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Stakeholder Perspectives on Access and Benefit-Sharing for Areas Beyond National Jurisdiction

Jane Eva Collins[1,2], Thomas Vanagt[1] and Isabelle Huys[2]*

[1] ABSint, Bruges, Belgium, [2] Faculty of Pharmaceutical Sciences, Clinical Pharmacology and Pharmacotherapy, KU Leuven, Leuven, Belgium

Negotiations for a new international legally binding instrument under the United Nations Convention on the Law of the Sea for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (ABNJ) are currently ongoing. A "package" of four elements are under discussion, one of which is "marine genetic resources (MGR), including questions on the sharing of benefits." Governance of MGR in ABNJ requires consideration of access and benefit-sharing options. The MGR element is considered the most contentious since there is a lack of convergence on this topic amongst delegates. This is currently hindering progress in negotiations. Therefore, resolving issues linked to MGR holds the key to reaching agreement of the instrument as a whole. The aim of this article is to gather stakeholder perspectives on goals and options for a new genetic resource mechanism for ABNJ. A scoping literature review was conducted to identify goals and options in terms of access and of benefit-sharing in ABNJ. Next, semi-structured interviews were conducted with 24 people from five different stakeholder groups; scientific research community, private sector, developing States, developed States, and civil society. Results indicated that stakeholders all agree with conservation and sustainable use of marine biological diversity of ABNJ as the most important goals of a potential new genetic resource mechanism for ABNJ. Stakeholders preferred a light-touch governance approach to access, with notification pre- (and possibly also post-) collection of MGR *in situ*. Mandatory non-monetary benefit-sharing at point of sampling was considered most appropriate, possibly with scope for voluntary monetary benefit-sharing at the point of commercialization. It may be useful to keep these perspectives in mind during negotiations and also during future implementation processes in order to attain the goals of perceived greatest importance. By understanding the different viewpoints and priorities, delegates will be better equipped to negotiate the remainder of the issues related to MGR, to reach mutually acceptable compromises and, ultimately, a new biodiversity beyond national jurisdiction agreement.

Keywords: marine, genetic resources, areas beyond national jurisdiction, access, benefit-sharing

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****Correspondence:***
Jane Eva Collins
jane.collins@abs-int.eu

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Abbreviations: ABMT, area-based management tools; ABNJ, areas beyond national jurisdiction; ABS, access and benefit-sharing; BBNJ, biodiversity beyond national jurisdiction; EIA, environmental impact assessment; ILBI, international legally binding instrument; IP, intellectual property; ITPGRFA, International Treaty on Plant Genetic Resources for Food and Agriculture; LDCs, least developed countries; MGR, marine genetic resources; MPA, marine protected areas; MSR, marine scientific research; R&D, research and development; SIDS, small island developing States; UNCLOS, United Nations Convention on the Law of Sea; UNGA, United Nations General Assembly; WHO-PIP, World Health Organization, Pandemic Influenza Preparedness (PIP) framework.

INTRODUCTION

Formal negotiations for a new international legally binding instrument (ILBI) under the United Nations Convention on the Law of Sea (UNCLOS, 1982) for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) have now commenced. The first session of the Intergovernmental Conference (IGC) convened from 4 to 17 September 2018, the second from 25 March to 5 April 2019 and the third from 19 to 30 August 2019. The fourth session was planned to take place in the first half of 2020 but has now been postponed to the earliest possible available date to be decided by the General Assembly due to concern regarding the Coronavirus disease (COVID-19)[1]. Negotiations address a "package" of four elements and cross-cutting issues, as agreed during preparatory committee meetings in 2011. The four elements are: marine genetic resources (MGR), including questions on the sharing of benefits; measures such as area-based management tools (ABMT), including marine protected areas (MPAs); environmental impact assessments (EIA), and; capacity-building and transfer of marine technology (UNGA Res. 72/249, UN Doc. A/Res/72.249, December 24, 2017, para. 2.).

