ASSESSMENT OF COMMITMENTS ON SUSTAINABLE FISHERIES TO THE OUR OCEAN CONFERENCES

Where are we now?

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Summary (English):

Many ocean commitments have been made at the five *Our Ocean* conferences since 2014 under six different areas of action. The Institute of Marine Research was given the task of evaluating the 182 commitments made to the action area “Sustainable fisheries”. We analysed the content, summarised the progress of implementation and evaluated the impact of the commitments.

A total of 77 entities provided commitments. Governments made up the largest group and accounted for 65% of the commitments. NGOs were the second largest group of pledgers and accounted for 20% of the commitments.

There was a high degree of fulfilment of the commitments: three quarters of the commitments had a 50% or higher degree of fulfilment and 50% of the commitments have been finalised. Some recent commitments (made in 2017 and 2018) have not been initiated.

Combatting of illegal, unreported and unregulated fisheries and support to the port state measures process are key issues addressed by many of the commitments. We also recognise that important components such as science, advice and laws have less support in the *Our Ocean* commitments and should receive more attention in the future.

Regional fisheries management organizations (RFMOs) are important instruments for sustainable fisheries management and was addressed by some commitments. For RFMOs to be effective, we emphasize that they should be empowered to have legal authority to devise fisheries regulations.

There are quite a few commitments in our analysis that were hard to evaluate. To increase transparency in pledging of commitments, more emphasis should be put on documenting and evaluating their impact.

We consider that the *Our Ocean* commitments in sustainable fisheries overall have been successful in terms of generating attention to the issue and providing funding of projects that are supportive of sustainable fisheries. To achieve effective fisheries management and sustainable fisheries, it is important that all the components of the fisheries management system are in operation at the appropriate spatial scale (local, national, regional) over time. A gap analysis on requirements for achieving sustainable fisheries at the appropriate scale, is a good starting point for a systematic approach to providing commitments. We suggest that this is considered in future *Our Ocean* conferences.

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1 - Introduction

1.1 – Sustainable fisheries management

The *Our Ocean* conference series was started in 2014. It has become a high-profile platform to present commitments for actions for the oceans (Grorud-Colvert et al., 2019). A number of commitments were made during the five *Our Ocean* conferences in six different action areas. Here we report on an assignment issued by the Ministry of Foreign Affairs, tasking the Institute of Marine Research to evaluate the 182 commitments that had been made for the "Sustainable fisheries" action area. We analyse the commitments made, the extent to which they have been implemented and evaluate their impact.

The concept of Maximum Sustainable Yield (MSY) originates from fisheries biology and fisheries management and dates back to the 1930s – aiming to exploit fish resources with a long-term maximum catch without overfishing and depleting the resource. Before World War II – overfishing was not really a problem in most fisheries due to low fishing effort. However, from the late 1940s, there was a tremendous development of fishing vessels and fishing technology (gear, instruments) leading to a significant increase in fishing effort, resulting in severe overfishing in the 1950s and 60s.

One of several catastrophic examples was the depletion of the largest fish stock in the North East Atlantic, the Norwegian spring spawning herring in the late 1960s (Dragesund et al., 2008). This was a wake up call for the entire fisheries sector and led to a common realisation that sustainable fisheries management was required. Sustainable fisheries management is thus a relatively new undertaking that gradually developed over several decades (FAO, 1995). This has led to the rebuilding of many depleted fish stocks in waters like the North East Atlantic, illustrating that sustainable fisheries are achievable if prioritised by all the relevant entities.

The world's capture fish landings plateaued at about 85 million tonnes in the 1990s and have not increased since (FAO, 2018). One billion people, largely in developing countries, rely on seafood as their primary source of animal protein. In addition, millions of jobs around the world depend on fisheries, aquaculture and their global markets. Seafood is the most traded food commodity in the world (FAO, 2018), and an integral part of many people's livelihoods. In the FAO State of World Fisheries and Aquaculture 2018, the percentage of overfished fish stocks was estimated to be 33%, while 60% of fish stocks were maximally sustainably fished and 7% underfished (FAO, 2018). There is a trend towards an increase in the proportion of overfished stocks.

There are huge discrepancies in the implementation of sustainable fisheries management practices in different parts of the world. Generally, management systems are more developed and better implemented in industrialised countries (Hilborn et al., 2005; Costello et al., 2012), where there are also more active regional fisheries management organisations (RFMOs). So, while fish stocks in developed countries are generally harvested sustainably, or moving towards sustainability, the situation in the unassessed stocks in most developing countries is generally far worse (Worm et al., 2009; Costello et al., 2012; FAO, 2018).

There is increasing recognition of the need for an ecosystem approach to fisheries, and its gradual implementation. The ecosystem approach broadly aims to reduce the effect of fisheries on ecosystem structure (Brodziak and Link, 2002; Pikitch et al., 2004; Bianchi and Skjoldal, 2008), while at the same time incorporating ecosystem information in management decisions. To achieve sustainable fisheries, the effects of fishing activities, not only on the target stocks, but also on their ecosystems must be considered. Another important factor is to harvest the stock dynamically in response to its productivity. The productivity is generally determined by the interactions with other ecosystem components and climate. Fish stocks can be affected, not only by fisheries, but also by other human activities, such as the petroleum industry, aquaculture, shipping, ocean energy and tourism. It is therefore, important, when managing fisheries, that the effects on fish stocks by other sectors are considered and managed as well (Pikitch et al., 2004; Link and Browman, 2014).

There are several aspects that are essential to achieving sustainable fisheries management: scientifically based stock assessment and management advice, regulation of access to fisheries and catch restrictions, and enforcement of regulations (FAO, 1995; FAO, 1997; Gullestad et al., 2013; Hilborn and Ovando, 2014). The implementation of these components requires a legal framework, competent institutions and the political will to put control and implementation strategies in place. Many harvested stocks are widely distributed, often across several national Exclusive Economic Zones (EEZs) as well as international waters. Achieving sustainable fisheries can, therefore, be complex. Nevertheless, the lessons learned from many countries that have invested in these components of fisheries management, show that fisheries can be sustainable and that the effects of harvesting on the rest of the ecosystem can be mitigated. In many

developing countries, management systems are poorly developed or absent.

Illegal, unreported and unregulated fishing (IUU) is estimated to amount to between 11 and 26 million tonnes annually (Agnew et al., 2013; www.fao.org). In addition, transnational organized crime undermines the sustainable management of fish resources and threatens the development of a healthy blue economy. Other harmful impacts on marine ecosystems include pollution, littering, acidification, overfishing, and habitat destruction. The global potential harvest from capture fisheries is estimated to be about 20 million tonnes higher than current levels if sound management practices were to be implemented (Costello et al., 2016; SAPEA, 2017).

There is, therefore, substantial potential to increase sustainable fisheries production with improved management. An increasing world population will need 50% more food by 2050 and seafood can play a significant role in this respect.

Although not perfect, fisheries management in many developed countries is reasonably good and moving towards sustainability. However, there is still a long way to go to achieve sustainable fisheries globally. Many commitments have been made over the years to implement actions towards sustainable fisheries, including the provision of funding. The question now is, whether there is any documented proof of perceivable improvement because of impacts from these commitments?

The 2030 UN Agenda for Sustainable Development was adopted by all the United Nations Member States in 2015 (UN, 2015). There are 17 Sustainable Development Goals (SDGs) and SDG 14 deals with “Life below water”. Goal 14.4 specifically deals with sustainable fisheries: “*By 2020, effectively regulate harvesting, and end overfishing, illegal, unreported and unregulated (IUU) 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.*” Measures to strengthen the sustainability of fisheries are urgently needed if this ambitious goal is to be achieved in the near future.

This is the broad context for evaluating the *Our Ocean* commitments made in the action area “Sustainable fisheries”. We analyse the content of these commitments, summarise the progress of implementation and evaluate the resultant impact of the commitments.

2 - Materials and methods

2.1 - Self-reporting by pledgers

As part of the background material for this project, the Institute of Marine Research (IMR) was given a list of 182 commitments that were made in the action area “Sustainable fisheries” at the previous five *Our Ocean* conferences. For each commitment, a brief description of the content and contact information was provided.

To assess the progress made by each commitment, questionnaires (see Appendix 1) were emailed to the contact persons between 8–12 April 2019. It comprised three questions, with the option of providing “Additional comments”. The questions asked were:

1. To what extent has the commitment been fulfilled?
2. Which actions have been undertaken to achieve your commitment?
3. How will these achievements likely impact on the sustainability of the fisheries?

The questionnaire could be answered online or using the form attached to the survey email. The pledgers were asked to report on the implementation and impact of their commitments, using a method similar to that used by Grorud-Colvert et al (2019) in the study of MPA commitments. Of the 182 contacts who were sent the questionnaire, 156 responded to all three questions, while eight did not complete all of them. Eighteen did not respond, but ten of these had described the impact of their commitments on the *Our Ocean* webpage, so sufficient information on the progress and outcome was available for this study. Based on this, there is information on the progress of implementation of 95.6% of the commitments.

Information based on self-reporting has its limitations. We base our results, analyses and discussions on the assumption that responders provided accurate information. We are not able to verify the validity of this assumption.

A very small number of commitments were made at the first conference in 2014, and the most were pledged in 2017 (Table 1). For the three first conferences, self-reports on impact are given for all the commitments, but for the 2017 and 2018 conferences, impact information lacks from four commitments in each of the years (Table 1).

Table 1. *Number of commitments made each year and the number of commitments where impact information.*

Year	Commitments	Impact information
2014	6	6
2015	33	33
2016	24	24
2017	71	67
2018	48	44
	182	174

2.2 - Categorisation of the pledgers

Those who made commitments – the pledgers – were categorised into six groups: Governments, Commercial actors, Foundations, NGOs, International organisations and Research (Appendix 2).

2.3 - Categorisation of the commitments

Part of the task given by the Ministry of Foreign Affairs was to categorise the commitments. Sustainable fisheries depend on coordinated efforts between science, management and the industry. Based on our experience and best practice in fisheries management (see FAO, 1995; FAO, 1997; Gullestad et al., 2013) we developed a list of ten components that are important to achieve sustainable fisheries (Table 2). We then categorised the 182 commitments accordingly. Most commitments were relatively focused and therefore easy to assign to a particular component. Some

were of a more diffuse or multi-purpose nature and were categorised according to what we assumed to be the major purpose of the commitment. A few commitments were grouped as “Undefined” as they were not considered to be supportive of sustainable fisheries (e.g. commitments to aquaculture).

