعاب المرجانية (أكثر من ٨٥ في المائة) موجهة نحو التخطيط والعمليات - وتركز هذه الالتزامات على أشكال مختلفة للتخطيط تنفذها الدول أو هي مطالبة بتنفيذها بهدف وضع قواعد واستجابات للضغوط البشرية المنشأ المتولدة محلياً على النظم الإيكولوجية للشعاب المرجانية. ومن أهداف الالتزامات الأكثر شيوعا: '1' تثبيت تركيزات غازات الاحتباس الحراري في الغلاف الجوي والحد من الانبعاثات، مع دعم التكيف في الدول النامية، ولا سيما الدول الجزرية الصغيرة النامية؛ '2' تنظيم أنشطة استغلال الموارد السمكية لحفظ وإدارة الأرصدة السمكية عند مستويات مستهدفة من خلال حدود وتدابير قائمة على العلم لحماية النظم الإيكولوجية ذات الصلة، مع إيلاء الأولوية لدعم مصائد الأسماك الضيقة النطاق؛ '3' إجراء عمليات تخطيط

متكاملة لمنع وخفض ومكافحة مختلف مصادر تلوث المحيطات، إلى جانب تقييمات للأثر البيئي، ولا سيما مع التركيز على قدرات لمعالجة النفايات؛ '4' تنظيم التلوث النفطي الناجم عن استخراج النفط والغاز من المناطق البحرية، فضلاً عن النقل البحري؛ '5' المعالجة الأوسع نطاقاً لإعادة هيكلة الساحل المادية للشريط الساحلي وللضغوط المتعددة البشرية المنشأ على النظم الإيكولوجية للشعاب المرجانية أو النظم الإيكولوجية الساحلية والبحرية، عادة من خلال التخطيط والتنظيم على أساس المناطق، مثل الإدارة المتكاملة للمناطق الساحلية وتخطيط الحيز البحري، وشبكات المحميات البحرية.

وعلى الرغم من أن نطاق الصكوك الدولية المتعلقة بالشعاب المرجانية هو نطاق شاسع إلا أن ''عمقه'' أقل – بمعنى أن طبيعة الالتزامات من جانب الدول عامة للغاية، وطوعية إلى حد بعيد - ويركز الكثير من الالتزامات على "النظم الإيكولوجية البحرية والساحلية" بشكل عام أو على القطاعات الاقتصادية المختلفة للأنشطة البشرية التي قد تدفع التغيرات في النظم الإيكولوجية للشعاب المرجانية، بدلاً من التركيز على النظم الإيكولوجية للشعاب المرجانية نفسها. بيد أنه مع ذلك فإن هذه الالتزامات تنطبق على الشعاب المرجانية حتى وإن لم تكن محط تركيزها. وفيما يخص غالبية هذه الالتزامات الواسعة النطاق (٥٢ في المائة) يمكن اعتبار ''قوة'' أو فعالية الالتزام ضعيفة (بمعنى أن الالتزام غير مطلوب، وهو مضمن في صك طوعي)، بينما تعتبر ١٧ في المائة منها قوية (بمعنى أنها مطلوبة، ومضمنة في صك ملزم قانوناً). وبطبيعة الحال، فإن مجرد وصف قوة الالتزام بأنها أضعف قوة ممكنة لا يعني أن الالتزام لن يتم الوفاء به من جانب الدول أو أنه لن يحقق أثراً، بل يعني ببساطة أن الاشتراط على الدول تنفيذ الالتزام هو اشتراط ضعيف نسبياً.

وعلى الرغم من أن الدول تتحمل المسؤولية الرئيسية عن تنفيذ الغالبية العظمى من الالتزامات الدولية، إلا أن عدداً قليلاً نسبياً من آليات الحوكمة قد أنشئ بموجب الصكوك لمساعدة الدول على القيام بذلك - وتتوقف كفاءة الصكوك الدولية على الآليات التي تعمل من خلالها، مثل آليات الإنفاذ وآليات التمويل. ومن بين ٥٩١ التزاماً من الالتزامات ذات الصلة بالشعاب ترتبط ١٣ في المائة فقط منها بإشارات إلى آليات إنفاذ، كما أن سدس هذه الالتزامات هي التزامات واردة في اتفاقية الأمم المتحدة لقانون البحار. وهذه عادةً ما تشترط على الدول ''اعتماد وإنفاذ'' التدابير اللازمة لتنفيذ الالتزامات الواردة في الصك، وفي بعض الحالات، تطلب الصكوك القانونية العالمية من الدول أن تقدم تقارير إلى مؤتمرات الأطراف من أجل رصد التقدم المحرز. وإضافة إلى اتفاقية الأمم المتحدة لقانون البحار، يرد ثلثٌ آخر من الالتزامات ذات الصلة بالشعاب المرجانية المتسقة مع إشارات إلى الإنفاذ، في صكوك البحار الإقليمية. وفي ظل وجود عدد قليل نسبيا من آليات الإنفاذ أو العقوبات المحددة في مجموعة الصكوك الدولية المتعلقة بالشعاب المرجانية فإن العديد من الدول قد لا يكون لديها حافز للامتثال للالتزامات، ولا سيما في الاقتصادات المنخفضة الدخل واقتصادات الدخل المتوسط الأدنى التي توجد فيها مطالب متنافسة على الموارد العامة الشحيحة. ومن ثم، تركز أكثر الصكوك على ''الجزرة'' بدلاً من ''العصا''، أي على الحوافز الاقتصادية بدلا من العقوبات والإنفاذ.

ولا ترتبط معظم الصكوك بآليات مالية للمساعدة في تمويل التكاليف المصاحبة، مما يمثل تحدياً للعديد من الدول ذات الدخل المنخفض ودول الدخل المتوسط الأدنى التي تقع على عاتقها مسؤولية تنفيذ التزامات تتعلق بالشعاب المرجانية- ومن بين الالتزامات الـ591 المتصلة بالشعاب المرجانية تشير زهاء ٢٥ في المائة إلى أحكام أو آليات تمويل، إلا أن النسبة أعلى بكثير في الالتزامات المتعلقة بتغير المناخ. بيد أن قلة من هذه الإشارات المرجعية تصف في الواقع إنشاء أو تعزيز آليات مالية، بينما يمكن وصف معظمها بأنها عبارة عن دعوات عامة موجهة إلى الدول المتقدمة النمو ومؤسسات التمويل الإنمائي لتقديم المزيد من التمويل اللازم لدعم التنفيذ من جانب الدول النامية. وأنشئ العدد القليل من الآليات المالية التي كونتها الصكوك الدولية المتعلقة بالشعاب المرجانية استجابةً لاتفاقيات عالمية ملزمة مثل اتفاقية التنوع البيولوجي، واتفاقية الأمم المتحدة الإطارية بشأن تغير المناخ، واتفاقية استكهولم. وتتسم هذه الآليات بسمات مشتركة تشمل ما يلي: '1' توليد موارد جديدة وإضافية، '2' توفير التمويل على أساس المنحة أو على أساس تساهلي، '3' الحوكمة من جانب مؤتمر الأطراف، '4' التشغيل من جانب مؤسسة تمويل إنمائي، مثل مرفق البيئة العالمية.

ويمثل التنسيق على نطاق ٢٣٢ صكاً من الصكوك السياساتية الدولية المتعلقة بالشعاب المرجانية والـ591 التزاماً من الالتزامات التي تحتوي عليها، تحدياً خاصاً - وقد أنشأت الصكوك أو حددت آليات قليلة لتعزيز التنسيق بشكل واضح، على الرغم من أنه في واقع الأمر فإن الآليات المالية يمكن أن تسهم في ذلك. وتتطلب طبيعة الالتزامات التي تتمحور حول الدولة مرونةً لكي تصوغ الحكومات استجابات ملائمة محليا، مع التركيز على عمليات التخطيط المتكاملة على الصعيد الوطني وفي بعض الحالات على الصعيد الإقليمي. بيد أنه بالنظر إلى الأهداف العالمية للحد من الضغوط البشرية المنشأ على الشعاب المرجانية والقدرات المتباينة على معالجتها بين الدول ذات الاختصاص تجاه الشعاب المرجانية، فإن تنسيق الجهود المبذولة على الصعيدين الإقليمي والعالمي سيكون ضرورياً على الأرجح.

الاستنتاجات والإجراءات الموصى بها

في حين أن معظم النظم الإيكولوجية للشعاب المرجانية في المياه الدافئة بالعالم خاضعة لولاية خمس وعشرين دولة فقط فإن التهديد الوجودي الذي تواجهه هذه النظم منتشر على الصعيد العالمي، بعيداً عن متناول أي دولة أو كيان آخر - إن اتفاق باريس هو الصك الدولي الرئيسي للتصدي لتغير المناخ، ويهدف إلى وقف الزيادة في متوسط درجة الحرارة العالمية عند ما دون ٢ درجة مئوية فوق مستويات ما قبل العصر الصناعي ومواصلة الجهود الرامية إلى قصر الارتفاع في درجات الحرارة عند 1,5 درجة مئوية فوق مستويات ما قبل العصر الصناعي (وهو مستوى من المتوقع أن تعاني فيه نسبة إضافية قدرها من ٧٠ إلى 90 في المائة من الشعاب المرجانية في العالم من التدهور). ويتوقف تحقيق هذا الهدف على إجراءات طوعية غير ملزمة تتخذها الدول.

ونظراً لأن آثار محركات التغيير المتعددة البشرية المنشأ على النظم الإيكولوجية للشعاب المرجانية هي آثار تراكمية فإن الجهود الرامية لمعالجة المحركات المولدة محليا يمكن أن تعزز سلامة هذه النظم الإيكولوجية وقدرتها على الصمود في وجه تغير المناخ - وعلى سبيل المثال فإن الابيضاض الناجم عن الإجهاد الحراري هو استجابة للإجهاد في الشعاب المرجانية ويمكن لآثاره أن تتفاقم نتيجةً للإجهاد الموضعي (مثل استخراج الأسماك من الشعاب المرجانية وإدخال الملوثات، والفقدان المادي، وما إلى ذلك). وعلى هذا النحو فإن الالتزامات التي تهدف إلى معالجة محركات التغيير المولدة موضعياً في النظم الإيكولوجية للشعاب المرجانية أصبحت أكثر إلحاحاً مع استمرار تغير المناخ.

وبالنظر إلى الطابع الملح للمسألة فإن هذا التحليل يسعى إلى الإجابة على السؤال التالي: ما هو الدور الذي يمكن للسياسات الدولية أن تضطلع به في مساعدة الدول على معالجة محركات التغيير البشرية المنشأ المولدة محلياً في النظم الإيكولوجية للشعاب المرجانية، من أجل تعزيز قدرتها على المجابهة وقدرتها على البقاء في مواجهة تغير المناخ المنتشر على نطاق العالم؟ للإجابة على هذا السؤال، أجري تحليل لتصميم الصكوك الدولية المتعلقة بالشعاب المرجانية. وتشير نتائج التحليل إلى أن الصكوك مصممة على نطاق واسع لمعالجة محركات التغيير المعروفة. بيد أنه بالنظر إلى النتائج الإيكولوجية المقيسة (مثل استمرار تدهور الشعاب المرجانية والتسارع المتوقع لهذا التدهور في ظل تغير المناخ) فإنه يعتقد أن الفجوة الرئيسية هي في فعالية التنفيذ على الصعيد الوطني (بالنظر إلى أن ما يقدر بـ٨٥ في المائة من الشعاب المرجانية في المياه الدافئة تخضع لولاية ٢٥ دولة). وقد حُددت المسارات المحتملة للسياسات الدولية، للمساعدة في تعزيز التنفيذ على الصعيد الوطني، على أساس هذا الافتراض.

ويحدد هذا التحليل ما لا يقل عن أربعة من المسارات المحتملة التي يمكن من خلالها أن تساعد أشكال استجابة السياسات الدولية الدول التي توجد فيها شعاب مرجانية على مخاطبة المحركات المحلية لفقدان الشعاب وتحسين قدرتها على الصمود (واحتمال بقائها) في مواجهة تغير المناخ - وتتيح هذه المسارات المحتملة نهجا استراتيجية مميزة دون أن تكون متعارضة لدعم المناقشات والتوصل إلى اتفاق بشأن سبل المضي قدما من جانب جمعية الأمم المتحدة للبيئة. وبالنظر إلى الكم الهائل من الصكوك الدولية والالتزامات المتصلة بالشعاب الموجودة بالفعل الخاصة بجميع العوامل المعروفة محليا تقريبا، تنطوي جميع المسارات المحتملة على تسريع أداء الالتزامات القائمة (أي تنفيذها). ويمكن مواصلة تعزيز هذا عن طريق تنقيح الإطار الحالي للسياسة والإدارة/ الحوكمة بغية تقويتها و/أو إنشاء صكوك أو آليات جديدة. ***أما بقاء الأمور على حالها، الذي يمكن اعتباره المسار الخامس المحتمل المتميز، فليس خياراً عملياً للإدارة المستدامة للشعاب المرجانية.***

الخيار الأول: المحافظة على إطار السياسات الراهن بشأن الشعاب المرجانية الدولية وفقا لتصميمه الحالي، ولكن مع التركيز *1* - على التنفيذ العاجل على الصعيد الوطني - وهذا من شأنه أن يستند إلى الالتزام المتجدد من جانب الدول للتصدي لمحركات التغيير في النظم الإيكولوجية للشعاب المرجانية، ويمكن أن يشمل الإجراءات التالية:

'1' إجراء تحليل أو استعراض للسياسات المتصلة بالشعاب على الصعيد الوطني ودون الوطني، مع الاستفادة من الإطار التحليلي والأساليب المستخدمة في هذا التحليل، لتقييم مدى ترجمة الالتزامات الدولية الراهنة إلى سياسات وطنية وأطر استراتيجية ومؤسسية. وهذا من شأنه أن يتيح تحديد الثغرات/ الفجوات، بما في ذلك إجراء الدول مراجعة/تدقيقاً ذاتياً لسياساتها الوطنية الرامية إلى تحقيق الالتزامات الحالية وفقا للصكوك الدولية؛

'2' وضع الدول خطط تنفيذ متكاملة للوفاء بالالتزامات الدولية، مع التركيز على دعم الجهود الوطنية ودون الوطنية لتنفيذ السياسات والتحليل، وصياغة الفوائد الاجتماعية والاقتصادية من تنفيذها ومراعاتها، باستخدام أدوات الإدارة القائمة، وتحديد الدعم التقني والمالي اللازمين.

***الخيار الثاني*: تعزيز الإطار السياساتي الدولي القائم** - إضافةً إلى الجهود الرامية إلى التعجيل بالتنفيذ فإن الإطار السياساتي الحالي يمكن مواصلة تنقيحه بغرض تعزيز الآليات والحوافز المقدمة للدول لتنفيذ التزاماتها. ويمكن أن يشمل أيضا كفالة أن تكون ولاية المنظمات الدولية ذات الصلة وإمكانتها تمكنها من تقديم مساعدة فعالة للدول لتسريع التنفيذ. ويمكن النظر في اتخاذ الإجراءات التالية: *2-*

'1' يمكن أن تدعو جمعية الأمم المتحدة للبيئة الدول إلى التصديق على تلك الصكوك الدولية الملزمة الخاصة بالسياسات الدولية، متى نشأت الحاجة للمزيد من الدعم، وتقديم تقارير منتظمة عن التقدم المحرز نحو تنفيذ الالتزام الدولي على الصعيد الوطني؛

'2' يمكن تعديل الصكوك السياساتية الدولية الإقليمية، بما في ذلك توسيع نطاق ولاية الآليات القائمة من قبيل اتفاقيات وخطط عمل البحار الإقليمية وما يتصل بها من صكوك؛

'3' يمكن للدول المشاركة في المبادرة الدولية للشعب المرجانية إسناد دور موسع للمبادرة على سبيل المثال فيما يتعلق برصد التقدم المحرز في تنفيذ الالتزامات الدولية على الصعيد الوطني؛

'4' يمكن أن تعتمد المؤسسات المالية الإنمائية، مثل البنك الدولي ومصارف التنمية الإقليمية ومصارف الاستثمار في البنية الأساسية 'ضمانات للشعاب المرجانية'، مثلاً توجيهات خاصة بالشعاب المرجانية ترمي إلى تنفيذ الضمانات البيئية القائمة التي تنطبق على جميع المشروعات التي تمولها، بما يضمن النظر في الآثار المحتملة على النظم الإيكولوجية للشعاب المرجانية؛

'5' يمكن للدول أن تتفق على هدف عالمي جديد خاص بالشعاب المرجانية، من شأنه أن يكون قابل للقياس الكمي وطموحاً من أجل التصدي لمختلف العوامل المؤثرة، كجزء من الإطار العالمي للتنوع البيولوجي لما بعد عام ٢٠٢٠ بعد انتهاء أهداف آيتشي.

***الخيار الثالث*: وضع صكوك دولية جديدة و/أو آليات حوكمة** - يركز الخياران الأول والثاني على مجموعة من السياسات الدولية القائمة. ويمكن تعزيز هذا من خلال تطبيق الصكوك الجديدة أو آليات التصدي للتحديات والثغرات الرئيسية أو كليهما. وكما ذُكر سابقا، فإن الالتزامات القائمة 'ضعيفة' إلى حد كبير من منطلق الاشتراطات الموضوعة على الدول، وغالباً تغيب الآليات الموضوعة لدعم التنفيذ. ويشير هذا الأمر إلى الاختيار فيما بين صك قانوني عالمي جديد يركز فقط على الشعاب المرجانية، أو آلية دولية جديدة لدعم تنفيذ الالتزامات المتصلة بالشعاب على الصعيد الوطني أو كليهما. وتشمل الخيارات ما يلي: *3-*

'1' تتفق الدول على صك عالمي جديد خاص بالشعاب المرجانية، على سبيل المثال معاهدة أو اتفاقية بشأن الشعاب المرجانية، تحتوي على أهداف محددة لعوامل التغيير المختلفة وآليات الحوكمة/الإدارة لدعم التنفيذ (بما في ذلك الرصد والإبلاغ)؛

'2' و/أو تتفق الدول على صك جديد ينبثق من أحد الصكوك القائمة أو الناشئة (على شاكلة غاية وخطة ترتبط بها تختص بالشعاب المرجانية في الإطار العالمي للتنوع البيولوجي لما بعد عام ٢٠٢٠ بموجب اتفاقية التنوع البيولوجي، أو الصكوك المحددة في سياق خطة التنمية المستدامة لعام ٢٠٣٠ و/أو اتفاقية الأمم المتحدة الإطارية بشأن تغير المناخ؛

'3' و/أو تتفق الدول على إنشاء آلية جديدة لدعم التنفيذ على الصعيد الوطني للالتزامات القائمة في مجال السياسات المتعلقة بالشعاب المرجانية، بما في ذلك آلية تمويل جديدة مخصصة للنظم الإيكولوجية للشعاب المرجانية، مثل صندوق عالمي للشعاب المرجانية (مثلاً 'صندوق البيئة المرجانية') لتقديم المنح أو التمويل بشروط ميسرة للبلدان المنخفضة الدخل من أجل إحراز تقدم نحو بلوغ الأهداف القائمة والالتزامات السياساتية الدولية، العالمية الجديدة، و/أو آليات عالمية جديدة للرصد والإبلاغ، مثلاً في شكل لجنة أو منتدى معني بالشعاب المرجانية في إطار الأمم المتحدة.

4- ***الخيار الرابع (شكل موحد من الخيارات الثلاثة السابقة): سرعة الدعم المقدم إلى الدول من أجل تنفيذ السياسات، أي ''حل مشكلة الشعاب المرجانية على مستوى الدول''*** - ومن المهم أن الخيارات الثلاثة المبينة أعلاه لا تناقض بعضها بعضاً، بل ويمكن تجميعها في مجموعات/حزم متنوعة. ومثال على ذلك، يُقدَّم خيار رابع، يجمع المسارات الثلاثة المذكورة أعلاه، للتركيز على إنجاز السياسات في الدول الصغيرة نسبياً التي لها ولاية على الشعاب المرجانية في المياه الدافئة في شتى أرجاء العالم (مثلا يخضع زهاء ٨٥ في المائة من الشعاب المرجانية في المياه الدافئة بالعالم لولاية ٢٥ بلدا)، بما في ذلك الإجراءات التالية:

'1' تجري دول الشعاب المرجانية تدقيقا ذاتياً للسياسات الوطنية الرامية إلى تنفيذ الالتزامات الحالية في الصكوك الدولية، ووضع الخطط التنفيذية لإنجاز السياسات، وتحديد الدعم التقني والمالي اللازمين؛

'2' يمكن للدول أن تنشئ فريقاً للرصد الدولي (مثلاً ''مرصد لسياسات الشعاب المرجانية'') أو إسناد هذا الدور إلى المبادرة الدولية للشعاب المرجانية (بالتشاور والتعاون مع المنظمات الدولية المختصة)، بحيث تصبح مسؤولة عن رصد التقدم المحرز في تنفيذ الالتزامات الدولية على الصعيد الوطني في دول الشعاب المرجانية؛

'3' تتفق الدول على إنشاء آلية تمويل جديدة مخصصة تحديداً للنظم الإيكولوجية للشعاب المرجانية، مثل صندوق عالمي للشعاب المرجانية لتقديم المنح أو التمويل الميسر لدول الشعاب المرجانية المنخفضة الدخل ودول الشعاب المرجانية المتوسطة الدخل من الشريحة الدنيا من خلال مؤسسة قائمة مثل مرفق البيئة العالمية.

النظر في المضي قدماً على أحد المسارات (على النحو المبين أعلاه أو إجراء نوع من التوحيد للمسارات، كما هو مبين في المثال الوارد في الخيار الرابع) يتوقف على طبيعة القيد الرئيسي على تنفيذ الدول للصكوك الدولية - فعلى سبيل المثال، ربما لا تُولى الأولوية للشعاب المرجانية في البرامج الوطنية لأنها تائهة بين الالتزامات والأهداف الأخرى في هذه المجموعة الحالية من الصكوك الدولية المتعلقة بالشعاب المرجانية. وإذا كان توجيه الأولوية العقبة الرئيسية، فربما يجوز استحداث صك دولي جديد للمساعدة على تعزيز الجهود التي تبذلها الدول، أو يمكن تحديد التزامات محددة خاصة بالشعاب المرجانية بوضوح في معاهدة جديدة. وإذا كانت القدرات اللازمة لترجمة الأحكام المعتمدة دولياً إلى إجراءات وطنية القيد الأساسي، فيجوز النظر في وضع آلية جديدة و/أو تعزيز الصكوك القائمة لتسريع التنفيذ.

إن التصدي لتحديات القدرات البشرية والمالية أمر بالغ الأهمية، بصرف النظر عن المسار المنشود لسياسات الشعاب المرجانية - وتشكل القدرات المحدودة عائقا رئيسياً أمام الوفاء بالالتزامات الدولية المتعلقة بالشعاب المرجانية في العديد من البلدان، ولا سيما أقل البلدان نمواً، والبلدان الجزرية الصغيرة النامية والبلدان النامية الأخرى. والجهود المبذولة لبناء القدرات التي تدعم إعداد سياسات فعالة بشأن الشعاب المرجانية وتنفيذها على الصعيد الدولي والصعيد الوطني بحاجة إلى تعزيز. وفي هذا الصدد، تجدر الإشارة إلى أن حشد موارد إضافية والنص على تبادل المعلومات والخبرات والدروس المستفادة هي أحد أكبر المزايا المرتبطة باعتماد الصكوك الدولية.

ويمكن أن تساعد آلية تمويل جديدة لتوفير موارد إضافية الدول على سد الفجوات في القدرات - وينبغي الاعتراف بالحاجة الملحة إلى زيادة وتنويع مصادر التمويل المخصص للشعاب المرجانية. ومن شأن آلية تمويل جديدة مخصصة تحديداً للنظم الإيكولوجية للشعاب المرجانية، مثل إنشاء صندوق عالمي يقدم المنح، والتمويل بشروط ميسرة و/أو تمويل الاستثمار لدفع عجلة التقدم نحو بلوغ الأهداف والالتزامات الدولية، أن تؤدي إلى مزايا اجتماعية واقتصادية ملحوظة وفوائد كبيرة للتنوع البيولوجي البحري، وهي إحدى الركائز الرئيسية للمسارين الثالث والرابع المذكورين فيما سبق.

ونظراً لأن الشعاب المرجانية تمثل إحدى الأولويات العالمية والعابرة للحدود، تظل السياسة الدولية أداة بالغة الأهمية للإدارة المستدامة للشعاب المرجانية - ومعظم الشعاب المرجانية خاضعة للولاية الوطنية، وفي حين يصعب توصيفها على أنها منفعة عالمية عامة كأساس لاتخاذ إجراء جماعي، فإن لها خصائص الموارد المجمعة المشتركة (أو منفعة شبه عامة). فالترابط المتمحور حول مورد مشترك، عادة يشكل الأساس المنطقي للعمل الجماعي والاستثمارات الجديدة. وللعمل الجماعي منطق موجه آخر ألا وهو 'الاهتمام المشترك للبشرية'. وهذا الشاغل المشترك، حتى وإن لم يكن موردا مشتركاً، يمكن أن يشكل أساساً للعمل الجماعي، وقد كان جزء من الأساس المنطقي لاتفاقية التنوع البيولوجي. وعلى وجه التحديد، يمكن أن يكون الشاغل المشترك للبشرية الأساس المنطقي للتعاون الدولي ومساعدة الدول ذات الدخل المنخفض، التي تخضع لولايتها الكثير من الشعاب المرجانية في المياه الدافئة. إن المسارات والإجراءات المقترحة لا تعارض فيما بينها، وينبغي النظر إليها باعتبارها جزءاً من حزمة للوفاء بأهداف التنمية المستدامة ذات الصلة. ومع وضع الإطار العالمي للتنوع البيولوجي لما بعد عام ٢٠٢٠، ودنو موعد المؤتمر المعني بالمحيطات لعام ٢٠٢٠ لتقييم حالة تنفيذ الهدف ١٤ من أهداف التنمية المستدامة، فإن هذه الخيارات أو توليفة ما منها سوف تصبح على الأرجح جزءاً أساسياً في أي عمل منسق تضطلع به الدول.

开展分析的理据

近几十年来，世界各地的温水珊瑚礁生态系统迅速发生变化，而且速度不断加快。造成这种情况的原因是大气中的温室气体浓度增加，海面温度随之上升，且人类活动产生了其他多种压力。政府间气候变化专门委员会在2018年预测，如果全球平均气温比工业化前平均气温升高1.5摄氏度，世界的珊瑚礁就会再减少70%至90%，(如果气温上升2摄氏度，将会减少99%以上)。预计这种规律不是千篇一律的，某些珊瑚礁可能比其他珊瑚礁更能抵御这种压力，而另一些珊瑚礁则可能在全球平均气温上升较少的情况下就出现退化。出于这些原因，政府间气候变化专门委员会可以肯定地说，珊瑚礁是世界上最易受气候变化影响的海洋生态系统之一。

过度捕捞和污染等其他造成珊瑚礁变化的人为驱动因素影响到世界上大部分珊瑚礁。除了造成珊瑚礁普遍退化外，这些当地产生的驱动因素削弱了珊瑚礁抵御气候变化的能力，加剧了珊瑚礁生态系统对海平面温度升高的反应。如果减少当地产生的多重压力的累积影响，则有助于提高珊瑚礁生态系统在面对白化现象时的完整性和抵御能力。

国际社会已多次承诺对观察到和预测的珊瑚礁生态系统变化采取协调一致的政策对策。尽管许多国家正在努力将这些承诺转化为当地行动，但珊瑚礁生态系统变化驱动因素的严重程度和这种系统的估计变化速度却不减反增。鉴于这一挑战，联合国环境大会2016年通过了关于珊瑚礁可持续管理的第2/12号决议，重申需要开展国际合作保护珊瑚礁生态系统，并呼吁各国政府在必要时利用捐助方提供的技术和财务支助，优先开展这一工作。具体而言，决议促请联合国环境规划署与国际珊瑚礁倡议、其他相关国际组织和其他相关伙伴合作，编写一份关于保护和可持续管理珊瑚礁的全球和区域政策工具及治理机制的分析报告。

参照对珊瑚礁的影响不断加剧的人为变化驱动因素，评估了现行国际政策的制订。分析的重点是用于应对这些驱动因素的国际文书制订工作方面的差距，包括这些文书设立的治理机制以及可采用哪些方案来弥补这种差距。第一步是找出相关的全球和区域文书的书面协议，并将其汇编成一份清单，作为分析的数据集。然后对阐述这些文书的书面协议内容进行了分析，以找出每份文件所作的承诺，并评估了这些承诺与各种变化驱动因素之间的差距、承诺的力度以及为履行承诺而设立的治理机制。

主要结论摘要

与珊瑚礁有关的现有国际文书数量众多，范围广泛，几乎对珊瑚礁生态系统变化的每个人为驱动因素都作出了相应的承诺。可以认为，至少有 232 项国际文书直接或间接支持养护和可持续管理珊瑚礁生态系统，以及(或)支持应对造成这些生态系统变化的人为因素。这些与珊瑚礁有关的国际文书是从 1960 年代起逐步制订的，包括 150 项全球文书，其中 29 项是法律文书(即具有约束力)，其余大都属于自愿文书(即不具约束力)。此外，还有 82 项区域文书，其中 44 项是法律文书。这包括总数为 32 项的区域海洋文书。涉及珊瑚礁的国际文书中至少有 591 个单项承诺，涉及造成珊瑚礁生态系统变化的众多人为因素。

这一国际政策框架有许多目标，旨在取得与珊瑚礁生态系统有关、或与影响珊瑚礁生态系统的人为变化驱动因素有关的具体成果。这些文书中有 79 个单独的有时限和可衡量的全球目标(其中 14%已过期)，并有 59 个区域目标。其中一半以上（53%）的目标仅见于 9 项文书：《保护海洋环境免受陆上活动污染全球行动纲领》、《生物多样性公约 2011-2020 年战略行动计划》、《巴黎协定》和《2030 年可持续发展议程》(全球文书)；《珊瑚三角区倡议区域行动计划》、《2011-2015 年太平洋区域环境方案行动计划》、《孟加拉湾战略行动方案》、《阿拉弗拉帝汶海战略行动方案》和《西印度洋战略行动方案》(区域文书)。总体而言，国际珊瑚礁文书提出了一整套众多而全面的可衡量的全球目标，以应对造成珊瑚礁生态系统变化的大多数人为驱动因素。例如，这些目标包括承诺将全球平均气温上升幅度控制在远低于比工业化前温度高 2 度的范围内；制止过度捕捞和非法捕捞，有效管制捕捞活动；防止和减少各种海洋污染；养护至少 10%的沿海和海洋区域；以及目前仍未实现的爱知目标 10，即在 2015 年之前尽量减少人类活动对珊瑚礁造成的多重压力，以保持珊瑚礁的完整性和功能。

众多珊瑚礁国际文书的重点是各国采取行动，因为大约 75%的承诺的履行由各国首要负责。在这一套国际文书中，《联合国海洋法公约》提供了所有海洋活动都必须遵循的法律框架，并规定了各国在不同海洋区的权利和承诺。沿海国家在领海中对其自然资源行使主权。沿海国家在专属经济区内拥有勘探、开发、养护和管理自然资源（无论是生物资源还是非生物资源）的主权。在大陆架上，沿海国家对勘探和开发其自然资源享有主权，这些自然资源包括海底和底土的矿物和其他非生物资源以及属于定居物种的生物。在专属经济区中和大陆架上，沿海国家也对海洋科学研究拥有管辖权。《联合国海洋法公约》还规定了各国保护和保全海洋环境的一般性义务。

根据《联合国海洋法公约》建立的海洋区，世界上大约 85%的温水珊瑚礁受 25 个国家的管辖。这些“珊瑚礁国家”实质上是世界温水珊瑚礁的准受托人。

与珊瑚礁有关的国际政策承诺大都(85%以上)着眼于规划和进程。它们重点关注各国应当或必须开展的各种形式的规划，以便针对当地对珊瑚礁生态系统产生的人为压力制定规则和对策。承诺

的一些最常见的目标包括：(一)稳定大气中温室气体的浓度和减少排放，同时支持发展中国家、特别是小岛屿发展中国家开展适应工作；(二)提出有科学依据的保护相关生态系统的限制和措施，以监管鱼类资源的捕捞，按预定数额养护和管理鱼类种群，优先支持小规模渔业；(三)开展综合规划工作，以防止、减少和控制各种来源的海洋污染，同时进行环境影响评估，尤其强调处理废物的能力；(四) 监管海上石油和天然气开采以及航运造成的石油污染；(五) 通过开展地区规划和管理，例如开展沿海地区综合管理和海洋空间规划以及建立海洋保护区网，处理海岸线实际重建问题，同时更广泛地处理珊瑚礁生态系统或沿海和海洋生态系统面临多重人为压力的问题。

虽然国际珊瑚礁政策的范围很广，但深度不够：各国做出的承诺相当笼统，而且基本上是自愿性的。许多承诺重点关注“海洋和沿海生态系统”或可能造成珊瑚礁生态系统变化的人类活动，而不是珊瑚礁生态系统本身。但尽管如此，这些承诺即便不以珊瑚礁为重点，也适用于珊瑚礁。可以认为这些广泛承诺中的大多数(52%)“力度”或稳健性不足(即承诺不是根据要求作出的，且见于自愿文书)，而只有 17%是强有力的(即属于按要求作出的承诺，见于有约束力的文书)。当然，即便说一项承诺力度极弱，也并不意味着它不会得到各国的履行或产生影响，而仅是要求各国这样做的力度相对较弱。

虽然各国负有履行绝大多数国际承诺的首要责任，但这些文书为协助各国履行承诺而设立的治理机制较少。国际文书的效率取决于它们的运作机制，包括协调、执行和筹资机制。在 591 项与珊瑚礁有关的承诺中，只有 13%的承诺提到执行机制。而其中六分之一的承诺见于《联合国海洋法公约》。它们通常要求各国“采取和强制执行”必要措施来履行文书中的承诺；在某些情况下，全球法律文书要求各国向缔约方大会报告进展情况。除《联合国海洋法公约》外，另外三分之一提到强制执行的关于珊瑚礁的承诺见于区域海洋文书。由于国际珊瑚礁文书中规定的执行机制或处罚措施较少，许多国家可能没有履行承诺的动力，特别是那些公共资源稀缺且供不应求的中低收入国家。因此，更多的文书强调“胡萝卜”而不是“大棒”，即提供经济激励措施而不是惩罚和强制执行。