Governance of MGR in areas beyond national jurisdiction (ABNJ) requires consideration of options related to access and also to benefit-sharing. There is as yet no legal, internationally accepted definition of the term "access" to genetic resources (Sirakaya, 2019). In addition, the requirement for governance of access in the BBNJ instrument has not yet been determined (UNGA Res. 72/249, UN Doc. A/Res/72.249, December 24, 2017, para. 2.). The draft treaty text does, however, highlight a number of options to consider in terms of potential access provisions (Article 10, President's aid to negotiations, June 2019). Under existing access and benefit-sharing (ABS) systems, the sharing of benefits is triggered by or tied to legal access to genetic resources (International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA], 2001; World Health Organization [WHO], 2011). Therefore, in order to meet the requirement for "the sharing of benefits" associated with utilization of MGR from ABNJ, potential provisions on access are useful to consider.

A list of types of non-monetary and monetary benefits that can be shared are listed in the Annex of 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 (2011), which is a separate international agreement that applies to genetic resources within national jurisdiction, but not to areas beyond national jurisdiction (ABNJ). However, a specific, internationally accepted definition of the term "benefit-sharing" is not yet agreed upon. In the context of BBNJ, the focus in terms of benefit-sharing could be on equipping all potential users, including developing States, with the capacity (such as knowledge and skills) required to access and utilize MGR from ABNJ (Collins et al., 2019). This could play a role in contributing toward the overarching goals of "conservation and sustainable use of BBNJ" (President's aid to negotiations, June 2019). Alternatively, or additionally, the focus in terms of benefit-sharing may be the desire to share any and all potential value (both monetary and non-monetary) associated with utilization of MGR from ABNJ amongst all States. It is important to note that the effectiveness and success of benefit-sharing measures, and the ABS system as a whole, under existing genetic resource frameworks has been questioned (Fedder, 2013; Pauchard, 2017; Muller, 2018). There is, to date, a lack of evidence to suggest that benefit-sharing leads to efficient conservation of biodiversity (Suneetha and Pisupati, 2009; Tvedt, 2013; Pisupati and Bavikatte, 2014; Morgera, 2018a). Stakeholder perspectives on the benefit-sharing options may, therefore, provide useful insight into which focuses are of greatest perceived importance in the BBNJ context.

The challenge addressed in this article, in the context of ongoing BBNJ negotiations, is determining how MGR from ABNJ should most appropriately be governed. Historically, during BBNJ meetings we have witnessed a disparity of opinions regarding the potential value of MGR from ABNJ for commercial development and whether or how this should be taken into account as part of the new instrument (UNGA Res. 72/249, UN Doc. A/Res/72.249, December 24, 2017, para. 2.). The MGR element is considered the most contentious since this is the area where we continue to see the greatest lack of convergence amongst delegates. As such, the MGR element currently hinders progress during negotiations. However, by resolving issues linked to MGR, we may hold the key to reaching an agreement. The aim of this article, therefore, is to reveal in detail the perspectives of different stakeholder groups in terms of goals and access and benefit-sharing options that may be considered as part of a potential governance mechanism for MGR from ABNJ.

METHODS

The study began with a scoping literature review to confirm the stakeholder groups involved and to identify stakeholder goals as well as elements and options that could be considered for a potential governance (/ABS) system for MGR from ABNJ (International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA], 2001; Nagoya Protocol, 2011; World Health Organization [WHO], 2011). The literature review involved searches through Pubmed, Embase, EurLex, the UNCLOS, the United Nations BBNJ website, the Convention on Biological Diversity and the Nagoya Protocol (UNCLOS, 1982; Convention on Biological Diversity [CBD], 1992; Nagoya Protocol, 2011)[2]. Search keywords included: MGR, genetic resources, access, benefit-sharing, ABS, ABNJ, and capacity building. Next, a semi-structured, semi-quantitative interview was prepared (see **Supplementary Material**). Interviews were conducted with 24 people from around the world and representative of the five stakeholder groups concerned (scientific research community, private sector, developing States, developed States, and civil society). A minimum of three and a maximum of six representatives were interviewed per group. The aim was to gather a minimum of five interviewees per stakeholder group

[1]https://undocs.org/en/a/74/l.41 last accessed March 18, 2020

[2]https://www.un.org/bbnj/ last accessed March 18, 2020

where possible. This was not possible for the private sector group which unfortunately only involved three participants. The stakeholder groups identified, and their interests in MGR, are listed in **Table 1**, their identified goals are listed in **Table 2**, the access elements are listed in **Table 3**, and the benefit-sharing options are listed in **Tables 4**, **5**.