Table 2. *Sustainable fisheries: Commitment categories, explanation and abbreviations.*

Categories	Elements	Abbreviation
Policies and political will for sustainable development	Priority for sustainable fisheries management – political and financial institutional instruments	Policy
Scientific knowledge on status and trends of fisheries resources	Fisheries independent data (research) Scientific capacity on fish stock assessment	Science
Management advice	Scientific advice to management on sustainable fishing effort and patterns Advice is understood and adhered to by fisheries managers	Advice
Fisheries laws, regulations and measures	Modern laws Relevant and modern regulations Relevant measures implemented, including those needed to adhere to management advice	Laws
Fisheries statistics	Data on catch, fishing effort, economics. Registries on fishermen, vessels, licenses,	Statistics
Fisheries monitoring, control and enforcement	Control that fisheries are conducted according to laws and regulations Control at sea and at landing Fisheries licenses, registries, etc.	Enforcement
Transparency and traceability	Information on data, advice, fishing permits, licenses, quotas, catches, etc. – easily available in the public domain Seafood certification, catch documentation schemes	Transparency
Stakeholder involvement	Good communication and information between stakeholders; science, management, industry, general public Co-management	Stakeholders
International cooperation	International fisheries agreements, including shared stocks agreements and RFMOs. Participation in relevant international fora	Cooperation
Seafood quality, safety and sustainability	Systems for monitoring and control of seafood quality and safety.	Seafood
Undefined		Undefined

2.4 - Evaluation of impact of the commitments

The commitments vary substantially, both in terms of level of funding and in terms of geographic scope. We try to assess the impact of the commitments on the overall objectives of “Sustainable fisheries” in the *Our Ocean* conferences: “The *Our Ocean* conference is seeking to secure commitments to stop overexploitation of fish stocks and combat IUU fishing and fisheries crime, helping to manage fisheries resources at sustainable levels with a long-term, ecosystem-based approach.”

The data from the questionnaires were used in the impact assessment. Only projects where commitments have been implemented as stated in the responses submitted were considered. We consider an “impact” to be a positive change in one or more of the ten components mentioned above (Table 2) resulting from commitments made at the *Our Ocean* conferences.

The impact of an activity is often difficult to measure. To make an evaluation based on the information at hand, we classified potential impacts subjectively as:

L – Low
M – Medium
H – High
U – Undefined

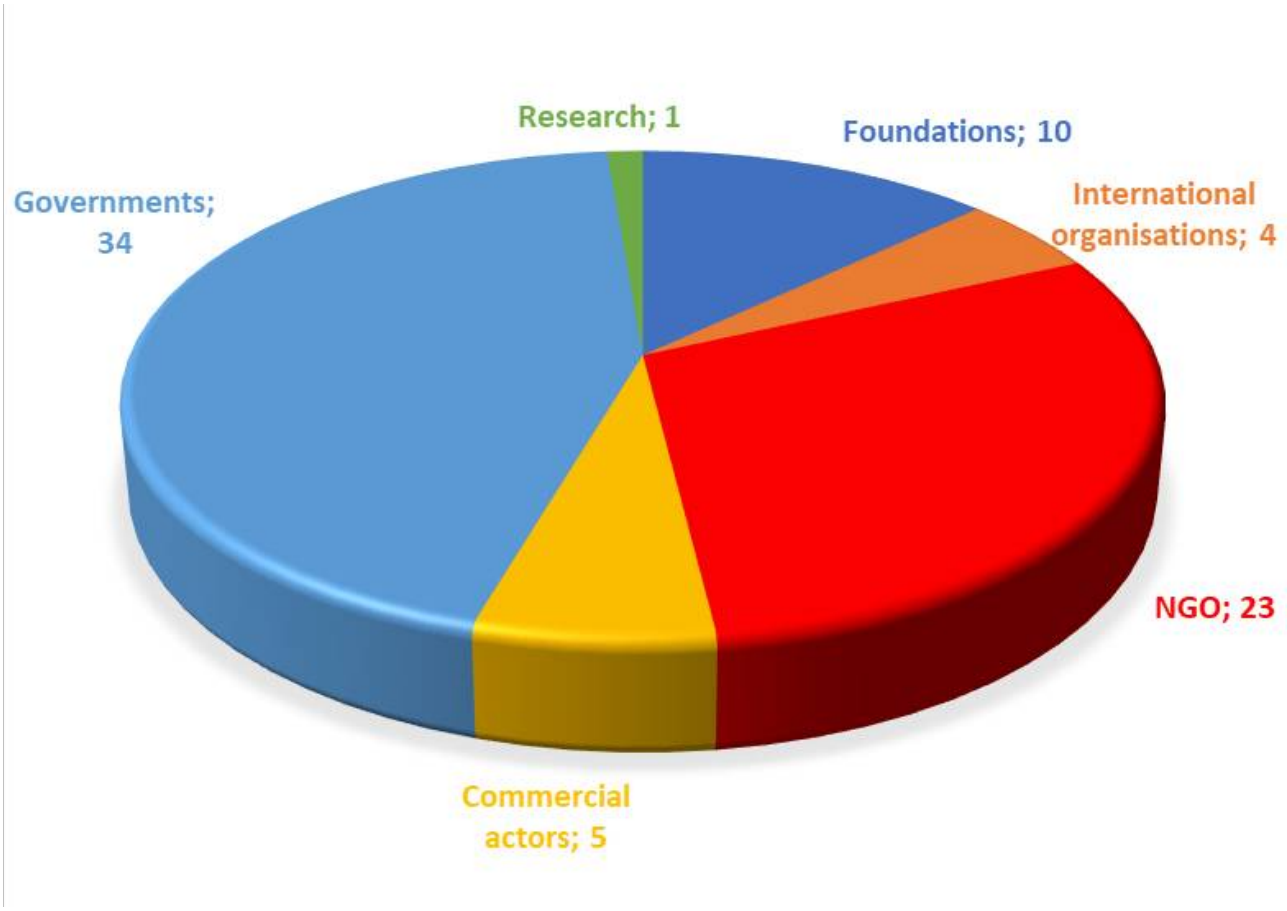
Commitments where there was little or no information on the impact were considered to be “Undefined” and were not included in any further evaluations. Initially, three experts individually scored each commitment using the scale shown above, after which a joint impact classification was made.

3 - Results

ASSESSMENT OF OUR OCEAN COMMITMENTS ON SUSTAINABLE FISHERIES

3.1 - Categorisation of the pledgers and area of implementation

A total of 77 entities provided commitments (see Appendix 2 and 3). These were grouped according to the type of entity. ”Governments” made up the largest, with almost half of the entities falling into this group (Figure 1, upper). “NGOs” were the second largest group, followed by “Foundations” and “International organisations”, “Commercial actors” and “Research”, respectively. “Governments” made 65% of the 182 commitments (Figure 1, lower). The “NGOs” were responsible for 20%, and the other groups together accounted for the remaining 15%.



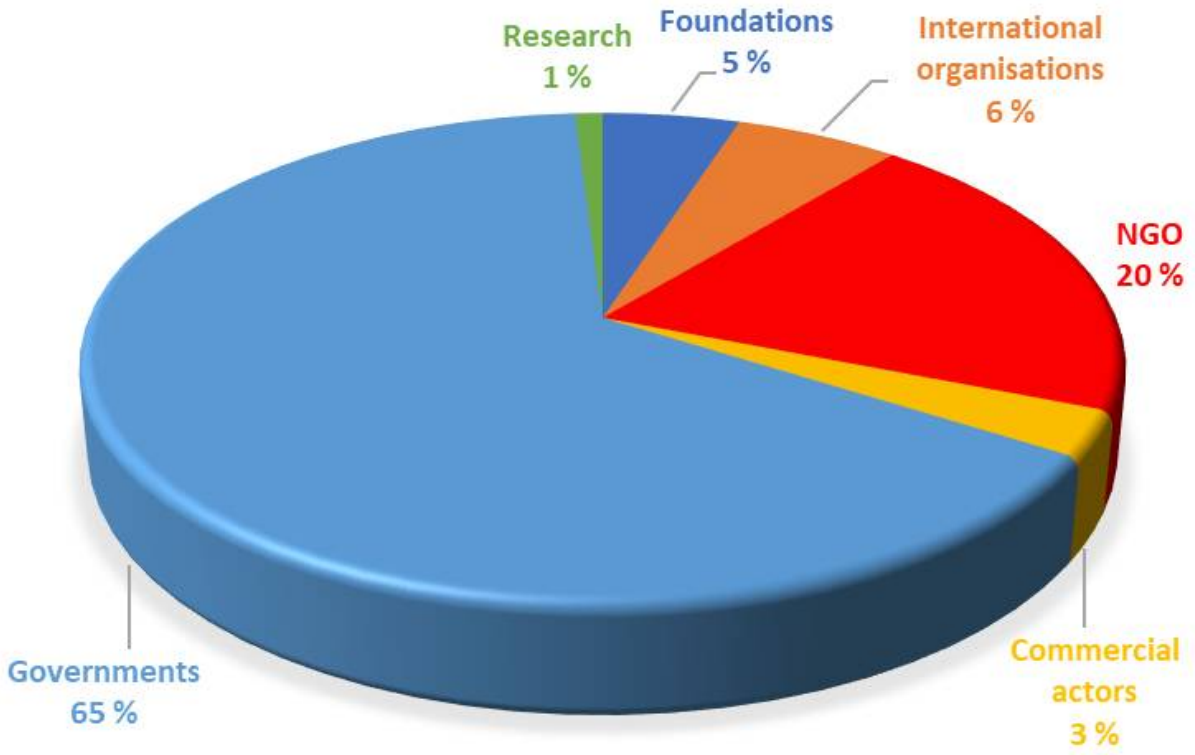


Figure 1. *Categorisation of the of pledgers and the number of entities per group that had made commitments (upper), and the proportion of commitments made per group (lower).*

6.2 - Progress in implementation of commitments

It takes time for the commitments to be implemented (Table 3) and for them to make an impact on the fisheries. The number of completed commitments were, as expected, highest for those that were pledged in the initial years, indicating that it takes time to fulfil promises that were made. Most of the projects resulting from commitments made at the first three conferences have been completed, while only 30% of those made in 2017, and 27% in 2018 have been completed. The status of some commitments is unknown, possibly because they have yet to be implemented. Four commitments are still in the planning phase (Figure 2). With regards to the degree of implementation, no difference was noted between commitments made by governments or by civil society/business. Some commitments have a timeframe of up to 10 years, while most have a relatively short time horizon of 1–2 years.