大多数工具没有与融资机制挂钩，以帮助筹集资金支付相关费用，这给许多负责履行与珊瑚礁有关的承诺的中低入国家造成了困难。在 591 项与珊瑚礁有关的承诺中，约有 25%提到筹资规定或机制。在与气候变化有关的承诺中，这一比例要高得多。然而，提到融资的地方极少实际描述如何设立或加强融资机制，大多数只是泛泛呼吁发达国家和发展融资机构提供更多必要的资金，支持发展中国家履行承诺。与珊瑚礁有关的国际文书根据《生物多样性公约》、《联合国气候变化框架公约》和《斯德哥尔摩公约》等有约束力的全球性公约，设立了为数不多的若干融资机制。这些机制的共同特点包括：(一)产生更多的新资源，(二)采用赠款或优惠的方式提供资金，(三)由缔约方大会管理，(四) 由发展筹资机构、例如全球环境基金运营。

对 232 项国际珊瑚礁文书和文书中的 591 项承诺进行协调是一项特殊的挑战。这些文书几乎没有设立或指定明确用于促进协调的机制，尽管在实际中，财务机制可能会对此有所帮助。由于这些承诺以国家为中心，所以就要求各国政府灵活制定适合当地情况的应对措施，重点进行国家一级（并在某些情况下进行区域一级）的综合规划工作。然而，考虑到减少珊瑚礁所受人为压力的全球目标，以及对珊瑚礁拥有管辖权的各国应对这种压力的能力有所差异，可能需要在区域和全球两级进行协调工作。

结论和建议采取的行动

虽然世界上大多数温水珊瑚礁生态系统仅由 25 个国家管辖，但危及这些系统生存的威胁在世界各地普遍存在，超出任何一个国家或其他实体的能力范围。《巴黎协定》是应对气候变化的主要国际文书，它力争把将全球平均气温上升幅度控制在远低于比工业化前温度高 2 度的范围内，努力把温度上升限制在比工业化前温度高 1.5° C(预计世界上 70%至 90%的珊瑚礁在这一温度下会进一步减少)。实现这一目标取决于各国自愿采取不具约束力的行动。

由于造成变化的多种人为驱动因素对珊瑚礁生态系统的影响是累积性的，努力应对当地产生的驱动因素可以加强这些生态系统面对气候变化的完整性和抵御能力。例如，热压力引起的白化是珊瑚的一种应激反应，局部压力(如捕捉礁石鱼、污染物进入、物质损失等)可能加剧这种反应的影响。因此，随着气候发生变化，更加迫切需要旨在应对当地产生的珊瑚礁生态系统变化驱动因素的承诺。

由于问题紧迫，本分析报告试图回答这一问题：国际政策可以发挥什么作用来帮助各国应对珊瑚礁生态系统中当地产生的人为驱动因素，以便在全球广泛发生气候变化时提高它们的抵御能力和生存潜力？为了回答这个问题，对国际珊瑚礁文书的制订进行了分析。分析结果表明，文书的制订大体上是为了应对已知的变化驱动因素。然而，考虑到所评定的生态结果(例如珊瑚礁继续减少，而且如果气候发生变化，这种减少预计会加快)，可认为关键差距是国家一级履行承诺的效力(因为估计 85%的温水珊瑚礁受 25 个国家的管辖)。根据这一看法，提出了通过国际政策协助加强国家一级承诺履行的可能途径。

本分析报告提出，国际政策对策可至少通过四种可能途径，帮助珊瑚礁国家应对当地珊瑚礁丧失的驱动因素，加强珊瑚礁在气候发生变化时的抵御能力(和生存潜力)。这些可能途径提供了不同但并非相互排斥的战略性办法，以协助环境大会讨论和商定下一步行动。鉴于几乎所有已知的当地驱动因素都已有相应的国际珊瑚礁文书和承诺，因此所有可能途径都要求加快履行(即执行)现

有的承诺。还可以为加强现有的政策和治理框架对其进行修订，以及(或)设立新的文书或机制，从而进一步促进这方面的工作。**“一切照常”或可看作第五种途径，但并不是可持续管理珊瑚礁的可行选项。**

1. **选项一：维持目前已制订的国际珊瑚礁政策框架，但重点加快国家一级的执行。**这将建立在各国重新承诺应对珊瑚礁生态系统变化驱动因素的基础上，可包括以下行动：

    (一) 在国家和国家以下一级分析或审查与珊瑚礁有关的政策，借鉴本分析报告使用的分析框架和分析方法评估现有国际承诺在多大程度上已转化成国家政策、战略和体制框架。这样便能发现差距，包括能使各国对本国履行国际文书中现有承诺的政策进行自我审计；

    (二) 各国制定履行国际承诺的综合执行计划，重点支持在国家和国家以下各级执行政策，分析、阐明和考虑执行政策带来的社会和经济利益，利用现有的管理工具，提出需要哪些技术和财政支持。

2. **选项二：加强现有的国际政策框架。**除了努力加快执行工作以外，还可以进一步修订现有政策框架，加强各国履行承诺的机制和激励措施。这还可包括确保相关国际组织的任务规定和手段能让它们有效地协助各国加快执行工作。可考虑采取以下行动：

    (一) 联合国环境大会可邀请各国批准需要获得进一步支持的、具有约束力的全球性国际政策文书，并定期报告本国履行国际承诺的进展；

    (二) 可修订区域政策文书，包括扩大各项区域海洋公约和行动计划及相关文书等现有机制的任务规定；

    (三) 参与国际珊瑚礁倡议的国家可责成该倡议发挥更大的作用，例如在监测国家一级履行国际承诺的进展方面；

    (四) 世界银行、区域开发银行和基础设施投资银行等发展融资机构可采用“珊瑚礁保障措施”，例如具体涉及珊瑚礁的指导方针，以用于实施适用于它们资助的所有项目的现有环境保障措施，确保可能对珊瑚礁生态系统产生的影响得到考虑；

    (五) 各国可商定一个新的全球珊瑚礁目标，目标可以量化且足够宏大，以应对各种驱动因素，作为爱知目标之后的 2020 年后全球生物多样性框架的一部分。

3. **选项三：制定新的国际政策文书和(或)治理机制。**选项一和二侧重于现有的国际政策。可以通过制定新的文书和(或)机制处理关键的挑战和差距来进一步予以加强。如前所述，就

对于各国的要求而言，可认为现有的承诺在很大程度上是“软弱无力”的，而且往往缺乏协助执行工作的机制。这表明，可以制定一项专门处理珊瑚礁问题的新的全球法律文书，以及(或)设立一个支持在国家一级履行国际珊瑚礁承诺的新机制。可采用以下方式:

(一) 各国商定一项专门针对珊瑚礁的新全球文书，例如一项关于珊瑚礁的条约或公约，内有为各种变化驱动因素和治理机制规定的具体目标，以支持承诺的履行(包括监测和报告);

(二) 各国商定一份嵌套在现有或刚出现的文书下的新文书，例如《生物多样性公约》2020 年后全球生物多样性框架中的一个具体涉及珊瑚礁的目标和相关的计划、2030 年可持续发展议程框架和（或）《联合国气候变化框架公约》框架中的具体文书; 以及（或）

(三) 各国商定设立一个新机制，支持在国家一级履行现有的珊瑚礁政策承诺，包括专门为珊瑚礁生态系统设立一个新的筹资机制，例如设立一个全球珊瑚礁基金(如“珊瑚环境基金”)，为低收入国家提供赠款或优惠资金，推动在实现现有目标和国际政策承诺方面取得进展，和(或)设立一个新的全球监测和报告机制，例如采用联合国下设一个珊瑚礁委员会或论坛的方式。

4. **选项四(由前三个选项合并而成)：迅速支持各国的政策执行工作，即“珊瑚礁国家解决方案”。**重要的是，上面描述的三个选项并不是相互排斥的，而且可以组合成不同的方案。为举例说明，现提出第四个选项，将上述三个途径合并起来，重点关注对世界温水珊瑚礁拥有管辖权的较小国家(例如，25 个对 85%的珊瑚礁拥有管辖权的国家)的政策执行工作，包括采取以下行动:

(一) 珊瑚礁国家对本国政策进行自我审计，以履行国际文书中的现有承诺，制定政策执行计划，提出需要哪些技术和财务支持;

(二) 各国可设立一个新的总体国际监测小组(例如“珊瑚礁政策观察站”)，或责成国际珊瑚礁倡议(与主管国际组织协商合作)发挥作用，负责监测珊瑚礁国家在国家一级履行国际承诺的进展;

(三) 各国商定专门为珊瑚礁生态系统设立一个新的筹资机制，例如设立一个全球珊瑚礁基金，通过全球环境基金等现有机构为中低收入珊瑚礁国家提供赠款或优惠资金。

考虑采用哪种途径(即上文所述的途径，或选项四所示的多种途径组合）取决于阻碍各国执行国际文书的主要制约因素的性质。例如，国家议程可能没有把珊瑚礁列为优先事项，因为它淹没在现有国际珊瑚礁文书中的其他所有承诺和目标中。如果国家的优先次序安排是主要的制约因素，

那么也许可以制定一项新的国际文书来帮助加强各国的努力，或者在某项新条约中专门针对珊瑚礁作出承诺。如果把国际上通过的规定切实转化为国家行动的能力是一个主要制约因素，则可以考虑通过设立一个新的机制和（或）加强现有文书来加快执行工作。

无论采用何种珊瑚礁政策途径，处理人力和财力方面的挑战都至关重要。能力有限是许多国家，特别是最不发达国家、小岛屿发展中国家和其他发展中国家履行国际珊瑚礁承诺的主要障碍。需要加大努力来培养能力，支持在国际和国家一级有效制定和执行珊瑚礁政策。在此方面应当指出，进一步筹集资源，开展信息、经验和教训交流，是通过各项国际文书的最大好处之一。

建立一个提供更多资源的新财务机制，可有助于各国弥补能力上的差距。人们认识到，迫切需要增加用于珊瑚礁的资金，并实现资金来源多样化。专门为珊瑚礁生态系统设立一个新的筹资机制，例如一个提供赠款、优惠资金和(或)投资资金以加快实现国际目标和承诺的全球基金，可在社会经济和海洋生物多样性方面产生重大惠益，并成为上述第三和第四个选项的一个主要支柱。

由于珊瑚礁跨越国界，是一个全球优先事项，因此国际政策仍然是可持续珊瑚礁管理的一个重要工具。大多数珊瑚礁位于国家管辖范围内，虽然很难把它们界定为可对之采取集体行动的全球公益物，但它们确实具有共有资源(或准公益物)的特征。共享资源的相互依存关系通常是集体采取行动和进行新投入的理由。为“人类共同关心的问题”采取集体行动也是有理有据的。这类共同关心的事项即便不是共享资源，也可以是集体采取行动的依据，这也是制订《生物多样性公约》的部分理由。具体而言，人类的共同关切可以是为低收入国家提供国际合作和援助的理由，因为温水珊瑚礁大都位于这些国家的管辖范围内。此处提出的途径和行动并不是相互排斥的，应视为实现相关可持续发展目标的一揽子计划的一部分。随着 2020 年后全球生物多样性框架制定工作的进行，以及评估可持续发展目标 14 执行情况的 2020 年海洋会议即将召开，上述选项或其组合可能成为各国采取协调行动的核心内容。

Analyse des moyens d'action et mécanismes de gouvernance aux niveaux mondial et régional concernant la protection et la gestion durable des récifs coralliens

Résumé analytique

Justification de l'analyse

Depuis quelques dizaines d'années, les écosystèmes des récifs coralliens d'eaux chaudes dans le monde subissent des changements rapides et accélérés. Ces changements sont dus à l'augmentation des concentrations de gaz à effet de serre dans l'atmosphère et à la hausse de la température de surface de la mer qui en résulte, ainsi qu'à de nombreuses autres pressions associées à l'activité humaine. Selon les prévisions du Groupe d'experts intergouvernemental sur l'évolution du climat, en 2018 les récifs coralliens dans le monde diminueront encore de 70 à 90 % avec une augmentation de la température moyenne de la planète de 1,5° C par rapport aux niveaux préindustriels (les pertes seraient supérieures à 99 % pour une augmentation de 2° C). Cette tendance ne devrait pas être uniforme, certains récifs pouvant être plus résistants à ces agressions tandis que d'autres se dégraderont avec une plus faible augmentation de la température moyenne. C'est pourquoi le Groupe d'experts est convaincu que les récifs coralliens constituent l'un des écosystèmes marins du monde les plus vulnérables aux changements climatiques.

D'autres facteurs anthropiques du changement des récifs coralliens, tels que la surpêche et la pollution, ont des retentissements sur une grande partie d'entre eux dans le monde. Outre la dégradation généralisée des récifs, ces facteurs générés localement réduisent leur résilience aux changements climatiques, exacerbant les effets produits par l'élévation des températures de surface de la mer sur les écosystèmes coralliens. La réduction des effets cumulatifs de plusieurs facteurs agressifs d'origine locale peut contribuer à améliorer l'intégrité et la résilience des écosystèmes des récifs coralliens face aux phénomènes de blanchissement.

La communauté internationale s'est engagée à maintes reprises à coordonner les réponses politiques aux changements observés et prévus dans les écosystèmes des récifs coralliens. Bien que de nombreux États s'efforcent de traduire ces engagements en actions locales, l'intensité des facteurs et les taux estimés de changement de ces écosystèmes ne cessent d'augmenter. Sensible à ce défi, l'Assemblée des Nations Unies pour l'environnement a adopté, en 2016, la résolution 2/12 sur la gestion durable des récifs coralliens, réaffirmant la nécessité d'une coopération internationale pour la protection des écosystèmes coralliens et exhortant les gouvernements nationaux à donner la priorité à cet effort, en faisant appel au soutien technique et financier de donateurs, le cas échéant. Plus précisément, la résolution engage le Programme des Nations Unies pour l'environnement, en coopération avec l'Initiative internationale pour les récifs coralliens et d'autres organisations et partenaires concernés, à élaborer une analyse des moyens

d'action et mécanismes de gouvernance aux niveaux mondial et régional portant sur la protection et la gestion durable des récifs coralliens.

La conception de l'ensemble actuel de mesures internationales a été évaluée à la lumière de l'intensification des facteurs anthropiques de changement qui ont des retentissements sur les récifs coralliens. L'analyse s'est concentrée sur les lacunes en termes de conception d'instruments internationaux visant à s'attaquer à ces facteurs, notamment les mécanismes de gouvernance qu'ils ont créés, et les solutions possibles pour combler ces lacunes. Dans un premier temps, les accords écrits des instruments mondiaux et régionaux pertinents ont été recensés et rassemblés dans un inventaire qui a servi d'ensemble de données pour l'analyse.

Le contenu des accords écrits décrivant ces instruments a ensuite été analysé pour déterminer les engagements pris dans chaque document et évaluer les décalages entre ces engagements et les divers facteurs de changement, la solidité de ces engagements, et les mécanismes de gouvernance établis pour les respecter.

Résumé des principales constatations

La panoplie actuelle d'instruments internationaux relatifs aux récifs coralliens est vaste et large, et les engagements pris correspondent à pratiquement tous les facteurs anthropiques de changement dans les écosystèmes des récifs coralliens. Il existe au moins 232 instruments internationaux considérés comme soutenant directement ou indirectement la conservation et la gestion durable de ces écosystèmes, et/ou traitant des facteurs anthropiques courants de changement dans ces systèmes. La panoplie s'est élargie progressivement depuis les années 1960, et comprend 150 instruments mondiaux, dont 29 d'instruments juridiques (c'est-à-dire contraignants), la plupart des autres étant « imbriqués » en tant qu'instruments volontaires (c'est-à-dire non contraignants). En outre, il existe 82 instruments régionaux, dont 44 juridiques. Au total, on dénombre 32 instruments relatifs aux mers régionales. Cet ensemble d'instruments comprend au moins 591 engagements distincts destinés à faire face au large éventail de facteurs anthropiques de changement dans les écosystèmes de récifs coralliens.

Ce cadre d'action international rassemble un grand nombre d'objectifs visant à atteindre des résultats spécifiques utiles en ce qui concerne les écosystèmes de récifs coralliens ou les facteurs anthropiques de changement qui les perturbent. Les instruments englobent 79 objectifs mondiaux distincts, mesurables et assortis de délais (dont 14 % sont arrivés à échéance), ainsi que 59 objectifs régionaux. Plus de la moitié (53 %) se retrouvent dans neuf instruments seulement : le Programme d'action mondial pour la protection du milieu marin contre la pollution due aux activités terrestres, le plan d'action stratégique 2011-2020 de la Convention sur la diversité biologique, l'Accord de Paris et le Programme de développement durable à l'horizon 2030 (instruments mondiaux) ; le plan d'action régional de l'Initiative

relative au Triangle du Corail sur les récifs coralliens, la pêche et la sécurité alimentaire, le plan d'action 2011-2015 du Secrétariat du Programme régional océanien de l'environnement, le programme d'action stratégique pour le golfe du Bengale, le programme d'action stratégique pour les mers de Timor et d'Arafura, et le programme d'action stratégique pour l'océan indien occidental (instruments régionaux). Pris ensemble, les instruments internationaux relatifs aux récifs coralliens fournissent une gamme complète, quoique large, d'objectifs mondiaux mesurables pour s'attaquer à la plupart des facteurs anthropiques de changement dans les écosystèmes des récifs coralliens. Ainsi, ces objectifs recouvrent les engagements à maintenir l'élévation de la température moyenne de la planète bien en deçà de 2 degrés par rapport aux niveaux préindustriels ; à mettre fin à la surpêche et à la pêche illégale et à réglementer efficacement la récolte ; à prévenir et à réduire la pollution marine de toutes sortes ; à conserver au moins 10 % des zones côtières et marines ; ainsi que l'objectif 10 d'Aichi, venu à échéance, visant à réduire au minimum les nombreuses pressions anthropiques exercées sur les récifs coralliens d'ici à 2015, afin de préserver leur intégrité et leur fonctionnement.

Cette vaste panoplie d'instruments internationaux relatifs aux récifs est axée sur l'action des États, à qui incombe la responsabilité d'honorer environ 75 % des engagements. Dans cette panoplie d'instruments internationaux, la Convention des Nations Unies sur le droit de la mer fournit le cadre juridique dans lequel il convient de mener toutes les activités dans les océans et les mers, et établit les droits et engagements des États dans les différentes zones maritimes. Dans une mer territoriale, les États côtiers exercent leur souveraineté sur leurs ressources naturelles. Dans une zone économique exclusive, ils ont le droit souverain d'explorer, d'exploiter, de conserver et de gérer les ressources naturelles, vivantes ou non. Sur le plateau continental, les États côtiers exercent des droits souverains aux fins d'exploration et d'exploitation de leurs ressources naturelles, qui comprennent les ressources minérales et les autres ressources non vivantes des fonds marins et du sous-sol ainsi que les organismes vivants appartenant aux espèces sédentaires. Tant dans la zone économique exclusive que sur le plateau continental, les États côtiers ont également compétence en matière de recherche scientifique marine. La Convention des Nations Unies sur le droit de la mer établit en outre l'obligation générale pour les États de protéger et de préserver le milieu marin.

En vertu des zones maritimes établies dans le cadre de la Convention des Nations Unies sur le droit de la mer, quelque 85 % des récifs coralliens des eaux chaudes dans le monde relèvent de la compétence de 25 pays. Ces « états récifaux » font pour ainsi dire office d'administrateurs des récifs d'eau chaude dans le monde.

La majorité (plus de 85 %) des engagements politiques internationaux relatifs aux récifs coralliens sont axés sur la planification et les processus. Ils se concentrent sur diverses formes de planification que les États devraient ou sont tenus d'établir pour élaborer des règles et des réponses aux pressions anthropiques d'origine locale qui pèsent sur les écosystèmes des récifs coralliens. Parmi les objectifs les plus courants de ces engagements figurent : i) la stabilisation des concentrations atmosphériques de gaz à

effet de serre et la réduction des émissions, parallèlement au soutien à l'adaptation dans les pays en développement, en particulier dans les petits États insulaires en développement (PIED ; ii) la réglementation de l'exploitation des ressources halieutiques pour conserver et gérer les stocks à des niveaux ciblés au moyen de limites et de mesures scientifiques pour protéger les écosystèmes associés, en accordant la priorité à la pêche artisanale ; (iii) la conduite de processus de planification intégrée pour prévenir, réduire et maîtriser diverses sources de pollution marine, ainsi que d'études d'impact sur l'environnement, en mettant en particulier l'accent sur les capacités de traitement des déchets ; iv) la réglementation de la pollution par les hydrocarbures provenant de l'extraction pétrolière et gazière offshore, ainsi que du transport maritime ; et (v) la prise en main de la restructuration physique du littoral et les moyens de remédier aux multiples pressions anthropiques exercées sur les écosystèmes des récifs coralliens ou les écosystèmes côtiers et marins dans leur ensemble, généralement par une planification et une réglementation à l'échelle de la zone, telles que la gestion intégrée des zones côtières et l'aménagement de l'espace marin, ainsi que des réseaux de zones marines protégées.

Si ces instruments internationaux relatifs aux récifs coralliens sont d'une vaste portée, leur « profondeur » est plus limitée – en d'autres termes, les engagements des États présentent une teneur assez générale et sont, pour beaucoup, pris de manière volontaire. Nombre de ces engagements portent sur les « écosystèmes marins et côtiers » en général ou sur les divers secteurs économiques de l'activité humaine susceptibles d'entraîner des changements dans les écosystèmes des récifs coralliens, plutôt que sur ces écosystèmes proprement dits. Ils n'en demeurent pas moins applicables aux récifs coralliens, même s'ils ne les ciblent pas directement. La « fermeté » ou solidité de la plupart d'entre eux (52 %) peut être considérée comme fragile (ce qui signifie que l'engagement n'est pas requis et figure dans un instrument volontaire), tandis que 17 % seulement sont considérés comme forts (c'est-à-dire requis dans un instrument contraignant). A fortiori, ce n'est pas parce que la fermeté d'un engagement est considérée comme des plus fragiles qu'il ne sera pas respecté par les États ou n'aura pas d'impact ; l'obligation faite aux États de le respecter sera tout simplement relativement faible.

Bien que les États aient la responsabilité principale d'honorer l'immense majorité des engagements internationaux, les instruments fixent relativement peu de mécanismes de gouvernance pour les aider dans cette tâche. L'efficacité des instruments internationaux dépend des dispositifs par l'intermédiaire desquels ils fonctionnent, tels que les mécanismes d'application et de financement. Sur les 591 engagements relatifs aux récifs coralliens, 13 % seulement étaient associés à des renvois vers des mécanismes d'application. Un sixième d'entre eux étaient pris dans le cadre de la Convention des Nations Unies sur le droit de la mer. Ces engagements font généralement obligation aux États « d'adopter et d'appliquer » les mesures nécessaires pour respecter les engagements figurant dans l'instrument, et dans certains cas les instruments juridiques mondiaux requièrent que les États fassent rapport aux Conférences des Parties pour suivre les progrès. Outre la Convention des Nations Unies sur le droit de la mer, un autre tiers des engagements assortis de renvois en termes d'application figuraient dans des instruments relatifs aux mers régionales. Étant donné le nombre relativement faible de mécanismes d'application ou de sanctions précisés dans la panoplie d'instruments internationaux relatifs aux récifs coralliens, bien des États peuvent ne pas se sentir incités à respecter leurs engagements, en particulier dans les économies à

revenu faible ou moyen inférieur où rivalisent les demandes en matière de ressources publiques limitées. Par conséquent, la plupart des instruments mettent l'accent sur la « carotte » plutôt que sur le « bâton », c'est-à-dire sur les incitations économiques plutôt que sur les sanctions et leur application.

La plupart des instruments ne sont pas reliés à des mécanismes financiers visant à contribuer au financement des coûts associés, ce qui représente un défi pour les nombreux États à faible revenu et à revenu moyen inférieur ayant la responsabilité de respecter les engagements relatifs aux récifs. Sur les 591 engagements portant sur les récifs coralliens, environ 25 % font référence à des dispositions ou mécanismes de financement. Cette proportion est beaucoup plus élevée pour les engagements portant sur les changements climatiques. Cependant, rares sont ceux qui décrivent réellement la création ou le renforcement de mécanismes financiers ; la plupart peuvent être qualifiés d'appels généraux faits aux États développés et aux institutions de financement du développement pour apporter un financement supplémentaire, en fonction des besoins, afin de soutenir la mise en œuvre par les États en développement. Les quelques mécanismes financiers créés par les instruments internationaux relatifs aux récifs ont été établis en réponse à des conventions mondiales contraignantes, telles que la Convention sur la diversité biologique, la Convention-cadre des Nations Unies sur les changements climatiques et la Convention de Stockholm. Ces mécanismes ont en commun : i) la génération de ressources nouvelles et supplémentaires, ii) l'octroi de financements sous forme de dons ou à des conditions de faveur, iii) la gouvernance par la Conférence des Parties, et iv) la gestion par une institution de financement du développement, par exemple le Fonds pour l'environnement mondial.

La coordination entre les 232 moyens d'action internationaux relatifs aux récifs et les 591 engagements qu'ils contiennent pose un défi spécifique. Les instruments définissent ou désignent peu de dispositifs pour promouvoir explicitement la coordination même si, en pratique, des mécanismes financiers peuvent y contribuer. La nature même des engagements, centrés sur l'État, nécessite que les gouvernements fassent preuve de souplesse pour élaborer des réponses adaptées aux besoins locaux, en mettant l'accent sur des processus intégrés de planification nationale et, dans certains cas, régionale. Toutefois, au vu tant des objectifs mondiaux pour réduire les pressions anthropiques qui pèsent sur les récifs que des capacités différenciées à les atteindre parmi les États dont relèvent ces récifs, une coordination des efforts aux niveaux régional et mondial sera probablement nécessaire.

Conclusions et mesures recommandées

Bien que la plupart des écosystèmes de récifs coralliens des eaux chaudes dans le monde relèvent de la juridiction de vingt-cinq États seulement, la menace existentielle qui pèse sur eux revêt une portée mondiale, bien au-delà du ressort d'un État ou d'une entité en particulier. L'Accord de Paris est le principal instrument international d'action face aux changements climatiques ; il vise à maintenir l'élévation de la température moyenne de la planète bien en deçà de 2° C par rapport aux niveaux

préindustriels et à poursuivre les efforts pour limiter l'augmentation de la température à 1,5° C par rapport à ces niveaux (température à laquelle une part supplémentaire de 70 à 90 % des récifs coralliens du monde devraient dépérir). La réalisation de cet objectif passe par l'adoption, par les États, de mesures volontaires et non contraignantes.

Étant donné que les effets de plusieurs facteurs anthropiques de changement sur les écosystèmes des récifs coralliens se cumulent, les efforts visant à s'attaquer aux facteurs générés localement peuvent améliorer l'intégrité et la résilience de ces écosystèmes face aux changements climatiques. Ainsi, le blanchiment induit par la contrainte thermique est une réaction de stress chez les coraux, dont les impacts peuvent être exacerbés par des contraintes localisées (telles que l'extraction de poissons de récif, l'apport de polluants, les pertes physiques, etc.). À ce titre, les engagements visant à s'attaquer aux facteurs de changement générés localement dans les écosystèmes des récifs coralliens sont devenus d'autant plus pressants que le climat évolue.

Compte tenu de l'urgence, cette analyse tente de répondre à la question suivante : quel rôle la politique internationale peut-elle jouer pour aider les États à lutter contre les facteurs anthropiques locaux de changement dans les écosystèmes des récifs coralliens, afin d'améliorer leur résilience et leur potentiel de survie face aux changements climatiques généralisés à l'échelle mondiale ? Pour répondre à cette question, une analyse de la conception des instruments internationaux relatifs aux récifs a été réalisée. Cette analyse fait apparaître que ces instruments ont été élaborés, pour l'essentiel, pour faire face aux facteurs de changement connus. Cependant, au vu des résultats écologiques mesurés (tels que le déclin continu des récifs et son accélération prévue sous l'effet des changements climatiques), le principal déséquilibre devrait résider dans l'efficacité d'exécution au niveau national (puisqu'environ 85 % des récifs coralliens des eaux chaudes relèvent de la juridiction de 25 États). Sur la base de cette hypothèse, des voies potentielles pour améliorer l'exécution au niveau national par l'intermédiaire de mesures internationales ont été dégagées.

L'analyse met en évidence au moins quatre voies envisageables par lesquelles des interventions internationales peuvent aider les États récifaux à s'attaquer aux facteurs locaux de perte des récifs et à améliorer leur résilience (et leur potentiel de survie) face aux changements climatiques. Ces voies envisageables fournissent des approches stratégiques distinctes, mais pas incompatibles, pour soutenir les débats et accords quant à la façon dont l'Assemblée des Nations Unies pour l'environnement peut progresser. Au vu du grand nombre d'instruments et d'engagements internationaux relatifs aux récifs qui existent déjà pour pratiquement tous les facteurs locaux connus, toutes les voies potentielles impliquent d'accélérer l'exécution des engagements actuels (c'est-à-dire leur mise en œuvre). À cela peut s'ajouter la révision du cadre de décision et de gouvernance existant en vue de les renforcer et/ou de mettre en place de nouveaux instruments ou mécanismes. *Le statu quo, qui pourrait être considéré comme une cinquième voie potentielle distincte, n'est pas une option viable pour une gestion durable des récifs coralliens.*

1. ***Première option : maintenir le cadre d'action international actuel concernant les récifs coralliens tel qu'il a été conçu, en mettant cependant l'accent sur une mise en œuvre accélérée au niveau national***. Cette option reposerait sur un engagement renouvelé des États à s'attaquer aux facteurs de changement dans les écosystèmes des récifs coralliens, et pourrait inclure les mesures suivantes :

    i. analyse ou examen des politiques relatives aux récifs aux niveaux national et infranational, en s'appuyant sur le cadre analytique et les méthodes servant à cette analyse, afin d'évaluer dans quelle mesure les engagements internationaux actuels se concrétisent dans des structures générales, stratégiques et institutionnelles au niveau national. Cette mesure permettrait d'identifier les lacunes, et d'inclure notamment un auto-audit, par les États, des politiques nationales visant à donner suite aux engagements existants dans les instruments internationaux ; et

    ii. élaboration, par les États, de plans de mise en œuvre intégrés pour exécuter les engagements internationaux, en mettant l'accent sur le soutien à l'application des politiques aux niveaux national et infranational, sur l'analyse, sur l'articulation et sur la prise en compte des avantages sociaux et économiques de cette mise en œuvre, sur l'utilisation des outils de gestion existants, et sur l'identification de l'appui technique et financier requis.

2. ***Deuxième option : renforcer le cadre d'action international existant.*** Outre les efforts visant à accélérer la mise en œuvre, il serait possible de réviser de manière plus poussée le cadre dans lequel inscrire l'action menée actuellement afin de renforcer les mécanismes et les incitations permettant aux États de donner suite à leurs engagements. Cette mesure pourrait également prévoir de veiller à ce que le mandat et les moyens des organisations internationales compétentes leur permettent d'aider efficacement les États à accélérer cette mise en œuvre. Les facteurs suivants peuvent être pris en compte :

    i. l'Assemblée des Nations Unies pour l'environnement pourrait inviter les États à ratifier les moyens d'action internationaux contraignants et d'intérêt général qui nécessitent un soutien supplémentaire, et à rendre compte régulièrement des progrès accomplis dans la réalisation des engagements internationaux au niveau national ;

    ii. les moyens d'action au niveau régional peuvent être modifiés, notamment pour élargir le mandat des mécanismes existants, tels que les conventions et plans d'action concernant les mers régionales et les instruments connexes ;

    iii. les États participant à l'Initiative internationale pour les récifs coralliens peuvent lui confier un rôle élargi, par exemple concernant le suivi des progrès réalisés dans la mise en œuvre des engagements internationaux au niveau national ;

iv. les institutions de financement du développement, telles que la Banque mondiale, les banques régionales de développement et les banques d'investissement pour les infrastructures peuvent adopter des « garanties pour les récifs coralliens », par exemple des orientations spécifiques aux récifs coralliens pour la mise en œuvre des mesures de protection de l'environnement existantes applicables à tous les projets qu'elles financent, garantissant la prise en compte des incidences potentielles sur les écosystèmes des récifs coralliens ; et

v. les États pourraient convenir d'un nouvel objectif mondial pour les récifs coralliens, qui serait quantifiable et ambitieux pour faire face aux différents facteurs, et ferait partie intégrante du cadre mondial de la biodiversité pour l'après-2020 comme suite aux objectifs d'Aichi relatifs à la diversité biologique.

3. ***Troisième option : introduire de nouveaux instruments internationaux et/ou mécanismes de gouvernance***. Les deux premières options sont axées sur la panoplie de mesures internationales existantes. Celle-ci pourrait être renforcée par l'introduction de nouveaux instruments et/ou mécanismes visant à remédier aux lacunes et problèmes principaux. Comme cela a été mentionné précédemment, les engagements existants sont pour beaucoup considérés comme « fragiles » en termes d'exigences imposées aux États, et les mécanismes d'appui à leur mise en œuvre font souvent défaut. Cela suggère une option pour un nouvel instrument juridique mondial portant uniquement sur les récifs coralliens et/ou pour un nouveau mécanisme international d'appui à la mise en œuvre des engagements liés aux récifs au niveau national. Les solutions sont notamment les suivantes :

   i. les États conviennent d'un nouvel instrument mondial spécifique aux récifs coralliens, par exemple un traité ou une convention sur les récifs coralliens, avec des objectifs spécifiques pour les facteurs du changement et des mécanismes de gouvernance pour soutenir son application (notamment la surveillance et la notification) ;

   ii. les États conviennent d'un nouvel instrument imbriqué dans un instrument existant ou émergeant, tel qu'un objectif et un plan associé portant spécifiquement sur les récifs coralliens et s'inscrivant dans le cadre mondial de la biodiversité pour l'après-2020 en vertu de la Convention sur la diversité biologique, d'instruments spécifiques dans le contexte du Programme de développement durable à l'horizon 2030 et/ou dans celui de la Convention-cadre des Nations unies sur les changements climatiques ; et/ou

   iii. les États conviennent de créer un nouveau mécanisme pour soutenir l'exécution au niveau national des engagements politiques existants concernant les récifs coralliens, notamment un nouveau mécanisme de financement spécifique aux écosystèmes de récifs coralliens, tel qu'un fonds mondial pour les récifs coralliens (par exemple un « Fonds pour l'environnement corallien ») destiné à fournir aux États à faible revenu des subventions ou un financement à des conditions favorables afin de progresser vers la réalisation des objectifs et engagements politiques internationaux existants, et/ou un nouveau dispositif

mondial de surveillance et de communication, par exemple sous forme d'une commission ou d'une instance sur les récifs coralliens sous l'égide des Nations Unies.