The term "representative" in this article is used to describe an expert who is currently working in, or actively involved with, their chosen stakeholder group (participants self-identified as involved in/representative of one of these groups). Interviewees were also mandated to represent their organization at the IGC. It is important to note that only State parties have negotiation status. Interviewees were recruited according to knowledge of, and involvement in, BBNJ negotiations and the MGR element in particular. The latter factor substantially reduced the number of suitable candidates, since MGR represents a very complicated topic for many. Availability and willingness to participate in the interview represented another controlling factor in the recruitment of participants.

The authors sought to attain diversity amongst interviewees in all of the five stakeholder groups. Nonetheless, the authors acknowledge that respondents from the private sector and civil society groups are from the Global North. With regards to the private sector, we do not believe this to be a misrepresentation, because this group is primarily based in developed States. This is also true for the civil society group, all of whom represent organizations that are working on issues related to the North-South balance and are conscious of concerns of all States.

Interviews were conducted during the third session of the intergovernmental conference (IGC3) for BBNJ in New York (between 19–28 August 2019), or shortly after via Skype. The interviews followed a pre-defined guide list of questions which requested participants to score a variety of access and benefit-sharing options according to their perspective and to give short reasons for their decisions. The score for each question was averaged for each of the five stakeholder groups, to give a representative result per group. This enabled comparison of results between stakeholder groups. Standard deviation was used to indicate variance of answers within each stakeholder group, but not to analyze differences between stakeholder group. Interviews were audio-recorded and transcribed. Microsoft Excel software was used as a means to store the data. A thematic analysis of the transcripts was conducted to identify common themes in responses. All data were anonymized by grouping results into stakeholder groups. Written informed consent forms were signed by all of the interviewees in this study.

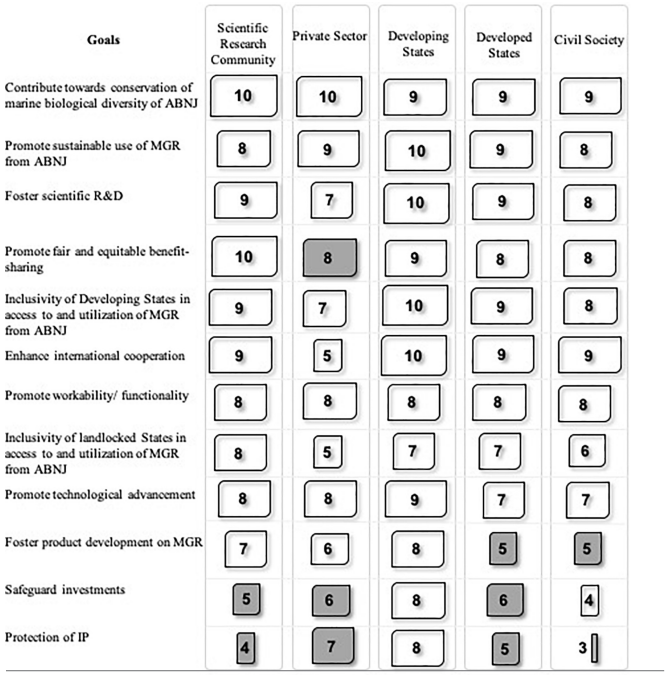
RESULTS

Based on engagement in BBNJ negotiations, and confirmed during review of literature, five main stakeholder groups were identified (see **Table 1**). These stakeholder groups likely represent those with an interest in, and also the potential to be affected by, the new ILBI encompassing a potential new ABS mechanism for ABNJ. However, it is important to note that although members from the scientific research community and private sector are following BBNJ negotiations, so far only a fraction of these two stakeholder groups are actively involved in the process. The authors were, therefore, keen to gather perspectives

TABLE 1 | A list and description of the five main stakeholder groups linked to MGR from ABNJ.