Table 3. *Degree of completion of implementation of commitments over the years.*

	100 %	75 %	50 %	25 %	0 %	Unknown	Total
2014	6						6
2015	27	4	2				33
2016	22		1	1			24
2017	24	16	16	11		4	71
2018	13	6	5	16	4	4	48
Total	92	26	24	28	4	8	182

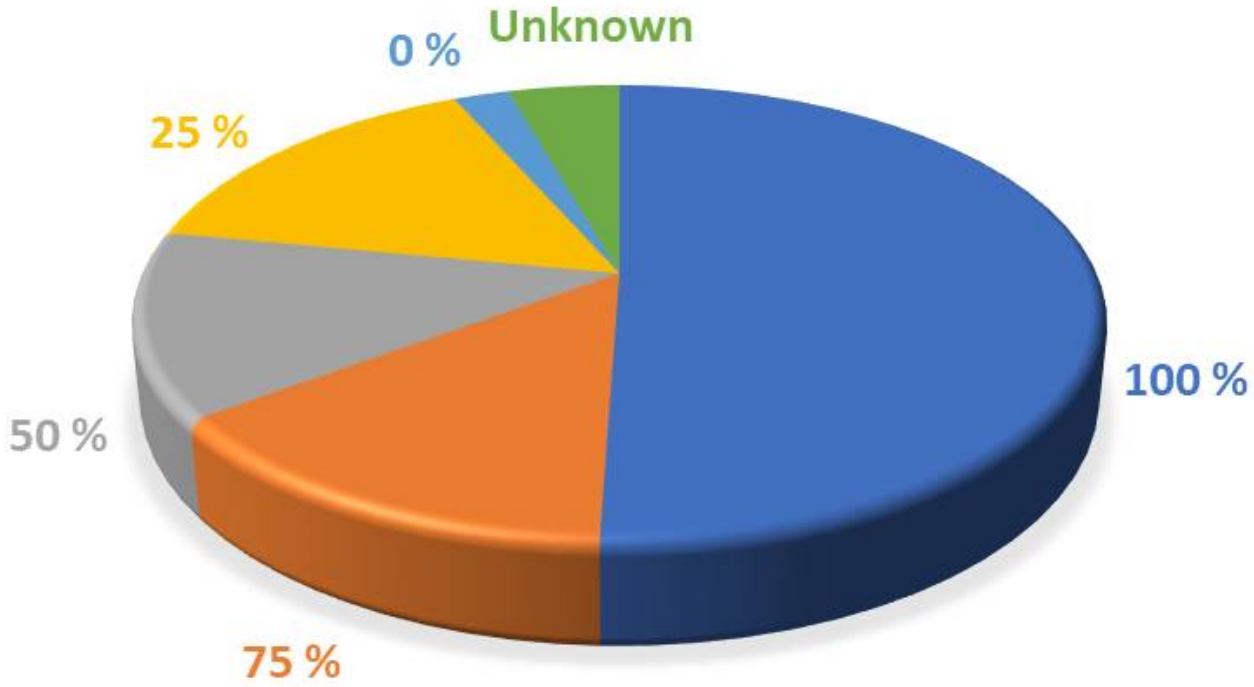


Figure 2. *Degree of fulfilment of commitments in the five different categories (0, 25, 50, 75 and 100%, and Unknown) and the number of commitments per fulfilment category.*

6.3 - Geographic distribution of pledgers and commitments

The geographic distribution of the “Government” category was analysed further (Figure 3). Europe made the most commitments and to the highest number of regions. The commitments were for implementation in all regions, with the exclusion of North America. Europe made most commitments to Europe itself, but also made many commitments to Africa and globally (Figure 3).

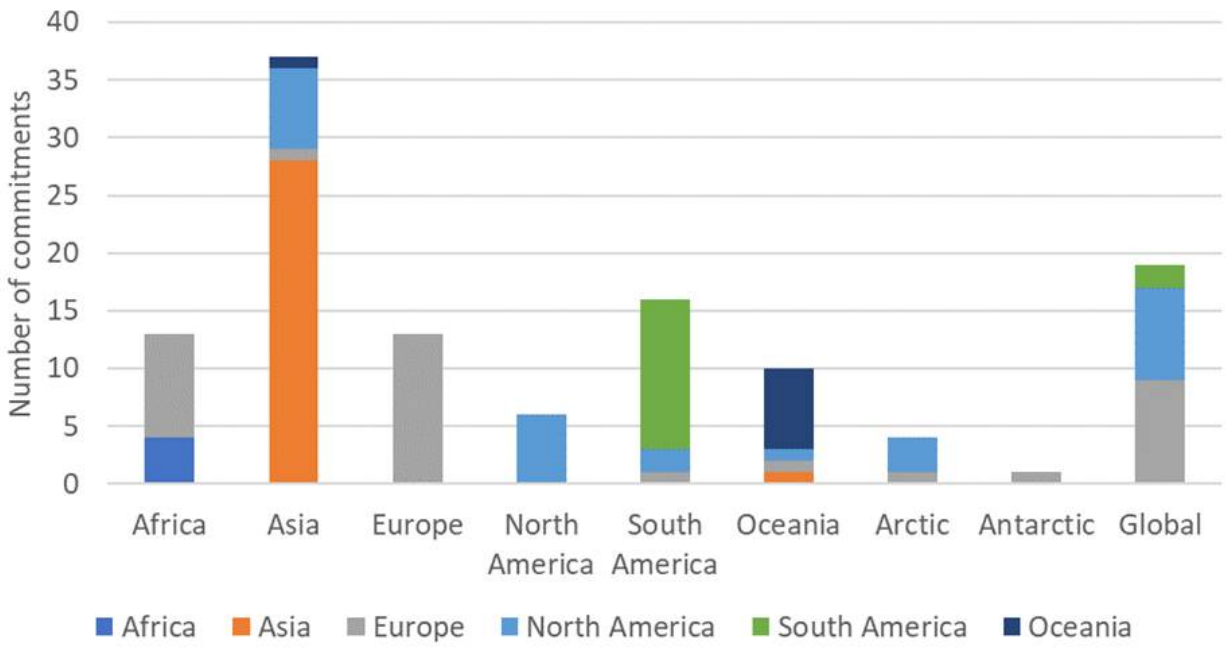


Figure 3. *Distribution of area of implementation of commitments by pledging governments in different parts of the world (colour codes).*

Of the 36 European commitments that could be identified using our ten commitment components, 23 related to “Enforcement”, seven to “Science” and two to “Cooperation” (Figure 4). The rest were targeted at “Seafood”, “Policy”, “Statistics” and “Transparency”.

Asia was the second largest pledger, making a total of 29 commitments (Figure 3) aiming at Asia, with the most important pledges being from the governments of Indonesia, Thailand and Japan. They focused on “Transparency” (6), “Statistics” (4), “Policy”, “Enforcement”, “Cooperation” and “Other” (three each) and “Science” and “Laws” with two each.

North America (USA and Canada) was the third largest pledger making a total of 27 commitments (Figure 3). Seven of these addressed Asia, six North America, two South America and three the Arctic. In addition, nine were global. Of the 27 commitments from North America, ten were on “Enforcement”, seven on “Cooperation” three on Transparency, and two on “Statistics”. In addition, “Policy”, Science, Advice and “Stakeholders” were included. One was “Other”.

South America is the fourth on the list and made 15 commitments. Thirteen of these commitments were for South America and two were global. Ten of the commitments were on “Policy” related issues, four on “Cooperation”, and one refers to “Law”. The main country contributing from South America was Chile.

The fifth on the list of pledgers is Oceania with 8 commitments. Of these, seven are to Oceania and one to Asia. The commitments were related to the categories, four were on “Enforcement”, two on “Statistics”, one on “Policy” and “Other”. In Oceania, there are two main contributing countries, Australia and New Zealand.

Africa made four commitments, all for Africa. Two each on the categories “Enforcement” and “Laws”.

If we look at the 63 commitments given by the different organisations- 19 of them are on “Transparency” and 11 on “Enforcement”. Then they had seven on “Cooperation” and six on both “Policy” and “Advice”. Further on they had four on “Statistics”, “Stakeholders” and “Other”, and finally, one on “Science” and ”Seafood”. A majority (28) of their commitments were worldwide or global, while 13 focused on different regions of Asia.

Asia is the largest receiver (area of implementation) of commitments made by governments with a total of 37 (Figure 3).

28 commitments were from countries in Asia, 7 from North America, and one from Oceania and Europe. All components of sustainable management are included with a concentration on “Transparency”, “Statistics” and “Enforcement”.

The second largest receiver of commitments is South America. Of the 16 commitments made, 13 were from South America itself, two from North America, and one from Europe.

The third largest is Europe, receiving 13 commitments, all pledged from Europe itself. The component with highest number of commitments (7), is “Enforcement” and the rest evenly spread over the others.

The fourth largest receiver of commitments is Africa, with a total of 13. Four of them are from Africa and nine are from Europe. Of the commitments to Africa, three are on “Science”, three on “Enforcement”, two on “Policy” and “Cooperation”. There was also one each on “Advice”, “Laws” and “Seafood” quality.

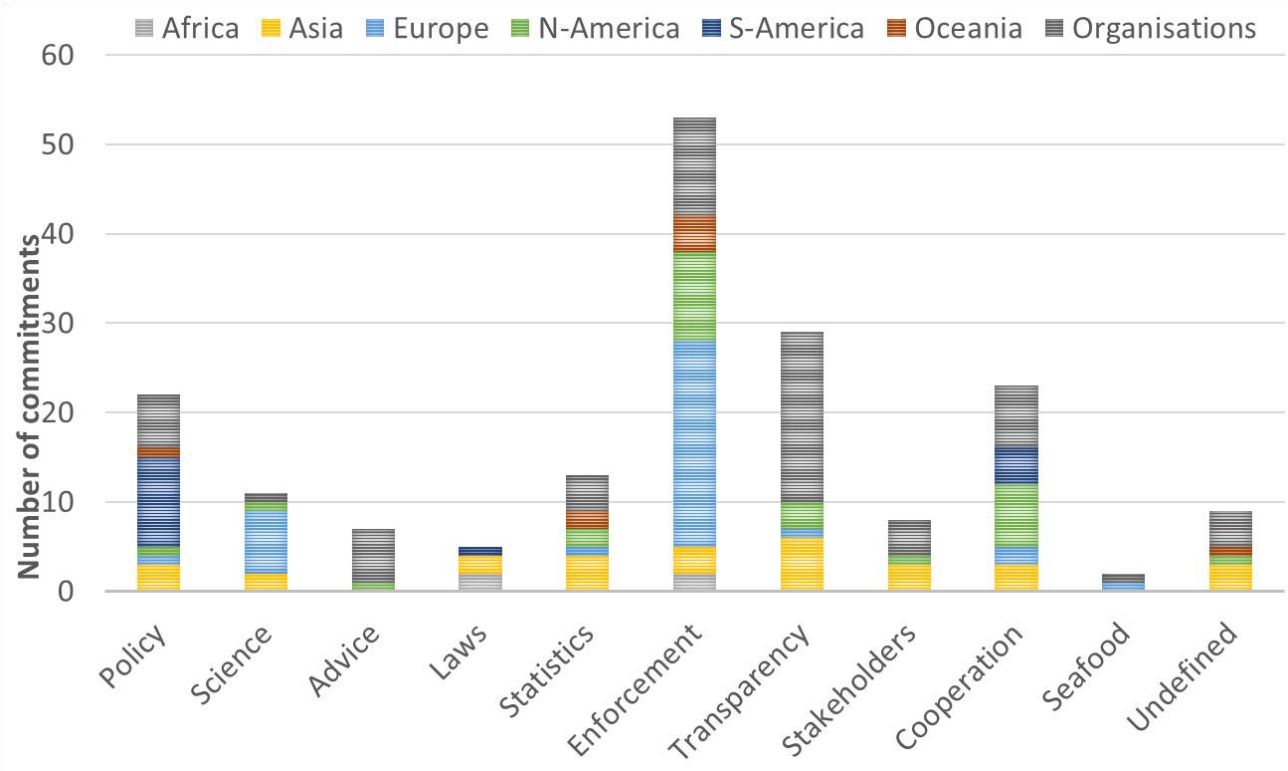
The fifth largest receiver of commitments is North America, with six commitments, all from North America. There are commitments on “Enforcement”, “Transparency”, “Advice” and international “Cooperation”.

Oceania received ten commitments, seven from within Oceania and the rest from, Asia and North America. The commitments were on “Enforcement”, “Stakeholders” and “Statistics”.

The Arctic received four commitments, three from North America and one from Europe. Two were on “Science”, one on “Policy” and one on international “Cooperation”.