4. ***Quatrième option (faisant la synthèse des trois précédentes) : un soutien rapide aux États pour la mise en œuvre des mesures, ou « solution pour les États récifaux ».*** Il est important de noter que les trois options décrites ci-dessus ne sont pas incompatibles et pourraient être combinées en divers ensembles. À titre d'exemple, une quatrième option, fondée sur les trois ci-dessus, pourrait être axée sur l'exécution de mesures dans les États relativement petits ayant juridiction sur les récifs coralliens d'eau chaude dans le monde (ainsi, 85 % de ces récifs relèvent de la compétence de vingt-cinq États), et englober les actions suivantes :

    i. les États des récifs coralliens mènent un auto-audit des mesures nationales prises pour honorer leurs engagements en vertu des instruments internationaux et élaborent des plans de mise en œuvre de ces mesures, en recensant les appuis techniques et financiers nécessaires ;

    ii. les États peuvent créer un nouveau groupe international de surveillance général (par exemple, un « observatoire des politiques relatives aux récifs coralliens ») ou confier à l'Initiative internationale pour les récifs coralliens (en consultation et en coopération avec les organisations internationales compétentes) le rôle de suivre les progrès accomplis dans la mise en œuvre des engagements internationaux au niveau national dans les États récifaux ; et

    iii. les États conviennent de créer un nouveau mécanisme de financement spécifique pour les écosystèmes de récifs coralliens, tel qu'un fonds mondial pour les récifs coralliens, afin de fournir des subventions ou un financement à des conditions favorables aux États à faible revenu et à revenu moyen inférieur, par l'intermédiaire d'une institution existante telle que le Fonds pour l'environnement mondial.

Les facteurs à prendre en considération pour progresser sur une voie (tels que décrits ci-dessus, ou une combinaison de ces facteurs, comme l'illustre l'exemple de la quatrième option) dépendent de la nature de la principale contrainte qui pèse sur la mise en œuvre des instruments internationaux par les États. Ainsi, la question des récifs peut ne pas être prioritaire dans les programmes nationaux parce qu'elle est perdue au milieu de tous les autres engagements et objectifs de la panoplie actuelle d'instruments internationaux relatifs aux récifs. Bien que l'établissement de priorités nationales soit la principale contrainte, il est possible d'introduire un nouvel instrument international pour aider à renforcer les efforts des États, ou de mettre en relief des engagements spécifiques aux récifs dans un nouveau traité. Si la capacité à traduire efficacement les dispositions adoptées au niveau international par des mesures nationales constitue une contrainte majeure, l'on peut envisager un nouveau dispositif et/ou une consolidation des instruments existants pour accélérer la mise en œuvre.

Il est crucial de relever les défis en termes de capacités humaines et financières, quelle que soit la voie suivie en matière de mesures portant sur les récifs coralliens. Les capacités limitées constituent un obstacle majeur au respect des engagements internationaux relatifs aux récifs dans de nombreux pays, en particulier dans les pays les moins avancés, les petits États insulaires en développement et d'autres pays en développement. Il est nécessaire d'accroître les efforts pour renforcer les capacités à l'appui de l'élaboration et de la mise en œuvre de mesures efficaces en matière de récifs coralliens aux niveaux international et national. À cet égard, il convient de noter que la mobilisation de ressources supplémentaires et l'échange d'informations, d'expériences et d'enseignements tirés comptent parmi les principaux avantages associés à l'adoption d'instruments internationaux.

Un nouveau mécanisme financier visant à fournir des ressources supplémentaires pourrait aider les États à combler le manque de capacités. Le besoin urgent d'augmenter et de diversifier le financement des récifs coralliens est notoire. Un nouveau mécanisme de financement spécifique pour les écosystèmes de récifs coralliens, tel qu'un fonds mondial fournissant des subventions, des financements à des conditions de faveur et/ou des financements d'investissement pour progresser vers le respect des objectifs et engagements internationaux, pourrait apporter d'importants avantages socio-économiques et en termes de biodiversité marine, et constitue un pilier essentiel des troisième et quatrième options spécifiées ci-dessus.

Étant donné que les récifs coralliens sont transfrontaliers et représentent une priorité mondiale, la politique internationale reste un outil essentiel pour leur gestion durable. La plupart des récifs coralliens sont sous juridiction nationale et, bien qu'il soit difficile de les qualifier de biens publics mondiaux pour agir de manière collective, ils présentent certaines caractéristiques de biens publics (ou quasi publics). L'interdépendance à l'égard d'une ressource partagée justifie, en général, une action collective et de nouveaux investissements. Un « intérêt commun de l'humanité » peut également justifier une telle action collective. Cette préoccupation commune, même s'il ne s'agit pas d'une ressource partagée, peut servir de base à une action collective et faisait partie intégrante des principes fondamentaux de la Convention sur la diversité biologique. Plus précisément, un intérêt commun de l'humanité peut justifier la coopération internationale et l'aide aux États à faible revenu, sous la juridiction desquels se trouvent une grande partie des récifs coralliens d'eau chaude. Les voies et mesures proposées ne sont pas incompatibles, et doivent être considérées comme faisant partie d'un ensemble de mesures visant à atteindre les objectifs de développement durable concernés. Parallèlement à l'élaboration du cadre mondial de la biodiversité pour l'après-2020, et à l'approche de la Conférence sur les océans de 2020 pour évaluer l'état d'avancement de la mise en œuvre de l'objectif de développement durable 14, ces options ou une combinaison de celles-ci tendront à constituer un élément central de l'action coordonnée des États.

Resumen

Justificación del análisis

Los ecosistemas de los arrecifes de coral de aguas cálidas en todo el mundo han experimentado cambios rápidos y acelerados en los últimos decenios. Estos cambios han sido impulsados por el aumento de la concentración de gases de efecto invernadero en la atmósfera y los consiguientes aumentos de temperatura de la superficie del mar, así como por otras muchas presiones relacionadas con la actividad humana. El Grupo Intergubernamental de Expertos sobre el Cambio Climático calculó que, en 2018, los arrecifes de coral del mundo se reducirían entre un 70 % y un 90 % adicional a causa del aumento de la temperatura media mundial de 1,5º C respecto de los niveles preindustriales (con pérdidas superiores al 99 % si el aumento es de 2º C). La previsión es que este patrón no será uniforme, y que algunos arrecifes sean más resilientes que otros a ese estrés, mientras que otros pueden degradarse con un aumento menor de la temperatura media mundial. Por estos motivos, el Grupo Intergubernamental de Expertos sobre el Cambio Climático ha declarado con un alto grado de confianza que los arrecifes de coral son uno de los ecosistemas marinos más vulnerables del mundo al cambio climático.

Otros impulsores antropógenos del cambio en los arrecifes de coral, como la pesca excesiva y la contaminación, afectan a una gran parte de los arrecifes del mundo. Además de provocar la degradación generalizada de los arrecifes, estos factores generados localmente reducen la resiliencia de los arrecifes de coral frente al cambio climático, y exacerban la reacción de estos ecosistemas a las temperaturas elevadas de la superficie marina. La reducción de los efectos acumulativos de los diversos factores de perturbación generados localmente puede contribuir a mejorar la integridad y la resiliencia de los ecosistemas de los arrecifes de coral ante fenómenos de decoloración.

La comunidad internacional se ha comprometido en reiteradas ocasiones a responder con políticas coordinadas a los cambios observados y previstos en los ecosistemas de los arrecifes de coral. Si bien muchos Estados trabajan para traducir esos compromisos en medidas locales, la intensidad de los factores y las tasas estimadas de cambio en los ecosistemas de arrecifes de coral no han hecho más que aumentar. Consciente de este problema, en 2016 la Asamblea de las Naciones Unidas sobre el Medio Ambiente aprobó la resolución 2/12 sobre la gestión sostenible de los arrecifes de coral, en la que reiteró la necesidad de que exista una cooperación internacional para la protección de los ecosistemas de los arrecifes de coral y exhortó a los Gobiernos nacionales a dar prioridad a esa labor, basándose en el apoyo técnico y financiero de los donantes cuando fuera necesario. Concretamente, en la resolución se solicitaba al Programa de las Naciones Unidas para el Medio Ambiente que, en cooperación con la Iniciativa Internacional sobre los Arrecifes de Coral, otras organizaciones internacionales y otros asociados pertinentes, preparase un análisis de los instrumentos de política y los mecanismos de gobernanza de alcance mundial y regional relacionados con la protección y la gestión sostenible de los arrecifes de coral.

Se evaluó el diseño de la actual política internacional en su conjunto en relación con la intensificación de los factores antropógenos causantes del cambio que afecta a los arrecifes de coral. El análisis se centró en las deficiencias en el diseño de los instrumentos internacionales para combatir los factores, incluidos los mecanismos de gobernanza creados por ellos, y posibles opciones para resolver esas deficiencias. Como primera medida, se determinaron los acuerdos escritos de los instrumentos mundiales y regionales pertinentes y se compilaron en un inventario que sirvió de conjunto de datos para el análisis. A continuación se analizó el contenido de los acuerdos escritos en los que se describían estos instrumentos para señalar los compromisos contraídos en cada documento y evaluar los desequilibrios entre esos compromisos y los diversos factores causantes del cambio, la fuerza de esos compromisos y los mecanismos de gobernanza establecidos para llevarlos a cabo.

Resumen de las conclusiones principales

El actual conjunto de instrumentos internacionales relativos a los arrecifes de coral es amplio y variado, con compromisos para casi cada factor antropógeno de cambio en los ecosistemas de los arrecifes de coral. Existen al menos 232 instrumentos internacionales de los que se considera que promueven directa o indirectamente la conservación y la gestión sostenible de los ecosistemas de los arrecifes de coral o abordan los factores antropógenos comunes que alteran esos ecosistemas. Este conjunto de instrumentos internacionales relacionados con los arrecifes de coral se ha desarrollado gradualmente desde la década de 1960, y comprende 150 instrumentos mundiales, de los cuales 29 son instrumentos jurídicos (es decir, vinculantes), que integran a la mayoría de los restantes como instrumentos voluntarios (es decir, no vinculantes). Además, existen 82 instrumentos regionales, 44 de los cuales son jurídicos. Esto incluye un total de 32 instrumentos relativos a mares regionales. El conjunto de instrumentos internacionales que afectan a los arrecifes comprende al menos 591 compromisos concretos en relación con el amplio abanico de factores antropógenos que alteran los ecosistemas de los arrecifes de coral.

Este marco normativo internacional abarca un gran número de metas para lograr resultados específicos en relación con los ecosistemas de los arrecifes de coral o con los factores antropógenos que los afectan. Los instrumentos incluyen 79 metas mundiales concretas con plazos definidos y cuantificables (el 14 % de las cuales ya han expirado), así como 59 metas regionales. Más de la mitad (el 53 %) de ellas están localizadas en apenas nueve instrumentos: el Programa de Acción Mundial para la Protección del Medio Marino frente a las Actividades Realizadas en Tierra, el Plan Estratégico del Convenio sobre la Diversidad Biológica 2011-2020, el Acuerdo de París y la Agenda 2030 para el Desarrollo Sostenible (instrumentos mundiales); el Plan de Acción Regional para la Iniciativa del Triángulo de Coral, el Plan de Acción de la Secretaría del Programa Regional del Pacífico Sur para el Medio Ambiente 2011-2015, el Programa de Acción Estratégico de la Bahía de Bengala, el Programa de Acción Estratégico de los Mares de Arafura y Timor y el Programa de Acción Estratégico del Océano Índico Occidental (instrumentos regionales). En conjunto, los instrumentos internacionales relacionados con los arrecifes proporcionan un grupo amplio y exhaustivo de metas mundiales cuantificables para dar respuesta a la mayoría de los factores antropógenos que alteran los ecosistemas de los arrecifes de coral. Por ejemplo, estas metas incluyen compromisos para mantener el aumento de la temperatura media mundial muy por debajo de 2 grados centígrados con respecto a los niveles preindustriales; para poner fin a la sobrepesca y a la pesca ilegal y reglamentar de manera eficaz la explotación pesquera; para prevenir y reducir la contaminación marina de todo tipo; para conservar al menos el 10 % de las zonas costeras y marinas; y la meta 10 de Aichi, cuyo plazo ya ha expirado, para reducir al mínimo las múltiples presiones antropógenas sobre los arrecifes de coral para 2015, a fin de mantener su integridad y funcionamiento.

Este amplio conjunto de instrumentos internacionales relacionados con los arrecifes se centra en las medidas adoptadas por los Estados, que tienen la responsabilidad principal sobre aproximadamente el 75 % de los compromisos. Dentro de este conjunto de instrumentos internacionales, el Tratado de la Convención de las Naciones Unidas sobre el Derecho del Mar proporciona el marco jurídico dentro del cual deben desarrollarse todas las actividades en los océanos y los mares, y establece los derechos y los compromisos de los Estados en las distintas zonas marítimas. En el mar territorial, los Estados ribereños ejercen su soberanía sobre los recursos naturales. En la zona económica exclusiva, los Estados ribereños tienen derechos de soberanía para explorar, explotar, conservar y administrar los recursos naturales vivos o no vivos. En la plataforma continental, los Estados ribereños ejercen derechos de soberanía a los efectos de explorar y explotar los recursos naturales, que son los recursos minerales y otros recursos no vivos del lecho del mar y el subsuelo, así como los organismos vivos pertenecientes a especies sedentarias. Tanto en la zona económica exclusiva como en la plataforma continental, los Estados ribereños también tienen jurisdicción en lo relativo a la investigación científica marina. El Tratado de la Convención de las

Naciones Unidas sobre el Derecho del Mar también establece la obligación general de los Estados de proteger y preservar el medio marino.

En virtud de las zonas marítimas establecidas en el Tratado de la Convención de las Naciones Unidas sobre el Derecho del Mar, alrededor del 85 % de los arrecifes de coral de aguas cálidas están bajo la jurisdicción de 25 países. Estos "Estados de los arrecifes de coral" funcionan esencialmente como cuasi administradores de los arrecifes de aguas cálidas del mundo.

La mayoría (más del 85 %) de los compromisos normativos internacionales relacionados con los arrecifes están orientados a la planificación y a los procesos. Se centran en diversas formas de planificación que los Estados deberían o están obligados a realizar a fin de elaborar normas y respuestas para las presiones antropógenas generadas a nivel local sobre los ecosistemas de los arrecifes de coral. Algunos de los objetivos más comunes de los compromisos son: i) estabilizar las concentraciones atmosféricas de gases de efecto invernadero y reducir las emisiones, al tiempo que se apoya la adaptación de los países en desarrollo y en particular de los pequeños Estados insulares en desarrollo; ii) regular la explotación de los recursos pesqueros para conservar y gestionar las poblaciones a niveles específicos a través de límites y medidas de base científica para proteger los ecosistemas asociados, dando prioridad al apoyo a la pesca en pequeña escala; iii) llevar a cabo procesos de planificación integrada para prevenir, reducir y controlar diversas fuentes de contaminación oceánica, junto con evaluaciones del impacto ambiental haciendo particular hincapié en la capacidad de tratamiento de los desechos; iv) regular la contaminación por hidrocarburos procedentes de la extracción de petróleo y gas en alta mar, así como del transporte marítimo; y v) abordar la reestructuración física de la línea costera junto con las múltiples presiones antropógenas sobre los ecosistemas de los arrecifes de coral y los ecosistemas costeros y marinos en general, normalmente mediante la planificación y la reglamentación por zonas, como la gestión integrada de las zonas costeras y la planificación del espacio marino, y las redes de zonas marinas protegidas.

Las políticas internacionales sobre los arrecifes de coral tienen un amplio alcance pero no puede decirse lo mismo de su profundidad: los compromisos de los Estados son de carácter bastante general y en buena medida voluntarios. Muchos de los compromisos se centran en los "ecosistemas marinos y costeros" en general o en los diversos sectores económicos de la actividad humana que pueden provocar cambios en los ecosistemas de los arrecifes de coral, más que en los ecosistemas de arrecifes de coral propiamente dichos. No obstante, estos compromisos son aplicables a los arrecifes de coral, incluso si no están centrados en ellos. Para la mayoría de estos amplios compromisos (el 52 %), la "fuerza" o solidez del compromiso podría considerarse débil (es decir, no se exige el compromiso, y este está contenido en un instrumento voluntario), mientras que solo el 17 % se consideran fuertes (es decir, el compromiso sí es exigible y está consagrado en un instrumento vinculante). Por supuesto, el que la solidez del compromiso se caracterice como lo más débil posible no significa que los Estados no lo cumplan o que no se logren resultados, sino simplemente que el requisito de que los Estados cumplan con su compromiso es relativamente débil.

Si bien los Estados tienen la responsabilidad primordial de cumplir la gran mayoría de los compromisos internacionales, los instrumentos han establecido relativamente pocos mecanismos de gobernanza para ayudarles en esa labor. La eficacia de los instrumentos internacionales depende de los mecanismos que les permiten funcionar, como los mecanismos de aplicación y los mecanismos de financiación. De los 591 compromisos relacionados con los arrecifes, solo el 13 % estaban vinculados a referencias de mecanismos de aplicación. De ellos, una sexta parte eran compromisos asumidos en el Tratado de la Convención de las Naciones Unidas sobre el Derecho del Mar. Generalmente, estos obligan a los Estados a "adoptar y aplicar" las medidas necesarias para cumplir los compromisos contenidos en el instrumento y, en algunos casos, los instrumentos jurídicos mundiales exigen que los Estados informen a las Conferencias de las Partes a fin de realizar un seguimiento de los progresos. Además de la Convención

de las Naciones Unidas sobre el Derecho del Mar, otra tercera parte de los compromisos relacionados con los arrecifes vinculados a referencias de aplicación estaban contenidos en instrumentos relativos a mares regionales. El conjunto de instrumentos internacionales que afectan a los arrecifes especifica pocos mecanismos de aplicación y sanciones, de modo que es posible que muchos Estados no tengan incentivos para cumplir los compromisos, en particular los países con economías de ingresos bajos o medio bajos con demandas concurrentes por los escasos recursos públicos. Con relativamente pocos mecanismos de ejecución o sanciones establecidos en el cuerpo de instrumentos internacionales relacionados con los arrecifes, muchos Estados no tienen incentivos para cumplir los compromisos, en particular los países de ingresos bajos y de ingresos medio-bajos con demandas concurrentes por los escasos recursos públicos. Por lo tanto, la mayor parte de los instrumentos hacen más hincapié en "la zanahoria" que en "el palo", es decir, en los incentivos económicos en lugar de las sanciones y la aplicación.

La mayoría de los instrumentos no están vinculados a mecanismos financieros que contribuyan a financiar los costos asociados, lo que supone un problema para los numerosos Estados de ingresos bajos y medio-bajos que tienen la responsabilidad de cumplir sus compromisos en materia de arrecifes. De los 591 compromisos en materia de arrecifes, aproximadamente el 25 % hace referencia a disposiciones o mecanismos de financiación. La proporción es mucho más elevada entre los compromisos relacionados con el cambio climático. Sin embargo, en realidad pocas de estas referencias especifican el establecimiento o la mejora de los mecanismos de financiación, y la mayoría pueden considerarse llamamientos generales para los Estados desarrollados y las instituciones de financiación del desarrollo a aumentar la financiación, según sea necesario, para apoyar la ejecución por los Estados en desarrollo. Los pocos mecanismos de financiación creados por los instrumentos internacionales relativos a los arrecifes se establecieron en respuesta a convenios y convenciones mundiales vinculantes como el Convenio sobre la Diversidad Biológica, la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Convenio de Estocolmo. Estos mecanismos tienen las siguientes características comunes: i) generación de recursos nuevos y adicionales, ii) suministro de recursos financieros a título de subvención o en condiciones de favor, iii) gobernanza por la Conferencia de las Partes y iv) ejecución por una institución de financiación del desarrollo, como por ejemplo el Fondo para el Medio Ambiente Mundial.

La labor de coordinación de los 232 instrumentos normativos internacionales relativos a los arrecifes y los 591 compromisos que contienen plantea un desafío singular. Los instrumentos han establecido o designado escasos mecanismos que promuevan expresamente la coordinación, aunque en la práctica los mecanismos de financiación pueden contribuir a ello. El carácter eminentemente estatal de los compromisos requiere que los Gobiernos tengan flexibilidad para elaborar respuestas adecuadas a nivel local, con especial atención en los procesos de planificación integrada nacionales y, en algunos casos, regionales. Sin embargo, habida cuenta de las metas mundiales para reducir las presiones antropógenas sobre los arrecifes, y de la diferente capacidad para combatirlas que tienen los Estados con jurisdicción sobre los arrecifes, es probable que sea necesario coordinar de los esfuerzos a nivel regional y mundial.

Conclusiones y medidas recomendadas

Si bien la mayoría de los ecosistemas de arrecifes de coral de aguas cálidas del mundo están bajo la jurisdicción de tan solo 25 Estados, la amenaza a la existencia de estos sistemas es de carácter mundial, más allá del alcance de un Estado u otra entidad. El Acuerdo de París es el principal instrumento internacional para hacer frente al cambio climático, con el objetivo de mantener el aumento de la temperatura media mundial muy por debajo de 2 °C con respecto a los niveles preindustriales y proseguir los esfuerzos para limitar ese aumento de la temperatura a 1,5 °C por encima de los niveles preindustriales (aumento para el que se prevé que los arrecifes de coral sufran una reducción adicional de entre un 70 % y un 90 %). El logro de esta meta depende de las medidas voluntarias y no vinculantes que adopten los Estados.

Dado que los efectos de múltiples factores antropógenos que alteran los ecosistemas de arrecifes de coral son acumulativos, las medidas que se adopten para hacer frente a los factores generados localmente pueden mejorar la integridad y la resiliencia de esos ecosistemas ante el cambio climático. Por ejemplo, la decoloración inducida por el calor es una reacción al estrés en los corales, cuyos efectos pueden verse agravados por factores de estrés localizados (por ejemplo, extracción de peces de arrecife, vertido de contaminantes, pérdida física, etc.). Así pues, los compromisos encaminados a dar respuesta a los factores locales que alteran los ecosistemas de los arrecifes de coral se tornan aún más urgentes a medida que cambia el clima.

Habida cuenta de la urgencia, el presente análisis trata de responder a la pregunta: ¿qué papel puede desempeñar la política internacional para ayudar a los Estados a combatir los factores antropógenos generados localmente que alteran los ecosistemas de los arrecifes de coral, a fin de aumentar su resiliencia y sus posibilidades de supervivencia frente al cambio climático mundial? Para responder a esa pregunta, se llevó a cabo un análisis del diseño de los instrumentos internacionales en materia de arrecifes. Los resultados del análisis indican que los instrumentos han sido diseñados en gran medida para combatir los factores de cambio conocidos. Sin embargo, teniendo en cuenta los resultados ecológicos medidos (por ejemplo, la constante disminución de los arrecifes y la aceleración prevista de esta disminución a causa del cambio climático), se considera que las principales deficiencias se encuentran en la eficacia de la ejecución a nivel nacional (ya que aproximadamente el 85 % de los arrecifes de coral de aguas cálidas están bajo la jurisdicción de 25 Estados). Sobre la base de esta consideración se han determinado posibles vías por las que la política internacional puede contribuir a mejorar la ejecución a nivel nacional.

En este análisis se señalan al menos cuatro posibles vías por las que las políticas internacionales permiten ayudar a los Estados de los arrecifes de coral a hacer frente a los factores locales que provocan la pérdida de los arrecifes y aumentar la resiliencia de los arrecifes de coral (y sus posibilidades de supervivencia) frente al cambio climático. Esas posibles vías ofrecen enfoques estratégicos distintos pero no excluyentes entre sí para apoyar el debate y llegar a un acuerdo sobre el camino a seguir por la Asamblea de las Naciones Unidas sobre el Medio Ambiente. Teniendo en cuenta la gran cantidad de instrumentos internacionales relacionados con los arrecifes y los compromisos que ya existen para casi todos los factores generados localmente, todas las vías posibles pasan por acelerar el cumplimiento de los compromisos existentes (es decir, su aplicación). Esto podría ampliarse aún más mediante la revisión del marco normativo y de gobernanza existente con miras a reforzarlo o el establecimiento de nuevos instrumentos o mecanismos. ***Seguir como hasta ahora, lo que podría considerarse como una posible quinta vía, no es una opción viable en el caso de la gestión sostenible de los arrecifes de coral.***

1. ***Primera opción: mantener el actual marco normativo internacional relacionado con los arrecifes según lo previsto, pero haciendo hincapié en la aceleración de su aplicación a nivel nacional.*** Esta vía requeriría que los Estados renueven su compromiso de combatir los factores que alteran los ecosistemas de los arrecifes de coral, y podría incluir las medidas siguientes:
    i. la realización de un análisis o examen de las políticas relacionadas con los arrecifes a nivel nacional y subnacional, aprovechando el marco analítico y los métodos utilizados para este análisis, a fin de evaluar en qué medida los compromisos internacionales actuales se han traducido en marcos normativos, institucionales y estratégicos nacionales. Ello permitiría detectar lagunas, entre otras cosas mediante una auditoría por los Estados de sus propias políticas nacionales para cumplir los compromisos actuales en los instrumentos internacionales; y
    ii. que los Estados elaboren planes de ejecución integrados para cumplir los compromisos internacionales, con énfasis en el apoyo a la aplicación nacional y subnacional de las políticas, analizando, articulando y teniendo en cuenta los beneficios sociales y

económicos de la ejecución, utilizando los instrumentos de gestión existentes, y determinando todo el apoyo técnico y financiero que se necesita.

2. ***Segunda opción: fortalecer el actual marco normativo internacional.*** Además de los esfuerzos en pro de la aplicación acelerada, se puede revisar nuevamente el marco normativo actual a fin de fortalecer los mecanismos e incentivos para que los Estados cumplan sus compromisos. Ello incluye también velar por que el mandato y los medios de las organizaciones internacionales pertinentes les permitan prestar una asistencia eficaz a los Estados para que aceleren la aplicación. Se podrán considerar las siguientes medidas:
    i. la Asamblea de las Naciones Unidas sobre el Medio Ambiente podría invitar a los Estados a que ratifiquen aquellos instrumentos de política internacional mundiales y vinculantes para los que se necesita apoyo adicional, y a que informen periódicamente sobre los progresos realizados hacia el cumplimento de los compromisos internacionales;
    ii. se podrían modificar los instrumentos normativos regionales, en particular para ampliar el mandato de los mecanismos existentes, como los convenios y planes de acción sobre mares regionales e instrumentos conexos;
    iii. los Estados involucrados en la Iniciativa Internacional sobre los Arrecifes de Coral podrían darle un papel de mayor peso, por ejemplo en relación con el seguimiento de los progresos en el cumplimiento de los compromisos internacionales en el plano nacional;
    iv. las instituciones de financiación para el desarrollo, como el Banco Mundial, los bancos regionales de desarrollo y los bancos de inversión en infraestructura podrían adoptar "salvaguardias relativas a los arrecifes de coral", esto es, orientación específica relacionada con los arrecifes de coral para la aplicación de las salvaguardias ambientales existentes a todos los proyectos que financian, a fin de garantizar que se tienen en cuenta los posibles efectos en los ecosistemas de los arrecifes de coral; y
    v. los Estados podrían convenir en una nueva meta mundial sobre los arrecifes de coral, que fuera cuantificable y ambiciosa para hacer frente a los diversos factores, como parte del marco mundial para la diversidad biológica después de 2020 a raíz de las Metas de Aichi.

3. ***Tercera opción: introducir nuevos instrumentos o mecanismos de gobernanza internacionales.*** Las opciones primera y segunda se centran en el conjunto de las políticas internacionales existentes. Esto podría ampliarse aún más mediante la introducción de nuevos instrumentos o mecanismos que aborden problemas y deficiencias fundamentales. Como ya se ha mencionado, los compromisos existentes están en buena medida considerados como "débiles" en lo tocante a los requisitos impuestos a los Estados, y con frecuencia se carece de mecanismos que presten apoyo a su cumplimiento, lo cual da pie a plantear una opción con un nuevo instrumento jurídico mundial centrado exclusivamente en los arrecifes de coral, o bien un nuevo mecanismo internacional para apoyar la aplicación a nivel nacional de los compromisos relacionados con los arrecifes. Las opciones son las siguientes:
    i. que los Estados convengan en un nuevo instrumento mundial específico para los arrecifes de coral, por ejemplo un tratado o una convención sobre los arrecifes de coral, con metas específicas para los diferentes factores de cambio y los mecanismos de gobernanza para apoyar el cumplimiento (incluidos el seguimiento y la presentación de informes);
    ii. que los Estados convengan en la elaboración de un nuevo instrumento incluido en el seno de un instrumento existente o emergente (como una meta y un plan asociado específico para los arrecifes de coral en el marco mundial para la diversidad biológica después de 2020 de conformidad con el Convenio sobre la Diversidad Biológica, instrumentos específicos en el contexto de la Agenda 2030 para el Desarrollo Sostenible o la Convención Marco de las Naciones Unidas sobre el Cambio Climático); o

iii. que los Estados acuerden crear un nuevo mecanismo para apoyar el cumplimiento a nivel nacional de los compromisos existentes de política relacionados con los arrecifes, incluido un nuevo mecanismo de financiación específico para los ecosistemas de los arrecifes de coral, como un fondo mundial para los arrecifes de coral (por ejemplo, un "Fondo para el Medio Ambiente de los Arrecifes de Coral") para ofrecer subvenciones o financiación en condiciones favorables a Estados de ingresos bajos a fin de promover el avance hacia las metas y los compromisos políticos internacionales existentes, o bien un nuevo mecanismo de seguimiento y presentación de informes, por ejemplo en forma de una comisión o un foro sobre los arrecifes de coral en el marco de las Naciones Unidas.

4. ***Cuarta opción (unificada a partir de las tres anteriores): ofrecer un rápido apoyo a los Estados para la aplicación de las políticas, es decir, "la solución de los Estados de los arrecifes de coral".*** Cabe señalar que las tres opciones descritas anteriormente no son mutuamente excluyentes y podrían combinarse de diferentes maneras. A modo de ejemplo, se presenta una cuarta opción, unificada a partir de las tres vías anteriores, centrada en la ejecución de las políticas en los Estados relativamente pequeños con jurisdicción sobre los arrecifes de coral de aguas cálidas de todo el mundo (el 85 % de esos arrecifes están bajo la jurisdicción de 25 Estados), que comprende las medidas siguientes:
   i. los Estados de los arrecifes de coral llevan a cabo una auditoría de sus propias políticas nacionales para cumplir los compromisos actuales en los instrumentos internacionales, desarrollan planes de aplicación para el cumplimiento de las políticas, y señalan los apoyos técnicos y financieros necesarios;
   ii. los Estados pueden crear un nuevo grupo internacional de seguimiento global (por ejemplo, un "observatorio de políticas sobre los arrecifes de coral"), o encomendar la labor a la Iniciativa Internacional sobre los Arrecifes de Coral (en consulta y cooperación con organizaciones internacionales competentes); el grupo se encargaría de supervisar los progresos en el cumplimiento de los compromisos internacionales en el plano nacional en los Estados de los arrecifes de coral; y
   iii. los Estados acuerdan la creación de un nuevo mecanismo de financiación específico para los ecosistemas de los arrecifes de coral, como un fondo mundial para los arrecifes de coral que proporcione subvenciones o financiación en condiciones favorables a los Estados de los arrecifes de coral de ingresos bajos y medio-bajos a través de una institución existente como el Fondo para el Medio Ambiente Mundial.

Las consideraciones para avanzar siguiendo una vía (como se describe más arriba, o alguna combinación de ellas, como ilustra el ejemplo de la opción cuarta) dependen de la naturaleza de la principal limitación para el cumplimiento de los instrumentos internacionales por parte de los Estados. Por ejemplo, es posible que los arrecifes no sean una prioridad en las agendas nacionales porque se pierden entre todos los demás compromisos y objetivos del conjunto actual de instrumentos internacionales relacionados con los arrecifes. Si el establecimiento de prioridades es la principal limitación nacional, entonces tal vez se pueda introducir un nuevo instrumento internacional que ayude a fortalecer los esfuerzos de los Estados, o quizá sea posible situar los compromisos específicos de los arrecifes en un lugar destacado en un nuevo tratado. Si una limitación importante es la capacidad de traducir de manera eficaz las disposiciones aprobadas internacionalmente en medidas nacionales, se podría considerar la opción de crear un nuevo mecanismo o reforzar los instrumentos existentes para acelerar el cumplimento.

Es fundamental abordar los problemas de capacidad humana y financiera, con independencia de la política sobre los arrecifes de coral por la que se opte. En muchos países los problemas de capacidad son un obstáculo importante al cumplimiento de los compromisos internacionales en materia de arrecifes, en particular en los países menos adelantados, los pequeños Estados insulares en desarrollo y otros países en

desarrollo. Hay que redoblar los esfuerzos por desarrollar la capacidad de apoyar la elaboración y aplicación de políticas eficaces en materia de arrecifes de coral en los planos internacional y nacional. A este respecto, cabe señalar que la movilización de recursos adicionales y la posibilidad de intercambiar información, experiencias y lecciones aprendidas son unas de las mayores ventajas asociadas con la aprobación de instrumentos internacionales.

Un nuevo mecanismo financiero para proporcionar recursos adicionales podría ayudar a los Estados a subsanar las deficiencias en materia de capacidad. Existe un amplio reconocimiento de la necesidad urgente de incrementar y diversificar los fondos destinados a la gestión de los arrecifes de coral. La existencia de un nuevo mecanismo de financiación específico para los ecosistemas de los arrecifes de coral, como un fondo mundial que proporcione subvenciones y financiación en condiciones favorables o financiación de inversiones con vistas a promover el avance en pos de las metas y compromisos internacionales, podría traer consigo importantes beneficios en el terreno socioeconómico y de la biodiversidad marina, y es un pilar fundamental de las vías tercera y cuarta mencionadas anteriormente.

Habida cuenta de que los arrecifes de coral son transfronterizos y una prioridad mundial, la política internacional sigue siendo un instrumento fundamental para la gestión sostenible de los arrecifes de coral. La mayoría de los arrecifes de coral están sujetos a jurisdicción nacional y, si bien resulta difícil caracterizarlos como bienes públicos mundiales como base para la acción colectiva, sí que poseen características de bienes comunes (o bienes cuasi públicos). Normalmente la interdependencia de un recurso compartido es el fundamento para la acción colectiva y para nuevas inversiones. También hay una justificación de la acción colectiva en aras de un “preocupación común de toda la humanidad”. Una preocupación común, aunque no sea un recurso compartido, puede ser la base para la acción colectiva y formó parte de la justificación para el Convenio sobre la Diversidad Biológica. Más concretamente, una preocupación común de toda la humanidad puede justificar la cooperación internacional y la asistencia a los Estados de ingresos bajos, bajo cuya jurisdicción se localizan gran parte de los arrecifes de coral de aguas cálidas. Las vías y las medidas propuestas no son mutuamente excluyentes, y deben considerarse parte de un conjunto para alcanzar los Objetivos de Desarrollo Sostenible pertinentes. A medida que se elabora el marco mundial para la diversidad biológica después de 2020, y la Conferencia sobre los Océanos se dispone a evaluar el estado de ejecución del ODS 14, es probable que esas opciones o alguna combinación de ellas constituyan una pieza fundamental de cualquier medida coordinada por parte de los Estados.