Stakeholder groups	Description of stakeholders and potential interest in MGR from ABNJ	References
Scientific research community	This group is most heavily involved in the initial, pure research and discovery phase linked to MGR from ABNJ in the value chain. Collection of *in situ* MGR samples (biological, chemical, or physical) and data arc almost exclusively the task of scientists during research campaigns. Without scientific research, many *ex situ* repositories would not exist	Broggiato et al., 2014; McMeel et al., 2014; Oldham et al., 2014; Harden-Davies, 2017a; Art 18, Presidents aid to negotiations, June 2019; Vierros et al., 2016
Private sector	The private sector currently represents the main user of the ocean and its resources, with business sectors ranging from offshore oil and gas to fisheries, seabed minerals, renewable energy and shipping. The business community therefore plays an important role in the sustainable use of marine resources and limitation of potential environmental impacts. Although industry is not yet heavily involved in utilization of MGR from ABNJ, it is thought that this type of activity could potentially develop in the future. This shift may be particularly encouraged as scientists continue to discover new genetic resources with a variety of innovative and possibly lucrative applications.	Martins et al., 2014; Art 43, Presidents aid to negotiations, June 2019; World Ocean Council
Developing States Developed States	At present, there exists a disparity between developed and developing States in terms of their ability to utilize MGR from ABNJ. This ability is influenced not only by financial resources, but also by access to sophisticated technology, cutting-edge scientific knowledge and associated facilities. This may also be characterized by the presence/absence of a developed, national biotechnology industry. As such, developing States and developed States represent two different stakeholder groups.	Harden-Davies, 2017b; Broggiato et al., 2018; Collins et al., 2019; Art 7, Presidents aid to negotiations, June 2019; Vierros et al., 2016
Civil society	In general, civil society is concerned with the welfare of our environment. Activities that have the potential to negatively impact the natural environment will inevitably be questioned by members of the general public. As such, in the context of BBNJ, civil society is interested in taking the opportunity to help protect and conserve marine biodiversity.	Art 18, Presidents aid to negotiations, June 2019

TABLE 2 | Average score for goals in terms of a potential new genetic resource mechanism for ABNJ according to stakeholder groups.



Scores of 10 (largest shape size) indicate the goals considered most important, with numbers decreasing down to a possible minimum of 1 (smallest shape size) in accordance with relative importance. Shaded shapes indicate options where standard deviation is greater than half of the score.

on this issue from these particular groups. Whilst only three private sector entities were willing to take part in this study (which could be viewed as consistent with limited previous involvement of this group in BBNJ negotiations), this at least gives an initial indication of their concerns and goals in this context.

The results presented in this study reflect the perspective of a portion of each of the stakeholder groups. However, the authors acknowledge that this data cannot necessarily reflect all viewpoints or absolute agreement of any of the groups. We believe that consensus will likely only be reached as a result of collective efforts such as the ongoing BBNJ negotiation process. Nonetheless, the authors believe that this study presents the first documented overview of different stakeholder views with regards to detailed aspects of the MGR element of the BBNJ package.

Goals According to Stakeholders for a Potential New Mechanism to Govern MGR From ABNJ

Twelve goals regarding a potential new mechanism to govern MGR from ABNJ were identified as a result of a scoping review of literature and existing legislation. These goals are displayed in **Table 2**[3]. The importance of different goals was considered during the first part of the interview. Interview results regarding these goals are also displayed in **Table 2** to give an indication of the relative importance of goals for each stakeholder group and also overall, taking all stakeholders groups into consideration. Among the options provided for question 1 (see interview in **Supplementary Material**), scores across all stakeholder groups indicate that there are six goals of greatest perceived importance (see top six rows in **Table 2**).

Consistent with the overarching objective of the ILBI, contributing toward the conservation of marine biological diversity of ABNJ was generally considered as the most important goal. Interviewees from the developed State stakeholder group indicated that conservation of BBNJ should be regarded as vital for a potential new mechanism to govern MGR in ABNJ, otherwise we will not be contributing toward the overall objective[4]. In addition, participants from this group suggested that this instrument should be less oriented in terms of private sector investment and financial return, and more in terms of "conservation and sustainable use" as written in the draft treaty text (Presidents aid to negotiations, June 2019). One private sector interviewee noted that this goal is linked to the goal of "fostering scientific research and development (R&D)," because without scientific R&D conservation efforts may be jeopardized. In other words, scientific R&D is needed in order to enhance scientific knowledge so that we are better prepared to successfully protect and conserve marine biodiversity. Civil society participants mentioned that they are involved in and support the BBNJ process for the purpose of pursuing conservation efforts. Furthermore, interviewees felt that the same was true during negotiations for the Nagoya Protocol – civil society stakeholders stated that they supported those negotiations because they saw it as a means to promote conservation.