Antarctica received one commitment on “Science”.

There were some differences in categories of the commitments made (Figure 4). For example, Europe’s commitments were predominantly for “Enforcement” (23 commitments) and “Science” (7 commitments) components (Figure 4, upper panel). Asia’s commitments were more evenly distributed across the components (Figure 4).



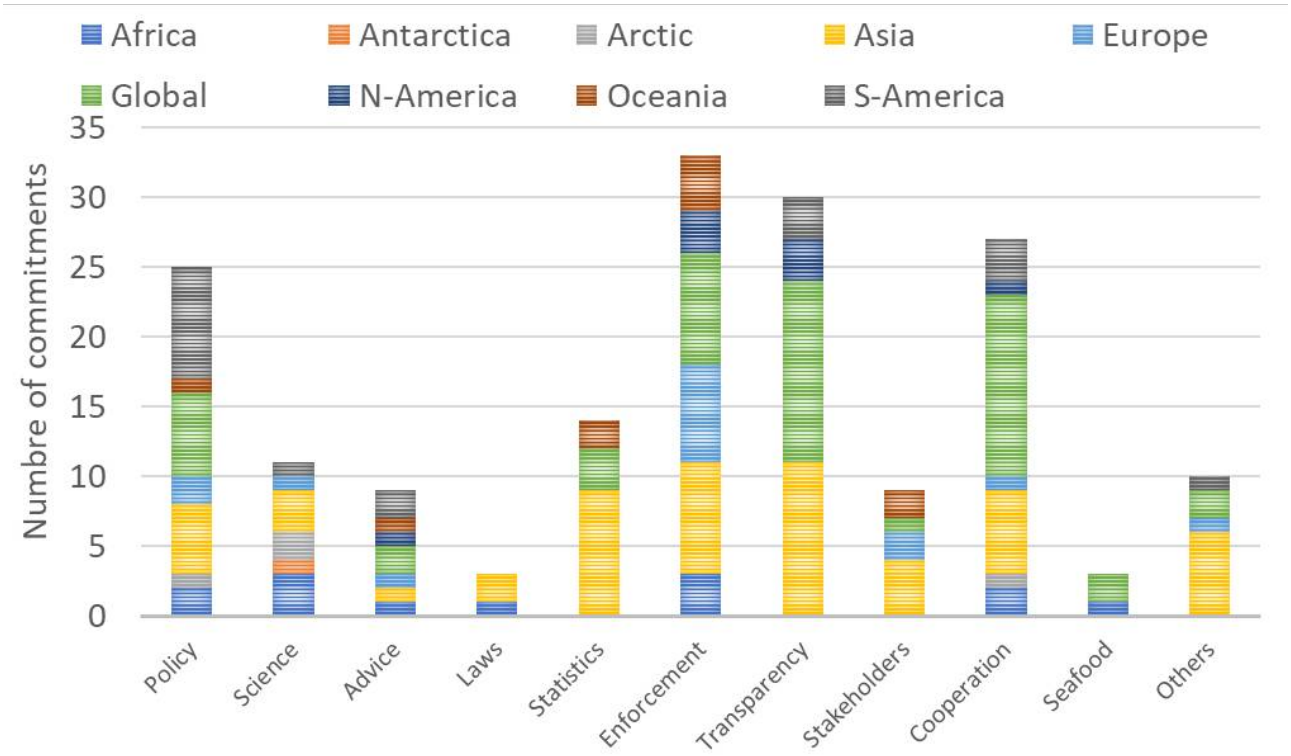
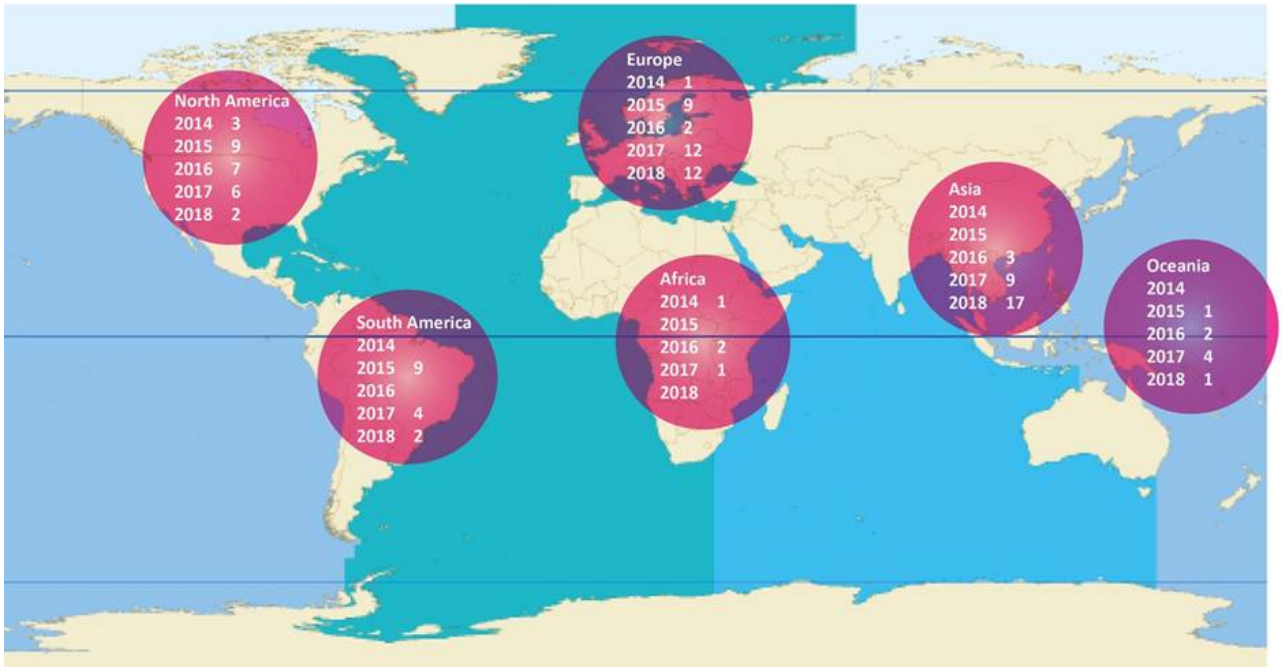


Figure 4. *Overview of components of commitments made by different governments in different parts of the world and organisations (upper) and the area of implementation per component (lower).*

The geographic distribution of countries that made commitments and the areas of implementation are further illustrated in Figure 5. Over the years, the number of participants at the *Our Ocean* conferences has increased. Europe, Asia and North America have been the major pledgers. Asian countries did not actively participate at the first two conferences, but made many commitments at the conference in Bali, Indonesia in 2018. Africa and the South West Pacific have made very few commitments. Generally, the host countries of *Our Ocean* conferences actively made commitments.



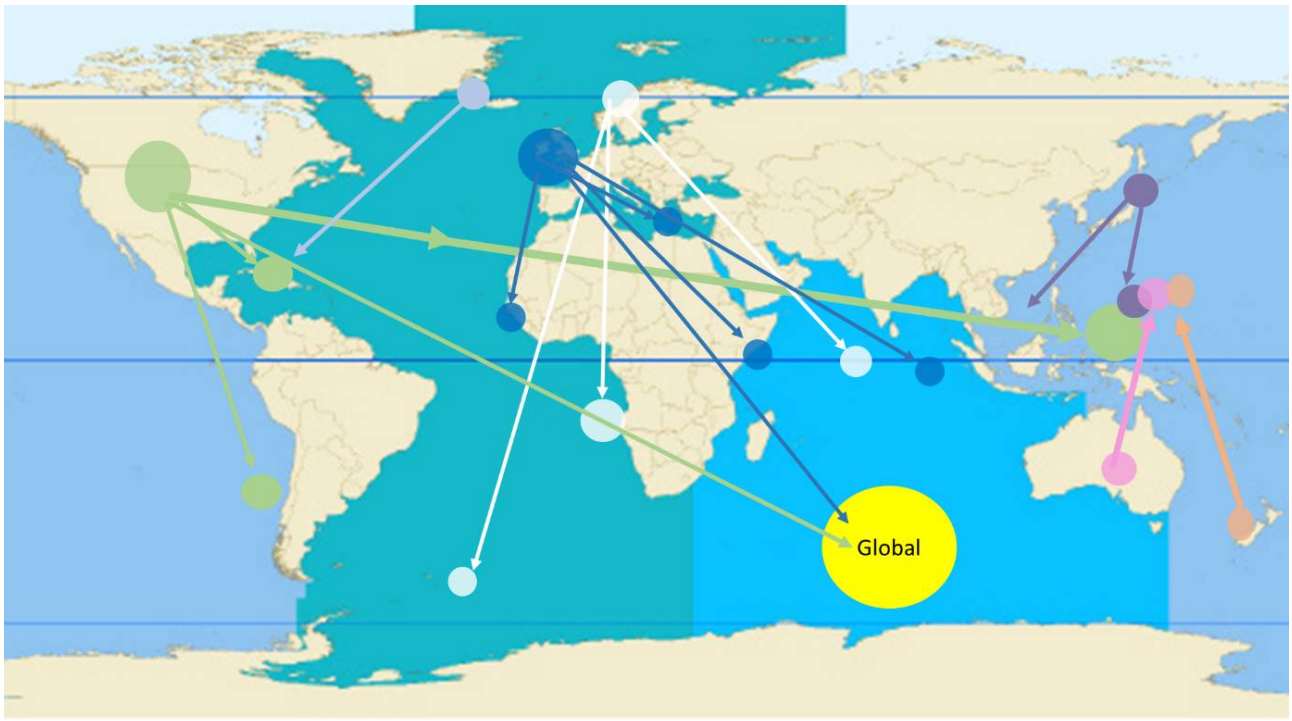


Figure 5. *Number of commitments made by the regions each year (upper panel), and location of pledgers and geographic area of implementation (lower panel).*

6.4 - Analysis of the commitment components

The commitments were further analysed with regards to the 10 components essential for sustainable fisheries (Figure 6). The commitments ranged from 3–53 per component. The “Enforcement” component had the most commitments, followed by “Transparency”, international “Cooperation” and “Policy”. Eight commitments were categorised as “Undefined”. Some differences between “Governments” and the “Other” pledger groups were apparent. “Governments” had a strong emphasis on “Enforcement”, while “Others” had “Transparency” as the most important component with “Enforcement” second (Figure 6, lower panel). “Advice” was emphasised by “Others” more than by ”Governments”. No major differences were found in the remaining components.