Анализ глобальных и региональных инструментов политики и механизмов управления, связанных с охраной и устойчивым регулированием коралловых рифов

Краткое содержание

Обоснование проведения данного анализа

За последние десятилетия экосистемы тепловодных коралловых рифов во всем мире претерпели быстрые и все ускоряющиеся изменения. Это обусловлено увеличением концентраций парниковых газов в атмосфере и последующим повышением температуры поверхности моря, а также множеством других факторов, связанных с деятельностью человека. Межправительственная группа экспертов по изменению климата в 2018 году прогнозировала, что число коралловых рифов в мире сократится еще на 70-90 процентов при повышении средней мировой температуры на 1,5 градуса Цельсия по сравнению с доиндустриальным уровнем (при повышении на 2 градуса Цельсия потери превысят 99 процентов). Ожидается, что эта тенденция будет неоднородной, и некоторые рифы могут быть более других устойчивы к такому стрессу, в то время как другие могут деградировать при менее значительном повышении средней мировой температуры. По этим причинам Межправительственная группа экспертов по изменению климата с высокой степенью уверенности заявляет, что коралловые рифы являются одной из наиболее уязвимых к изменению климата морских экосистем мира.

Дополнительные антропогенные факторы изменения состояния коралловых рифов, такие как перелов и загрязнение, оказывают воздействие на значительную часть рифов мира. Являясь причиной широкомасштабной деградации рифов, эти местные факторы, кроме того, снижают сопротивляемость коралловых рифов к изменению климата, усугубляя реакцию коралловых экосистем на повышение температуры поверхности моря. Сокращение совокупного воздействия многочисленных местных факторов стресса может способствовать повышению целостности и устойчивости экосистем коралловых рифов в условиях обесцвечивания.

Международное сообщество неоднократно заявляло о своей готовности координировать политические меры реагирования на изменения, наблюдаемые и прогнозируемые в экосистемах коралловых рифов. Несмотря на то, что многие государства работают над тем, чтобы воплотить эти обязательства в действия на местном уровне, интенсивность факторов изменений и оценочные темпы изменений в экосистемах коралловых рифов только возросли. Памятуя об этой задаче, Ассамблея Организации Объединенных Наций по окружающей среде приняла в 2016 году резолюцию 2/12 об устойчивом регулировании коралловых рифов, в которой она вновь подтвердила необходимость международного сотрудничества в целях защиты экосистем коралловых рифов и призвала правительства стран уделять этим усилиям приоритетное внимание, опираясь при необходимости на техническую и финансовую поддержку со стороны доноров. В частности, в резолюции содержался призыв к Программе Организации Объединенных Наций по окружающей среде в сотрудничестве с Международной инициативой по коралловым рифам и другими соответствующими организациями и партнерами подготовить анализ глобальных и региональных инструментов политики и механизмов управления, связанных с охраной и устойчивым регулированием коралловых рифов.

Была проведена оценка структуры всей проводимой в настоящее время международной политики в сопоставлении с усиливающимися антропогенными факторами изменений, затрагивающими коралловые рифы. Анализ был сосредоточен на пробелах в разработке международных документов для устранения этих факторов, включая созданные согласно им

механизмы управления, и возможных вариантах устранения этих пробелов. В качестве первого шага письменные соглашения по соответствующим глобальным и региональным документам были определены и сведены в единый перечень, который послужил в качестве набора данных для анализа. Текст письменных соглашений, содержащий описание этих документов, затем был проанализирован для определения принятых в каждом документе обязательств и оценки любых пробелов между этими обязательствами и различными факторами изменений, силой этих обязательств и механизмами управления, созданными для их выполнения.

Резюме ключевых выводов

Существующий в настоящее время комплекс международных документов, касающихся коралловых рифов, отличается масштабом и широтой: в них содержатся обязательства, соответствующие почти каждому из антропогенных факторов изменения экосистем коралловых рифов. Существует не менее 232 международных документов, которые, как считается, прямо или косвенно оказывают поддержку сохранению и рациональному использованию экосистем коралловых рифов и/или касаются общих антропогенных факторов изменений в этих системах. Этот комплекс международных документов, касающихся коралловых рифов, создавался постепенно, начиная с 1960-х годов, и включает 150 глобальных документов, 29 из которых являются правовыми документами (т. е. обязательными), в соответствии с которыми большинство остальных документов определены как добровольные (т. е. необязательные). Кроме того, существует 82 региональных документа, 44 из которых являются правовыми. Сюда входят в общей сложности 32 документа по региональным морям. Этот комплекс международных документов, касающихся рифов, включает не менее 591 отдельного обязательства в отношении широкого круга антропогенных факторов изменений в экосистемах коралловых рифов.

Эта база международной политики включает большое число целевых показателей для достижения конкретных результатов, касающихся экосистем коралловых рифов или антропогенных факторов затрагивающих их изменений. Эти документы включают 79 отдельных глобальных целевых показателей, ограниченных временными рамками и поддающихся измерению (срок достижения 14 процентов из которых истек), а также 59 региональных целевых показателей. Более половины из них (53 процента) содержатся лишь в девяти документах: Глобальной программе действий по защите морской среды от загрязнения в результате осуществляемой на суше деятельности, Стратегическом плане действий Конвенции о биологическом разнообразии на 2011-2020 годы, Парижском соглашении и Повестке дня в области устойчивого развития на период до 2030 года (глобальные документы); Региональном плане действий в рамках инициативы «Коралловый треугольник», Плане действий секретариата Тихоокеанской региональной программы по окружающей среде на 2011-2015 годы, Стратегической программе действий в Бенгальском заливе, Стратегической программе действий в Арафурском и Тиморском морях и Стратегической программе действий в западной части Индийского океана (региональные документы). В совокупности международные документы, касающиеся рифов, представляют собой всеобъемлющий, хотя и широкий, комплекс измеримых глобальных целевых показателей в отношении большинства антропогенных факторов изменений в экосистемах коралловых рифов. Например, эти целевые показатели включают в себя обязательства удерживать рост средней мировой температуры на уровне значительно ниже 2 градусов сверх доиндустриального уровня; положить конец перелову и незаконному рыболовству и эффективно регулировать промысел; предотвращать и сокращать любое загрязнение морской среды; сохранить не менее 10 процентов прибрежных и морских районов; а также Айтинскую задачу 10, срок выполнения которой уже истек, направленную на сведение к минимуму многочисленных антропогенных нагрузок на коралловые рифы к 2015 году в целях поддержания их целостности и функционирования.

Этот широкий комплекс международных документов, касающихся рифов, сосредоточен на действиях государств, несущих основную ответственность за выполнение около

75 процентов обязательств. В рамках этого комплекса международных документов договор, именуемый «Конвенция Организации Объединенных Наций по морскому праву», обеспечивает правовую базу, на основе которой должна осуществляться вся деятельность в океанах и морях, и устанавливает права и обязательства государств в различных морских зонах. В территориальном море прибрежные государства осуществляют суверенитет над своими природными ресурсами. В исключительной экономической зоне прибрежные государства обладают суверенными правами на разведку, эксплуатацию, сохранение и регулирование живых и неживых природных ресурсов. На континентальном шельфе прибрежные государства пользуются суверенными правами с целью разведки и эксплуатации своих природных ресурсов, которые состоят из минеральных и других неживых ресурсов морского дна и недр наряду с живыми организмами, принадлежащими к «сидячим» видам. Как в исключительной экономической зоне, так и на континентальном шельфе прибрежные государства также обладают юрисдикцией в отношении морских научных исследований. Договор, именуемый «Конвенция Организации Объединенных Наций по морскому праву», также устанавливает общее обязательство государств по защите и сохранению морской среды.

В соответствии с морскими зонами, установленными договором, именуемым «Конвенция Организации Объединенных Наций по морскому праву», около 85 процентов мировых тепловодных коралловых рифов находятся под юрисдикцией 25 стран. Эти «государства коралловых рифов» по существу выполняют функции доверительных собственников тепловодных рифов мира.

Большинство (более 85 процентов) международных политических обязательств, связанных с рифами, касаются планирования и процессов. Основное внимание в них уделяется различным формам планирования, которые государствам следует или необходимо осуществлять для разработки правил и мер реагирования на создаваемое на местном уровне антропогенное давление на экосистемы коралловых рифов. Некоторые из наиболее общих целей данных обязательств включают: i) стабилизацию концентрации парниковых газов в атмосфере и сокращение выбросов при одновременной поддержке адаптации в развивающихся государствах и особенно МОСРГ; ii) регулирование промысла рыбных ресурсов в целях сохранения и регулирования рыбных ресурсов на целевых уровнях за счет научно обоснованных ограничений и мер по защите связанных с ними экосистем с уделением приоритетного внимания поддержке мелкого рыболовства; iii) осуществление процессов комплексного планирования в целях предотвращения, сокращения и сохранения под контролем различных источников загрязнения океана наряду с оценкой воздействия на окружающую среду и, в частности, с уделением особого внимания возможностям обработки отходов; iv) регулирование загрязнения нефтью в результате шельфовой добычи нефти и газа, а также судоходства; и v) решение вопросов физической реструктуризации береговой линии в сочетании с многочисленными антропогенными нагрузками на экосистемы коралловых рифов или прибрежные и морские экосистемы в более широком смысле, как правило, посредством планирования и регулирования на территориальной основе, например, комплексное управление прибрежными зонами и морское пространственное планирование, а также сети охраняемых морских районов.

Хотя международные документы, касающиеся коралловых рифов, охватывают широкий круг вопросов, их глубина не столь значительна, то есть обязательства государств носят достаточно общий и в основном добровольный характер. Многие из этих обязательств сосредоточены на «морских и прибрежных экосистемах» в целом или на различных экономических секторах деятельности человека, которые могут привести к изменениям в экосистемах коралловых рифов, а не на самих экосистемах коралловых рифов. Тем не менее эти обязательства применимы к коралловым рифам, даже если они не ориентированы на них. Для большинства из этих широких обязательств (52 процента) «силу» или надежность обязательства можно считать слабой (т. е. обязательство не требуется и содержится в добровольном документе) в

то время, как только 17 процентов были признаны сильными (т. е. обязательными, содержащимися в обязательном документе). Конечно, тот факт, что сила обязательства характеризуется как наименьшая из возможных, означает не то, что оно не будет выполнено государствами или не окажет воздействие, а лишь то, что требование к государствам сделать это является относительно слабым.

Хотя на государствах лежит основная ответственность за выполнение подавляющего большинства международных обязательств, документами было создано сравнительно небольшое число механизмов управления в поддержку этого процесса. Эффективность международных документов зависит от механизмов, с помощью которых они функционируют, таких как механизмы обеспечения соблюдения и финансирования. Из 591 обязательства, связанного с рифами, только 13 процентов связаны со ссылками на механизмы обеспечения соблюдения. Одну шестую их часть составляют обязательства по договору, именуемому «Конвенция Организации Объединенных Наций по морскому праву». Как правило, они требуют, чтобы государства «принимали и применяли» меры, необходимые для выполнения содержащихся в документе обязательств, а в некоторых случаях в глобальных правовых документах содержится требование к государствам представлять отчетность конференциям Сторон для мониторинга хода деятельности. Помимо Конвенции Организации Объединенных Наций по морскому праву, еще треть касающихся рифов обязательств, соответствующих ссылкам на обеспечение соблюдения, содержится в документах по региональным морям. Учитывая относительно небольшое число механизмов обеспечения соблюдения или санкций, предусмотренных в комплексе международных документов, касающихся рифов, многие государства могут не иметь стимулов для выполнения обязательств, особенно в странах с низким и ниже среднего уровнем дохода, где существует конкурирующий спрос на дефицитные государственные ресурсы. Следовательно, в большинстве документов акцент делается не на «кнут», а на «пряник», т. е. экономические стимулы, а не санкции и обеспечение соблюдения.

Большинство документов не связаны с механизмами финансирования для содействия финансированию сопутствующих расходов, что представляет собой проблему для многих государств с низким и ниже среднего уровнем дохода, несущих ответственность за выполнение обязательств, связанных с рифами. Из 591 обязательства, связанного с рифами, примерно 25 процентов содержат ссылки на финансовые положения или механизмы финансирования. Эта доля намного выше среди обязательств, связанных с изменением климата. Однако лишь в немногих из этих ссылок фактически идет речь о создании или укреплении механизмов финансирования; большинство из них скорее можно охарактеризовать как общие призывы к развитым государствам и учреждениям по финансированию развития предоставлять дополнительное финансирование, необходимое для поддержки деятельности развивающихся государств. Небольшое число механизмов финансирования, созданных в соответствии с международными документами, касающимися рифов, было учреждено в ответ на глобальные, имеющие обязательную силу конвенции, такие как Конвенция о биологическом разнообразии, Рамочная конвенция Организации Объединенных Наций об изменении климата и Стокгольмская конвенция. Эти механизмы имеют общие черты, которые включают: i) создание новых и дополнительных ресурсов, ii) предоставление финансирования на безвозмездной или льготной основе, iii) управление со стороны Конференции Сторон и iv) деятельность какого-либо учреждения по финансированию развития, например Глобального экологического фонда.

Особую проблему представляет координация между 232 международными политическими документами, касающимися рифов, и 591 содержащимся в них обязательством. В соответствии с этими документами было создано или определено лишь небольшое число механизмов для непосредственного содействия координации, хотя на практике этому могут способствовать механизмы финансирования. Государственно-ориентированный характер обязательств требует от правительств гибкости в разработке соответствующих местным условиям

ответных мер с акцентом на процессы комплексного планирования на национальном, а в некоторых случаях и на региональном уровне. Однако, учитывая как глобальные цели по снижению антропогенного давления на рифы, так и дифференцированный потенциал для решения этих вопросов в государствах, обладающих юрисдикцией в отношении рифов, вероятно, потребуется координация усилий на региональном и глобальном уровнях.

Выводы и рекомендуемые действия

Хотя большинство экосистем тепловодных коралловых рифов мира находятся под юрисдикцией лишь 25 государств, угроза существованию этих систем имеет глобальный масштаб и выходит за пределы компетенции какого-либо одного государства или другого субъекта. Парижское соглашение является основным международным документом для реагирования на изменение климата: оно направлено на удержание роста средней мировой температуры на уровне значительно ниже 2°C сверх доиндустриального уровня и продолжение усилий по ограничению повышения температуры до 1,5°C сверх доиндустриального уровня (при котором ожидается сокращение мировых коралловых рифов еще на 70-90 процентов). Достижение этой цели зависит от добровольных, необязательных действий государств.

Поскольку воздействие многочисленных антропогенных факторов изменения на экосистемы коралловых рифов носит кумулятивный характер, усилия по устранению местных факторов, могут способствовать повышению целостности и устойчивости этих экосистем перед лицом изменения климата. Например, обесцвечивание, вызванное тепловым стрессом, является реакцией кораллов на стресс, воздействие которого может усугубляться локальными видами стресса (например, добыча рифовой рыбы, попадание загрязняющих веществ, физические потери и т. д.). В связи с этим обязательства, направленные на устранение местных факторов изменения экосистем коралловых рифов, приобретают еще более неотложный характер по мере изменения климата.

Учитывая неотложный характер проблемы, в настоящем анализе делается попытка ответить на вопрос: какую роль может сыграть международная политика в оказании государствам помощи в устранении местных антропогенных факторов изменения экосистем коралловых рифов, с тем чтобы повысить их устойчивость и потенциал выживания в условиях изменения климата в глобальном масштабе? Для ответа на этот вопрос был проведен анализ структуры международных документов, касающихся рифов. Результаты анализа свидетельствуют о том, что документы были разработаны для широкого охвата известных факторов изменений. Однако, учитывая измеряемые экологические результаты (например, продолжающееся сокращение рифов и прогнозируемое ускорение этого сокращения в условиях изменения климата), предполагается, что основной недостаток заключается в эффективности осуществления деятельности на национальном уровне (учитывая, что, по оценкам, 85 процентов тепловодных коралловых рифов находятся под юрисдикцией 25 государств). На основе этого предположения были определены потенциальные варианты того, как международная политика могла бы способствовать повышению результативности на национальном уровне.

В настоящем анализе определены по меньшей мере четыре возможных варианта того, как международные политические меры реагирования могут помочь государствам, на территории которых расположены коралловые рифы, устранить местные факторы утраты рифов и повысить устойчивость коралловых рифов (и потенциал их выживания) перед лицом изменения климата. Эти потенциальные варианты обеспечивают отдельные, но не взаимоисключающие стратегические подходы в поддержку обсуждения и согласования Ассамблеей по окружающей среде путей продвижения вперед. С учетом большого количества международных документов и обязательств, касающихся рифов, которые уже существуют в отношении почти всех известных местных факторов, все потенциальные варианты влекут за собой ускорение выполнения существующих обязательств (т. е. осуществления). Это может быть

дополнительно усилено пересмотром существующей структуры политики и управления с целью ее укрепления и/или созданием новых инструментов или механизмов. ***Сохранение существующего порядка вещей, которое можно считать пятым отдельным возможным вариантом, не является целесообразным вариантом устойчивого регулирования коралловых рифов.***

1. ***Вариант первый: сохранение нынешней международной политической основы в отношении рифов в том виде, в каком она была разработана, но с уделением особого внимания ускорению осуществления на национальном уровне.*** Это будет основано на подтверждении государствами своих обязательств по устранению факторов изменений в экосистемах коралловых рифов и может включать в себя следующие виды деятельности:

    i. проведение анализа или обзора политики в отношении рифов на национальном и субнациональном уровнях с использованием аналитических рамок и методов, использованных для этого анализа, для оценки степени воплощения нынешних международных обязательств в национальную политику, стратегические и институциональные рамки. Это позволит выявить пробелы, включая проведение государствами самостоятельного обзора национальной политики по выполнению существующих обязательств, зафиксированных в международных документах; и

    ii. разработка государствами комплексных планов выполнения международных обязательств с уделением особого внимания поддержке реализации политики на национальном и субнациональном уровнях, анализу, формулированию и учету социальных и экономических выгод от осуществления, с использованием существующих инструментов управления и определением потребности в какой-либо технической и финансовой поддержке.

2. ***Вариант второй: укрепление существующих рамок международной политики.*** В дополнение к усилиям, направленным на ускоренное осуществление, существующая политическая структура может быть дополнительно пересмотрена с целью укрепления механизмов и стимулов для выполнения государствами своих обязательств. Это может также включать обеспечение того, чтобы мандат и средства соответствующих международных организаций позволяли им оказывать государствам эффективную помощь в ускорении осуществления. Можно рассмотреть следующие виды деятельности:

    i. Ассамблея Организации Объединенных Наций по окружающей среде может предложить государствам ратифицировать те глобальные, имеющие обязательную силу международные политические документы, для осуществления которых необходима дальнейшая поддержка, и регулярно отчитываться о ходе выполнения международных обязательств на национальном уровне;

    ii. в региональные политические документы могут быть внесены поправки, в том числе с целью расширения мандата существующих механизмов, таких как конвенции и планы действий по региональным морям, и связанных с ними документов;

    iii. государства, участвующие в Международной инициативе по коралловым рифам, могут возложить на нее более широкую роль, например, в отношении мониторинга хода выполнения международных обязательств на национальном уровне;

    iv. учреждения по финансированию развития, такие как Всемирный банк, региональные банки развития и инвестиционные банки в сфере инфраструктуры, могут принять меры по защите коралловых рифов, например, имеющие непосредственное отношение к коралловым рифам руководящие принципы реализации существующих мер по охране окружающей среды, применительно ко

всем финансируемым ими проектам с обеспечением учета потенциального воздействия на экосистемы коралловых рифов; и

v. государства могут согласовать новую глобальную цель в отношении коралловых рифов, которая была бы поддающейся количественной оценке и амбициозной, с тем чтобы учесть различные факторы, в рамках глобальной рамочной программы по сохранению биоразнообразия на период после 2020 года в соответствии с Айтинскими задачами.

3. ***Вариант третий: создание новых международных документов и/или механизмов управления.*** Первый и второй варианты ориентированы на существующий комплекс международных политических мер. Это может быть дополнительно усилено за счет создания новых документов и/или механизмов, направленных на решение ключевых проблем и устранение пробелов. Как упоминалось ранее, существующие обязательства в основном считаются «слабыми» с точки зрения предъявляемых к государствам требований, а механизмы оказания поддержки осуществлению зачастую отсутствуют. Это предполагает вариант, предусматривающий создание нового глобального правового документа, сосредоточенного исключительно на коралловых рифах, и/или нового международного механизма в поддержку выполнения обязательств, касающихся рифов, на национальном уровне. Возможны следующие варанты действий:

   i. государства согласовывают новый глобальный документ, касающийся конкретно коралловых рифов, например, договор или конвенцию по коралловым рифам с конкретными целями в отношении различных факторов изменений и механизмов управления для содействия их реализации (включая мониторинг и отчетность);

   ii. государства согласовывают новый документ, включенный в существующий или разрабатываемый документ (например, целевой показатель и соответствующий план, касающийся конкретно коралловых рифов, в рамках глобальной рамочной программы по сохранению биоразнообразия на период после 2020 года в соответствии с Конвенцией о биологическом разнообразии, конкретные документы в контексте Повестки дня в области устойчивого развития на период до 2030 года и/или Рамочной конвенции Организации Объединенных Наций об изменении климата); и/или

   iii. государства договариваются создать новый механизм для поддержки выполнения на национальном уровне существующих политических обязательств, касающихся рифов, включая новый механизм финансирования, специально предназначенный для экосистем коралловых рифов, такой как глобальный фонд для коралловых рифов (например, «Фонд коралловой среды»), для предоставления безвозмездного или льготного финансирования государствам с низким уровнем дохода в целях ускорения прогресса в достижении существующих целей и выполнении международных политических обязательств, и/или новый глобальный механизм мониторинга и отчетности, например, в форме комиссии или форума по коралловым рифам в рамках Организации Объединенных Наций.

4. ***Вариант четвертый (сводный на основе трех предыдущих): быстрая поддержка государствам в осуществлении политики, т. е. «решение для государств, где расположены коралловые рифы».*** Важно отметить, что три вышеописанных варианта не являются взаимоисключающими и могут быть объединены в различные наборы. В качестве одного из примеров представлен четвертый вариант, сводный на основе трех вышеуказанных вариантов, сосредоточенный на осуществлении политики в относительно небольших государствах, обладающих юрисдикцией в отношении тепловодных

коралловых рифов мира (например, 85 процентов этих рифов находятся под юрисдикцией 25 государств), включая следующие виды деятельности:

i. государства, где расположены коралловые рифы, проводят самостоятельный обзор национальной политики по выполнению текущих обязательств по международным документам и разрабатывают планы осуществления политики, выявляя необходимость в какой-либо технической и финансовой поддержке;

ii. государства могут создать новую всеобъемлющую международную группу мониторинга (например, «группа наблюдения за осуществлением политики в отношении коралловых рифов») или возложить эту роль на Международную инициативу по коралловым рифам (в консультации и сотрудничестве с компетентными международными организациями), которая будет отвечать за мониторинг хода выполнения международных обязательств на национальном уровне в государствах, где расположены коралловые рифы; и

iii. государства договариваются создать новый механизм финансирования, специально предназначенный для экосистем коралловых рифов, такой как глобальный фонд для коралловых рифов, для предоставления безвозмездного или льготного финансирования государствам, где расположены коралловые рифы, с низким и ниже среднего уровнем дохода через существующее учреждение, такое как Глобальный экологический фонд.

Соображения, касающиеся выбора того или иного варианта (из описанных выше или их сочетания, как показано на примере четвертого варианта), зависят от характера основного препятствия на пути осуществления государствами международных документов. Например, рифам может не уделяться приоритетное внимание в национальных повестках дня, поскольку этот вопрос теряется среди всех других обязательств и целей, содержащихся в существующем в настоящее время комплексе международных документов, касающихся рифов. Если главным препятствием является приоритизация на национальном уровне, то, вероятно, можно было бы создать новый международный документ для содействия активизации усилий государств, либо обязательства, конкретно касающиеся рифов, могли бы занять основное место в новом договоре. Если одним из основных препятствий является способность эффективно претворять принятые на международном уровне положения в жизнь на национальном уровне, то можно рассмотреть вопрос о создании нового механизма и/или усилении существующих документов для ускорения осуществления.

Решение задач в области людских и финансовых ресурсов имеет важнейшее значение независимо от того, какой политический курс будет выбран в отношении коралловых рифов. Ограниченный потенциал является одним из основных препятствий на пути выполнения международных обязательств, касающихся рифов, во многих странах, включая, в частности, наименее развитые страны, малые островные развивающиеся государства и другие развивающиеся страны. Необходимо активизировать усилия по созданию потенциала, способствующего эффективной разработке и осуществлению политики в отношении коралловых рифов на международном и национальном уровнях. В этой связи следует отметить, что мобилизация дополнительных ресурсов и обеспечение обмена информацией, опытом и извлеченными уроками являются одними из самых больших преимуществ, связанных с принятием международных документов.

Новый механизм финансирования для предоставления дополнительных ресурсов может помочь государствам восполнить нехватку потенциала. Признана настоятельная необходимость увеличения и диверсификации финансирования деятельности в отношении коралловых рифов. Новый механизм финансирования конкретно для экосистем коралловых рифов, такой как глобальный фонд, предоставляющий безвозмездное, льготное и/или инвестиционное

финансирование для ускорения прогресса в достижении международных целей и выполнении обязательств, может принести значительные социально-экономические выгоды и выгоды в плане биоразнообразия морской среды и является одним из основополагающих элементов третьего и четвертого вариантов, о которых говорится выше.

Поскольку коралловые рифы являются трансграничными и имеют глобальный приоритет, международная политика по-прежнему является одним из важнейших инструментов устойчивого регулирования коралловых рифов. Большинство коралловых рифов находятся под национальной юрисдикцией, и, хотя их трудно охарактеризовать как глобальное общее достояние человечества в качестве основы для коллективных действий, они все же имеют характеристики общественных ресурсов (или квазиобщественных благ). Взаимозависимость от общих ресурсов, как правило, является основанием для коллективных действий и новых инвестиций. Существует также обоснование для коллективных действий, направленных на решение «общих проблем человечества». Такая общая озабоченность, даже при отсутствии общего ресурса, может стать основой для коллективных действий и была частью обоснования Конвенции о биологическом разнообразии. Говоря более конкретно, общая проблема человечества может служить основанием для международного сотрудничества и оказания помощи государствам с более низким уровнем дохода, под юрисдикцией которых находится бóльшая часть тепловодных коралловых рифов. Предлагаемые пути и действия не являются взаимоисключающими и должны рассматриваться как часть комплекса мер по достижению соответствующих целей в области устойчивого развития. По мере разработки глобальной рамочной программы по сохранению биоразнообразия на период после 2020 года и приближения конференции по океану 2020 года для оценки хода осуществления ЦУР 14 эти варианты или их сочетание, вероятно, станут центральным элементом любых скоординированных действий государств.

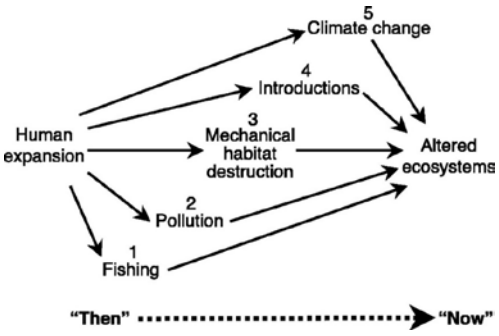
I. Introduction: Rationale for the Analysis

1.1 Overview of the recent and projected human-driven changes in coral reef ecosystems

Concern over the relatively rapid and accelerating changes in the structure and functioning of coral reef ecosystems around the world has featured prominently in the news in recent months and years, with 2018 declared as the third International Year of the Reef by the International Coral Reef Initiative.[i, ii, iii, iv] For example, in 2016 the northern third of Australia's Great Barrier Reef (as well as other countries, like the Maldives)[v] experienced an unprecedented loss of corals after a marine heatwave and global bleaching event, transforming the ecological functioning of 29 percent of the 3,863 reefs comprising the world's largest coral reef system.[vi] While such bleaching events have become more frequent in recent decades,[vii] the most recent global scientific assessment of the status of coral reef ecosystems occurred in 2008 – estimating that 19 percent of the world's coral reefs had been heavily degraded over the preceding century, another 15 percent were considered to be under imminent threat of loss under the next 10 to 20 years, and another 20 percent were under threat of loss in 20 to 40 years.[viii] At regional scales, a number of studies have estimated a similar extent of coral loss. For example in the Caribbean, a meta-analysis showed that average hard coral cover on reefs across the entire Caribbean basin was reduced by 80 percent between 1977 and 2001, and particularly after the bleaching event of 2005.[ix, x] Another multi-decade time-series analysis of coral cover for 88 Caribbean locations shows an average decline of 53 percent between 1970-83 and 1999-2011.[xi] Similarly, in the Indo-Pacific region, analysis of a coral cover database of over 6,000 surveys of 2,667 coral reefs performed between 1968 and 2004 showed an estimated annual coral cover loss of approximately 1 percent over the period from 1983 to 2003, and 2 percent between 1997 and 2003, though the status of reefs in the Pacific islands was considered healthy in 2011 (amid signs of future decline).[xii, xiii] More recent analyses show relatively stable average live coral cover with high variability across locations and species in the Pacific region.[xiv] Another recent report shows an increasing trend in Western Indian Ocean coral mortality due to bleaching events, with up to 30-50 percent due to the 1998 event and up to 10 percent due to the 2016 event.[xv] Lastly, over 2,000 surveys conducted over a 27-year period (1985 – 2012) on 214 reefs along the Great Barrier Reef showed a loss of over 50 percent of initial coral cover.[xvi]

The changes in coral reef ecosystems over the last century have been driven by the same types of human activity intensifying throughout the oceans and along coasts with the advent of industrial fishing and the rapid expansion of coastal development and population growth (see Figure 1 below).[xvii, xviii, xix] As one of the first human drivers of change in ocean ecosystems, overfishing was followed by pollution from largely land-based sources that increased significantly from pre-industrial levels, for example with anthropogenic inputs of nitrogen and phosphorus into estuarine and coastal ecosystems more than doubling during the 20th century and scientifically-reported low-oxygen zones in coastal waters increasing exponentially between the 1960s and 2008.[xx, xxi, xxii] Coastal development has also grown exponentially over the 20th century as the global population generally migrated towards the ocean, with the coastal zone now home to an estimated 38 percent of the worldwide population.[xxiii, xxiv, xxv] By 2011 the combination of these drivers was suggested to threaten more than 60 percent of the world's reefs.[xxvi]

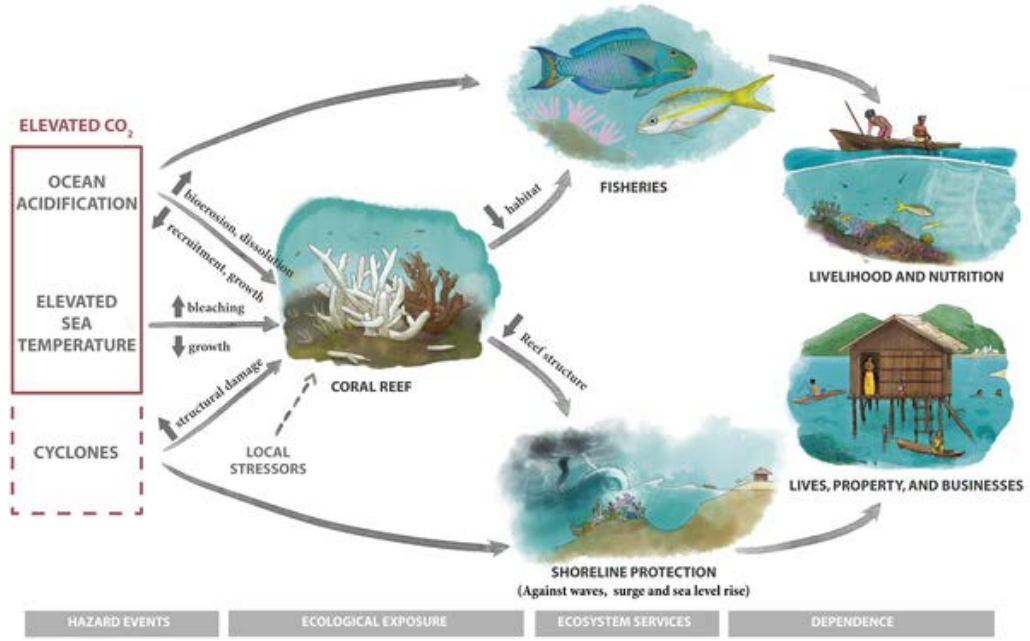
Figure 1. Historical sequence of human disturbances affecting coastal ecosystems



Source: Jackson et al. 2001, illustrating a historical sequence of human disturbances affecting coastal ecosystems, beginning with fishing (step 1), with steps 2 – 5 likely varying in order in different cases.

On top of these local human drivers of change in coral reef ecosystems, climate change is projected to further alter ecosystem functions and services throughout the oceans.[xxvii] Since the pre-industrial era, anthropogenic emissions of greenhouse gases have driven large increases in atmospheric concentrations of carbon dioxide, methane and nitrous oxide, and are extremely likely to have been the dominant cause of warming observed since the mid-20th century.[xxviii] These increasing concentrations put shallow, warm-water coral reef ecosystems at risk from two key stresses or pressures: (i) elevated sea surface temperature (that can cause coral bleaching and related mortality) and (ii) ocean acidification, while climate change also affects local drivers (e.g. land use patterns and sources of pollution) (Figure 2).[xxix]

Figure 2. Conceptual diagram linking stresses related to increased concentrations of atmospheric carbon dioxide to coral reef ecosystems and the services they provide



Source: Pendleton et al. 2016.