All stakeholder groups considered sustainable use of MGR from ABNJ as important. Interviewees from the scientific research community and from civil society indicated ambiguity and a lack of clarity in terms of understanding the meaning of this goal and what this would actually mean when applied to MGR. Scientists noted that they were unsure how an ABS system would promote sustainable use, unless this was related to, or due to the sharing of information and shared use of samples. In addition, it was suggested that the importance of this goal could depend on the definition of MGR, which is still to be negotiated during future BBNJ conferences. If a project involved the collection of a sponge sample for research into potential pharmaceutical

[3]Contribute toward conservation of marine biological diversity of ABNJ (Preamble, Presidents aid to negotiations, June 2019; Art 9, Nagoya Protocol); Promote sustainable use of MGR from ABNJ (Preamble, Presidents aid to negotiations, June 2019; Art 9, Nagoya Protocol); Foster scientific research and development (R&D) (Art 1, Presidents aid to negotiations, June 2019; Art 239, UNCLOS); Promote fair and equitable benefit-sharing (Art 11, Presidents aid to negotiations, June 2019; Art 5, Nagoya Protocol); Inclusivity of developing States in access to and utilization of MGR from ABNJ (Art 7, Presidents aid to negotiations, June 2019); Enhance international co-operation in marine scientific research (MSR) (Art 242 UNCLOS; Art 23, Nagoya Protocol); Promote workability/functionality (Broggiato et al., 2018); Inclusivity of landlocked States in access to and utilization of MGR from ABNJ (Art 7, Presidents aid to negotiations, June 2019); Promote technological advancement (Art 7, Presidents aid to negotiations, June 2019); Foster product development on MGR (Article 150, UNCLOS; Appendix II, Bonn Guidelines); Safeguard investments (Broggiato et al., 2018); Protection of intellectual property (IP) (Art 12, Presidents aid to negotiations, June 2019).

[4]The overarching objective of the BBNJ instrument is "*the conservation and sustainable us of marine biological diversity of areas beyond national jurisdiction*" (Presidents aid to negotiations, June 2019).

TABLE 3 | Stakeholder perspectives on access options for a potential new genetic resource mechanism for ABNJ.

Access elements	**Stakeholder groups**				
	Scientific research community	**Private sector**	**Developing States**	**Developed States**	**Civil society**
Regulation/governance of access	Both options equally selected (no consensus)	No regulation	Yes regulation	Yes regulation	Yes regulation
Regulatory/governance mechanism	Notification	Notification	Notification	Notification	Notification
Material scope	*In situ* and *ex situ* access	*In situ* access only	*In situ*, *ex situ*, and *in silico* access	*In situ* and *ex situ* access	*in situ* and *ex situ* access
Access trigger	Both options equally selected (no consensus)	Access for sampling	Access for utilization	Access for sampling	Access for sampling
Utilization scope	R&D	R&D	R&D	R&D	R&D
Facilitated access	Both options equally selected (no consensus)	Facilitated access	Facilitated access	Facilitated access	Facilitated access
Monetary cost	No monetary cost	Both options equally selected (no consensus)	Yes monetary cost	No monetary cost	Both options equally selected (no consensus)
Geographical scope	Same for both the seabed and the high seas	Same for both the seabed and the high seas	Different for the seabed and the high seas	Same for both the seabed and the high seas	Same for both the seabed and the high seas

TABLE 4 | Stakeholder perspectives on non-monetary and monetary benefit-sharing options in the context of MGR from ABNJ.

Benefit-sharing elements	**Stockholder groups**				
	Scientific research community	**Private sector**	**Developing States**	**Developed States**	**Civil society**
Non-monetary benefit-sharing options					
Sharing of raw data					
Metadata	+	+	+	+	++
Genetic sequence data	+	+	+	+	++
Biochemical Information	+	+	+	+	+
Sharing of research results	+	+	++	++	+
Capacity building	++	+	++	++	+
Technology transfer	+	+	+	+	+
Research directed toward priority needs of developing countries/humankind	+	++	+	+	+
Monetary benefit-sharing options					
Joint ventures	+	++	++	+	++
Access fee per sample	–	0	+	–	0
Milestone payments	–	–	++	–	–
License fee at the time of commercialization	+	+	+	–	0
Royalties	+	0	+	–	+
Research funding	++	++	+	++	++
Salaries (e.g., Ph.D. funding)	++	++	+	+	+
Joint IP rights	+	–	+	–	–