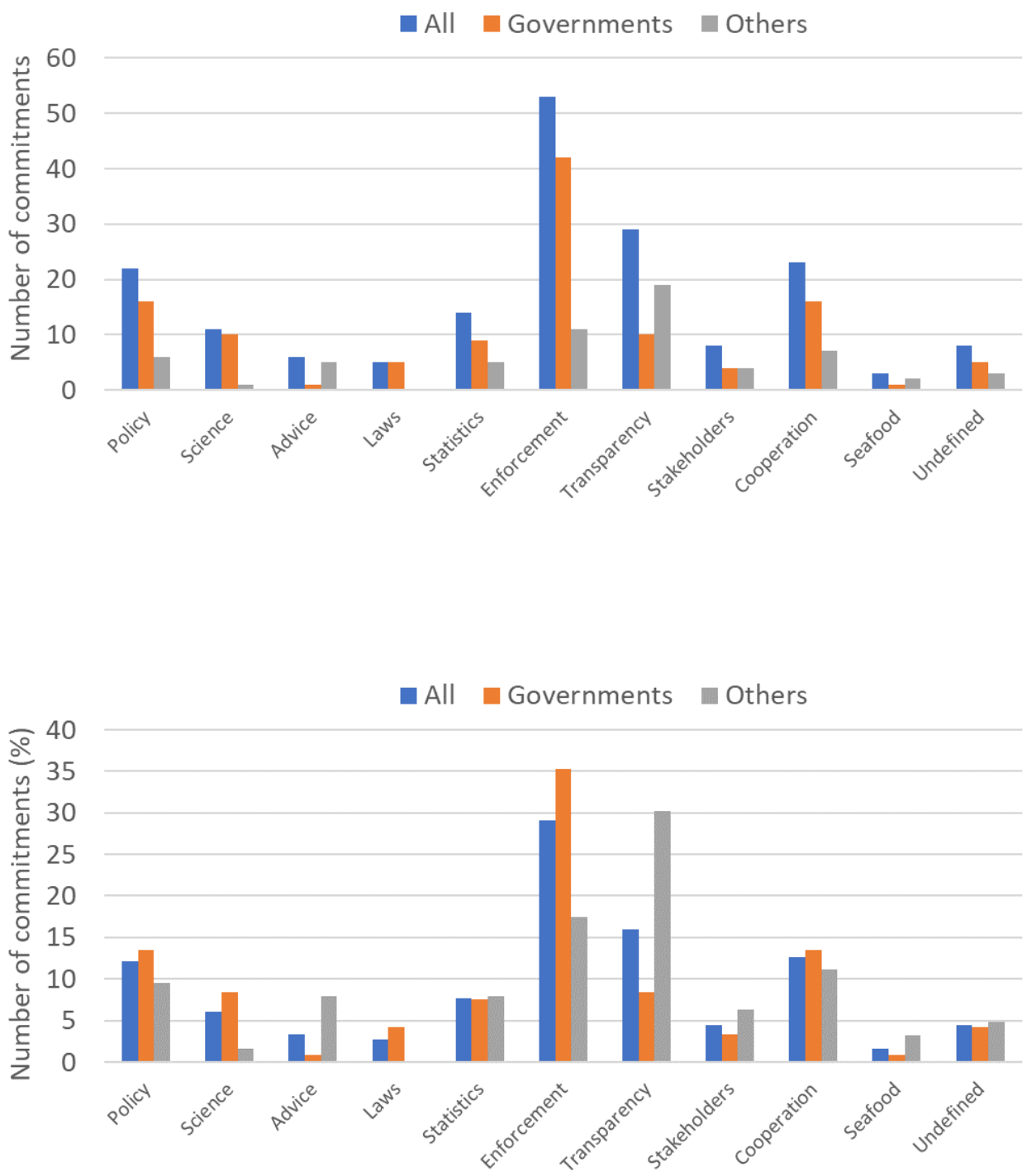


Figure 6. *Overview of number of commitments per component for all 182 commitments and separate for governments and the other groups taken together (see Figure 1). Upper panel is in absolute numbers and lower panel is in percentage to facilitate direct comparison between the pledger groups.*

6.5 - Assessment of impact of commitments

Although many commitments did not have a financial pledge associated with them, 87 did include a monetary contribution, totalling about 1.6 billion USD, with about 55% coming from “Governments”. While this is a large amount, it is only indicative of the total effort as there are a lot of commitments that have not been put a monetary value to. Of

those that committed money, 40 promised less than 2 million USD. The two highest amounts were allocated for building new vessels. Ireland will complete a 286 million USD naval vessel replacement, tasked primarily with maritime surveillance and fishery protection. Norway promised more than 150 million USD to promote fisheries development and management abroad, including building a third research vessel to train fisheries experts and managers from around the world. In addition, the Marisla Foundation announced that it would provide 100 million USD over five years to support projects to end overfishing, control, plastic pollution, and protect marine mammals. “Rare” committed 100 million USD by 2021 to support sustainable small-scale fisheries; ending overfishing, protecting critical marine habitats, strengthening access for small-scale fishers to marine resources and improving economic and social resilience. The Thai Union will invest 90 million USD in initiatives to ensure that 100% of all its tuna are sustainably sourced, with a commitment to achieving a minimum of 75% by 2020. Sustainably sourced tuna are defined as either: certified according to the standards of the Marine Stewardship Council or involved in a Fishery Improvement Project.

The distribution by category of the 87 commitments with a given financial contribution is shown in Figure 7. Most of the amounts committed were for “Enforcement” and “Cooperation”. Some funding was also provided for “Transparency” and “Policy”, and only very small financial contributions for the other categories.

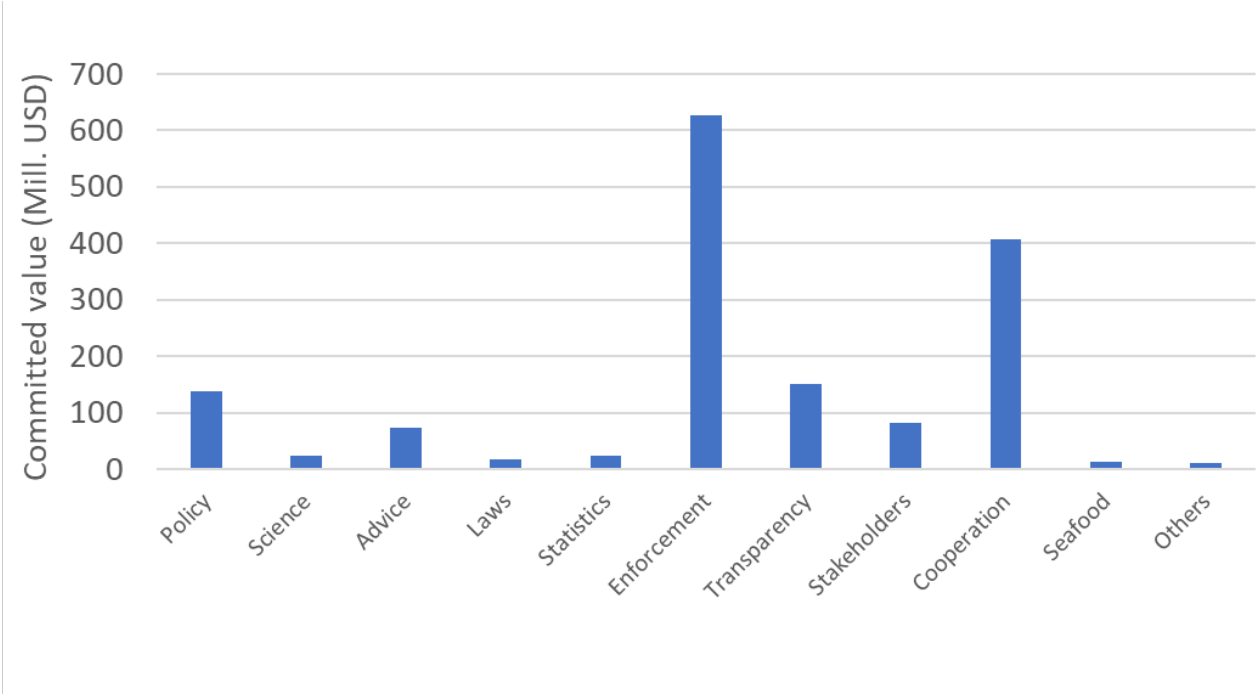


Figure 7. *Overview of committed amounts by commitment category.*

The impact assessment of the commitments is shown in Figure 8. It was difficult to assess the impact of many (78) of the commitments because they were only made at recent conferences and have not been fully implemented. Also, the information available to evaluate impact was limited. Of the remaining 104 commitments, 27 were assessed to have had a high impact, 57 a medium impact and 20 a low impact on achieving of the objectives stated above. This means that 80% of the assessed commitments were allocated to the “Medium” and “High” categories. The “Low” impact commitments were considered to have been related to a topic beyond the goals of *Our Ocean* and the ten components (Table 2).

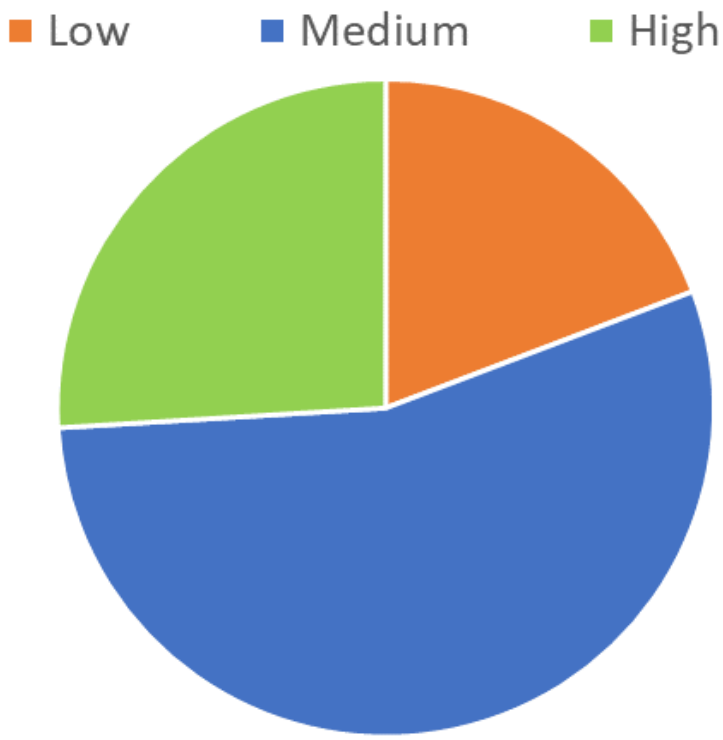


Figure 8. *Impact level of the sustainable fisheries commitments.*

The evaluation of the impact by commitment components is shown in Figure 9. “Enforcement” had the highest number of high impact commitments followed by “Cooperation” and “Policy”, “Statistics” and “Transparency”. “Advice”, “Stakeholders” and “Seafood” did not have any high impact evaluations. There were relatively few undefined commitments for the “Science” and “Statistics” components, and more for “Seafood” and “Advice”. For the other components the undefined was close to the average of 43%. The impacts are further addressed in the Discussion.