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) states with high confidence that coral reefs are one of the marine ecosystems most vulnerable to the changes resulting from increased concentrations of greenhouse gases in the atmosphere (notably sea surface temperature increases and ocean acidification).[xxx] According to the IPCC Global Warming of 1.5 Degrees C special

report in 2018, the world's coral reefs are projected to decline by a further 70 to 90 percent with a 1.5 degree Celsius increase in the global mean temperature from pre-industrial levels (the level targeted in the Paris Agreement), with larger loss (greater than 99 percent) with a 2 degree Celsius increase.[xxxi] However, this pattern of degradation is not expected to be uniform, and certainly, some coral reefs may prove more resilient than others to such stress.[xxxii, xxxiii] At the same time, some reef ecosystems may be degraded at global mean temperature increases even below 1.5 degree Celsius, as widespread coral bleaching has already been occurring globally since 2014 with a global increase of 0.9 °C.[xxxiv, xxxv] Such projections led the International Society for Reef Studies, an association of coral reef scientists and managers, to issue a consensus statement in October 2015 calling on nations to keep the average global temperature increase to less than two degrees Celsius in the short-term, and less than 1.5 degrees Celsius in the long-term, relative to the pre-industrial period, in order to prevent global collapse of coral reef ecosystems.[xxxvi] Such a collapse would threaten a range of services that coral reef ecosystems provide to people (as one of the world's most productive marine ecosystems), e.g. tourism and recreation, coastal protection, support for fisheries, etc., providing global economic benefits estimated in 2003 to be on the order of US$29 billion annually.[xxxvii] More recent analyses show that Mesoamerica and the Coral Triangle regions also derive multi-billion dollar annual economic benefits from coral reef ecosystems: US$34.6 and $36.7 billion, respectively.[xxxviii]

Coral reef ecosystems are affected simultaneously by climate change and multiple local anthropogenic drivers of change. Because these are not isolated they often result in a positive feedback loop and cumulative impacts.[xxxix] Additionally, different types of drivers may interact in a given coral reef ecosystem, and where such interactions occur, combined with ecological complexity, negative impacts on coral reef ecosystems may happen sooner and be more severe than previously thought.[xl] For example, local drivers of change such as overfishing may reduce the resilience of reef ecosystems to impacts from the global driver of increasing emissions of greenhouse gases in the atmosphere, and in turn impacts from this global driver exacerbate the impacts of overfishing or other local drivers such as destructive fishing, predators, pollution, etc.[xli, xlii, xliii] For these reasons, states and stakeholders have often emphasized efforts to addresses the cumulative impacts of multiple anthropogenic drivers in order to enhance the integrity and resilience of coral reef ecosystems in the face of bleaching events (bleaching is a cumulative-stress response where global warming is the most widespread stressor, but which known localized stresses exacerbate).[xliv, xlv, xlvi, xlvii]

The anthropogenic drivers of change that most commonly combine or contribute to changing coral reef ecosystems are summarized in Table 1 below, from a search of the scientific literature supplemented with relevant grey literature publications and expert elicitation. For specificity, these drivers of change have been deconstructed into: (i) the human activities driving the changes, and (ii) the actual pressures on the coral reef ecosystems caused by these activities, organized according to 'themes' that are analogous to a 'sector'.[1]

Table 1. Summary of Key Anthropogenic Drivers of Change in Coral Reef Ecosystems

Theme	**Anthropogenic Drivers of Change**	
	Activity	**Associated Pressures on Coral Reef Ecosystems**
Climate	Activities resulting in emissions of	Elevated sea surface temperature causing thermal stress

[1] An 'economic sector' is defined here as a specific area or group of industries in the global economy.

change	greenhouse gases in the atmosphere	Ocean acidification
		Tropical cyclone damage or other extreme events
Production from living resources	Harvesting of living resources by large-scale/industrial operators	Extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities)
		Input of other substances (e.g. synthetic substances such as fishing nets)
		Input of litter (solid waste matter, including micro-sized litter)
		Physical loss (e.g. due to destructive fishing practices)
	Harvesting of living resources by small-scale and/or subsistence operators	Extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities)
		Input of other substances (e.g. synthetic substances such as fishing nets)
		Input of litter (solid waste matter, including micro-sized litter)
		Physical loss (e.g. due to destructive fishing practices)
	Harvesting of living resources by recreational operators	Extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities)
		Input of other substances (e.g. synthetic substances such as fishing nets)
		Input of litter (solid waste matter, including micro-sized litter)
		Physical loss (e.g. due to destructive fishing practices)
	Hunting and collecting of living resources for other purposes (including 'bioprospecting')	Physical disturbance (temporary or reversible)
		Physical loss
	Coastal aquaculture (including 'ranching', seaweed cultivation)	Input of nutrients
		Input of organic matter
		Input of microbial pathogens
		Input of other substances
		Input or spread of non-indigenous species
		Reduction in light penetration (i.e. 'shading')
Generation of land-based sources of	Production and disposal of plastics	Input of litter (solid waste matter, including micro-sized litter)
	Waste treatment and disposal	Input of nutrients
		Input of organic matter

pollution[2]		Input of microbial pathogens
		Input of other substances (e.g. noxious, hazardous, or toxic chemicals)
		Sedimentation rate changes
	Urban or industrial activities	Input of other substances (e.g. noxious, hazardous, or toxic chemicals)
		Input of nutrients
		Input of organic matter
		Input of microbial pathogens
		Sedimentation rate changes
	Agriculture	Input of nutrients
		Input of organic matter
		Input of microbial pathogens
		Input of other substances (e.g. noxious, hazardous, or toxic chemicals)
		Sedimentation rate changes
Extraction of non-living resources	Extraction of minerals (e.g. sand, coral mining)	Physical disturbance (temporary or reversible)
		Physical loss
	Extraction of oil and gas (including infrastructure)	Physical disturbance (temporary or reversible)
		Input or spread of non-indigenous species
		Input of other substances (e.g. noxious, hazardous, or toxic chemicals)
		Underwater noise changes
	Extraction of water (i.e. desalination)	Physical disturbance (temporary or reversible)
		Changes to hydrological conditions
Production of energy	Transmission of electricity and communications (cables)	Physical disturbance (temporary or reversible)
	Renewable energy generation (wind, wave and tidal power, or biofuel from algae), including infrastructure*	Physical disturbance (temporary or reversible)
		Physical loss
		Changes to hydrological conditions

[2] The United Nations Convention on the Law of the Sea treaty defines marine pollution as "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 legitimate uses of the sea, impairment or quality for use of the sea water and reduction of amenities."

Physical restructuring of the coastline, rivers or seabed	Coastal land claim (e.g. mangrove loss)	Physical disturbance (temporary or reversible)
		Physical loss
		Changes to hydrological conditions
		Sedimentation rate changes
	Canalization and other watercourse modifications	Physical disturbance (temporary or reversible)
		Physical loss
		Changes to hydrological conditions
	Coastal defense and flood protection	Physical disturbance (temporary or reversible)
		Physical loss
		Changes to hydrological conditions
	Restructuring of seabed morphology, including dredging and depositing of materials	Physical disturbance (temporary or reversible)
		Physical loss
		Changes to hydrological conditions
Tourism and recreation	Tourism and recreation activities (e.g. resulting in anchor use on reefs, vessel groundings, diving and snorkeling)	Physical disturbance (temporary or reversible)
		Physical loss
		Disturbance of species due to human presence
		Input of litter (solid waste matter, including micro-sized litter)
		Input of nutrients
		Input of organic matter
		Input of other substances (e.g. from sunscreen)
	Tourism and recreation infrastructure	Physical disturbance (temporary or reversible)
		Physical loss
		Disturbance of species due to human presence
	Marine biota souvenirs to sell to tourists, exporters	Physical disturbance (temporary or reversible)
		Physical loss
Transport	Transport - shipping	Input of other substances (e.g. noxious, hazardous, or toxic chemicals, organic matter)
		Input or spread of non-indigenous species
		Input of organic matter
		Input of litter

		Physical loss
		Underwater noise changes
	Transport - infrastructure	Physical disturbance (temporary or reversible)
		Physical loss
		Input of other substances (e.g. noxious, hazardous, or toxic chemicals)

** List is not exhaustive, particularly for pressures linked to types of activities*
Sources: see Annex 1.

1.2 International responses to these changes

On numerous occasions the international community of states has undertaken coordinated responses to the changes observed and projected in coral reef ecosystems, notably in Chapter 17 of the Agenda 21 emerging from the 1992 United Nations Conference on Environment and Development,[xlviii] the 2002 Plan of Implementation of the World Summit on Sustainable Development,[xlix] the Aichi Biodiversity Targets adopted by the Conference of the Parties to the Convention on Biological Diversity in 2010,[l] the Future We Want outcome document of the United Nations Conference on Sustainable Development in 2012,[li] and the Sustainable Development Goals (SDGs) in the Agenda 2030 adopted by the United Nations General Assembly in 2015,[lii] among others. In 2010 the United Nations General Assembly adopted a resolution on coral reefs, urging member states as well as competent international organizations to take action to protect coral reef ecosystems, while a number of General Assembly resolutions on oceans and the law of the sea have also addressed coral reefs.[liii, liv]

Even as many national governments work to translate this global consensus and political commitment into local action, the intensity of the drivers of change and the estimates of the rates of change in coral reef ecosystems have only increased. Mindful of this challenge, in 2016 the United Nations Environment Assembly passed a resolution reiterating the need for international cooperation for the protection of coral reef ecosystems, and calling for national governments to prioritize this effort, drawing upon technical and financial support from donors when necessary.[lv] More specifically, the resolution called for the UN Environment, in cooperation with the International Coral Reef Initiative (ICRI) and other relevant organizations and partners, to prepare an analysis of global and regional policy instruments and governance mechanisms related to the protection and sustainable management of coral reefs.[lvi]

Box 1. United Nations Environment Assembly (UNEA) Resolution 2/12, paragraph 13

"Requests the Executive Director, in cooperation with the International Coral Reef Initiative, other relevant international organizations and other relevant partners to prepare, by 2018, an analysis of global and regional policy instruments and governance mechanisms related to the protection and sustainable management of coral reefs."

1.3 Objectives of this analysis

This report summarizes the results of an analysis of written documents that describe global and regional policy instruments and governance mechanisms related to the anthropogenic drivers of change in coral

reef ecosystems, in response to Resolution 2/12 of the United Nations Environment Assembly (UNEA).[3] Specifically, the analysis includes: (i) an assessment of the design of international policy instruments and governance mechanisms in terms of their sectoral scope, legal status, geographic coverage, and strength, and (ii) identification of gaps in the design of the instruments and possible options for addressing these. Essentially, the analysis aims to answer the question: does the international community currently have sufficient public policy instruments to address the anthropogenic drivers of change in coral reef ecosystems, given recent observations and the current state of knowledge? If not, what role could international policy play in helping to address these drivers and conserve and protect coral reef ecosystems, and what policy changes would be needed? The analysis aims to provide answers to these questions and clear recommendations on the way forward, for consideration by UN member states.

This analysis has been carried out in close collaboration with ICRI and under the supervision of a coral reef policy advisory committee. The committee was comprised of coral reef and environmental policy experts nominated by member states in response to a call for nominations sent to members of the Committee of Permanent Representatives to UN Environment in October 2017. Fourteen member states nominated experts to the committee. The committee met in June 2018 to validate the methodology for this analysis, review the list of policy instruments and governance mechanisms to be considered, and provide overall guidance for conducting the analysis. The committee met again in October 2018 to review a first comprehensive draft analysis report and discuss recommended action for consideration by UNEA. The committee also agreed a detailed process for review of the analysis report, including by reviewers nominated by member states (invitation sent to members of the Committee of Permanent Representatives to UN Environment September 2018) as well as by experts from selected agents of international policy, such as the secretariats of multilateral environmental agreements. The results of the analysis were presented to the general meeting of ICRI prior to finalization and submission to UNEA.

II. Methods Used in the Analysis

2.1 A Conceptual Framework to Guide the Analysis

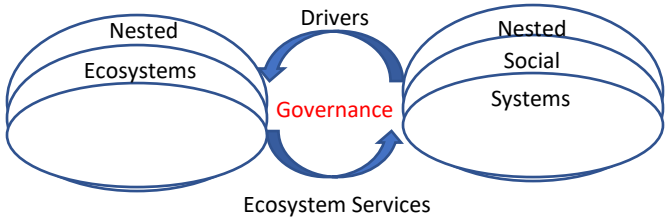
The starting point for this analysis is the socio-ecological systems (SES) framework, drawing on the broader research on human-environment interactions.[lvii] In this framework, social and ecological factors are considered equally important.[lviii] The changing human condition serves to both directly and indirectly change ecosystems, and in turn changes in ecosystems cause changes in human well-being.[lix, lx, lxi, lxii] Such a framework can be used to characterize the interaction between society and coral reefs at multiple scales. For example, a given coral reef ecosystem may be impacted by local interactions with social systems such as through fishing, while at the same time being influenced by global interactions with society such as from increased temperatures resulting from anthropogenic greenhouse gas emissions.

The types of impact that social systems have upon coral reef ecosystems are characterized here as different anthropogenic drivers of change, while the benefits these ecosystems provide to humans are characterized as a flow of ecosystem services.[lxiii] Essentially, the SES conceptual framework provides a mental map to illustrate the interdependent nature of societies and coral reef ecosystems (see Figure 3), where there are multiple anthropogenic drivers of change, each of which may impact coral reef ecosystems through a number of different pathways at multiple scales, which in turn affects the contributions that these systems provide to people (which affects the intensity of the drivers, etc.).[lxiv, lxv]

[3] UNEA Resolution 2/12 (2016).

Efforts to enhance the benefits that coral reef ecosystems provide to people have often focused on changing the nature and/or intensity of the anthropogenic drivers affecting these systems, through governance.[lxvi, lxvii, lxviii, lxix, lxx] Governance is defined here as the process of discussing, agreeing on, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal.[lxxi] Essentially, governance can be considered as the filter by which humans interact with the ecosystems, and broken down for further analysis into components such as instruments and mechanisms (see Box 2 for key terms and definitions).[lxxii]

Figure 3. Simplified Socio-ecological Systems Framework, including the Concept of Governance



Source: Re-drawn from Ommer et al. (2011)

2.2 Scope of the Analysis

This analysis is conducted from the perspective of the international community of states, and what they can do collectively through public policy instruments to respond to the multiple anthropogenic drivers of change in warm-water coral reef ecosystems described in Table 1, and support coral reef conservation and sustainable management. These international public policy instruments represent an agreement by states to achieve a shared goal. By assembling and reviewing the body of relevant international public policy instruments, the analysis aims to answer the question: have states collectively introduced policy instruments sufficient to address the drivers of change in warm-water coral reef ecosystems, given recent observations and the current state of knowledge? Or are there gaps likely to result in insufficient responses at various levels? Essentially, does the body of international public policy provide sufficient protection for coral reef ecosystems to ensure their sustainability? If the answer is yes, then perhaps the current decline in coral reef ecosystems are more likely correlated to implementation of the instruments, rather than the instruments themselves. In answering these questions, four key aspects bound the scope of the analysis: instrument definitions, coral reef ecosystems, scale and causal links.

Instrument definitions. The discourse around the term "policy instruments" is broad, with both national and disciplinary variations. This presents definitional challenges and requires that choices are made (see Box 2). The term emerged from the public policy literature as a basic unit of analysis (with public policy itself defined as a particular course of action or inaction pursued by governments, individually or collectively).[lxxiii, lxxiv] Policy instruments are defined broadly on the basis of this literature, as tools by which governments use power in attempting to ensure support and effect social change (in this case to protect and sustainably manage coral reef ecosystems). [lxxv] Essentially these are the tools of government to achieve a public policy goal, and typically categorized as either forms of regulation, economic incentives or provision of information.[lxxvi]

A more specific discourse often involves the legal instruments that codify public policy goals and instruments into law, enforceable by the government. At the international level, these legal instruments are defined as treaties or agreements concluded between states in written form and governed by international law.[lxxvii] Based on the common usage within the public policy discourse, the terms 'policy instrument' and 'legal instrument' are not considered here as mutually exclusive, but rather legally enforceable mandates (i.e. legal instruments) are considered here as one form of tool or 'instrument' of public policy. Hence, the analysis includes both (i) written agreements between states that are legally binding, and (ii) written agreements between states that are voluntary or non-binding instruments of international public policy' that affect the protection and sustainable management of coral reefs. This definition allows for a broad consideration of the intentions articulated by governments at the international level to protect and sustainably manage coral reefs, in an effort to as fully address the aim of the UNEA Resolution 2/12 as possible. However, to avoid confusion, global and regional policy instruments throughout the text are specified as either 'legal instruments' or 'voluntary instruments', or simply 'instruments'.

Box 2. Key terms and definitions

- **Governance**: the process of discussing, agreeing on, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal. This complex concept is broken down here into components such as instruments and mechanisms at various levels, for further analysis.
- **Policy instruments:** tools by which governments use power in attempting to ensure support and effect social change. The term used in UNEA Resolution 2/12, "global and regional policy instruments", is defined as public policy instruments agreed between two or more states, articulated in written form, some of which are legal instruments that are considered binding upon the states, others of which are voluntary or non-binding agreements. Within instruments, legal instruments contain 'obligations' and voluntary instruments contain 'provisions', both of which are collectively defined here as '*commitments*' made by the states, which can be considered as discrete, multi-dimensional variables for analysis.
- **Governance mechanisms:** Many instruments create 'governance mechanisms', defined here as organizations or processes to help administer and deliver (i.e. to implement) the instruments. This may include associated funding mechanisms and investments. Essentially, governance mechanisms are defined as the means by which governments deliver the instruments that they have specified, e.g. organizations or funds created for implementation.

Both instruments and mechanisms can be considered as independent variables, affecting the intermediate outcomes (measures of the anthropogenic drivers of change, which are often multi-dimensional variables), which in turn affect the outcome variables that measure the functions of coral reef ecosystems.

Coral reef ecosystems. The analysis considers warm-water coral reef ecosystems predominantly occurring in the shallow, coastal waters of the tropics, between the latitudes of 25° south and 25° north. The analysis excludes cold-water coral ecosystems as they are not ecologically connected to warm-water coral ecosystems, while the anthropogenic pressures as well as the applicable instruments differ. Such ecosystems may warrant a separate analysis. Additionally, the analysis does not focus on associated ecosystems such as mangroves and seagrass.

Scale. The scale of this analysis is limited to international public policy, i.e. at global and regional levels. Additionally, the scale of the analysis also reflects the scale of the anthropogenic drivers in coral reef ecosystems, which can be distinguished by the level at which they are generated: globally widespread or locally-generated.[lxxviii] Climate change is considered as globally widespread, while all others could be considered as locally-generated. Reducing locally-generated pressures will give coral reef ecosystems

greater opportunities to adapt to the impacts of climate change, given the cumulative effectives of multiple drivers of change.[lxxix, lxxx] For this reason, the analysis focuses particularly on the international policy instruments to address the locally-generated drivers of change in coral reef ecosystems such as harvesting of living resources, coastal development, tourism and recreation, those that cause pollution, etc., in parallel to the global policy dialogue on addressing climate change. This is consistent for example with recommendations from the Conference of the Parties (CoP) to the Convention on Biological Diversity, urging states to address those drivers of change that are tractable at non-global levels, in order to help strengthen the resilience of coral reef ecosystems to climate change.[lxxxi]

Causal links. This analysis aims to answer the question of whether or not the international community has sufficient public policy tools to address the anthropogenic drivers of change in coral reef ecosystems. Assuming a standard public policy cycle that includes: (i) a phase of policy design, and (ii) a phase of policy delivery (i.e. implementation), which (iii) leads to outcomes,[lxxxii] this analysis focuses on the first phase of the cycle only: design. This is because a full analysis of policy delivery would require assessment of delivery at the national level on a country-by-country basis, which was not feasible. Perhaps more importantly, an assessment of the *effectiveness* of policy delivery, i.e. the degree to which the policies goals were realized due to the instrument, was simply not possible.[lxxxiii] This is because determining whether or not the introduction of any particular instrument has led to targeted outcomes in coral reef ecosystems, requires establishing a causal link between observed outcomes and the instrument introduced, by investing heavily to measure changes in ecological outcome indicators compared to a counterfactual without the instrument.[lxxxiv] For these reasons, the analysis focuses on the design of international coral reef policy instruments to address the known drivers of change in coral reef ecosystems, rather than the effectiveness of the governance mechanisms for instrument delivery, or their impact (i.e. outcomes realized due to the instruments). This assumes characteristics of instrument delivery, given consistency between design and ecological outcomes (e.g. if policy instruments are designed to deliver a range of outcomes, and those outcomes are subsequently observed, the instruments can be assumed to have been effectively delivered). Of course a range of factors external to instruments can also affect ecological outcomes, e.g. demographics, markets and technology, etc.).

2.3 Brief Overview of Methods Used

Based on the conceptual framework described previously, where instruments and the governance mechanisms they create or use are considered as independent variables that affect anthropogenic drivers of change in coral reef ecosystems, the first step was to identify the relevant global and regional instruments that would constitute the data set for analysis (see Annex 1 for more detail on methods). Once the inventory of international coral reef instruments was constructed, their content was analyzed to identify the commitments made in each document, and assess any gaps between these commitments and the various drivers of change, as well as the strength of these commitments, and the governance mechanisms established to deliver them. This analysis was conducted in order to assess the extent to which the various drivers of change are addressed by international instruments. Numerous assumptions were made in bounding discrete commitments within instruments, and assigning numerical values to represent various characteristics. The results should be interpreted as indicative, for purposes of illustrating gaps and for illustrating ratios of certain types of content to others in the instruments, but not as a quantitative analysis with margins of error for estimates. For example, in matching commitments to specific drivers of change (e.g. to activities), there are some cases where the language was not identical so did not match, but the drivers may be addressed through other commitments articulated in broader language. Such cases are noted as they occur, to ensure that the results are not misleading. Finally, somewhat analogous to efforts to identify ‘bright spots’ of coral reefs that have proved resilient to key

drivers such as impacts from climate change,[lxxxv] examples of interventions characterized as 'successful' are highlighted in boxes, in order to illustrate effective delivery mechanisms.

This research strategy can be summarized along the following steps (see Annex 1 for details):

1. Step One: Create an inventory of the current global and regional instruments relevant to the key anthropogenic drivers of change in coral reef ecosystems, to consider if they have been designed to address the known drivers or if there are gaps;
2. Step Two: Analyze the content of these instruments to consider if they have collectively been designed to address the known drivers or if there any potential gaps that can be identified;
3. Step Three: Summarize the key findings; and
4. Step Four: Propose policy-relevant recommendations, based on the analysis and drawing upon expert elicitation from the coral reef policy advisory committee.

III. Results

3.1 The International Coral Reef-Related Policy Inventory

As the units of analysis, 232 international instruments and associated protocols were included in the inventory as aiming directly or indirectly to support conservation and sustainable management of coral reef ecosystems, and/or address anthropogenic drivers of change in these systems – i.e. 'coral reef-related policy' (see Annex 2 for the inventory). Of these, 150 are instruments agreed by states at the global level, and the remaining 82 at the regional level. The global instruments can be further sub-divided into 32 binding international agreements between states to assume commitments for which they can be held accountable (legal instruments often referred to as 'hard law' – see Box 3 below), as well as 118 voluntary agreements, guidelines and initiatives that are non-binding (and often referred to as 'soft law'), of which 102 are 'nested' under one of the binding agreements (i.e. linked to a previous binding

Box 3. Global Legal Instruments and Associated Protocols Related to Coral Reefs [Number of Parties that Ratified]

1969: International Convention on Civil Liability for Oil Pollution Damage [34]
1969: International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties [89]
1971: Ramsar Convention on Wetlands [170]
1972: The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Convention [193]
1973: Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) [183]
1973: International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) [157]
1979: Convention on Long-Range Transboundary Air Pollution (CLRTAP) [51]
1982: United Nations Convention on the Law of the Sea (UNCLOS) [168]
- 1995: United Nations Fish Stocks Agreement [89]

1983: Convention on Migratory Species (Bonn Convention) [126]
1989: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal [186]
1990: International Convention on Oil Pollution Preparedness, Response and Cooperation [112]
1991: Espoo Convention on Environmental Impact Assessments in a Transboundary Context [45]
1992: Convention on Biological Diversity (CBD) [196]
- 1995: The Jakarta Mandate [196]
- 2010: The Nagoya Declaration; The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity [112]

1992: Protocol to International Convention on Civil Liability for Oil Pollution Damage [137]
1992: The Water Convention - Convention on the Protection and Use of Transboundary Watercourses and International Lakes [43]
1996: Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention – London Protocol) [50]
1997: Convention on the Law of the Non-Navigational Uses of International Watercourses [36]
1998: Aarhus Convention - Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters [47]
1998: United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol [192]
2000: Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances [39]
2001: International Convention on Civil Liability for Bunker Oil Pollution Damage [90]
2001: International Convention on Control of Harmful Anti-Fouling Systems on Ships [81]
2001: Stockholm Convention on Persistent Organic Pollutants (POPs) [182]
2004: International Convention for the Control and Management of Ships' Ballast Water and Sediments [78]
2005: Mauritius strategy for the further implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (BPOA) [NA]
2007: The Nairobi International Convention on the Removal of Wrecks [41]
2009: Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships [6]
2009: The Port State Measures Agreement [55]
2013: Minamata Convention on Mercury [101]

agreement, for example a resolution of the conference of parties to a legal instrument, often referred to as a 'convention').[4] Of note, a subset of the global legal instruments are often categorized as multilateral environmental agreements (MEA). The regional instruments can be sub-divided into 44 legal (binding) instruments and 38 voluntary (non-binding) instruments, and from this total 32 of the regional instruments are Regional Seas instruments developed under the Regional Seas Programme initiated in 1974.

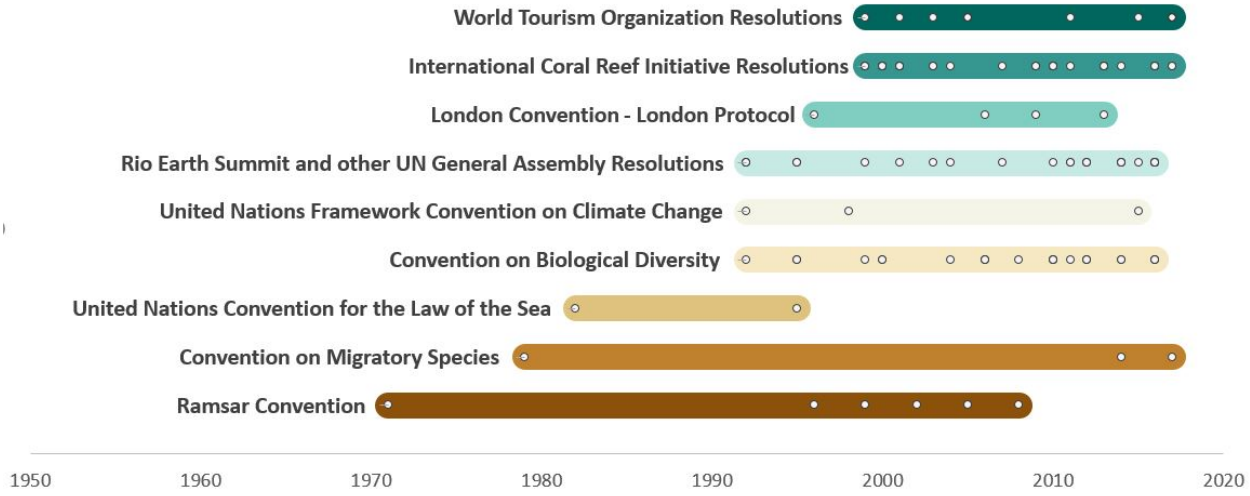
In addition to the global legal instruments listed in Box 3, the inventory includes a number of voluntary global instruments that are often cited in the literature on coral reef policy, such as the Global Program of Action (GPA) for the Protection of the Marine Environment from Land-based Activities and the International Coral Reef Initiative (ICRI), among others. At the regional level, almost forty percent of the instruments in the inventory were created under the Regional Seas programmes. In general, some of the international instruments relevant to coral reef ecosystems that are most often cited in the scientific literature include (not in order):

- The Convention on Biological Diversity (CBD),
- The Convention on the International Trade in Endangered Species (CITES),
- The Ramsar Convention,
- The Regional Seas conventions (Antigua Convention and the Cartagena Convention),
- The United Nations Convention on the Law of the Sea (UNCLOS), and
- The UNESCO World Heritage Convention, among others.

This body of international coral reef-related instruments has developed incrementally since the 1960s, with global legal instruments agreed in clusters around the early 1970s and the United Nations Conference on the Human Environment, and the early 1990s and the United Nations Conference on Environment and Development (i.e. the 'Earth Summit') among others (e.g. the CBD as a global biodiversity conservation treaty, the UNFCCC, subsequently the GPA as a source of conceptual and practical guidance to states on reducing marine pollution and conserving the ocean environment, the United Nations Fish Stocks Agreement, the Code of Conduct for Responsible Fisheries, etc.). Subsequent voluntary instruments were increasingly introduced through initiatives like ICRI starting in the 1990s (see Figure 4).[lxxxvi]

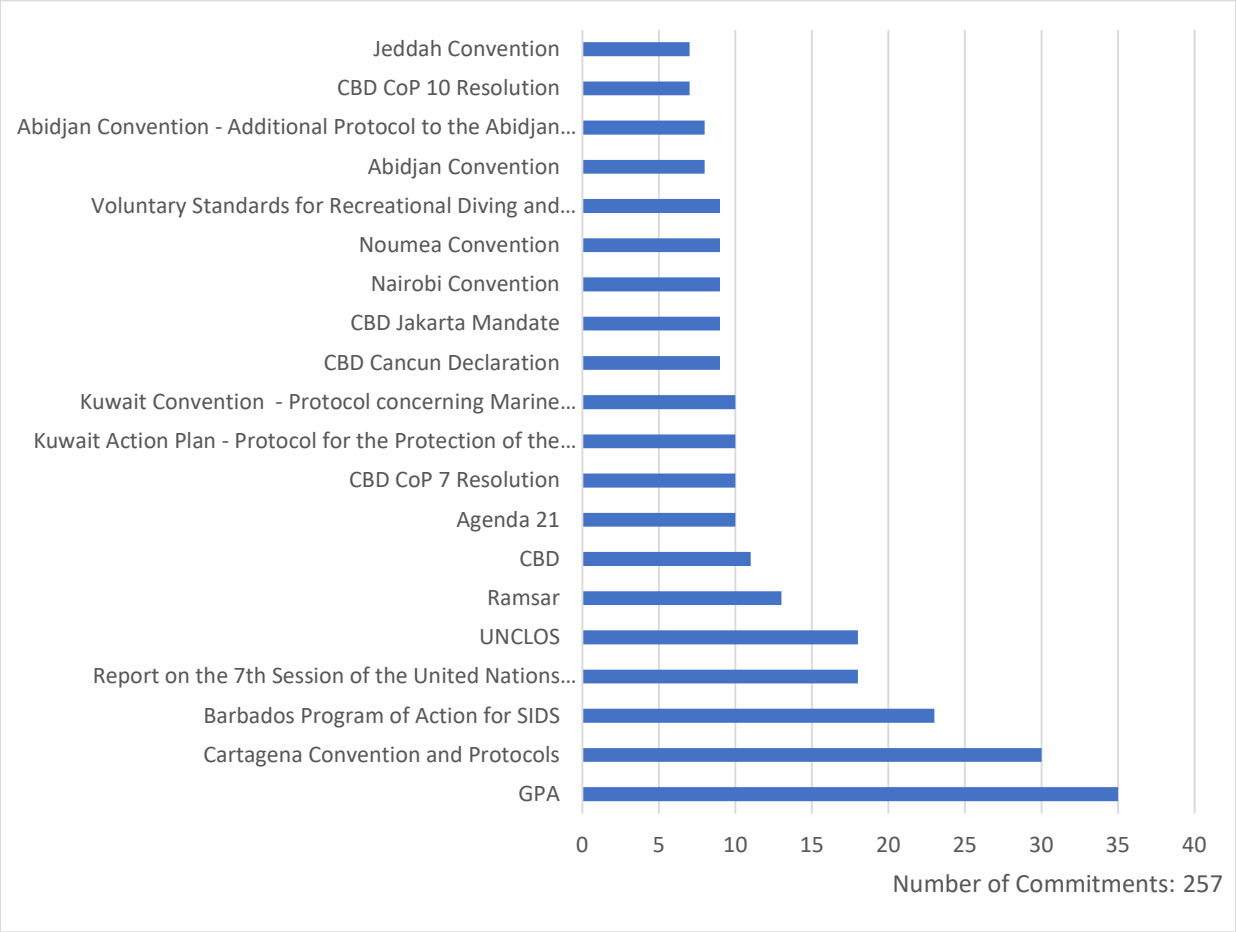
[4] Legal agreements may also be nested under other legal agreements, e.g. the 'UN Fish Stocks Agreement' is a legal agreement nested under the United Nations Convention on the Law of the Sea (as an implementing agreement to that treaty).

Figure 4. Timeline of Selected Global Coral Reef-Related Instruments



The individual reef-relevant commitments made by states in each instrument were identified, according to the specific human activities addressed, and any additional commitments to address specific anthropogenic pressures (or all collectively). Figure 5 below illustrates the twenty international instruments with the largest number reef-relevant commitments identified, with the GPA for the Protection of the Marine Environment from Land-based Activities having the largest amount (roughly 6 percent of the total).

Figure 5. Instruments with the Most Reef-Related Policy Commitments



Note that Figure 5 indicates only the potential relevance of these instruments for coral reef conservation and sustainable management outcomes (e.g. the instruments most frequently referenced in the analysis). It does not however indicate the relative importance of individual commitments to coral reef outcomes, e.g. UNCLOS may have a small number of direct reef-related commitments, but all of these would be essential for the body of policy to follow. Indeed among this body of instruments (e.g. Figures 5 and 6), the most important milestone for international policy related to conservation and sustainable management of coral reef ecosystems was the adoption in 1982 of UNCLOS, which created the legal framework for all activities in the oceans and seas and established the rights and obligations of states within the different maritime zones.[lxxxvii] In the territorial sea, coastal States exercise sovereignty over their natural resources. UNCLOS established a new maritime zone beyond the territorial sea, i.e. the exclusive economic zone (EEZ), which can extend up to a limit of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. In the EEZ, coastal States have "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds."[lxxxviii, lxxxix] At the same time, in the EEZ, coastal States have jurisdiction with regard to the protection and preservation of the marine environment.[xc] On the continental shelf, which comprises 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, coastal States exercise sovereign

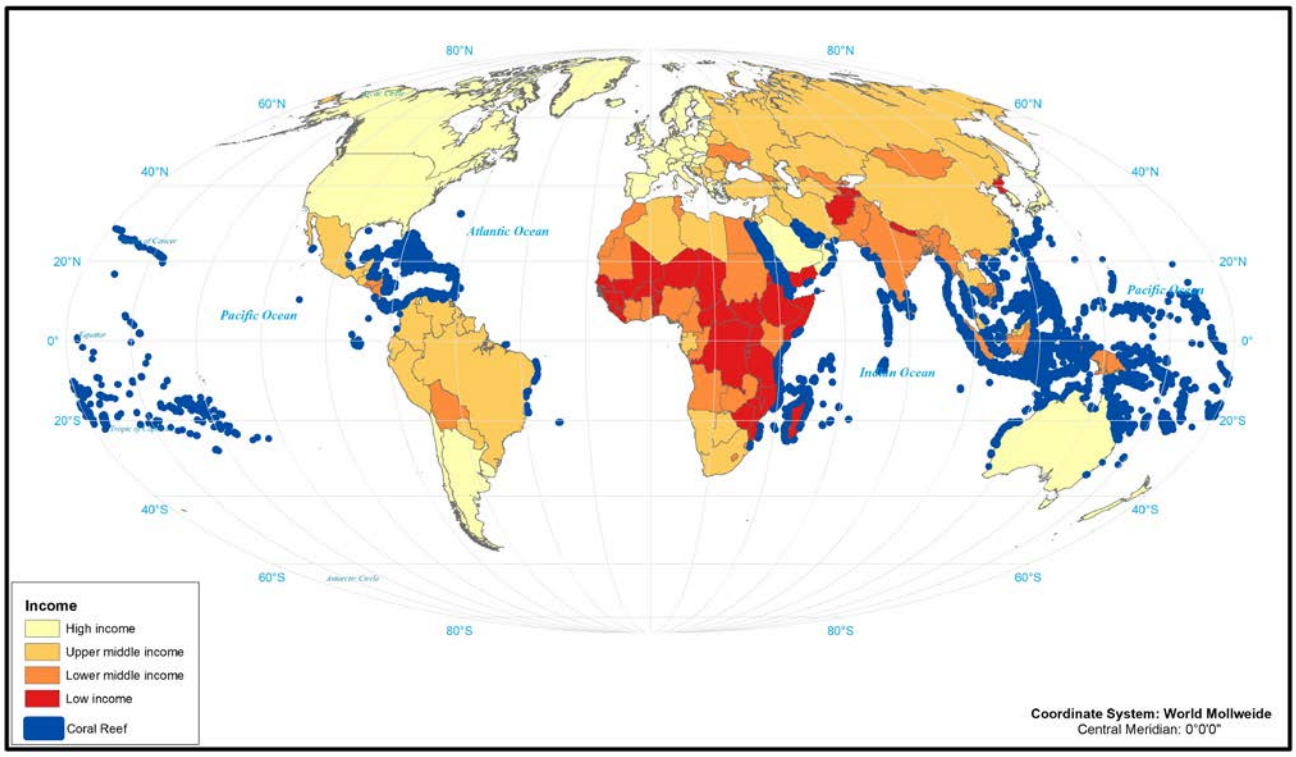
rights for the purpose of exploring it and exploiting its natural resources, which consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil. In the EEZ and on the continental shelf, coastal States have jurisdiction with regard to marine scientific research.