The top half of the table displays results regarding non-monetary benefit-sharing options and the bottom half displays results regarding monetary benefit-sharing. The potential beneficial impact associated with options are represented as follows: ++ for greatest potential beneficial impact, + for positive impact, 0 for neutral impact, – for negative impact, –– for greatest potential negative impact. Potential burden is represented as follows: shaded square for least potential burden, diagonal line through square for greatest potential burden.

applications, this may be considered as sustainable use since the scientists would need only a small volume of sample from which to extract the DNA, and thereafter would be able to synthesize the DNA in the lab. As such, R&D related to MGR found in the sponge would not require the harvesting of a large amount of material (there are currently no sponge species which are threatened due to R&D). However, if the definition of MGR in the ILBI is very broad, there could potentially be a greater risk for

TABLE 5 | Stakeholder perspectives on elements and options related to benefit-sharing in the context of MGR from ABNJ.

Benefit-sharing elements	Stakeholder groups				
	Scientific research community	**Private sector**	**Developing States**	**Developed States**	**Civil society**
Voluntary or mandatory benefit-sharing *(shaded for most positive perceived impact)*					
Voluntary	–	++	–	+	+
Mandatory	+	–	++	+	+
Voluntary and mandatory depending on type of benefit-sharing	++	+	+	++	++
Pre-set conditions or negotiate case-by-case					
Pre-set conditions	+	+	+	+	+
Case-by-case	–	–	–	–	–
Trigger for benefit-sharing					
At the point of sampling	0	++	+	++	+
At the point of utilization	+	–	+	–	+
At the point of commercialization	+	+	++	–	++
Sometime after the user benefits from utilization of genetic resources (e.g., after a product has been in the market for 1 year)	++	0	+	–	+
At the time pf application for IP rights	+	–	+	––	+
Option to renegotiate/change conditions (of a pre-existing contract)					
When the genetic resource is obtained from a previous user	+	+	+	––	+
When the user changes Intent and wants to renegotiate conditions	++	+	++	–	–
Not at all	–	+	–	++	++

The potential overall impact associated with options are represented as follows: ++ for greatest potential beneficial impact, + for positive impact, 0 for neutral impact, – for negative impact, –– for greatest potential negative impact.

unsustainable harvesting of large quantities of material. Overall, interviewees from the scientific research community agreed that while this goal is important, the conservation of BBNJ would be more important.

All stakeholder groups considered fostering scientific R&D as important. This was particularly emphasized by the scientific research community who consider this to be one of their main goals. It was suggested that there is still much unknown about the marine environment and associated biodiversity, therefore scientific R&D should be encouraged as a priority in order to enhance our collective scientific knowledge in this regard. However, interviewees from developed States indicated a slight reservation with this goal due to inclusion of the term "development." One participant representative of civil society also suggested that whilst this goal may be important in general, it may not necessarily be the primary objective of a genetic resource mechanism or ABS system.

Fair and equitable benefit-sharing was another goal that all stakeholders viewed as imperative. Interviewees from the private sector and from developed States indicated that, although they agree with this goal in principle, the importance of this would depend on factors such as how this is done, with whom, and what the type of benefit-sharing measures included. Standard deviation of the average of results for the private sector was greater than half of the average, indicating moderately significant differences of opinion represented by participants in this group. These differences in opinion may reflect varying perspectives in terms of whether this aspect should form an important part of the potential genetic resource framework, rather than simply whether fair and equitable benefit-sharing as such is important. Developed State participants suggested that this would be considered more important if the focus was more on non-monetary benefit-sharing (than monetary), such as capacity building and co-operation in MSR. One interviewee from the developing States stakeholder group mentioned that they do not fully agree with the term "fair and equitable benefit-sharing" and would prefer a rephrasing of the goal to include the words "common heritage of mankind" (CHM), in line with the CHM principle (Art 136, UNCLOS, 1982).