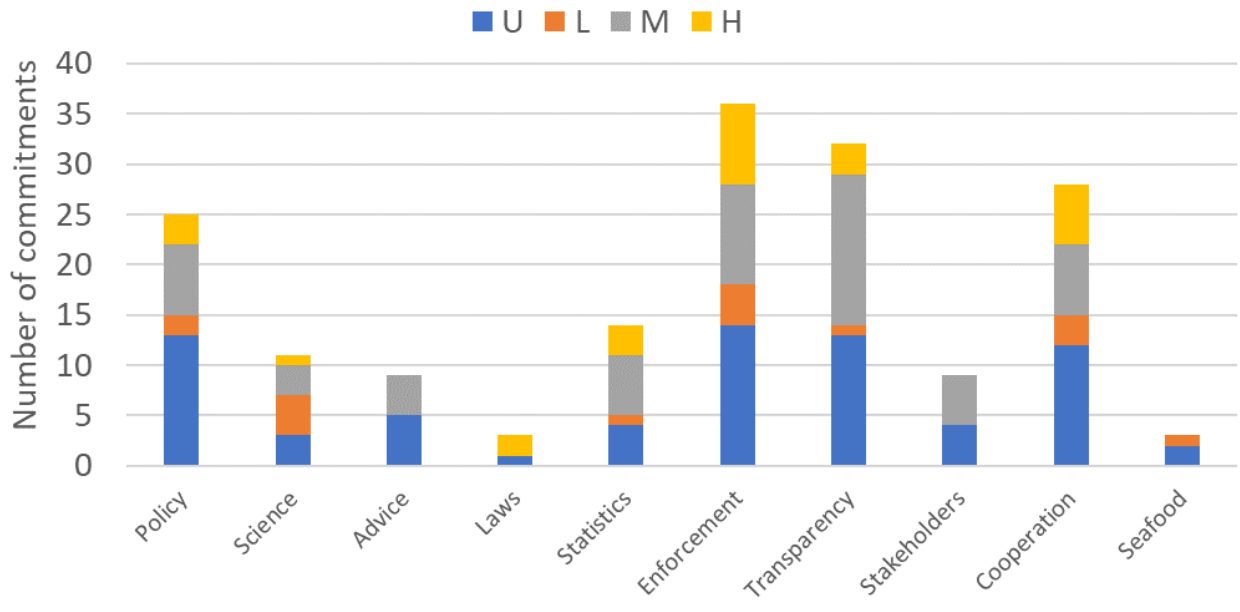


Figure 9. *Overview of commitment category by impact evaluation. U is undefined, L is low impact, M is medium impact, H is high impact.*

6.6 - Selected cases of commitments

Below we present five cases to illustrate the variety in theme and content of the commitments.

Case 1 – Combating IUU fisheries

As described above, “Enforcement” is the most frequent component for fisheries sustainability, mainly because there is a lot of attention paid to IUU fisheries. Fifteen governments (including the European Union which is considered as a single entity) have made commitments relating to this issue. Only a few civil organisations (of these only two NGOs) have mentioned IUU fishing. Fighting IUU fisheries covers a spectrum of commitments:

- The campaign to get the Port State Measures Agreement on IUU fishing ratified.
- Making unique vessel identifiers mandatory to enhance traceability of vessels (EU).
- Implement a new policy to fight IUU fishing (Chile).
- Promote sustainable marine fisheries and combat IUU fishing and seafood fraud (USA).
- Commitment to fight IUU fishing by upgrading of Monitoring, Control, and Surveillance (Thailand).
- Combat illegal fishing through legislation that establishes a catch documentation system to ensure traceability of fish catches (Morroco).
- Combat IUU fishing through policy, legal, and technical assistance, and capacity building to strengthen enforcement (FAO).
- Open the first regional center for maritime surveillance in 2018 to address IUU fishing (Palau).
- Enhance awareness of the consequences of IUU fisheries on food security, poverty reduction and profit (Norway).

Case 2 - The Technology for Tuna Transparency Challenge

Several commitments deal with tuna fisheries. An example is a commitment given by New Zealand in 2015. Offshore tuna fisheries are an important source of economic revenue and coastal fisheries resources are vital to the food security, resilience and livelihoods of Pacific peoples, providing between 50%–90% of the protein for coastal communities and are the primary or secondary source of income for up to 50% of households. As an economic resource that is shared throughout the region, including in New Zealand waters, management of the highly migratory tuna species (skipjack, yellowfin, bigeye and south Pacific albacore) requires strong regional commitment from all Pacific Island countries to be effective. Therefore, the commitment from Micronesia in 2018 is very important. The Technology for Tuna Transparency Challenge is an invitation to the broader global community to join the Federated States of Micronesia as it makes strides towards ensuring that fleets fishing its waters do so with 100 percent transparency. This is the first time a developing nation has made this type of commitment to 100 percent transparency across its commercial fisheries.

Case 3 - Indigenous rights to fish

A project to research ways to strengthen indigenous rights to fish and food sovereignty, as well as co-management models for fisheries security in Inuit communities in the Arctic was made by the Environmental Law Institute, USA in 2017. The project utilize indigenous knowledge and social science methodologies and will engage with Inuit who play a role in natural resources management under each case study – all guided by input provided by an expert advisory committee. «Food sovereignty» is the idea of a right of Inuit to define their own hunting, gathering, fishing, land and water policies; the right to define what is sustainably, socially, economically, and culturally appropriate for the distribution

of food; and to maintain ecological health.

Case 4 - The Marine Stewardship Council

The Marine Stewardship Council (MSC) programme provides standards for certification of fisheries to ensure sustainability. The permission to use the MSC label on products and menus demonstrate to a company's customers that its seafood is sustainably sourced. Fisheries in the MSC program are assessed according to agreed, science-based standards of sustainability. The assessment process encourages dialogue and transparent reporting, enabling those involved to establish actions for the fishery to achieve and maintain sustainability. Fisheries which meet the MSC Standard and become certified address marine habitats, species and seafood supplies. Where there is room for improvement, they are also required to deliver conditions of certification. Between 2016 and 2018 MSC certified fisheries delivered 288 conditions to further improve their sustainability.

Case 5 – Sustainable seafood sales and purchase

Carrefour announced that half of all fish that it sells (both wild and farmed) will come from sustainable sources by 2020. To fulfil this commitment, Carrefour is working with its suppliers to select fish from healthy stocks, promote more selective catching methods, develop sustainable aquaculture by reducing antibiotics and using non GMO feed, and fight illegal fishing. Also Hilton Worldwide announced increased seafood procurement from certified fisheries (including MSC sources). This can drive demand for more sustainable seafood. The plans described by both companies are ways to work towards more sustainable fisheries. Furthermore, both companies understand that this challenge must be a collective effort and are committed to supporting their partners in this area.

4 - Discussion

4.1 - Our Ocean commitments: a global perspective

Although many achievements have been made – e.g. on reduction of IUU fishing (Agnew et al., 2009) – there is still a long way to go before the world's fisheries are sustainably conducted which is one of the targets for SDG 14 in the coming year. The *Our Ocean* conferences and the implementation of related commitments clearly adds to and reinforces the efforts towards this end.

Over the last decades, considerable efforts have been invested in the development of sustainable fisheries – on a national, regional and global scale. Globally, the UN and its subsidiary bodies have played an important role in developing the framework for sustainable fisheries, such as the 1982 UN Law of the Sea Convention (UNCLOS), the 1995 UN Fish Stocks Agreement (UNFSA), and the FAO Code of Conduct on Responsible Fisheries. Regionally, RFMOs have played an important role in addressing sustainable fisheries. At the same time, the process of moving towards sustainable fisheries globally is well embedded in the broader UN sustainable development goals (https://sustainabledevelopment.un.org/). To achieve the sustainability goals in fisheries, the international and regional objectives must be implemented by the fishing nations of the world. To achieve sustainable fisheries, it is important that all the elements of the fishery management system are in operation at the appropriate local, national or regional scale. This can be difficult to achieve at platforms like *Our Ocean* with time limited and independent commitments addressing quite different aspects of the management systems. The time limitation may restrict the value of such instruments because we know that the development of a good management system takes time. It is therefore important that commitments are made in addition to the basic funding of the institutions directly involved in the fisheries management, and well co-ordinated with them.

If we look at the 25 largest fishing nations by catch volume, we see that many of them are not part of the *Our Ocean* conferences with their commitments (Table 4). This does not necessarily mean that the "non-commitment countries" do not have efforts towards sustainable fisheries, as for example Russia and China do. China has considerable distant water fisheries, and has recently published plans and policies to reduce IUU in these fisheries (Wang and Ji, 2019).

Likewise, that Russia as a large fishing nation is not present among the countries in the *Our Ocean*-process, does not mean that measures for sustainable fisheries have not been implemented. As an example; through joint efforts by Norway and Russia, the management of the fisheries on the large stocks in the Barents Sea has developed to one of the worlds showcases for sustainable fisheries (Hønneland, 2006; Alekseev et al., 2011; Gullestad et al., 2013).

Table 4. *Fisheries catches by country (FAO, 2018) and number of commitments made by the respective government.*

Country	Catch (2016) Tonnes x 1000	No of commitments
China	15 246	0
Indonesia	6 110	10
USA	4 897	26
Russia	4 467	0
Peru	3 775	1
India	3 560	0
Japan	3 168	6
Vietnam	2 678	0
Norway	2 034	8
The Philippines	1 865	1
Malaysia	1 574	0
Chile	1 500	9
Morocco	1 432	1
South Korea	1 377	1
Thailand	1 343	6
Mexico	1 311	0
Myanmar	1 186	1
Iceland	1 067	1
Spain	906	2
Canada	832	1
Taiwan	750	1
Argentina	736	0
Ecuador	715	0
UK	702	0
Denmark	670	0

* *EU has pledged 18 commitments.*

3.2 - Components of successful fisheries management

The present analysis shows that there is a high degree of completion of the commitments to Sustainable Fisheries made at the *Our Ocean* conferences. As part of an assessment of the impacts of these commitments, in the sense of addressing the different elements of a sustainable fisheries enterprise, it is useful to briefly consider the state of these elements of successful fisheries management in a broader perspective.

Policy

Even if all other elements of the management system are in place, there must be a will by decision makers (politicians and administrators) to make the system work. The politicians, or the decision makers have multiple roles in the system. They make it work by funding the different elements of it, and by using the system, and actually promote sustainable management. The will by managers to make both these roles come true is related to the degree of understanding of how important it is to manage the exploitation of living marine resources. These resources are renewable food resources and therefore they have a high value on a long-term basis if managed sustainably. The degree of understanding of this point is typically dependent on how important the fisheries sector is for the country. But it is important to emphasize that even if the fish resources may be limited in abundance, the very fact that they are renewable make them highly valuable on a long-term basis, and important for food security and human health in many places. Socio-economic factors such as growth and development of new jobs are also important determinants of the will to manage sustainably.

There are twenty-five commitments related to policy. Of these, thirteen are evaluated as having uncertain level of impact (Figure 8), while seven have medium, three have high and two low level of impact on the development of a

sustainable fishery management. In our opinion this is a crucial element to sustainable fisheries and should have received much more attention both in terms of number of commitments and their level of impact on the development.

Science

For management of fisheries, knowledge of the abundance and development of the resource in question is needed. It is also necessary for managers to know the general biology of the resource, the distribution of the different size-groups and stages of the resource, and the status of the species likely to be exploited in a mixed fishery. This is the basic scientific knowledge needed for management. It is also useful for managers to know how different fishing gears affect ecosystems. In an ecosystem perspective, effects on the resources from other sectors are useful information for the management. These may include stressors on the ecosystem from maritime transport, petroleum industry, pollution and contaminants, aquaculture etc.