By virtue of the maritime zones established under UNCLOS, the world's warm-water coral reefs fall under national jurisdiction. More specifically, some 85 percent of the world's warm-water coral reefs are estimated to be under the jurisdiction of 25 countries (and more specifically, over 40 percent of the world's warm-water coral reefs are under the jurisdiction of 3 countries – Australia, Indonesia and the Philippines)[xci]:

- Australia
- Bahamas
- China
- Cuba
- Egypt
- Eritrea
- Federated States of Micronesia
- Fiji
- France
- India
- Indonesia
- Kiribati
- Madagascar
- Malaysia
- Maldives
- Marshall Islands
- Mozambique
- Papua New Guinea
- Philippines
- Saudi Arabia
- Seychelles
- Solomon Islands
- Tanzania
- United Kingdom
- United States

Approximately half of these 'coral reef states' are considered as low-income and lower-middle-income economies, potentially with relatively fewer resources to devote to conservation (see Figure 6).

Figure 6. Global Distribution of Warm-Water Coral Reefs



Sources: UNEP-WCMC, WorldFish Centre, WRI, TNC (2018). Global distribution of warm-water coral reefs, compiled from multiple sources including the Millennium Coral Reef Mapping Project. Version 4.0. Includes contributions from IMaRS-USF and IRD (2005), IMaRS-USF (2005) and Spalding et al. (2001). Cambridge (UK): UN Environment World Conservation Monitoring Centre. URL: http://data.unep-wcmc.org/datasets/1, World Bank Countries by income group, available at http://databank.worldbank.org/data/download/site-content/CLASS.xls)

In summary, by jurisdiction twenty-five states are essentially quasi-trustees over most of the world's warm-water coral reefs, with sovereign rights for their conservation and sustainable management, and as a result subsequent international reef-related instruments (the majority, as shown in Figure 4) tend to focus on action that should be taken by states at the national level.[xcii]

3.2 Analysis of the Design of International Reef-Related Instruments to Address Key Anthropogenic Drivers of Change

The results of the analysis of the design of international reef-related instruments to address the key anthropogenic drivers of change are summarized as follows: (i) a general overview of the design of the instruments and the governance mechanisms created to support their delivery, and (ii) a summary of the design of the instruments to address the different drivers of change (climate change, production from living resources, generation of land-based sources of pollution, extraction of non-living resources, production of energy, physical restructuring of the coastline, rivers and seabed, tourism and recreation, and transport).

3.2.1 General overview of the design of the instruments and the mechanisms created to support their delivery

The breadth of international reef-related instruments. Looking first at the breadth of coverage by the international instruments (both legal and voluntary), Table 2 summarizes the number of individual commitments contained within the instruments in order to address each anthropogenic driver of change in coral reef ecosystems. Again, these values should be seen as indicative of gaps and ratios, rather than exact measures, given the assumptions used in the qualitative analysis, for example to bound where one commitment ends and another begins, etc. As such, the focus is on gaps or cells shaded, rather than on ascribing importance to a higher count of commitments for one activity as opposed to the other (e.g. having 20 commitments for an activity as compared to 10 for another). Even in the case of the gaps or shaded cells, this often reflects that commitments were not specified in the same terms or language as the particularly activity within a driver, though such activities may be covered within broader commitments (e.g. no commitments were specified in terms of harvesting of living resources by large-scale/industrial operators, however the commitments articulated in terms of all activities related to production from living resources apply to harvesting by large-scale/industrial operators).

Table 2. Total Number of Reef-Relevant Commitments contained within the Instruments, per Human Activity Driving Changes in Coral Reef Ecosystems

Anthropogenic Drivers of Change		**Number of Policy Commitments**	
Theme	**Activity**	Per Activity	Per Theme
Climate change	Activities resulting in emissions of greenhouse gases in the atmosphere	33	33
Production from living resources	Harvesting of living resources by large-scale/industrial operators	0	64
	Harvesting of living resources by small-scale and/or subsistence operators	8	
	Harvesting of living resources by recreational operators	0	
	Hunting and collecting of living resources for other purposes (including 'bioprospecting')	7	
	Coastal aquaculture (including 'ranching', seaweed cultivation)	10	
	All activities related to production from living resources	39	
Generation	Production and disposal of plastics	18	160

of land-based sources of pollution	Waste treatment and disposal	48	
	Urban or industrial activities	3	
	Agriculture	9	
	All activities generating marine pollution	82	
Extraction of non-living resources	Extraction of minerals (e.g. sand, coral mining)	3	48
	Extraction of oil and gas (including infrastructure)	45	
	Extraction of water (i.e. desalination)	0	
Production of energy	Transmission of electricity and communications (cables)	3	4
	Renewable energy generation (wind, wave and tidal power), including infrastructure*	1	
Physical restructuring of the coastline, rivers or seabed	Coastal land claim (e.g. mangrove loss)	13	19
	Canalization and other watercourse modifications	1	
	Coastal defense and flood protection	0	
	Restructuring of seabed morphology, including dredging and depositing of materials	5	
Tourism and recreation	Tourism and recreation activities (e.g. resulting in anchor use on reefs, vessel groundings, diving and snorkeling)	32	65
	Tourism and recreation infrastructure	3	
	Marine biota souvenirs to sell to tourists, exporters	30	
Transport	Transport – shipping	54	54
	Transport - infrastructure	0	
TOTAL		447	447

Note: red shading indicates a category where no commitments were identified

In addition to the policy commitments referenced in Table 2 above, a number of commitments are contained within the instruments that aim to address drivers at the level of specific pressures, or aim to address all pressures simultaneously (e.g. the resiliency of the ecosystems to these multiple pressures combined). These additional commitments are summarized in Table 3 below. Note that shaded cells are not necessarily a gap, as commitments were matched to activities in Table 2 first, and then only those that could not be matched to these activities were assessed in terms of pressures in Table 3. Essentially, the instruments include commitments that broadly cover almost all of the anthropogenic drivers of change in coral reef ecosystems.

Table 3. Total Number of Reef-Relevant Commitments contained within the Instruments, per Anthropogenic Pressure Driving Changes in Coral Reef Ecosystems

Anthropogenic Pressure	Number of Policy Commitments
Elevated sea surface temperature causing thermal stress	0
Ocean acidification	6
Tropical cyclone damage	1
Extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities)	0
Input of litter (solid waste matter, including micro-sized litter)	0
Input of nutrients	0
Input of organic matter	0
Input of microbial pathogens	1
Input or spread of non-indigenous species	12
Input of other substances	2
Physical loss	2
Physical disturbance (temporary or reversible)	1
Sedimentation rate changes	4
Changes to hydrological conditions	0
Reduction in light penetration (i.e. ‘shading’)	0
Sea level rise	2
Underwater noise changes	1
Disturbance of species due to human presence	0

Commitments aiming to address all pressures simultaneously – (e.g. ecosystem-based)*	112
TOTAL	144

**This category is not the sum of the commitments aiming to address the other specific pressures, but rather an additional category to capture those commitments that aim to address all pressures simultaneously, e.g. that focus on the ecosystems rather than specific drivers.*
Note: shading indicates a category where no commitments were identified

Tables 2 and 3 indicate the large volume of commitments (591) that states have included in the instruments contained in the inventory, distributed widely across all of the various anthropogenic drivers of change in coral reef ecosystems. The vast majority (over 76 percent) were defined in terms of the human activities driving changes in the reef ecosystems, rather than the specific pressures on the ecosystems caused by these activities. Essentially, 76 percent of the reef-relevant commitments made by states correspond to human activities, and another 15 percent could only be broadly defined to simultaneously address all anthropogenic pressures on reef ecosystems.

In terms of the geographic coverage of the commitments made, just as the majority of the reef-related international instruments are global, so too are the specific commitments they contain – with almost two thirds (64 percent) at the global level, and just over a third (36 percent) at the regional level. The latter are largely from instruments linked to the Regional Seas Programme or the Large Marine Ecosystem (LME) projects funded by the Global Environment Facility (GEF). The Regional Seas Programme was launched by UN Environment in the 1970s to bring states together around action plans for protection of the marine environment, often beginning with a conference of the governments.[xciii] This program and practice led to the 32 Regional Seas instruments included in the inventory (see section 3.1), and a significant number of policy commitments relevant for coral reef ecosystems throughout these regions.[xciv]

The geographic coverage of these regional instruments is not uniform: there are a number of gaps in drivers addressed at the regional level, at least from the instruments included in this inventory (see Annex 2). Within these instruments, a focus of many of the commitments is on addressing activities generating land-based sources of pollution across the regions, as well as pollution from extraction of oil and gas and activities resulting in coastal land claims. Essentially where drivers are addressed, e.g. addressing sources of land-based ocean pollution or production from the ocean's living resources, the distribution of commitments covers most regions, while those that are not addressed such as production of energy from the ocean, much of the activities leading to physical restructuring of the coastline, are uniformly missing across the regions. No one region stands out as a glaring gap, but of course many of these commitments may only apply to a portion of a region, e.g. to one of many LMEs within a given region.

In addition to the drivers and regions covered by specific commitments in the international reef-related instruments, this body of policy has set a large number of targets to achieve specified outcomes relevant to coral reef ecosystems or the anthropogenic drivers of change affecting them. From the inventory, 79 discrete global targets were identified, as well as 58 regional targets (see Annex 13 for the full list of global targets). The majority of these targets are found in just nine instruments (global: GPA, Aichi Targets, Paris Agreement, 2030 Agenda; regional: CTI Regional Action Plan, SPREP Action Plan 2011-2015, Bay of Bengal SAP, Arafura and Timor Seas SAP, Western Indian Ocean SAP). Of the 79 targets, 14 percent have expired (i.e. the deadline has passed). Box 4 below highlights a sample of the current global targets relevant to coral reef ecosystems, organized by drivers of change, to illustrate the breadth.

Box 4. Selected Global Targets to Address Anthropogenic Drivers of Change in Coral Reef Ecosystems, found within International Reef-Related Instruments

Climate change

- Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change [Paris Agreement]
- Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production [Paris Agreement]

Production from living resources

- By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics [2030 Agenda]
- By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained [Aichi Targets]
- By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism [2030 Agenda]
- Provide access for small-scale artisanal fishers to marine resources and markets. Indicator is Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries [2030 Agenda]

Generation of land-based sources of pollution

- By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity [Aichi Targets]
- By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution [2030 Agenda]
- By the year 2025, dispose of all sewage, waste waters and solid wastes in conformity with national or international environmental quality guidelines [GPA]

Extraction of non-living resources

- By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits [Aichi Targets]

Tourism and recreation

- By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism [2030 Agenda]

Targets aiming to address all anthropogenic drivers simultaneously (i.e. driver not specified)

- By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning* [Aichi Targets]
- 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 [2030 Agenda]
- By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information [2030 Agenda]

** Target has expired (i.e. deadline has passed).*
Sources: Paris Agreement, UNGA 2030 Agenda, CBD Aichi Targets, GPA

Taken together, the global targets to address specific anthropogenic drivers of change (which features gaps for activities related to the production of energy; physical restructuring of the coastline, rivers or

seabed; and transport) and the broad commitments to simultaneously address all drivers, form a comprehensive broad set of measurable targets for achieving coral reef conservation and sustainable management outcomes. They address most of the anthropogenic drivers of change in coral reef ecosystems, including for example targets to hold the increase in the global average temperature to well below 2 degrees above pre-industrial levels; to end overfishing and effectively regulate harvesting; to prevent and reduce marine pollution of all kinds; to conserve at least 10 percent of coastal and marine areas; and the now overdue target to minimize the multiple anthropogenic pressures on coral reefs by 2015, so as to maintain their integrity and functioning (see Box 4).

In sum, the breadth of the anthropogenic drivers covered by the current body of international instruments is wide, with a large number of commitments made by states over the recent decades, corresponding to almost every driver, and most regions. However, many of these commitments are relatively broadly defined, to various economic sectors of human activity or coastal and marine ecosystems in general. While the breadth of international reef-related instruments may be wide, this does not indicate the 'depth' of the instruments, e.g. characteristics of the individual commitments made.

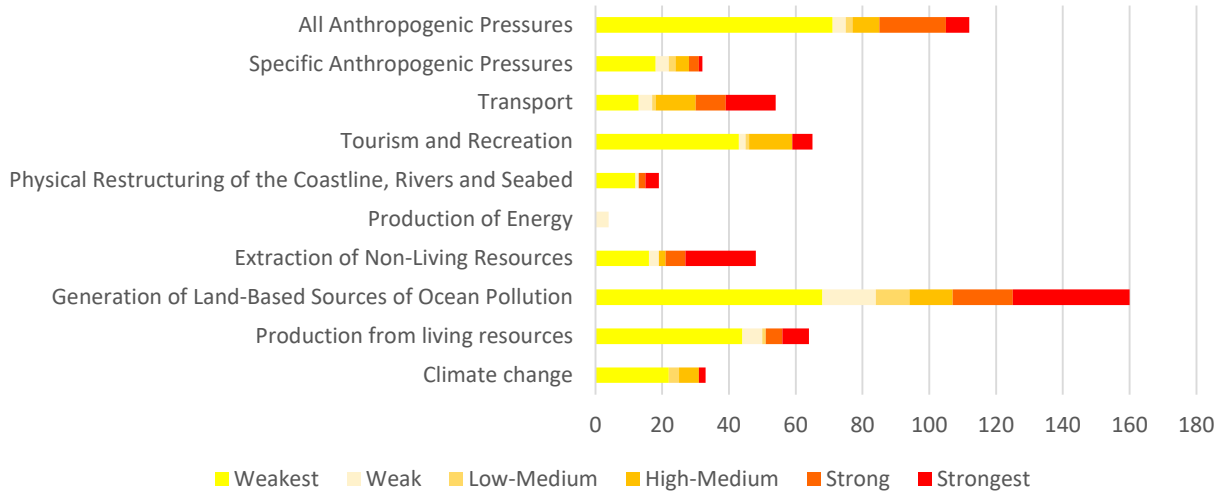
The depth of international reef-related instruments. The 'depth' of international reef-related instruments refers here to measures of a range of characteristics of the commitments that states have made (see Tables 3 and 4): what is prescribed in the commitment (an act, a prohibition, or a plan), the type of commitment made (substantive or procedural), and the 'strength' of the commitment (required, required with discretion, or not required). The vast majority (at least 85 percent) of the commitments prescribe some form of planning to address specific or multiple anthropogenic drivers of change in coral reef ecosystems. This distinction is given in order to better characterize the design of the instruments, but does not assign a particular greater importance or weight to 'actions' compared to 'plans'. Similarly, at least 79 percent of the commitments could be characterized as procedural, e.g. to carry out planning processes. For example, many of the commitments require states to carry out integrated coastal zone management processes to develop plans that can address and for example regulate, various anthropogenic drivers of change. Similarly, many others require processes for states to prepare fisheries management plans to regulate activities for harvesting living resources. Essentially, this characterization illustrates that the majority of commitments require states to conduct various forms of planning to develop rules and responses to locally-generated anthropogenic pressures on coral reef ecosystems. This is also consistent with a body of policy that is heavily state-centric, as mentioned in section 3.1, as national governments have the primary responsibility for delivering a minimum of 75 percent of the 591 commitments contained in the policy instruments (with the remainder largely the responsibility of CoP secretariats, as well as in some cases the scientific community and/or civil society (e.g. for voluntary guidelines).

For all of these commitments, the 'strength' or robustness can be roughly measured, by considering both if the commitment itself is required of states who are parties to the agreement, and also if the entire instrument is binding (i.e. 'hard law'). Each reef-relevant commitment included in the international instruments was assigned at least one of three measures of strength: required, required with discretion or not required. Combined with two possible measures of the strength of the underlying instrument, either binding or non-binding, this provides for six possible combinations of strength measures for each commitment, assigned a number from one to six with one the 'weakest' and six the 'strongest', as follows:

1. Weakest: non-binding instrument, commitment not required
2. Weak: binding instrument, commitment not required
3. Low-medium: non-binding instrument, commitment required with discretion
4. High-medium: non-binding instrument, commitment required
5. Strong: binding instrument, commitment required with discretion
6. Strongest: binding instrument, commitment required.

Note that some commitments may have multiple measures of strength, and in such instances they were ranked according to the single highest measure. This index of the strength of reef-related commitments contained in the international instruments is a crude approximation for indicative purposes only – most useful for noting the difference between strongest and weakest commitments, rather than the small gradations in the middle. These should not be seen as exact measures or the product of quantitative analysis, but rather values assigned for the purpose of indicating significant differences between various commitments and overall ratios of commitments with certain characteristics compared to others. Of course simply because the strength of a commitment is characterized as the weakest possible in the above measures, does not mean that it would not be met by states or deliver impact, but simply that the requirement upon states to do so is relatively weak.

Figure 7. 'Strength' of Reef-Related Policy Commitments to Address Anthropogenic Drivers of Change



The majority (52 percent) of the 591 commitments were considered in the weakest category, while 17 percent were considered as strongest (Figure 7). A small number of drivers had a much higher proportion of commitments considered as strongest, compared to the average across all 591 commitments, include:

- Extraction of non-living resources: 44 percent of commitments considered as strongest,
- Transport: 28 percent of commitments considered as strongest,
- Generation of land-based sources of pollution: 22 percent of commitments considered as strongest, and
- Physical restructuring of the coastline, rivers and seabed: 21 percent of commitments considered as strongest.

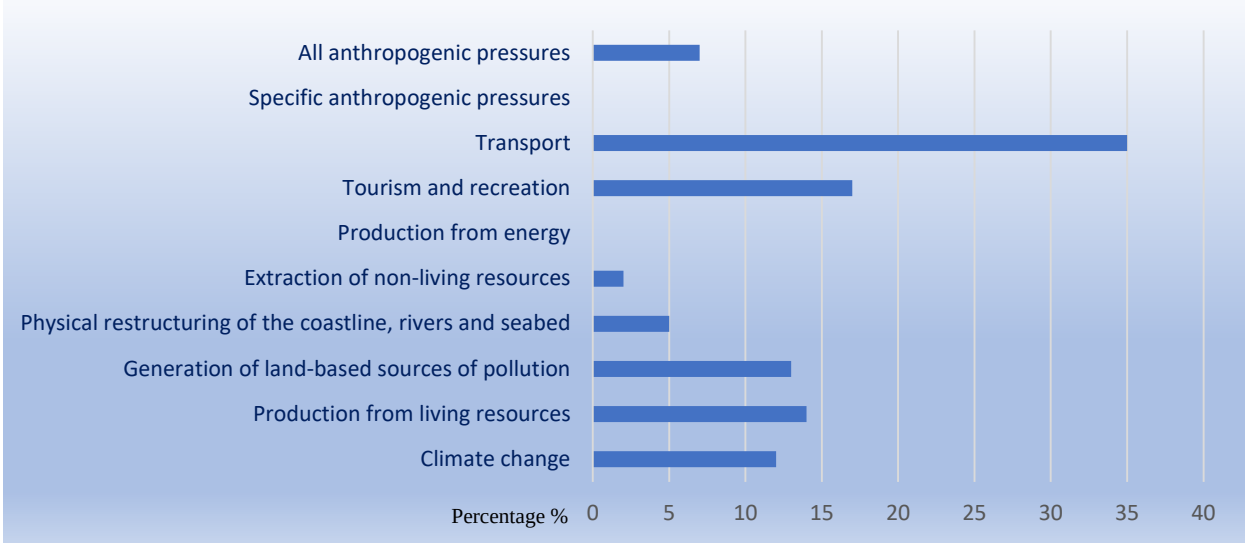
The commitments linked to the other drivers all had a proportion considered as strongest that was below the mean for the entire population. In summary, with a few exceptions such as above, the majority of the reef-related commitments identified in the inventory of international instruments, were considered to be the weakest– i.e. were commitments that are not required, contained in non-binding instruments.

The governance mechanisms for delivery of international reef-related instruments. The efficiency of instruments depends on the governance mechanisms through which they function.[xcv] The large number of commitments that states have made to address various anthropogenic drivers of change in coral reef ecosystems, can be matched to governance mechanisms described in the same instruments to support their delivery, for example provisions to enhance compliance with commitments (i.e. enforcement, including

monitoring and the penalty assessment process), including systems for monitoring progress in implementation and reporting to other states and stakeholders. Additionally, given the prevalence of warm-water coral reefs in areas under the jurisdiction of low and lower-middle income states, mechanisms for helping to finance the costs associated with these commitments are also identified, including to support technical capacity.

Of the 591 commitments identified in the 232 instruments, 13 percent were linked to enforcement mechanisms described in the instruments, depending upon the type of anthropogenic drivers addressed, as shown below in Figure 8.

Figure 8. Percentage of Commitments linked to Enforcement Mechanisms



Given the state-centric nature of these international instruments, this overall trend is perhaps not surprising, as typical references to enforcement call upon states who are parties to an agreement to adopt and enforce measures necessary for instrument delivery (in many cases as part of the integrated planning processes prescribed). First and foremost, some 16 percent of the commitments linked to references for enforcement are found in UNCLOS, which requires States to adopt and enforce rules relating to the conservation and utilization of the living resources in the EEZ and to the prevention, reduction and control of pollution of the marine environment from various sources of pollution, including from land-based sources, seabed activities within and beyond national jurisdiction, dumping and from vessels. UNCLOS also requires other States to comply with the laws and regulations adopted by coastal States in accordance with UNCLOS.

A number of legal and voluntary instruments further elaborate on the provisions of UNCLOS. For example, the 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 aims to give effect to the provisions of UNCLOS requiring cooperation between coastal States and high seas fishing States, and provides the legal regime for the conservation and management of straddling fish stocks and highly migratory fish stocks. The Code of Conduct for Responsible Fisheries provide guidance to states on setting science-based fishing limits and monitoring fishing activities among others, while the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA_IUU) includes minimum requirements for a state to authorize any vessel to harvest living resources within its EEZ, to maintain records of these authorized vessels, and to monitor their activities through satellite-based vessel monitoring systems (VMS)

and human observers. The Voluntary Guidelines for Small-Scale Fisheries call on states to take these measures in order to secure access to living resources within their EEZs for small-scale fishers. Lastly, the recent enforcement mechanism established by the Port States Measures Agreement to prevent, deter and eliminate illegal, unreported and unregulated fishing commits states to manage access to their ports in such a way as to ensure compliance of foreign vessels with the regulations in other states' EEZs.

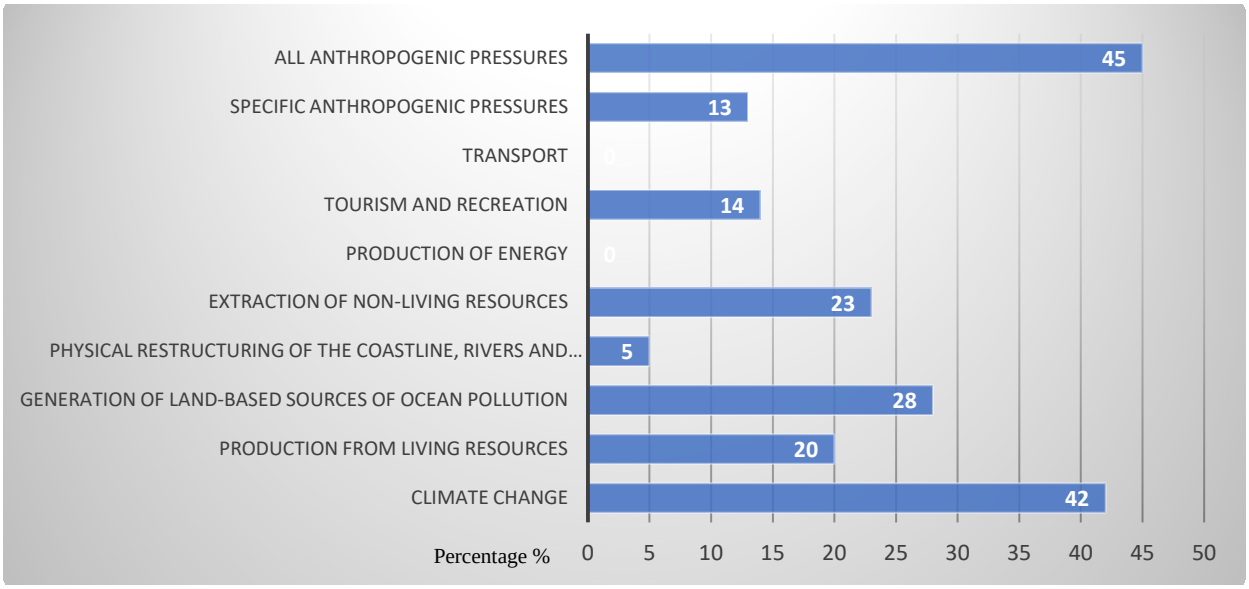
Several other global instruments call upon states to adopt and enforce measures to ensure compliance with the commitments they contain, and in many cases to periodically report to the conference of parties (CoP), e.g. the CITES, the Convention on Migratory Species and the UNFCCC, as well as the non-binding GPA. These instruments typically specify monitoring and reporting requirements on compliance and progress towards achieving targeted outcomes, for states to report periodically to the conferences of the parties (e.g. CBD, CITES, Stockholm Convention, UNFCCC and World Heritage Convention among others). Uniquely, the Paris Agreement is a non-binding instrument where states have significant reporting requirements, to verify compliance with their voluntary commitments to reduce emissions of greenhouse gases. Additionally, the GPA includes commitments for states to establish consistent national monitoring programs, which would support verification of compliance.

However, the vast majority of commitments linked to references to enforcement mechanisms are found in the various regional instruments linked to Regional Seas programmes – some one third of the total (i.e. 25 out of 74 commitments matched to references of enforcement). These regional agreements are one level closer to the states who have the primary responsibility under UNCLOS for adopting and enforcing measures to ensure compliance with the reef-related commitments in the international instruments reviewed. They typically create monitoring mechanisms between the states, specifying detailed reporting programs where states designate national authorities with the responsibility (e.g. the Coordinating Body on the Seas of East Asia).

In summary, only 13 percent of the reef-related commitments were matched to references of enforcement mechanisms. Of these, one sixth were commitments in UNCLOS. These typically require states to 'adopt and enforce' the measures needed to deliver the commitments in the instrument, and in some cases the global, binding instruments require states to report to the conferences of the parties to monitor progress. In addition to UNCLOS, another third of the reef-related commitments matched to references of enforcement were contained in Regional Seas instruments – one level closer to states. From an economic perspective, social actors will violate rules when the expected benefits of the violations exceed the expected costs.[xcvi, xcvii] With relatively few enforcement mechanisms or penalties specified in the body of international reef-related instruments, many states may not have incentive to comply with their commitments, particularly in lower income countries with competing demands for scarce public resources. Hence, more of the instruments emphasize 'the carrot' rather than 'the stick', i.e. economic incentives rather than penalties and enforcement.

In terms of financial mechanisms, references to financing support for developing states to meet their commitments in the international reef-related instruments are more prevalent than those concerning enforcement, though still limited in number. Of the 591 reef-related commitments, roughly 25 percent are linked to references of financing provisions or mechanisms, with a much higher proportion for those aiming to address climate change (see Figure 9).

Figure 9. Percentage of Commitments linked to Financing Mechanisms



However, few of these references actually describe the establishment or enhancement of financial mechanisms to support developing states to meet the commitments (including to support technical capacity), but rather most can be characterized as general calls for developed states and development finance institutions (DFIs) to provide additional financing as needed to support delivery by developing states (this is the case for example with UNCLOS, Agenda 21, the GPA, the Code of Conduct for Responsible Fisheries, the WSSD, the Barbados Program of Action, the Voluntary Guidelines for SSF, and a number of resolutions of UNEA, among others). Similarly, the majority of regional instruments do not specify a financing mechanism, but rather direct states who are parties to cooperate in order to mobilize external financing as needed (e.g. the Abidjan Convention, COBSEA, CTI Action Plan, the Jeddah Convention, the Noumea Convention, among others). Where regional instruments specified a financing mechanism, these were relatively small and covered only operating costs for the secretariat, based on contributions from states who are party to the agreement, as well as donors.

The few financial mechanisms created by the reef-related international instruments to support developing states to meet the commitments made, were established by global, binding conventions such as the CBD, UNFCCC and the Stockholm Convention, building upon the example in the international instruments to protect the ozone layer (the 1985 convention and subsequent protocols).[xcviii] These mechanisms include the GEF (operating the financing mechanism of the CBD and the Stockholm Convention), the Green Climate Fund (GCF) and the World Heritage Fund. While the World Heritage Fund has unique characteristics, the mechanisms established under the three instruments share common features, for example that they:

- Aimed to provide new and additional resources to developing states to finance the costs of meeting commitments;
- Provided financing to developing states on a grant or concessional basis;
- Were governed by the Conference of the Parties (COP), i.e. defined policies, programs, procedures and eligibility criteria for the mechanism; and
- Were operated by a DFI, for example through the GEF in these three cases.

For example, the CBD financing mechanism[5] is operated by the GEF, under the guidance of the CoP which periodically reviews effectiveness (and has signed a memorandum of understanding with the GEF).[xcix, c] The mechanism aims to support initiatives of developing states to achieve the Aichi targets and the CBD Strategic Plan for Biodiversity 2011 – 2020, and is funded by developed country parties to the convention as part of their obligation under Article 20, through periodic contributions (i.e. 'replenishments') to the GEF. More specifically, according to Article 20 developed states should provide new and additional financing to developing states in order to meet the 'full and incremental costs …of implementing measures which fulfil their commitments under the CBD.' [ci] The inclusion of this commitment to create a financial mechanism reflected the reality that many developing states felt they could only meet the commitments in the CBD with additional resources, including for technical capacity.[cii] Most states indicated in their fourth national reports to the CoP that limited capacity, both financial and human, was a major obstacle to meeting the commitments in the CBD. [ciii] Operationally, the CoP typically provides guidance to the financial mechanisms operated by the GEF in a single decision that identifies a consolidated list of priorities for financing and an outcome-oriented framework, and the GEF reports on disbursements and outcomes.[civ] In some cases, CoP decisions aimed to mobilize additional funding for the mechanism, e.g. for specific priorities such as establishing and maintaining protected areas, through convenings of donors, ongoing dialogues of parties, etc.[cv]

Box 5. Examples of Calls for Increased Financing of Coral Reef Conservation

Commitment to "support international cooperation with a view to conserving coral reef and mangrove ecosystems" – UNGA the Future We Want (2012)

Resolution "invites governments and donors to provide technical and financial support for the conservation and management of coral reefs, including in developing countries" – UNEA 2/12 (2016)

From this financing mechanism and the GEF more broadly, an estimated US$1.4 billion was committed between 2010 and 2016 to support conservation and sustainable management of coral reefs and associated mangroves and ecosystems, together with US$0.5 billion from other sources (in a total of 314 projects, 75 percent of which were small project).[cvi] The trend in financing flows increased over this time period, from US$44 million committed in 2010 to US$865 million in 2016, notably increasing after the sixth replenishment of the GEF included a focus on expanding the area of coral reefs within MPAs. However, these estimates include projects with multiple objectives beyond just coral reef conservation, so may be an overestimate.[cvii] Additionally, the global distribution of the funds did not necessarily match the distribution of coral reefs (with very different rates of expenditure per hectare of reef across different geographies).

In summary, the international instruments include a number of commitments for developed states to increase financing to support developing states to meet the reef-related commitments in the international instruments, but far fewer commitments to establish financial mechanisms and/or identify resources for them (Table 4). While the absolute volume of financial flows to support developing states to conserve and sustainably manage coral reef ecosystems is difficult to estimate (given projects with multiple objectives, and incomplete reporting on funding), the trend seems clearly to be increasing since 2010. At the same time, a significant gap could be assumed between the supply of funding available through current financial mechanisms, and the likely costs to developing states of meeting the commitments in the international reef-related instruments – based on estimates of US$4 to 8 billion in annual management costs required to meet the commitments of the entire CBD.[cviii, cix]

[5] See CBD, Articles 20 and 21; https://www.cbd.int/financial/

Table 4. Summary of the Analysis of the Design of International Reef-Related Instruments to Address Key Anthropogenic Drivers of Change

Anthropogenic Drivers of Change		**Number of Commitments**	**Characteristics of Commitments**		**Governance Mechanisms**	
Theme *[# of Commitments]*	Activity	Per Activity	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Climate change [33]	Activities resulting in emissions of greenhouse gases in the atmosphere	33	6.1	66.7	12.1	42.4
Production from living resources [64]	Harvesting of living resources by large-scale/industrial operators	0	0	0	0	0
	Harvesting of living resources by small-scale and/or subsistence operators	8	12.5	87.5	12.5	25.0
	Harvesting of living resources by recreational operators	0	0	0	0	0
	Hunting and collecting of living resources for other purposes (including 'bioprospecting')	7	57.1	42.9	0	0
	Coastal aquaculture (including 'ranching', seaweed cultivation)	10	40.0	60.0	0	0
	All activities related to production from living resources	39	25.6	71.8	20.5	28.2
Generation of land-based sources of pollution	Production and disposal of plastics	18	5.6	94.4	5.6	11.1
	Waste treatment and disposal	48	33.3	43.8	6.25	29.2
	Urban or industrial activities	3	0	100.0	0	66.7

[160]	Agriculture	9	33.3	44.4	0	0
	All activities generating marine pollution	82	59.8	25.6	20.7	31.7
Extraction of non-living resources [48]	Extraction of minerals (e.g. sand, coral mining)	3	100.0	0	0	0
	Extraction of oil and gas (including infrastructure)	45	60.00	35.6	2.2	24.4
	Extraction of water (i.e. desalination)	0	0	0	0	0
Production of energy [4]	Transmission of electricity and communications (cables)	3	100.0	0	0	0
	Renewable energy generation (wind, wave and tidal power), including infrastructure*	1	100.0	0	0	0
Physical restructuring of the coastline, rivers or seabed [19]	Coastal land claim (e.g. mangrove loss)	13	53.8	46.2	7.7	7.7
	Canalization and other watercourse modifications	1	0	100.0	0	0
	Coastal defense and flood protection	0	0	0	0	0
	Restructuring of seabed morphology, including dredging and depositing of materials	5	0	100.0	0	0
Tourism and recreation [65]	Tourism and recreation activities (e.g. resulting in anchor use on reefs, vessel groundings, diving and snorkeling)	32	6.3	50.0	3.1	6.3
	Tourism and recreation infrastructure	3	0	100.0	0	0
	Marine biota souvenirs to sell to tourists, exporters	30	20.0	80.0	33.3	23.3
Transport [54]	Transport – shipping	54	51.9	24.1	35.2	0
	Transport - infrastructure	0	0	0	0	0

Pressure					
All pressures	112	27.7	63.4	7.1	44.6
Inputs of Microbial Pathogens	1	0	100.0	0	0
Inputs of Other Substances	2	50.0	50.0	0	0
Inputs or Spread of Non-Indigenous Species	12	41.7	33.3	0	0
Ocean Acidification	6	0	83.3	0	0
Physical Disturbance	1	100.0	0.0	0	0
Physical Loss	2	50.0	50.0	0	0
Sea Level Rise	2	0	0.0	0	50.0
Sedimentation Rate Changes	4	0	100.0	0	75.0
Tropical Cyclones	1	0	100.0	0	0
Underwater Noise	1	0	100.0	0	0
TOTAL	**591**	**34.9**	**51.6**	**12.5**	**24.7**

Note: values are highlighted to show concentrations of commitments and/or percentages of commitments linked to mechanisms. Values are highlighted as follows:

- 'Number of Commitments': all positive values
- '% located in binding instruments': all values of 25% or greater
- '% considered weakest ': all values of 25% or less
- '% linked to text referencing enforcement': all values of 25% or greater
- '% linked to text referencing financial mechanisms': all values of 25% or greater

3.2.2 Design of instruments to address climate change

Commitments to address the climate change generally aimed to: (i) support action to mitigate emission of greenhouse gases and enhance sinks to reduce climate change, or (ii) enhance the capability of ecosystems, for example coral reefs, and communities to adapt to the impacts of climate change. For the first, commitments broadly aimed to stabilize concentrations of greenhouse gases in the atmosphere and reduce emissions or enhance sinks based on common but differentiated responsibilities and respective capabilities among states.[cx, cxi, cxii] In terms of adaptation, commitments often aimed to support developing states to identify and introduce actions to adapt to impacts of climate change, particularly in SIDS and notably to enhance resilience of coral reef ecosystems. For example, a commitment that aims "to identify coral reef areas that exhibit resistance to raised sea temperatures, testing and refinement of management regimes to enhance reef resilience to and recovery from raised sea temperatures and/or coral bleaching."[cxiii]

Box 6. Examples of Interventions to Deliver Commitments to Address Climate Change

Mexico, Quintana Roo State: Good Practices for Climate Change Adaptation project. This project aimed from 2013 to 2015 to develop a catalog of good practices to prevent or reduce the impact of climate change on coastal areas in the state, with a focus on land use, construction and ecosystems management. To achieve this objective, the project established a multi-stakeholder agreement and engaged a range of interest groups, documenting experiences and best practices. As a result of the efforts, some 50 best practices were identified from hotels, dwellers, architects and engineers living and working along the coast, all of which have proven successful in reducing the damages from the effects of climate change. These included practices such as building on poles or behind the dunes, maintaining healthy coral reefs as a natural barrier, leaving natural flows undisturbed. The Nature Conservancy has since used the process undertaken to identify best practices, in order to develop adaptation plans and conservation plans in a number of other areas around the world.

Source: https://panorama.solutions/en/solutions/good-practices-for-climate-change-adaptation

In terms of the number of commitments (not effectiveness), eleven commitments aimed to mitigate climate change, while 22 aimed to support adaptation to the impacts of climate change on coral reefs (see Table 5). These were typically in voluntary instruments and the majority (over 60 percent) considered 'weakest' strength – though for example voluntary commitments in the Paris Agreement may still be fulfilled and effective. More than almost any other driver of change in coral reef ecosystems, over 40 percent of the commitments to address climate change were linked to text referencing financing mechanisms – reflecting the establishment of mechanisms such as the Green Climate Fund, as well as calls for financing adaptation in developing economies and particularly SIDS. In summary, this qualitative data suggests a body of commitments largely voluntary and not linked to enforcement mechanisms, but heavily linked to financing mechanisms and calls for financing adaptation in developing economies.

Table 5. Summary of Commitments to Address Climate Change

Anthropogenic Drivers of Change	Number of Commitments	Regional	Characteristics of Commitments		Governance Mechanisms	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing

						mechanisms
Mitigate climate change	11	9.1	9.1	45.5	36.4	54.5
Support adaptation to the impacts of climate change on coral reefs	22	27.3	4.5	72.7	0.0	36.4
TOTAL	**33**	**21.2**	**6.1**	**63.6**	**12.1**	**42.4**

3.2.3 Design of instruments to address production from living resources

A large body of commitments exists across instruments for states to regulate production from marine living resources, beginning with those that establish jurisdiction over this production within defined areas of the oceans.[cxiv] A number of commitments aim to conserve and manage stocks of living resources1, for example commitments in the Code of Conduct for Responsible Fisheries for states to set science-based limits on harvests that maintain or rebuild fish stocks to targeted levels and protect associated ecosystems. Beyond commitments focused on fish stocks, many aim to promote an 'ecosystem approach to fisheries' that includes actions to manage fish by-catch, discards and other adverse ecosystem impacts from fisheries, including eliminating destructive fishing practices.[cxv] Lastly, a number of commitments aim to support small-scale fisheries and ensure that management measures consider human rights and the broader development context for these activities.[cxvi]

In terms of the number of commitments (not effectiveness), over half aimed to either conserve and manage stocks of living resources in EEZs (20 percent), conserve and protect the habitats and ecosystems supporting living resources and apply the ecosystem approach to fisheries (19 percent) or regulate coastal aquaculture (14 percent) (Table 6). While a portion were located in legal instruments such as UNCLOS, a large number were found in voluntary instruments such as the Code of Conduct for Responsible Fisheries and the Voluntary Guidelines for Securing Small-Scale Fisheries in the Context of Food Security and Poverty Eradication. In general, over two thirds of the commitments to address production from marine living resources are considered 'weakest', and only 20 percent are linked to text referencing financing mechanisms. In summary, UNCLOS includes clear and binding commitments to address production from marine living resources and particularly to conserve and manage the stocks of these resources, while the CBD's Jakarta Mandate includes commitments also focused on conserving the habitats and ecosystems that support these resources, followed in both cases by

Box 7. Examples of Interventions to Deliver Commitments to Address Production from Marine Living Resources

Fiji, Kubulau District, Bue Province: Community-based integrated land-sea management in Kubulau District – Fiji's first district-level ridge-to-reef management plan. Beginning in 2005, this project has aimed to preserve the functional integrity of Kubulau's ecosystems, from ridge to the reef, through community-based management measures. To achieve this objective, the project introduced a network of three locally-managed marine areas, 21 periodically-harvested fisheries closures, one community-managed forest area, and various restrictions of activities within and adjacent to freshwater habitats, all of which were included in a comprehensive ridge-to-reef management plan endorsed by all village chiefs in 2012. As a result, the communities have seen increases in catch size, fish size, fish diversity and the status of reefs, with total fish biomass increasing both inside and outside of protected areas.

Source:
https://www.icriforum.org/sites/default/files/ICRI_casestudies_2015_0.pdf

a number of voluntary commitments. The key gaps suggested by this data are found in the governance mechanisms, where relatively small percentages of the commitments are linked to text referencing enforcement or financing mechanisms.

Table 6. Summary of Commitments to Address Production from Marine Living Resources

Anthropogenic Drivers of Change	**Number of Commitments**	**Regional**	**Characteristics of Commitments**		**Governance Mechanisms**	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Establish jurisdiction over production from living resources within defined areas of the oceans	1	0.0	100.0	0.0	100.0	0.0
Conserve and manage stocks of living resources (e.g. fish stocks) in exclusive economic zones (EEZs)	13	30.8	30.8	69.2	46.2	38.5
Conserve and manage stocks of living resources in the high seas and/or straddling stocks and/or migratory stocks	3	0.0	33.3	66.7	33.3	33.3
Conserve and protect the habitats and ecosystems supporting living resources, and apply the ecosystem approach to fisheries	12	33.3	16.7	83.3	0.0	8.3
Regulate harvests of living resources in coral reef ecosystems	4	0.0	0.0	100.0	0.0	25.0
Protect species from activities related to production from living resources	2	0.0	50.0	50.0	0.0	50.0
Support small island developing states (SIDS)	2	0.0	50.0	0.0	0.0	100.0
Eliminate subsidies contributing to overfishing	2	0.0	0.0	100.0	0.0	0.0
Support small-scale producers	8	12.5	12.5	87.5	12.5	25.0
Regulate hunting and collecting of living resources for other purposes	7	57.1	57.1	42.9	0.0	0.0
Regulate coastal aquaculture	9	33.3	33.3	66.7	0.0	0.0
Sea ranching	1	0.0	100.0	0.0	0.0	0.0

TOTAL	**64**	**25.0**	**29.7**	**68.8**	**14.1**	**20.3**

3.2.4 Design of instruments to address generation of land-based sources of pollution

The largest body of commitments aims to address land-based sources of ocean pollution, particularly to support states to meet their duties under UNCLOS to prevent, reduce and control marine pollution (Table 7). These commitments have a range of objectives, the most frequent being to: regulate land-based sources of ocean pollution (25 percent), to reduce ocean pollution from wastewater (18 percent), to more generally reduce ocean pollution from all sources, including land-based sources (14 percent), to prevent or reduce ocean pollution from hazardous waste (12 percent), or to address ocean pollution from plastics and other marine litter (11 percent). Additionally, many commitments aim to support integrated planning (e.g. integrated coastal zone management, marine spatial planning, etc.) to reduce pollution into the ocean. [cxvii] Additionally, a number of specific commitments aim to reduce persistent organic pollutants from land-based sources, activities such as agriculture providing anthropogenic nutrient inputs into coastal waters, urban and industrial sources of ocean pollution, a growing number of commitments (mostly regional) to address sources of plastic pollution, and particularly those to support waste treatment (e.g. GPA commitments to develop national programs of action for the installation of appropriate and environmentally sound sewage facilities).

Box 8. Examples of Interventions to Deliver Commitments to Address Generation of Land-Based Sources of Pollution

Grenada, Beausejour watershed, Grenada Island: Reef Guardian Stewardship Program. With aid funding from the Australian government (via the Great Barrier Reef Marine Park Authority to the Grenada Fund for Conservation), since 2013 the government's Fisheries Division aimed to educate farmers on safeguarding coral reefs and associated ecosystems through the introduction of marine protected areas and the promotion of good practices in agriculture (e.g. in fertilizer application and use, water quality management, and soil management). The program has developed awareness tools to support farmers, conducted informational and training workshops, constructed a bio-digester plant to use hog waste for local energy production, and generally with these stakeholders following the Australian approach in the Reef Guardian Stewardship Program.

Source: ICRI. 2015. Case Studies: From Ridge to Reef. Implementing coral reef conservation and management through a community-based approach emphasizing land-sea connectivity. https://www.icriforum.org/sites/default/files/ICRI_casestudies_2015_0.pdf

In many cases, the majority of these commitments are found in legal, regional instruments established through the Regional Seas Programs. These commitments are relatively 'stronger', and for those aiming generally to address ocean pollution from all sources or from all land-based sources, a much smaller proportion is considered 'weakest' than is the case in many other drivers – again reflecting the relative 'strength' of commitments in regional instruments. Similar to the commitments to address other drivers, key gaps appear to be in the governance mechanisms for delivery, where some 13 percent of the commitments were linked to text referencing enforcement mechanisms and almost 28 percent were linked to text referencing financing mechanisms.

Table 7. Summary of Commitments to Address Generation of Land-Based Sources of Pollution

Anthropogenic Drivers of Change	Number of Commitments	Regional	Characteristics of Commitments		Governance Mechanisms	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Reduce ocean pollution from all sources	22	68.2	68.2	31.8	9.1	27.3
Regulate and reduce all sources of pollution in the coastal waters of small island developing states (SIDS)	9	0.0	11.1	0.0	0.0	88.9
Regulate all land-based point sources of ocean pollution	40	80.0	80.0	17.5	27.5	10.0
Regulate persistent organic pollutants from all land-based sources	5	0.0	20.0	80.0	80.0	100.0
Reduce anthropogenic nutrient inputs to the ocean from all land-based sources	2	0.0	0.0	100.0	0.0	100.0
Regulate land-based sources of heavy metal pollution to the ocean	1	0.0	0.0	100.0	0.0	100.0
Regulate land-based sources of pollution to coastal waters of SIDS	3	0.0	0.0	0.0	0.0	0.0
Address ocean pollution from agriculture	9	44.4	33.3	44.4	0.0	0.0
Address ocean pollution from plastics and other marine litter	18	72.2	5.6	94.4	5.6	11.1
Address ocean pollution from urban and industrial sources	3	0.0	0.0	100.0	0.0	66.7
Reduce ocean pollution from waste water	29	72.0	20.7	41.4	0.0	6.9
Prevent or reduce ocean pollution from hazardous waste	19	42.1	52.6	47.4	15.8	63.2
TOTAL	**160**	**58.8**	**43.1**	**41.3**	**13.1**	**27.5**

3.2.5 Design of instruments to address extraction of non-living resources

Commitments aiming to address pressures from activities extracting non-living resources focus largely on establishing jurisdiction over offshore extraction activities, and regulating these activities in order to prevent pollution (Table 8). In particular, half of the commitments focus on regulating the extraction of oil and gas and its effects on the marine environment. Regional commitments tend to be far more specific, for example setting standards for pollution control technologies and measures, particularly in offshore oil and gas activities.

Box 9. Examples of Interventions to Deliver Commitments to Address Extraction of Non-Living Resources

Belize: Economic Valuation of Belize's Reefs and Mangroves. This project aimed to support the government to account for and recover damages to environmental resources such as coral reef ecosystems. To achieve this objective, the project supported an economic valuation of the services provided by the country's coral reef and mangrove ecosystems. The results provided stakeholders and the government information needed to advocate and enact a ban on offshore drilling. Since this time, a similar study was conducted in St. Maarten leading to enactment of a MPA in 2010, and in 2011 the government of Jamaica was awarded damages for a ship grounding, citing the Belize case as a precedent.

A large percentage of these commitments are located in binding instruments (over 62 percent), and partially as a result are generally 'stronger' than those aiming to address other drivers (only one third of the commitments are considered 'weakest' strength, compared to over 68 percent of the commitments to address production from marine living resources for example). Again, as is the trend throughout the commitments and drivers, the key gap is in the governance mechanisms to ensure delivery: only 2 percent of the commitments are linked to text referencing enforcement, and just under 23 percent are linked to text referencing financing mechanisms.

Table 8. Summary of Commitments to address Extraction of Non-Living Resources

Anthropogenic Drivers of Change	**Number of Commitments**	**Regional**	**Characteristics of Commitments**		**Governance Mechanisms**	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Establish jurisdiction over all offshore extraction activities	3	0.0	100.0	0.0	0.0	0.0
Regulate all activities for offshore extraction	17	0.0	88.2	5.9	5.9	0.0
Regulate extraction of oil and gas (from both offshore and onshore)	24	37.5	45.8	50.0	0.0	45.8
Regulate extraction of minerals from the ocean	4	0.0	25.0	75.0	0.0	0.0
TOTAL	**48**	**18.8**	**62.5**	**33.3**	**2.1**	**22.9**

3.2.6 Design of instruments to address production of energy

Relatively few commitments focused solely on addressing production of energy apart from extraction of non-living resources (Table 9). These included three commitments in UNCLOS aiming to establish

jurisdiction over the laying of submarine cables and pipelines, and one to address the production of energy from the water, currents and winds. For the former, UNCLOS states that the laying of submarine cables and pipelines is part of the freedom of the high seas, which is also enjoyed in the EEZ, subject to the relevant provisions of the Convention, and all States are entitled to lay submarine cables and pipelines on the continental shelf, in accordance with its provisions. The delineation of the course for the laying of such pipelines on the continental shelf is subject to the consent of the coastal State. In addition, coastal states have the right to establish conditions for cables or pipelines entering their territory or territorial sea. For the latter, UNCLOS establishes that coastal states have sovereign rights with regard to the production of energy from the water, currents and winds in the EEZ. On the continental shelf, coastal States exercise sovereign rights for the purpose of exploring it and exploiting its natural resources, which include the mineral and other non-living resources of the seabed and subsoil. Beyond these commitments stating the jurisdiction to regulate production of energy, there is little more found in the body of instruments specific to this driver – which could be considered as one of the few gaps in coverage.

Table 9. Summary of Commitments to address Production of Energy

Anthropogenic Drivers of Change	Number of Commitments	Regional	Characteristics of Commitments		Governance Mechanisms	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Establish jurisdiction over underwater cables	3	0.0	100.0	0.0	0.0	0.0
Address reef-related impacts of renewable energy generation (wind, wave and tidal power), including infrastructure	1	0.0	100.0	0.0	0.0	0.0
TOTAL	**4**	**0.0**	**100.0**	**0.0**	**0.0**	**0.0**

3.2.7 Design of instruments to address physical restructuring of the coastline, rivers and seabed

Commitments to address physical restructuring of the coastline, rivers and seabed typically aimed to address impacts of coastal development (over 60 percent), while several others aimed to address dredging and depositing of materials, as well as impacts of coastal defenses, canalization and other watercourse modifications (Table 10). Many of these commitments are included in the GPA or CBD resolutions, as well as several UN General Assembly resolutions on oceans and the law of the sea, urging states to stop

Box 10. Examples of Interventions to Deliver Commitments to Address Physical Restructuring of the Coastline, Rivers and Seabed

St. Lucia: Coastal Protection at Point Sables Environmental Protected Area. With support from IUCN, this project aimed to safeguard ecosystem services provided by coastal agro-forests, beaches and coral reefs. To achieve this objective, the project supported the St. Lucia National Trust to provide interventions such as integrated management and re-vegetation of coastline, sand dunes and mangroves; exclusion of vehicles from the beach; clearance and rehabilitation of storm drains; improved waste management; and public awareness and education campaigns, among others. The results included more effective drainage and re-vegetation of sand dunes to prevent further erosion and counteract the impact of illegal sand-mining, as well as a reduction in this illegal activity.

Source: https://panorama.solutions/en/solution/coastal-protection-point-sables-environmental-protected-area-psepa-saint-lucia

the degradation and loss of ecologically important ecosystems and habitats such as coral reefs, due to coastal development. Roughly one third of these commitments are found in binding regional instruments, and almost two-thirds of these commitments are considered 'weakest' strength. Only five percent of these commitments are linked to text referencing enforcement mechanisms, and the same proportion is linked to text referencing financing mechanisms.

Specifically, a significant number of commitments aim to address pressures from physical restructuring of the coastline, particularly those aiming to support integrated coastal zone management and marine spatial planning, as well environmental impact assessments for coastal development. For example, the CBD Conference of the Parties resolved to focus on "actions to manage coastal development to ensure that the health and resilience of coral reef ecosystems are not adversely impacted, including prioritizing the protection of coral reef ecosystems in coastal development in land-use and sea-use management in coastal areas, through the application of area-based management measures, such as marine and coastal protected areas and/or marine spatial planning."[cxviii] A number of commitments aim to address impacts from coastal defenses and flood protection, for example that "states should adopt measures to minimize changes to natural erosion, sediment transport and sedimentation resulting from the construction of barrier and barrages."

Table 10. Summary of Commitments to Address Physical Restructuring of the Coastline, Rivers and Seabed

Anthropogenic Drivers of Change	**Number of Commitments**	**Regional**	**Characteristics of Commitments**		**Governance Mechanisms**	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Address the reef-related impacts of coastal development	12	58.3	58.3	41.7	8.3	8.3
Address the reef-related impacts of coastal defenses and flood protection	1	0.0	0.0	100.0	0.0	0.0
Address the reef-related impacts of canalization and other watercourse modifications	1	0.0	0.0	100.0	0.0	0.0
Address the reef-related impacts of restructuring seabed morphology, including dredging and depositing of materials	5	0.0	0.0	100.0	0.0	0.0
TOTAL	**19**	**36.8**	**36.8**	**63.2**	**5.3**	**5.3**

3.2.8 Design of instruments to address tourism and recreation

Box 11. Examples of Interventions to Deliver Commitments to Address Tourism and Recreation

Global: Green Fins. With support from the Reef World Foundation, this project aims to develop a recognized set of environmental standards to guide and support scuba diving and tourism business owners and national authorities. To achieve this objective, the project supported a code of conduct, an assessment system, outreach and capacity building and development of regulations where needed. The results have included completion of a study providing evidence that effective implementation of the practices described in the standards, such as programs designed to change scuba diving activities on coral reefs, may translate into reduced impacts; as well as completion of a study in the Philippines indicating that implementation of these standards and approach may significantly reduce the impact of the scuba diving industry on the marine environment. The approach and standards have been taken up in across six sites in Malaysia, leading to measurable reductions in anchoring, dive contacts with reefs, chemical discharge and garbage management. In the Philippines the Green Fins standards have been incorporated into the government's Biodiversity Strategy and Action Plan, and Departmental Administrative Order 2016-16 Coastal and Marine Ecosystems Management Program.

Source: www.greenfins.net; Green Fins. 2018a. Overview of the Green Fins Assessment Scores in Malaysia; Roche et al. 2016. Recreational Diving Impacts on Coral Reefs and the Adoption of Environmentally Responsible Practices within the SCUBA Diving Industry. Environmental Management, DOI 10.1007/s00267-016-0696-0; Hunt et al. 2013. The Green Fins approach for monitoring and promoting environmentally sustainable scuba diving operations in South East Asia. Ocean and Coastal Management 78: 35-44.

Commitments aiming to address pressures from tourism and recreation activities often focused on developing national plans, policies and programs for sustainable tourism, e.g. eco-tourism, as well as prohibiting trade in coral reef species using CITES. Those related to transport activities typically aimed to reduce oil pollution from shipping, as well as the spread of invasive species (Table 11). Over half of the commitments aiming to address the reef-related impacts of all tourism and recreation activities are found in regional instruments. Similar to many other drivers, the majority (two thirds) of these commitments were considered 'weakest', and only 17 percent were linked to text referencing enforcement mechanisms, and less than 14 percent linked to text referencing financing mechanisms.

In the case of tourism and recreation, similar to commitments aiming to address other drivers, the breadth of objectives and aspects of the driver covered is significant, but the depth or 'strength' of the commitments was small as mentioned previously. Similarly, little reference was provided to governance mechanisms for delivery, both in terms of enforcement and in terms of financing.

Table 11. Summary of Commitments to Address Tourism and Recreation

Anthropogenic Drivers of Change	**Number of Commitments**	**Regional**	**Characteristics of Commitments**		**Governance Mechanisms**	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Address the reef-related impacts of all tourism and recreation activities	30	56.7	6.7	53.3	3.3	0.0
Address the reef-related impacts of all tourism and recreation activities in SIDS	2	0.0	0.0	0.0	0.0	100.0
Address the reef-related impacts of all tourism and recreation infrastructure	3	0.0	0.0	100.0	0.0	0.0
Regulate marine biota souvenirs for sale to tourists, exporters	30	10.0	20.0	80.0	33.3	23.3
TOTAL	**65**	**30.8**	**12.3**	**66.2**	**16.9**	**13.8**

3.2.9 Design of instruments to address transport

Commitments to address transport aimed largely to address all reef-related impacts of shipping (over 53 percent), as well as to regulate discharges from ships (20 percent), invasive species transported by shipping (20 percent) and the remainder to regulate impacts from shipping on SIDS (Table 12). Many of these commitments are included in UNCLOS, as well as those in MARPOL 73/78 and resolutions of the CBD. Over one third of these commitments are found in binding regional instruments, and overall the 'strength' of these commitments is high relative to other drivers (over half are found in binding instruments for example). Over one third are linked to text referencing enforcement mechanisms, but none are linked to text referencing financing mechanisms.

Table 12. Summary of Commitments to Address Transport

Anthropogenic Drivers of Change	Number of Commitments	Regional	Characteristics of Commitments		Governance Mechanisms	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms
Address all reef-related impacts of shipping	29	58.6	62.1	17.2	34.5	0.0
Regulate discharges from ships	11	9.1	36.4	18.2	81.8	0.0
Address invasive species transported by shipping	11	9.1	54.5	45.5	0.0	0.0
Regulate impacts from shipping on SIDS	3	0.0	0.0	0.0	0.0	0.0
TOTAL	**54**	**35.2**	**51.9**	**22.2**	**35.2**	**0.0**

3.2.10 Design of instruments to address all anthropogenic pressures on coral reef ecosystems simultaneously

In addition to those commitments aiming to address specific types or themes of activities (e.g. production from marine living resources, tourism and recreation, etc.), a number of commitments did not refer to specific activities, but instead to addressing the pressures on coral reef ecosystems from these activities (Table 13). A relatively small number of commitments aimed to address specific pressures (e.g. input of organic matter, input of nutrients, etc.), while a large number (112) of commitments aimed to address all or multiple pressures simultaneously. These commitments typically aimed to address all pressures on coral reef ecosystems, or in some cases more broadly in coastal and marine ecosystems. They include a large number of commitments for general conservation and sustainable management of coastal and marine ecosystems, which were considered as applicable to coral reefs, such as

Box 12. Examples of Interventions to Deliver Commitments to Simultaneously Address All Pressures on Coral Reef Ecosystems

Maldives, North Ari Atoll: Project Regenerate – Reefs Generate Environmental and Economic Resiliency for Atoll Systems. With support from the United States Agency for International Development and IUCN, this project aims to enhance the use of GIS in national environmental decision-making; enhance understanding of resilience to climate change in North Ari Atoll; build the capacity of civil society to monitor and improve management of marine resources; and support environmental education and public awareness, among others. To achieve this objective, since 2013 the project has supported the development of a resilience-based management framework to improve the ability of policy-makers and stakeholders to understand and address the risks from pressures on the marine environment, and particularly to improve the ecological status of coral reef ecosystems. The results have included increased government capacity for use of GIS to plan ecosystem management measures; completion of social surveys with North Ari fishers on bait and reef fisheries; collection and analysis of high-resolution ecological data in 36 sites in North Ari atoll; assessment of ecosystem services; and adoption of Green Fins standards in local scuba diving centers.

Source: ICRI. 2015. Case Studies: From Ridge to Reef. Implementing coral reef conservation and management through a community-based approach emphasizing land-sea connectivity. Available at https://www.icriforum.org/sites/default/files/ICRI_casestudies_2015_0.pdf

commitments in the World Heritage Convention for protected areas (which includes 29 marine sites that protect coral reef ecosystems and a marine program that advises the World Heritage Committee on their monitoring).[cxix. cxx] Also, under the Ramsar Convention, 104 Ramsar Sites have been designated with coral reefs and 973 with marine and coastal wetlands.[cxxi] There is also a large body of commitments made through the CBD and instruments nested under it, for example to develop national biodiversity strategies and action plans and focus these efforts on coastal and marine ecosystems, as well as area-based regulations such as marine protected areas (MPAs) and marine spatial planning. In addition, the Ramsar Convention and the Convention on Migratory Species included commitments aiming to ensure habitat conservation and protection of migratory species, as well as application of environmental impact assessments to coastal development.

Almost two-thirds of these commitments are considered as 'weakest' strength, and only 7 percent are linked to text referencing enforcement. The majority are not linked to text referencing financing mechanisms, with the exception of the commitments for conservation and sustainable use of marine and coastal biological diversity under the CBD – an instrument that includes a financing mechanism. Again, as with many of the drivers, the key gaps here are in the governance mechanisms for delivery, with the exception of the CBD.

Box 13. Examples of Interventions to Deliver Commitments to Simultaneously Address All Pressures on Coral Reef Ecosystems

Indonesia, Birds Head Seascape, West Papua: Community-based conservation at scale. A collaboration between coastal communities; local, regency, provincial and national government agencies; international and local non-governmental organizations; and universities, this initiative aims to address habitat destruction in the waters of West Papua as a result of overfishing and resource exploitation, through the creation and management of a large-scale marine protected area network. To achieve this objective, the initiative has included efforts to: complete scientific assessments and characterization of the seascape (i.e. region); support awareness and social and political support for conservation; develop a marine protected area network jointly established by local communities and the government; supporting institutions for co-management of this protected area network; and developing a sustainable financing strategy for the initiative. The results have included a marine protected area network established and managed effectively according to rapid assessment scores; a reduction in the intensity of key, locally-generated drivers of change in the coral reef ecosystem (e.g. destructive fishing practices reduced to 1 percent of fishers in the area, illegal fishing from outside poachers reduced by over 90 percent, government ban on mining and shark and ray fishing, average annual growth in tourism of 30 percent, average increase in live coral cover within the protected areas of 12 percent since their establishment, and average increase in fish biomass within the protected areas of 114 percent since establishment – including increased fishing productivity for local fishers.

Table 13. Summary of Commitments to simultaneously address all Anthropogenic Pressures on Coral Reef Ecosystems

Anthropogenic Drivers of Change	Number of Commitments	Regional	Characteristics of Commitments		Governance Mechanisms	
Objective	Per Activity	% located in Regional Instruments	% located in Binding Instruments	% considered 'weakest' strength	% linked to text referencing enforcement	% linked to text referencing financing mechanisms

General conservation and sustainable management of coastal and marine ecosystems, considered applicable to coral reefs	38	60.5	42.1	42.1	8.7	26.1
Conservation and sustainable use of marine and coastal biological diversity under the CBD	34	0.0	35.3	64.7	0.0	79.4
Commitments under the Ramsar Convention	10	0.0	40.0	60.0	0.0	0.0
Commitments under the CMS	6	0.0	33.3	66.7	0.0	0.0
Commitments under the GPA	1	0.0	0.0	100.0	100.0	100.0
Commitments specifically for coral reef ecosystems	23	26.1	4.3	95.7	8.7	26.1
TOTAL	**112**	**25.9**	**31.3**	**63.4**	**7.1**	**44.6**

3.2.11 Additional issues in the design of the instruments

In addition to identifying and characterizing the reef-related commitments that states have made in international instruments as well as key delivery mechanisms, the treatment of several broad issues in the design of these instruments is highlighted here.

Stakeholder participation. Given that most of the reef-related commitments prescribe some form of planning process for states to develop and implement measures for coral reef ecosystem conservation and sustainable management, the role of stakeholders in these processes becomes significant. Many of the instruments include guidance to ensure stakeholder participation in these planning processes. For example, the CBD includes provisions that each state shall respect, preserve and maintain traditional lifestyles of indigenous and local communities in biodiversity conservation. A number of instruments prescribe stakeholder participation in the regulation of specific activities driving changes in reef ecosystems, such as formulating fisheries management rules together with communities, [cxxii] , [cxxiii] [cxxiv] In particular, the SSF Guidelines commit states to involve small-scale fishing communities in decision-making over production from living resources, with special attention to equitable participation of women, vulnerable and marginalized groups in the design and planning of instruments (see Box 14).[cxxv] Similarly, the CBD commits states to "take action to strengthen the capacities of indigenous peoples and local communities to implement the Convention by respecting their rights, the customary sustainable use of biodiversity, and the fair and equitable sharing of benefits arising from the use of their traditional knowledge and practices.[cxxvi] Additionally, the Barbados Program of Action is an instrument dedicated to

Box 14. Small-Scale Fisheries and Gender

States and small-scale fisheries actors should encourage and support the role and involvement of both men and women, whether engaged in pre-harvest, harvest or post-harvest operations, in the context of co-management and in the promotion of responsible fisheries, contributing their particular knowledge, perspectives and needs. All parties should pay specific attention to the need to ensure equitable participation of women, designing special measures to achieve this objective. The specific knowledge of women fishers and fish workers must be recognized and supported. States should investigate and document traditional fisheries knowledge and technologies in order to assess their application to sustainable fisheries conservation, management and development.

the unique circumstances and needs of SIDS, and calls upon states to support the efforts of island states to meet commitments for conservation and sustainable management of coastal and marine ecosystems.

Coherence and coordination. Policy coherence is a concept that refers to objectives of avoiding or minimizing negative spill-over effects of various policies across a body of policy, and the institutional mechanisms to promote coherence between them.[cxxvii] Given that high number of relevant international instruments (232) introduced over a period of several decades (see Figure 4), coherence is certainly an issue. However, within this body of instruments the common objectives of the 591 commitments do not register apparent contradictions based on an initial assessment, and in many cases the instruments aim to make explicit linkages. For example, the CBD calls on states to use existing instruments (e.g. the Regional Seas Programmes) to deliver reef-related policies, and in particular to implement the Code of Conduct for Responsible Fisheries,[cxxviii] the International Plan of Action for IUU fishing, the Port State Measures Agreement, and the GPA.[cxxix]

Alternatively, few mechanisms are established or designated by the instruments to explicitly promote coherence and coordination, though in practice financial mechanisms can serve this purpose, (e.g. the CBD uses its financial mechanism to promote coherence, developing strategic priorities for funding together with other global, binding instruments generally related to biodiversity such as CITES, CMS, etc.). In the absence of such mechanisms focused on reef-related commitments and outcomes, coordination across the 232 instruments and 591 commitments could be a significant issue and challenge for the international community. Given the large volume of instruments and commitments, it seems hard to imagine that some level of duplication would not exist, in the absence of coordination.

Climate change and other future changes. A key challenge for any instrument is to include processes for adjustment and adaptation based on monitoring and periodic evaluations of lessons learned.[cxxx] Is this body of international reef-related policy 'future-proofed' to ecological and potentially latitudinal shifts expected due to climate change? To what extent can this body of policy address emerging issues such as artificial reefs, genetic manipulation of corals and assisted evolution, among others? In this sense, the nature of the commitments prescribed in the body of instruments may be well-suited to respond and adapt to such changes, with its heavy focus on integrated national and in some cases regional-level planning processes (e.g. marine spatial planning). In essence, the majority of the commitments are for achieving targeted outcomes through prescribed planning processes, such that even though issues such as genetic manipulation of corals may not be explicitly addressed in the instruments, the processes should be flexible enough to accommodate them. A typical example is the 2013 ICRI Call to Action, which "encourages governments to develop and implement legislation and integrated management programs, including through marine spatial planning approaches (including targets and incorporating zoning and enforcement, managed access and participatory governance), to ensure that threats to coral reefs are systematically addressed." Such planning processes and approaches by design, allow for monitoring and evaluation, and adjustment to new drivers of change or changes in the intensity of drivers.[cxxxi] Hence, in this state-centric body of instruments, a focus on commitments for state-level planning processes rather than prescribed actions, may be a feature rather than flaw.