There are eleven commitments aimed at strengthening science for sustainable fisheries. It is well known that there is a huge demand for this kind of knowledge in many regions of the world (IOC–UNESCO, 2017). In addition to knowledge about the resources, there is a need for more knowledge on the effects of climate change. Ocean climate varies and affects living marine resources, both in terms of abundance and in terms of geographical distribution and thus – availability for the fishers (FAO, 2018). It is therefore a constant need for new and updated information as basis for sustainable management of ecosystems and resources. Of the eleven commitments, only one is evaluated as having high impact on the knowledge base for the development of sustainable future management. Three of the commitments were rated as undefined, while four where rated as having low impact. Three impacts were evaluated as having medium impact. Given the need for knowledge about the ever-changing marine ecosystems, we consider the number of commitments to science for management is too low, and a considerable strengthening of this element is needed to achieve sustainable fisheries globally (Costello et al., 2012).

Advice

Scientific knowledge on resources and ecosystems needs to be converted to advice for management in order to be useful for decision-makers. The advice element includes how to transfer the knowledge into understandable and useful information for managers. The management advice should be based on scientific knowledge of the status and development of the fish resources. The advice should preferably be based on an assessment of all available knowledge of the resources, including both fisheries dependent (catch and fishing effort) and fisheries independent (scientific surveys) information. Firm advice based on sound knowledge makes management more credible and more understandable for stakeholders, and scientific advice is needed even if knowledge is limited. Therefore, the advice system needs to be developed. Such advice systems exist for the most important fisheries in many countries of the industrialized part of the world but is weak or absent in many developing countries.

For the development of scientific advice for management, there were nine commitments. Five of these were rated as having unknown impact, while four were rated as having medium impact. The number of commitments on this issue is far too low for a significant improvement of the global status of advice systems.

Laws

Legislation is the basis for management, as it represents the legal authority for regulatory action. Regulations need to be amended to reflect changes in the status of the resource, geographical distribution of the resource or in relation to observed bycatch and developments in fishing technology.

There are three commitments addressing the development of legal frameworks. Two of them were evaluated as having high level impact while one was rated as having an unknown degree of impact. In many parts of the world laws and regulations are not well developed. This is an urgent issue that needs far more attention. An important special case is the development of multi-sector management for human activities at sea which may require reconciling different approaches to management and different decision-making frameworks.

Statistics

Reliable fishery statistics is of utmost importance for effective management of fisheries.

Only 14 commitments addressed fisheries statistics. The issue of adequate and reliable statistics is a general challenge throughout the world. Of the fourteen commitments, six were evaluated as having a medium impact, four were rated as uncertain, while three had high and one low impact level on the development of sustainable fisheries.

Enforcement

For management to be effective, there needs to be enforcement of the regulations of the fishing activity. The intent of regulations is usually to limit effort in fisheries, and enforcement measures are there to ensure that regulations are complied with by fishers.

Control of fishing activity is addressed by thirty-six commitments, and most of these commitments relate to combatting IUU Fisheries. This is the element of management with the highest number of commitments, indicating the significant global attention to this issue. However, fourteen of these commitments were rated as having an undefined level of impact. This does not mean that they will not have an impact, but time will show if the commitments will really have an impact. Ten of the commitments were rated as having a medium level of impact, eight were rated as having high and four having a low level of impact towards sustainable fisheries.

Transparency

For a management system to function well, good communication and transparency between the actors in the fisheries sector is required. The scientists need to communicate well with the managers and explain the rationale of recommendations for management measures. The scientists and managers also have to communicate well with the

fishers to ensure a common understanding of the basis for management decisions and measures.

There are thirty-two commitments aiming at developing transparency in the management systems. Of these, fifteen were rated as having a medium level of impact on the communication while thirteen were rated as having an uncertain level of impact. Three were rated as having a high level of impact while one was rated as having low impact. Communication is important for a successful management regime and should have a high focus. The total number of commitments aiming at this component reflects a certain level of understanding of this fact. “Transparency” was the component that had the highest number of commitments among the ”Others” category of pledgers while for “Governments”, the “Enforcement” component received the highest number of commitments (Figure 6). This topic is clearly seen as a challenge in many places.

Stakeholders

Stakeholders must be included in developing the understanding of the need for management. The stakeholders are a part of the management system. The fishers for example have an active role in following the management decisions or not. The long-term aim for management is to harvest the resource to achieve the maximum sustainable yield, balanced with socioeconomic considerations. It is important to communicate these considerations effectively. Nine commitments address this issue. Of these were five rated as having a medium level of impact on the management while four were rated as having an undefined impact level.

Cooperation

International cooperation is of utmost importance across the different components of sustainable fisheries. The distribution of fish resources is seldom limited to national boundaries, and it is therefore important to cooperate in the field of science, statistics, practical management, legislation control and political will. The management of living marine

resources is typically a regional task, and fish resources cannot be managed properly if only a part of a resource is under a well-developed system. A total of twenty-eight commitments addressed this issue. Twelve of these were rated as having uncertain impact on the development of sustainable management, while six were evaluated as having high, seven having medium and three having low impact on the management regime.

Seafood

Fish resources are vulnerable and may be affected by pollution and contaminants. It is therefore important that the landed fish is regularly sampled for quality checks. Only three commitments address this issue. This seems very low considering the importance of knowing what we eat and the nutritional quality of it. Two of the commitments were rated as having undefined impact while one was rated as having low impact.

3.3 - Impact of the Our Ocean commitments for sustainable fisheries

In a global perspective, the *Our Ocean* commitments are significant, but still limited compared to the overall efforts in this topic. It is therefore important that the *Our Ocean* commitments are aligned with ongoing initiatives and efforts, to create synergies and reinforce the implementation of initiatives addressing the ten components that are key to achieve sustainable fisheries. A more harmonised approach with an objective gap analysis of which components are missing the most in the fisheries management system, would have been a good starting point for more systematic approach to providing commitments. We suggest that this is considered in future *Our Ocean* conferences.

Regarding impact, 78 of the commitments were classified as “undefined” either due to lack of response to the questionnaire or lack of documentation on results. The remaining were evaluated as having high, medium or low impact towards sustainable fisheries. However, even for these categories, the assessment of impacts was difficult in many cases due to vague reporting of results and achievements. In these cases, we had to use our best judgement based on existing information. For future assessments of impacts of *Our Ocean* commitments, improved reporting of impact would be helpful.

Most of the high impact commitments fall within the categories of “Enforcement”, “Transparency”, and “Cooperation” – many of them with a common aim of combatting IUU-fisheries. In improved control of fishing vessel activity, vessel monitoring systems (VMS) are emphasized in detecting illegal activities. Many commitments support the international agreement on port state control measures (PSMA). The PSMA has proven to be an important tool to combat IUU-fishing., e.g in areas such as the Barents Sea (Hønneland, 2014) and the Antarctica. Also, as IUU fishing vessels or freighters/reefers are denied unloading of fish without proper catch documentation, this have a direct negative effect on the profitability and thus an important driver to reduce IUU fishing. Also, transparency and traceability can have a direct effect on the profitability of fisheries. If seafood products do not meet the sustainability criteria of certification regimes, fisheries and/or seafood products can be excluded from markets. Reduction of profit due to low sustainability in fisheries is therefore a potentially powerful tool to fight illegal fisheries and develop sustainable fisheries in general.

Many fish stocks are distributed in the waters (EEZs) of two or more coastal states – or in international waters. Shared stocks agreements between the different nations with ownership to such stocks is a basic requirement for sustainable management. Although the UN agreement on straddling and highly migratory fish stocks (1995) was ratified in 2001, a large majority of coastal states have still not entered into joint stocks agreements. However, in the context of the *Our Ocean* sustainable fisheries commitments, we find no commitment supporting processes towards shared stock agreements.

Fisheries subsidies is a major obstacle for the development of sustainable fisheries, as subsidies allows continued profitable fishing on overfished stocks and thus accelerating stock depletion. Despite years of negotiations in WTO to reduce fisheries subsidies, the global annual subsidies in the fishing sector is estimated at 35 billion USD (Sumaila et al., 2016). In this study we found only 3 commitments (USA/New Zealand, USA and EU) addressing this important field of reducing/eliminating harmful fisheries subsidies.

Control of fisheries at sea and at landing is complicated and costly. Complete elimination of illegal and unsustainable fishing practices is difficult, but new technology enable us to track vessels and monitor ports. Increased focus on transparency and traceability is therefore an interesting development, as this creates a direct link between sustainability and profitability. In this respect, the change of consumer attitudes towards a demand for sustainability can develop into the most powerful tool for sustainable fisheries (and aquaculture) – as this demand trickles down the seafood supply chain to the primary producers, affecting their market access and prices for their products. Here we see the development of interesting alliances between industry and science as e. g. the "Seafood Business for Ocean Stewardship (SeaBOS) – that "connects the global seafood business to science, connects wild capture fisheries to aquaculture, and connects European, North American companies to Asian companies. The ambition is to lead a global transformation towards sustainable seafood production and a healthy ocean" - https://solutionsforseafood.org/cass-resources/seafood-business-ocean-stewardship-seabos/. See also Osterblom et al (2015) that have investigated the role of the seafood industry in the development towards sustainability and Howard (2018) on stakeholder effects on sustainability.

We have therefore given a high impact score to commitments under the above categories as they can have direct and cost-effective impacts towards sustainable fisheries.

Many of the commitments that are evaluated to have medium or low impact are in components that by themselves may not lead to sustainable fisheries. For instance, science is a basic and important category, but if it is standing alone without political will to manage effectively or to enforce regulations, it may have little impact. The same goes for many of the other components that depend on a good interplay across categories to have significant effects on improved sustainability.

3.4 - Do the commitments match the key challenges?

The 2030 UN agenda for sustainable development (UN, 2015) sums up the key challenges for all major areas of human effects on the planet including fisheries. Effective measures to strengthen the sustainability of fisheries are urgently needed if the ambitious goal set for sustainable fisheries is to be achieved in the near future. It is widely recognised that challenges in fisheries management do vary in different parts of the world (Hilborn et al., 2005; Costello et al., 2012). Each component of the management system is important, political will ("Policy") to use the system and to manage has impact on all the other components. Political will is again influenced by how important the fishery sector is for a country. For coastal nations where large parts of the population are dependent on fish for their living, or where an industrial fishery contributes significantly to the nation's economy, the political will to manage will be higher simply because they see the need for it. A key challenge is therefore to make the politicians understand the benefits of the management and to allocate funding for the different elements in the system. Long-term commitment is imperative to build and empower the institutions needed to do fisheries management.

International cooperation is crucial in the development of a sustainable management for widely distributed and straddling stocks. The RFMOs are important instruments for a sustainable management of such fisheries (see http://www.fao.org/fishery/topic/166304/en). In the North Atlantic, there are several, –- for instance the North East Atlantic Fishery Commission (NEAFC) managing the main pelagic fish resources in the North East Atlantic, and the joint Russian–Norwegian Fishery Commission managing all fisheries in the Barents Sea. Another example is the International Pacific Halibut Commission managing the halibut in the Pacific for almost 100 years. These RFMOs have legal authority and can determine the total allowable catch and the sharing of the quotas between the nations. The decisions are based on negotiations between members of the RFMOs. In the south Atlantic there are no RFMOs with legal authority for the management of the fish resources, except the International Commission for the Conservation of Atlantic Tuna, ICCAT. All fisheries in the EEZs in the south Atlantic are therefore managed only on a national basis. In the Indian Ocean, the RFMOs are equally inadequately developed. We cannot see that any of the commitments are addressing the establishment or strengthening of these important bodies.

The highest number of commitments address the enforcement element and there is a strong focus on combatting IUU

fishing. It is a real international challenge to address this issue because it is so important for the establishment of reliable fishery statistics and sound management of the resources. The Port State Measures Agreement (PSMA) is the first binding international agreement to specifically address IUU fishing (FAO, 2016). Its objective is to prevent, deter and eliminate IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches. Several of the *Our Ocean* commitments addressed the PSMA and we consider that these contributions were important in mobilizing countries to get the agreement ratified.

Scientific knowledge of the resources is a real challenge in many regions of the world (Costello et al., 2012; Hilborn and Ovando, 2014). To monitor stocks on a regular basis is expensive. Building and operating fishery research vessels require significant funding. Many countries find it difficult to allocate resources for this purpose on a long-term basis. It also requires high competence. International cooperation and a regional approach may be very beneficial for this kind of work and needs further development.

3.5 - Concluding remarks and recommendations

A large majority of the commitments made to “Sustainable fisheries” have been implemented while some recent commitments remain to be fully implemented. Combatting of IUU fisheries and support to the port state measures process are important issues that are also addressed by many of the commitments. However, we also recognise that there are important components such as science, advice and laws that have less support in the *Our Ocean* commitments and in our opinion should receive more attention in the future.

RFMOs are important instruments for sustainable fisheries management. For these bodies to be effective, they should have legal authority. This does not mean that the countries give away their right to manage their resources, but through these bodies, the countries having rights in the exploitation of the resources in a region are forced to cooperate in the management of them. We recommend further support and empowerment of RFMOs towards having legal authority to set quotas.

Neumann and Unger (2019) call for a more effective and transparent review systems associated with ocean pledges to be able to link pledged commitments to actual implementation. There are quite a few commitments in our analysis that were hard to evaluate. For many of these, limited information was available to assess the broader impact. To increase transparency in pledging of commitments, more emphasis should be put on documenting and evaluating their impact.

We consider that the *Our Ocean* commitments in sustainable fisheries overall have been successful in terms of generating attention to the issue and funding projects that are supportive of sustainable fisheries. But we also consider that the challenges recognised internationally in developing sustainable fisheries are substantial, and that the efforts supported by *Our Ocean* in this respect may have a limited impact.

To achieve effective fisheries management and sustainable fisheries, it is important that all the components of the fisheries management system are in operation at the appropriate spatial scale (local, national, regional) over time. A gap analysis on requirements for achieving sustainable fisheries at the relevant scale, is a good starting point for a systematic approach to providing commitments. We suggest that this is considered in future *Our Ocean* conferences.

5 - Literature cited

Agnew, D. J., Gutiérrez, N. L., and Butterworth, D. S. 2013. Fish catch data: Less than what meets the eye. Marine Policy, 42: 268-269.

Agnew, D. J., Pearce, J., Pramod, G., Peatman, T., Watson, R., Beddington, J. R., and Pitcher, T. J. 2009. Estimating the worldwide extent of illegal fishing. Plos One, 4: e4570.

Alekseev, A. P., Bjordal, Å., Røttingen, I., Zilanov, V. K., and Shevelev, M. S. 2011. A brief history of Russian-Norwegian cooperation in marine research. In The Barents Sea – Ecosystem, resources and management: Half a century of Russian-Norwegian cooperation, pp. 15-39. Ed. by T. Jakobsen, and V. K. Ozhigin. Tapir Academic Press, Trondheim, Norway.

Bianchi, G., and Skjoldal, H. R. 2008. The Ecosystem Approach to Fisheries. p. 363. Published jointly by CABI and FAO, Rome.

Brodziak, J., and Link, J. 2002. Ecosystem-based fishery management: What is it and how can we do it? Bulletin of Marine Science, 70: 589-611.

Costello, C., Ovando, D., Clavelle, T., Strauss, C. K., Hilborn, R., Melnychuk, M. C., Branch, T. A., et al. 2016. Global fishery prospects under contrasting management regimes. Proc Natl Acad Sci U S A, 113: 5125-5129.

Costello, C., Ovando, D., Hilborn, R., Gaines, S. D., Deschenes, O., and Lester, S. E. 2012. Status and Solutions for the World's Unassessed Fisheries. Science, 338: 517-520.

Dragesund, O., Østvedt, O. J., and Toresen, R. 2008. Norwegian spring-spawning herring: history of fisheries, biology and stock assessment. In Norwegian Spring-Spawning Herring & Northeast Arctic Cod: 100 Years of Research and Management, pp. 41-82. Ed. by O. Nakken. Tapir Academic, Trondheim.

FAO. 1995. Code of conduct for responsible fisheries. 41 pp.

FAO. 1997. FAO Technical Guidelines for Responsible Fisheries - Fisheries Management - 4 ISBN 92-5-103962-3.

FAO. 2016. Agreement on port state measures to prevent, deter and eliminate illegal, unreported and unregulated fishing. 115 pp.

FAO. 2018. The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. 227 pp pp.

Grorud-Colvert, K., Constant, V., Sullivan-Stack, J., Dziedzic, K., Hamilton, S. L., Randell, Z., Fulton-Bennett, H., et al. 2019. High-profile international commitments for ocean protection: Empty promises or meaningful progress? Marine Policy, 105: 52-66.

Gullestad, P., Aglen, A., Bjordal, A., Blom, G., Johansen, S., Krog, J., Misund, O. A., et al. 2013. Changing attitudes 1970-2012: evolution of the Norwegian management framework to prevent overfishing and to secure long-term sustainability. ICES Journal of Marine Science, 71: 173-182.

Hilborn, R., Orensanz, J. M., and Parma, A. M. 2005. Institutions, incentives and the future of fisheries. Philosophical Transactions of the Royal Society B-Biological Sciences, 360: 47-57.

Hilborn, R., and Ovando, D. 2014. Reflections on the success of traditional fisheries management. ICES Journal of Marine Science, 71: 1040-1046.

Howard, B. C. 2018. Blue growth: Stakeholder perspectives. Marine Policy, 87: 375-377.

Hønneland, G. 2006. Quota fight and coastal state solidarity: Norwegian-Russian fisheries management over 30 years , Fagbokforlaget Vigmostad og Bjørke A/S, (In Norwegian). 152 pp.

Hønneland, G. 2014. Compliance and Postagreement Bargaining in the Barents Sea Fisheries. Ocean Development and International Law, 45: 186-204.

IOC-UNESCO. 2017. Global Ocean Science Report - The current status of ocean science around the world. 272 pp.

Link, J. S., and Browman, H. I. 2014. Integrating what? Levels of marine ecosystem-based assessment and management. ICES Journal of Marine Science, 71: 1170-1173.

Neumann, B., and Unger, S. 2019. From voluntary commitments to ocean sustainability. Science, 363: 35-36.

Osterblom, H., Jouffray, J. B., Folke, C., Crona, B., Troell, M., Merrie, A., and Rockstrom, J. 2015. Transnational Corporations as 'Keystone Actors' in Marine Ecosystems. Plos One, 10.

Pikitch, E. K., Santora, C., Babcock, E. A., Bakun, A., Bonfil, R., Conover, D. O., Dayton, P., et al. 2004. Ecosystem-based fishery management. Science, 305: 346-347.

SAPEA. 2017. Food from the oceans: how can more food and biomass be obtained from the oceans in a way that does not deprive future generations of their benefits? 154 pp.

Sumaila, U. R., Lam, V., Le Manach, F., Swartz, W., and Pauly, D. 2016. Global fisheries subsidies: An updated estimate. Marine Policy, 69: 189-193.

UN. 2015. Transforming our world: the 2030 Agenda for Sustainable Development 35 pp.

Wang, J., and Ji, L. 2019. China’s Distant Water Fishing (DWF) and Illegal, Unreported and Unregulated Fishing (IUU). p. 2. Ed. by G. E. I. Pamphlet.

Worm, B., Hilborn, R., Baum, J. K., Branch, T. A., Collie, J. S., Costello, C., Fogarty, M. J., et al. 2009. Rebuilding global fisheries. Science, 325: 578-585.

6 - Appendices

5.1 - Appendix 1

The questionnaire sent to pledgers.

5.1.1 - Our Ocean

Project ID	
Start	Year
Finish	Year

To what extent has the commitment been fulfilled?

	0 %
	25 %
	50 %
	75 %
	100 %

Which actions have been undertaken to achieve your commitment?

[fill in]

How will these achievements likely impact on the sustainability of the fisheries?

[fill in]

Additional comments

[fill in]

Your name

First	Last

I agree to my personal data being used in accordance with this document

Gathering of personal data (GDPR)

5.2 - Appendix 2

Organisations making commitments to action area “Sustainable fisheries” at the *Our Ocean* conferences during 2014–2018.

Organisation	Abbreviation	Category
ADM Capital Foundation	ADMCF	Foundation
Bloomberg		Foundation
Calouste Gulbenkian Foundation		Foundation
Carrefour		Commercial actor
Center for Oceanic Awareness, Research,	COARE	NGO
Coalition for Fair Fisheries Arrangements	CFFA	NGO
Conference for Peripheral Maritime Regions	CPMR	NGO
Conservation International		NGO
Coral Triangle Center		NGO
EACHMILE		NGO
Earth Twine Incorporated		NGO
EcoHub Global		NGO
Food and Agriculture Organization of the United Nations	FAO	International org.
Global Environment Facility	GEF	NGO
Global Partnership for Sharks and Rays		NGO
Grayling		Commercial actor
Hilton Worldwide		Commercial actor
International Council for the Exploration of the Sea	ICES	International org.
International Labour Organization	ILO	International org.
Indian Ocean Commission	IOC	International org.
International Pole & Line Foundation	IPLNF	Foundation
International Seafood Sustainability Foundation	ISSF	Foundation
Leonardo DiCaprio Foundation		Foundation
Marine Stewardship Council	MSC	NGO
Marisla Foundation		Foundation
mFish		NGO
Misool Foundation		Foundation
Monterey Bay Aquarium	MBA	NGO
Nature Conservancy		NGO
Nofima		Research
OCEANA		NGO
Oceano Azul Foundation		Foundation
Organization of Associated Producers of Large Tuna Freezers	OPAGAC	NGO
Pew Charitable Trust	PEW	Foundation
Proven Force		NGO
RARE		NGO
Skretting Group		Commercial actor
Sustainable Fish		NGO
Vulcan Inc		Commercial actor
Wildlife Conservation Society	WCS	NGO
World Benchmarking Alliance	WBA	NGO
WorldfFish		NGO
World Wildlife Fund	WWF	NGO

5.3 - Appendix 3

Governments making commitments to Sustainable fisheries during 2014–2018.

Country
Australia
Bangladesh
Canada
Chile
Costa Rica
EU
Germany
Grenada
Iceland
Indonesia
Ireland
Japan
Morocco
Mauritius
Micronesia
Myanmar
New Zealand
Nicaragua
Norway
Palau
Peru
Philippines
Portugal
Seychelles
South Korea
Spain
Sri Lanka
Sweden
Thailand
Taiwan
The Netherlands
Togo
UK
USA

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