3.2.12 Discussion on the effectiveness of delivery of the instruments

The previous sections summarized the results of the analysis of the design of international reef-related instruments, examining how the commitments contained in these instruments collectively responded to known anthropogenic drivers of change in coral reef ecosystems. However, as noted in chapter two, this is essentially one half of the equation in public policy analysis: assessing the design of instruments, but not how effectively they were delivered by states (or their impact). As mentioned previously, to systematically evaluate the delivery of international reef-related instruments would require state-by-state data and control sites that are likely unavailable, in order to provide the evidence for causality linkages

between given instruments and observed ecological outcomes. This information is not currently available, but for indicative purposes a number of examples of interventions at the state level or lower to deliver some or all of the commitments have been reviewed and summarized in Annex 14, somewhat analogous to efforts to identify 'bright spots' of coral reefs that have proved resilient to key drivers such as impacts from climate change.[cxxxii] These examples are ad-hoc and non-exhaustive, provided by members of the ICRI network to highlight cases considered by observers as 'successful' in achieving either outputs or outcomes related to delivery of various international reef-related instruments. Such examples highlight the importance of, and differences in, state-level capabilities to delivery international reef-related instruments, irrespective of the design.

A total of 94 examples were identified by members of the ICRI network, roughly half of which occurred in Africa (25 percent) and the Caribbean (26 percent), followed by the Western and Central Pacific Ocean (18 percent), Southeast Asia (16 percent) and Latin America (11 percent). Most of these examples occurred at the local level (70 percent), with the remainder occurring at the national level (16 percent), or in a handful of cases at the sub-national level (4 percent) or multi-national level (10 percent). These examples often highlighted efforts to deliver instruments aiming to simultaneously address multiple anthropogenic drivers of change in coral reef ecosystems, through relatively broad interventions. The interventions typically focused on empowering stakeholders for resource and ecosystem management, supporting area-based ecosystem management measures, establishing national or local financial mechanisms for protected areas, science-based coastal and land-use planning, and ecological restoration. More specifically, the interventions could be non-exhaustively summarized as follows, to illustrate the types of national and local actions undertaken that help deliver on global policy commitments:

- ***Stakeholder-led management of small-scale fisheries***, developed through social marketing campaigns, supported by information and communications technology (ICT) innovations to monitor fish catches and/or report illegal fishing activities, training and support to small-scale fishing organizations, etc.;

- ***Innovative techniques and processes for participatory planning to establish and/or strengthen areas-based management measures*** that account for vulnerabilities to climate change at different scales, such as temporal closures to fishing, multi-use MPAs based on zoning, MPAs as 'no-take reserves' or 'fish refuges', MPA networks, locally-managed marine areas, etc., where states and stakeholders co-govern (e.g. stakeholders manage and states support, such as community measures formalized as state by-laws, or national instruments that allow communities to establish MPAs according to standards and criteria, with financial assistance from the state);

- ***Inter-sectoral and agency planning processes for area-based management by the state,*** e.g. using multi-layered management tools (spatial and temporal), economic valuations of coral reef ecosystem services, scientific investigations of larval dispersal among reef populations in order to identify MPA networks, etc., translating into a combination of measures such as zoning of permitted or prohibited activities, no-take reserves, 'whole-of-reef' management plans to address multiple stressors, etc.;

- ***Integrated coastal zone and land use planning by the state,*** e.g. at the level of coastal districts and cities as required by national instruments (e.g. Indonesia's Spatial Planning Law No. 26/2007, Coastal Area Law 27/2007);

- ***New techniques, technology and processes to help build capacity for management of MPAs,*** such as the establishment of MPA learning sites; introduction of new conservation leadership models (e.g. cohorts of fellowships); national training programs for MPA management with state

agency staff; design of visualization tools that help stakeholders plan management measures; certification programs for MPA management, etc.;

- ***Small and large-scale restoration efforts,*** including installation of reef structures to enhance coastal defenses; large-scale reef restoration projects that use 'coral gardening', where small pieces of healthy coral are collected after a bleaching event, raised in underwater nurseries and transplanted to degraded reefs;

- ***Establishment of MPA financial mechanisms such as conservation trust funds,*** e.g. national conservation trust funds (NCTFs) created throughout the Caribbean with a combination of endowment and sinking funds, or the Meso-American Barrier Reef Fund, etc.; and

- ***Private sector initiatives*** such as certification for eco-tourism, promotion of sponge aquaculture as a more profitable alternative to seaweed farming, public-private partnerships for eco-tourism and MPA management, etc.

- ***Gender mainstreaming***, map and identify possible partnerships and expertise available to support gender mainstreaming. At a local level, a closer look is needed at gendered access and use rights to terrestrial and marine resources, participation in household and community decision-making, and the ecotourism gender division of labour. These analyses will suggest specific policy reforms and local arrangements for improving women's access to coastal resources, credit and more accessible markets, and higher value tourism-related activities.

IV. Key Findings and Policy-Relevant Recommendations

4.1 Summary of Key Findings

The results presented in the previous chapter illustrate the type of international instruments that have been introduced at both the global and regional level to address the anthropogenic drivers of change in coral reef ecosystems – considering the interaction between these drivers and reef ecosystems as part of socio-ecological systems (SES) where humans interact with nature, and this interaction in turn affects the services that nature provides to people (see Chapter 2 for a description of the SES framework underpinning this analysis). The results of this qualitative analysis can be synthesized in the following key findings:

A large and very broad body of international reef-related policy has developed incrementally over several decades, designed to address almost every anthropogenic driver of change in coral reef ecosystems. As a positive result for coral reef ecosystem conservation, this analysis suggests that the current body of international policy instruments related to coral reefs is already quite broad, with relatively few gaps in design in terms of the drivers addressed or geographic regions covered. The inventory of this large body of international policy includes:

- ***232 international reef-related instruments***, which include at least 591 commitments to address anthropogenic drivers of change in coral reef ecosystems; and
- ***79 discrete global targets to address the drivers of change that are time-bound and measurable (14 percent of which have expired),*** as well as 58 regional targets, most of which are found in just nine instruments (global: GPA, Aichi Targets, Paris Agreement, 2030 Agenda; regional: CTI Regional Action Plan, SPREP Action Plan 2011-2015, Bay of Bengal SAP, Arafura and Timor Seas SAP, Indian Ocean SAP). An example of a target specific to coral reef ecosystems, and which has expired, is the Aichi target that "by 2015 the multiple anthropogenic pressures on coral

reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning." Examples of broader global targets to address various drivers include commitments: to hold the increase in the global average temperature to well below 2 degrees above pre-industrial levels; to end overfishing and effectively regulate harvesting; to prevent and reduce marine pollution of all kinds; and to conserve at least 10 percent of coastal and marine areas.

This broad body of international policy is focused on action by states at the national level, with states having the primary responsibility for some 75 percent of the commitments. By virtue of the maritime zones established under UNCLOS, the world's warm-water coral reef ecosystems fall under national jurisdiction. In that context, in the territorial sea, coastal States exercise sovereignty over their natural resources. In the EEZ, coastal States have sovereign rights for the purposes of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, and jurisdiction for the protection and preservation of the marine environment. On the continental shelf, coastal States exercise sovereign rights for the purpose of exploring it and exploiting its natural resources, which consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species. In the EEZ and on the continental shelf, coastal States also have jurisdiction with regard to marine scientific research. These rights and responsibilities are reflected in the body of international reef-related policy: of the 591 commitments identified in this body of policy, a minimum of 75 percent are primarily the responsibility of states to deliver.

Given the focus on action by states, most of the commitments are planning and process-oriented. The majority of commitments focus on various forms of planning that states should or are required to conduct in order to develop rules and responses to locally-generated anthropogenic pressures on coral reef ecosystems – consistent with a body of policy that is heavily state-centric. Some of the most common objectives of the commitments included: (i) stabilizing atmospheric concentrations of greenhouse gases and reducing emissions, while supporting adaptation in developing states and particularly SIDS; (ii) regulating harvesting of fish resources to maintain stocks at targeted levels through science-based limits and measure to protect associated ecosystems, with a priority on support to small-scale fisheries; (iii) conducting integrated planning processes to prevent and reduce land-based sources of ocean pollution, together with environmental impact assessments and particularly an emphasis on waste treatment capabilities; (iv) regulating pollution from non-living resources, as well as shipping; and (v) addressing physical restructuring of the coastline together with multiple anthropogenic pressures on coral reef ecosystems or coastal and marine ecosystems more broadly, typically through area-based planning and regulation, such as integrated coastal zone management and marine spatial planning, and networks of marine protected areas.

While the body of international reef-related policy may be broad in its coverage of the drivers of change, it is not necessarily 'deep' in its response – i.e. the nature of the commitments for states are quite general, and are largely voluntary. Many of the commitments are focused on "marine and coastal ecosystems" in general or on the various economic sectors of human activity that may driver changes in coral reef ecosystems, rather than on coral reef ecosystems themselves. These commitments are nonetheless applicable to coral reefs even if not focused on them. Additionally, over half of all commitments were considered as having the weakest level of commitment (i.e. commitments that are not required, contained in non-binding instruments), though commitments linked to extraction of non-living resources, transport, generation of land-based sources of pollution and physical restructuring of the coastline all had an above-average proportion of strong commitments.

Although states (many of whom are low or lower-middle-income economies) have the primary responsibility to deliver the vast majority of the international policy commitments, relatively few governance mechanisms have been designed by the instruments to support them to do so. More

specifically, large areas of the world's warm-water reefs are under the jurisdiction of states with developing economies, and many of the international commitments are the responsibility of these states, yet most of the instruments are not linked to financing mechanisms or new and additional financial resources to support delivery. Additionally, given national jurisdiction over most reefs, the international instruments define relatively few enforcement mechanisms for the reef-related commitments.

4.2 Policy-Relevant Recommendations

As described in Chapter 1, this analysis aims to answer the question: does the international community currently have sufficient policy instruments to address the anthropogenic drivers of change in coral reef ecosystems, given recent observations and the current state of knowledge? If not, what role could international policy play in helping to address these drivers and conserve and protect coral reef ecosystems, and what policy changes would be needed?

Based upon the results of the analysis (see Chapter 3), this last question can be refined based on a distinction between those drivers that are globally widespread, and those that are locally-generated. The driver of climate change (exerting pressures in the form of elevated sea surface temperatures and ocean acidification) poses an existential threat to warm-water coral reef ecosystems and is globally widespread, beyond the reach of any one state. The international instrument agreed to respond to climate change is the Paris Agreement, which aims to hold the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. Achieving this target depends on voluntary, non-binding actions by states. Hence the question can be refined slightly, to ask: beyond assisting states to make the greenhouse gas emissions reductions needed to meet the target in the Paris Agreement, what role can international policy play in supporting conservation and sustainable management of coral reef ecosystems?

This slightly refined question remains essential for coral reef conservation objectives, because while climate change may be driving the largest changes in coral reef ecosystems, these systems are affected simultaneously by multiple anthropogenic drivers of change, that are not necessarily isolated and often result in a positive feedback loop. Additionally, different types of drivers may interact in a given coral reef ecosystem, and where such interactions occur, combined with ecological complexity, negative impacts on coral reef ecosystems may happen sooner and be more severe than previously thought. For these reasons, states and stakeholders have often emphasized efforts to addresses the cumulative impacts of multiple anthropogenic drivers in order to enhance the integrity and resilience of coral reef ecosystems in the face of climate change, as essentially global warming is a widespread anthropogenic driver of change, exacerbated by locally-generated drivers. In summary, given the cumulative effect of multiple, locally-generated anthropogenic drivers of change on coral reef ecosystems, this analysis raises a revised version of the question as follows: ***what role can international policy play in helping states to address the locally-generated anthropogenic drivers of change in coral reef ecosystems, in order to enhance their resilience and potential for survival in the face of globally-widespread climate change?***

To answer this question, an analysis was conducted of the design of international reef-related instruments. The results of the analysis suggest that instruments have been broadly designed to address the known drivers of change. However, given the ecological outcomes measured (e.g. continued decline in reefs and a projected acceleration in this decline under climate change), the key gap is assumed to be in the effectiveness of delivery at the national level (given that an estimated 85 percent of warm-water coral reefs are under the jurisdiction of 25 states). For this reason, the recommendations focus on the political will and capability of coral reef states to deliver the large number of existing international reef-related policy commitments (i.e. implementation). International policy commitments currently exist for almost all of the known locally-generated human drivers of change in coral reef ecosystems, even as these changes are still occurring and often increasing. However, while there are few gaps in the drivers covered in the

design of the current body of international policy, these policies lack enforcement mechanisms for most commitments, and also financing mechanisms to provide new or additional financial resources to the large number of low-income states responsible for the commitments. Additionally, given the breadth of reef-related commitments across so many instruments (agreed incrementally over a long period of time), there is a need for more consolidated and coordinated monitoring and reporting of the status of delivery for these commitments. For these reasons, the following policy pathways (i.e. policy-dependent scenarios) were recommended by the coral reef policy advisory committee for consideration by UNEA, to focus on accelerating implementation of existing commitments:[6]

Option One: status quo for international reef-related policy, with accelerated implementation. Given that the current body of policy covers almost all known human drivers of change in coral reef ecosystems, and that implementation by states is the key challenge or gap, one scenario could envisage a status quo in the body of policy, with accelerated and coordinated action by states. This acceleration would be based on a renewed commitment from states to address the locally-generated drivers of change in coral reef ecosystems, and could include the following actions:

a) States conduct a similar analysis or review of reef-related policies at the state level, following the analytical framework and methods used for this analysis of international policy, to assess the extent to which current international commitments have been translated into national policy and identify gaps [short-term], including
    - A self-audit by states of national policies to deliver the current commitments in international instruments,
    - Regular (e.g. every 3 to 5 years) reporting on progress toward national delivery of current international commitments s; and
b) States develop implementation plans for delivering the international commitments, with an emphasis on supporting local implementation of national policies, analyzing and articulating the social and economic benefits from implementation, utilizing existing management tools and identifying any technical and financial support needed [short-term].

Next steps for UN Environment, in consultation and cooperation with competent international organizations, to support this scenario would be to:

- identify states interested to move forward and conduct the self-audit and develop implementation plans (including any technical and financial support needed);
- establish a community of practice for conducting these policy reviews and developing implementation plans; and
- identify focal points in each state for tracking national delivery of international policy commitments and coordinating across relevant national agencies.
- Encourage collection and use of sex-disaggregated data.

Option Two: strengthening the existing international policy framework, including governance mechanisms, to increase implementation by states. While option one assumes a status quo for international reef-related policy (with accelerated implementation by states), another option may be to revise existing international instruments to strengthen mechanisms and incentives for states to implement existing commitments. This could include a combination of changes to existing international instruments, and support from international organizations to assist states to accelerate implementation, such as the following actions:

[6] Three policy pathways are proposed for consideration here in order to spur discussion, though an infinite number of options may exist from any given starting point. Note that they are articulated in terms of the expected time to completion: short-term (1 – 2 years), medium-term (3 – 5 years) or long-term (5 – 10 years).

a) States may create a new overarching international monitoring group (e.g. a 'coral reef policy observatory'), or task ICRI with the role (in consultation and cooperation with competent international organizations), to be responsible for monitoring progress in implementing international commitments at the national level, including a focused effort to collect more information to establish causal links between given instruments and ecological outcomes, and helping states to coordinate among the many reef-related commitments in multiple instruments [short-term];
b) Development finance institutions, such as the World Bank, the Asian Infrastructure Investment Bank, etc., may expand upon the existing environmental safeguards that apply to all projects they finance, in order to provide reef-specific guidance to ensure that all funding takes into consideration potential impacts on coral reef ecosystems, e.g. 'coral reef safeguards' [short-term];
c) States may conduct self-audits to assess the status of implementation of current international commitments, and report the results to the UN General Assembly and UNEA [short-term];
d) States could agree on a new global coral reef target, that would be quantifiable and ambitious in order to address the various drivers, as part of the post-2020 global biodiversity framework following the Aichi targets [medium-term];
e) UNEA could invite states to ratify those global, legal instruments where further support is needed (e.g. the Port State Measures Agreement) [medium-term];
f) International instruments may be amended to expand the mandate of existing governance mechanisms, likely on a regional basis through the Regional Seas Conventions, to support states to meet the existing commitments (e.g. with coordination from the ICRI Secretariat) [medium-term].

Next steps for UN Environment, in consultation and cooperation with competent international organizations, to support this scenario would include:

- identifying global legal instruments where additional ratification is essential to implementing international policy commitments for coral reef conservation and management;
- assessing opportunities for amendment of Regional Seas Conventions to strengthen governance mechanisms to support implementation by states; and
- preparing terms of reference for a new international monitoring role for existing reef-related policy commitments.

Option Three: introduction of new international policy instruments and/or governance mechanisms to support national implementation. Options one and two focus on the existing international body of policy, but another option would be to add to it, in order to accelerate implementation. As mentioned previously, existing commitments are largely considered to be 'weak' in terms of the requirements placed on states, and mechanisms to support delivery are often missing. This suggests an option for either: (i) a new global instrument focused solely on coral reefs, and/or (ii) a new international mechanism to support implementation of existing reef-related commitments, including the following actions:

a) States agree on a new global instrument specific to coral reefs, for example a negotiated binding treaty or convention on coral reefs, with specific targets for different drivers of change and linked to governance mechanisms to support delivery (including monitoring and reporting), or agree on a new policy instrument nested under an existing instrument (e.g. an ambitious new coral reef target as part of the post-2020 global biodiversity framework following the Aichi targets under the CBD) [long-term], and/or
b) States agree to create a new mechanism(s) to support delivery on existing reef-related policy commitments, for example:
    - A new financing mechanism specifically for coral reef ecosystems, such as a global fund for coral reefs (e.g. a 'Coral Environment Fund' or a 'REDD for Reefs' fund) to provide grant or concessional financing through an existing institution such as the GEF (with governance linked to an existing instrument such as the CBD or UNFCCC where the CoP

sets priorities, procedures and criteria for funding, or even under the GEF Council),[7] with funding targeted to cross-sectoral collaboration where possible and linked to reporting by states on progress towards existing targets and international policy commitments (the mechanism could also include a facility for non-grant financing of private sector models and operations that support delivery of existing policy commitments) [short to medium-term]; and/or

- A new global monitoring and reporting mechanism to support national implementation, e.g. a new international commission on coral reefs comprised of representatives of UN member states, in order to monitor and report progress on state delivery of international reef-related policy commitments, as well as to help coordinate delivery of reef-related commitments scattered across a large number of international instruments [short-term].

Next steps for UN Environment to support this scenario would include:

- Supporting an ad-hoc committee of UN member states to develop proposals for a new policy instrument specific to coral reefs; and/or
- Developing the concept for a new global financing mechanism to support coral reefs.

Importantly, the three options identified by the committee and described above are not mutually exclusive, and could be combined into various packages. As one example, a fourth option is presented below, consolidating from the three pathways identified by the coral reef policy advisory committee, to focus on policy delivery in the world's warm-water coral reef states:

Option Four (consolidated from the three previous): rapid support to states for policy implementation, i.e. "the coral reef-state solution". Focusing only on short and medium-term actions and on providing international support to the relatively small group of states with jurisdiction over the world's warm-water coral reefs (e.g. twenty-five states have jurisdiction over 85 percent of the world's warm-water coral reefs), the following actions could be consolidated from the three pathways identified by the committee, into a fourth option:

a) National implementation plans: Coral reef states conduct a self-audit of national policies to deliver the current commitments in international instruments and develop implementation plans for policy delivery, identifying any technical and financial support needed [short-term];
b) International monitoring and coordination to support national implementation: States may create a new overarching international monitoring group (e.g. a 'coral reef policy observatory'), or task ICRI with the role (in consultation and cooperation with competent international organizations), to be responsible for monitoring progress in implementing international commitments at the national level in coral reef states [short-term]; and
c) A new global financing mechanism for coral reefs: States agree to create a new financing mechanism specifically for coral reef ecosystems, such as a global fund for coral reefs (e.g. a 'Coral Environment Fund' or a 'REDD for Reefs' fund) to provide grant or concessional financing to low-income and lower-middle-income coral reef states through an existing institution such as the GEF [short to medium-term].

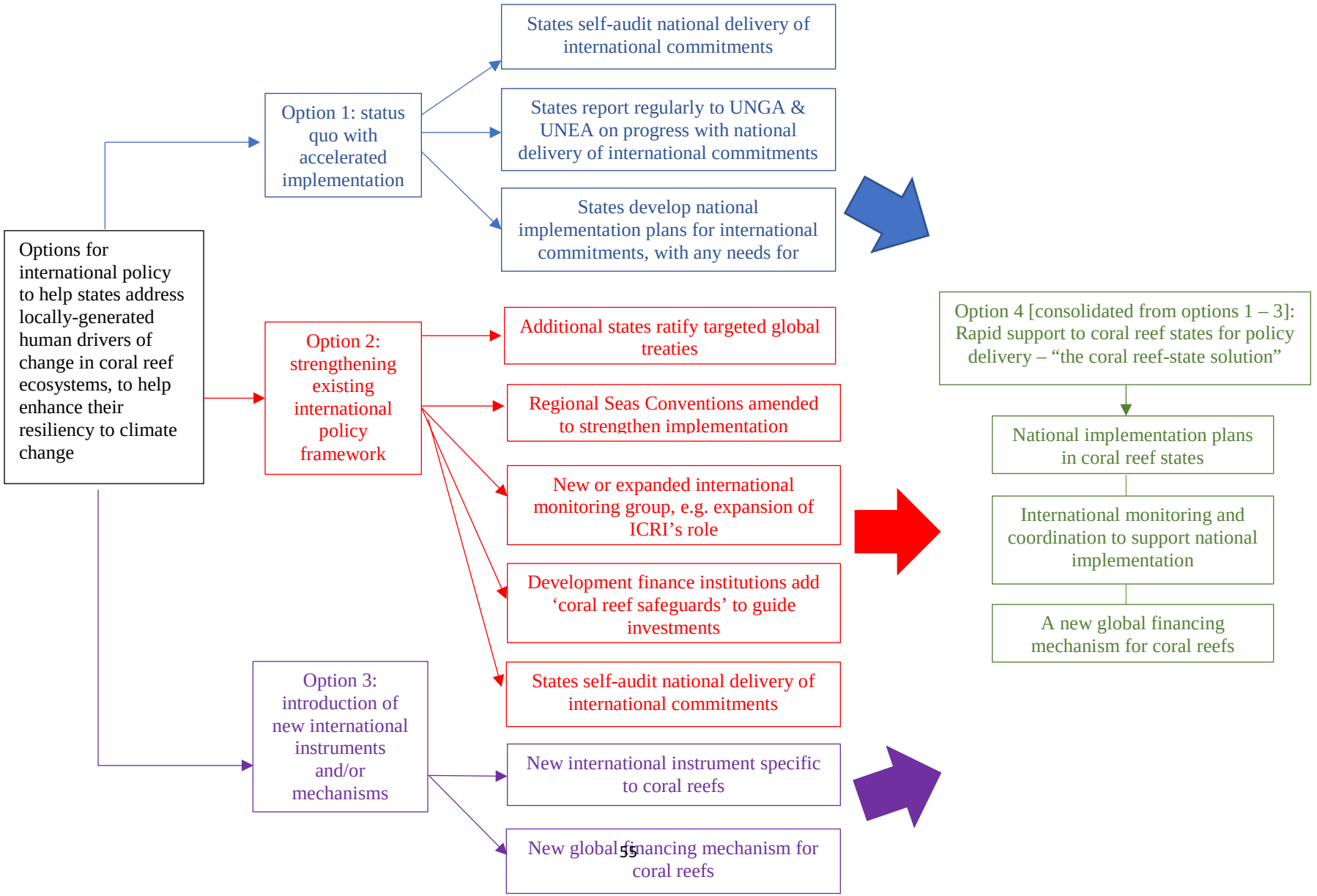
In summary, given:

- The existential threat to warm-water coral reef ecosystems from climate change, based on the projections in the IPCC 2018 special report that the world's coral reefs will decline by a further 70 to 90 percent with a 1.5 degree Celsius increase in the global mean temperature from pre-industrial levels (with losses greater than 99 percent with a 2 degree Celsius increase);[cxxxiii]

[7] For example, the CBD CoP could direct the secretariat to work with the GEF under the existing MOU to establish a window of funds solely for coral reefs, additional to country-based GEF allocations.

- The cumulative effect of multiple anthropogenic drivers of change on coral reef ecosystems, such that efforts to address locally-generated anthropogenic drivers of change (e.g. extraction of reef fish, input of pollutants, physical loss, etc.) can enhance the integrity and resilience of coral reef ecosystems in the face of pressures from the globally-widespread driver of climate change (e.g. bleaching is a cumulative-stress response where global warming is the most widespread stressor, but which known localized stresses exacerbate);cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl
- The large body of international policy that currently exists includes commitments for states to address almost all of the major known locally-generated anthropogenic drivers of change in coral reef ecosystems that may increase their vulnerability to climate change; and
- The voluntary nature of a number of international reef-related instruments, with relatively few global mechanisms to support states with low-income economies to deliver the instruments locally; then
- Figure 10 below aims to represent the three policy-relevant options for utilizing international policy to help states address the locally-generated anthropogenic drivers of change in coral reef ecosystems, in order to enhance their resilience and potential for survival in the face of globally-widespread climate change, as well as an indicative example (labelled ‘option four’) of how these non-mutually exclusive options could be combined or consolidated.

Figure 10. Simple Decision Tree for Considering Options to Leverage International Policy for Increased Conservation and Management of Coral Reef Ecosystems



The above simple decision tree proposes only one set of decisions and possible policy pathways (options 1 – 3, as well as an example of how these options could be combined or consolidated – option 4), though again there could be infinite combinations (including the 'do-nothing' or 'business-as-usual' option, which is implicit). The option or combination of options that best supports enhanced delivery of existing reef-related commitments would likely depend on whether the current constraint for states is: (i) willingness (i.e. political will to prioritize coral reef commitments on a limited agenda, and/or (ii) capability (i.e. capacity to implement actions needed to meet the commitments, including both technical and financial capacity). If a lack of political will is the main factor contributing to coral reef degradation from locally-generated anthropogenic drivers,[cxli, cxlii] then perhaps a new international instrument may be introduced to help strengthen states' commitment and prioritize reefs on national agendas, and/or existing instruments strengthened or delivery accelerated (options 1 and 2, and option 3.a for a new instrument). For example, reefs may not be prioritized in national agendas because they are lost among all of the other commitments and objectives in the current body of international reef-related policy instruments, so a new, reef-specific instrument could help address this challenge, or reef-specific commitments featured prominently in a new treaty. However, even with a new binding instrument, the options for establishing international enforcement mechanisms may be limited. At the same time, a new treaty could provide a reporting mechanism, which could enhance political will by providing greater visibility to states' commitments.[cxliii] Of note, a review in 2011 concluded that a single coral reef treaty may be unnecessary given the breadth of existing instruments and the commitments they contain.[cxliv]

If the key constraint is the capacity of low-income and lower-middle income coral reef states to meet international reef-related commitments, then creating a new financial mechanism to provide additional resources could help states fill the capacity gap (option 3.b), or some targeted combination of the three option such as the example presented in option four. Perhaps the biggest advantage of international policy instruments is to mobilize additional resources and provide an exchange of information.[cxlv] Coral reefs may be under the national jurisdiction of coastal states and difficult to characterize as global public goods as a basis for collective action and aid, however they exhibit characteristics of common pool resources (or quasi-public goods).[cxlvi] While interdependence on a shared resource, including global public goods, is typically the rationale for collective action for new investment, there is also a rationale for collective action for a 'common concern of humanity'. Such a shared concern, even if not a shared resource, can be a basis for collective action and was part of the rationale for the CBD.[cxlvii] More specifically, a common concern of humankind can be a rationale for international cooperation and aid to low-income and lower-middle-income coral reef states, who have jurisdiction to protect and sustainably manage coral reef ecosystems. Such aid can also be linked to information exchange, one of the central advantages to international policy. New and additional resources could also be linked to increased and coordinating monitoring and reporting, both enhancing information exchange and reducing the costs for developing states to meet existing commitments. Essentially, the provision of a new financial mechanism could help foster agreement by states to meet existing commitments, which may not have been the preference for independent decision-making. Such a mechanism could also foster increased accountability between states for meeting the targets already set in current international instruments.

The financial mechanism could be supported by ICRI, acting as a clearinghouse for information exchange on interventions, progress towards existing commitments, indicators of targets, etc. Developing states could prioritize needs for support based on the 79 targets identified here from existing international policy, as well as the 591 commitments throughout international policy, organized by the common anthropogenic drivers of change. While avoiding a 'check-list approach', a starting point could be to conduct of the self-audit of the relevant national instruments recommended in option 1, to assess coherence with existing commitments in international law, and any gaps. Such gaps could form the basis for any needed support through the financial mechanism, and monitoring progress toward the existing targets (e.g. in the 2030 Agenda and the Aichi targets). Using a standardized diagnostic of national reef policy instruments and

delivery mechanisms for commitments made under current international policy, states could prioritize directed and targeted funding from this new mechanism, to make measurable progress toward meeting existing targets. Table 14 below summarizes potential advantages and disadvantages between the proposed options.

Table 14. Potential Advantages and Disadvantages of Proposed International Policy Options

Option	Potential Advantages	Potential Disadvantages
Option 1: Status quo with accelerated implementation: • States self-audit national delivery of international commitments • States report regularly on progress • States develop national implementation plans	Does not require a change to the existing international policy framework, but rather renewed prioritization by coral reef states, facilitated by self-audits, national planning and international reporting	Focus is solely on assessment and planning, rather than on concrete actions
Option 2: Strengthen the existing international policy framework • Create an international monitoring group (or task ICRI) for national policy implementation • DFIs expand guidance for coral reef safeguards, leverage portfolios • States self-audit national delivery of international commitments • New global coral reef target • Invite states to ratify those global, legal instruments where further support needed • Amend instruments to expand the mandate of existing governance mechanisms, e.g. Regional Seas Conventions	Leverages existing international policy framework to try increase prioritization of coral reef commitments by coastal states; also helps to address coordination and monitoring challenges/gaps in current framework	Does not include any new mechanisms to support national implementation of coral reef commitments
Option 3: Introduction of new international instruments and/or mechanisms • New international instrument specific to coral reefs • New global financing mechanism for coral reefs	Creates new priorities for coral reef conservation, and new resources to support national implementation of commitments	New international instrument is a long-term undertaking, significant additional funds likely required for new financing mechanism
Option 4: Consolidated from previous three options: "coral reef-state solution" • States develop national implementation plans • Create an international monitoring group (or task ICRI) for national policy implementation • New global financing mechanism for coral reefs	Targeted and action-oriented package of support to coral reef states, for national implementation of existing international commitments, including new monitoring and coordination, new financing for low-income and lower-middle-income economies	Significant additional funds likely required for new financing mechanism

In closing, regardless of the option(s) taken, international policy can play a role in helping to address the drivers of change in coral reef ecosystems, and particularly in this case the locally-generated drivers, to enhance resilience of the ecosystems to globally-widespread climate change to the extent possible. As

mentioned previously and illustrated in option 4, the actions proposed in these options are not mutually exclusive, and could be seen as part of a package to meet both the reef-related Aichi targets[8] and reef-related targets for SDG 14.[9] As the post-2020 global biodiversity framework is developed, and the 2020 ocean conference approaches to assess the status of implementation of SDG 14, these options or some combination of them would likely be a central piece of any coordinated action by states.

[8] Reef-related Aichi targets include:

- By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning;
- By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained;
- By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits; and
- By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

[9] Reef-related targets for SDG 14 include:

- By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics;
- By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism;
- Provide access for small-scale artisanal fishers to marine resources and markets;
- By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution;
- By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism;
- 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; and
- By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

Glossary

Anthropogenic drivers of change in coral reef ecosystems: defined here as the types of impact that social systems have upon coral reef ecosystems, and deconstructed into: (i) the human activities driving the changes, and (ii) the actual pressures on the coral reef ecosystems caused by these activities, organized according to 'themes' that are analogous to a 'sector'. [cxlviii]

Coral reefs: defined as a physical structure which has been built up, and continues to grow, over decadal time scales, as a result of the accumulation of calcium carbonate laid down by hermatypic corals and other organisms.[cxlix]

Enforcement mechanisms: organizations, processes and/or systems to enhance compliance with policy commitments (i.e. for enforcement, including monitoring and the penalty assessment process)

Financial mechanisms: organizations, processes and/or systems established to provide financing support for developing states to meet their commitments in the international reef-related policy instruments, typically in the form of grant or concessional funds

Governance: the process of discussing, agreeing on, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal.[cl] Governance is a complex concept broken down here into the components of (i) instruments and (ii) mechanisms, operating at various levels, for further analysis.

Governance mechanisms: defined here as organizations or processes to help administer and deliver (i.e. to implement) policy instruments. This may include associated funding mechanisms and investments. Essentially, governance mechanisms are defined as the means by which governments deliver the instruments that they have specified, e.g. organizations or funds created for implementation.

Institutions: the rules, norms, shared strategies that members of a society construct in order to guide behavior toward specific goals. [cli]

International legal instruments: defined here as treaties or agreements concluded between states in written form and governed by international law[clii]

International voluntary instruments: defined here as non-binding, voluntary policy instruments agreed in written form between two or more states, for example guidelines and initiatives

Organizations: created by rules in order to administer them (and typically create subsequent rules for this purpose).[cliii]

Policy instruments: defined here as tools by which governments use power in attempting to ensure support and effect social change, in this case to protect and sustainably manage coral reef ecosystems.[cliv]

Policy commitments: within instruments, legal instruments contain 'obligations' and voluntary instruments contain 'provisions', both of which are collectively defined here as '*commitments*' made by the states, which can be considered as discrete, multi-dimensional variables for analysis

Policy instrument effectiveness: the degree of goal-realization due to the use of certain policy instruments.[clv]

Public policy: a particular course of action or inaction pursued by governments, individually or collectively[clvi]

Socio-ecological systems: human-nature interactions described as coupled human and natural systems, in which societies and environments shape each other, where the changing human condition serves to both directly and indirectly change ecosystems, and in turn changes in ecosystems cause changes in human well-being[clvii, clviii]

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United Nations Environment Programme
P.O. Box 30552, Nairobi 00100, Kenya
e-mail: regionalseas@un.org
Web: www.unenvironment.org