Another important goal was the inclusivity of developing States in access to and utilization of MGR from ABNJ. This goal was scored as more important to interviewees from developing States than to other stakeholder groups. According to participants from developed States, inclusivity of developing countries should

include small island developing States (SIDS) and least developed countries (LDCs) (as a subset of developing States). However, it was also mentioned that the importance of inclusivity of developing States should depend on which category a developing State is classified as[5]. For example, according to interviewees, middle-income developing countries may not be considered so important here compared to LDCs. In addition, individual developing State circumstances and situations should be taken into account to ensure that the mode of facilitating inclusivity is appropriate. Interviewees also felt that it would not be useful to transfer highly sophisticated technology to a country which does not have the desire or need for it, or which is not equipped in terms of skills and knowledge to make use of it. This may be considered as the absorptive capacity. Therefore, interviewees suggested that a "one-size fits all" approach may not be very helpful in order to promote inclusivity of developing States.

Enhancing international co-operation in MSR was also noted as important for all stakeholder groups. Interviewees from developing States indicated that they believe this could be beneficial for their stakeholder group, potentially to facilitate greater participation in these types of activities. Participants from the private sector suggested that ABS could be harnessed as a mechanism to promote this goal and also to promote conservation. However, this goal was considered less important for the private sector than for the other stakeholder groups. This is likely due to the focus of the private sector on stages in the value chain which are further downstream, with little (if any) direct involvement in the MSR phase. Interviewees representing civil society stated that this goal was vital to promote inclusivity and to attempt to reduce current inequality in terms of capability to conduct MSR.

After the six goals mentioned above, the next most important goal was the workability/functionality of a proposed new mechanism to govern MGR in ABNJ. As noted by one interviewee from the developing State group, this goal is vital because if we have a genetic resource mechanism/ABS system that is not workable, then nothing would arise from utilization of MGR from ABNJ. In other words, we could end up with no benefits to share. Participants from the private sector and civil society noted that lessons could be learnt here from implementation of the Nagoya Protocol in terms of how an ABS system can be unworkable. For example, obstacles related to implementation of the Nagoya Protocol, such as heavy administrative burdens, can stand in the way of conservation efforts (Tvedt, 2013; Pisupati and Bavikatte, 2014; Morgera, 2018a). Interviewees felt that failure to develop a workable system in the context of BBNJ may, therefore, not only impede adoption and implementation of this new agreement, but also hinder conservation.

Inclusivity of landlocked States (States that are surrounded by land and have no coast) in access to and utilization of MGR from ABNJ was considered as moderately important to all stakeholder groups. Participants from multiple groups indicated that landlocked States should be considered to the same extent as all other States, and that according to UNCLOS, all States should have equal capability to access the marine environment to conduct MSR. One interviewee from the scientific community noted that these negotiations are for an international treaty, and so every State should be on the same page in terms of inclusivity. Participants from civil society and from the developed State stakeholder groups indicated that the importance of aiming to facilitate inclusion of landlocked States would depend very much on whether the State in question was developed or developing. For example, they would find it more important to include a landlocked State if it were considered an LDC. Landlocked States as such are not the primary consideration, and it would be more significant to consider States which are least developed than those which are landlocked. This is because collection of MGR from ABNJ is only the first stage in the potential utilization value chain of MGR, and all of the subsequent stages that happen later could in fact be the more challenging parts where States may require more assistance. In this regard, it was suggested that the general concept of "inclusivity of developing States" should include developing landlocked States. One interviewee from the developed State stakeholder group mentioned that it is crucial we do not make a difference between whether a developing State is landlocked or coastal, since developing landlocked States could potentially be at the greatest disadvantage when it comes to accessing and utilizing MGR from ABNJ.

According to the scores given by stakeholder groups, promoting technological advancement was considered to be of similar importance to the goal of inclusivity of landlocked States in access to and utilization of MGR from ABNJ. Interviewees from the scientific research community and private sector indicated that perhaps technological advancement would be a benefit (rather than a goal) of the genetic resource mechanism, and could be very similar to, or fall under, the goal of fostering scientific R&D. It was suggested that scientists may aim to develop technology to access and monitor marine ecosystems, which could be useful in terms of achieving the overarching goal of conservation and sustainable use of BBNJ. However, it was also suggested that this theme could encompass technological advancement of all States and stakeholders, rather than just a few or only in terms of the general scientific research. As such, interviewees felt this technology could be considered in terms of benefit-sharing, perhaps with regards to technology transfer or collaborative projects. On the other hand, a participant from the developed State group explained that they gave this goal a lower score in comparison with most other goals, because they simply did not believe that technological advancement was actually achievable in this context.

Another goal considered in this study was fostering product development on MGR. Representatives from the private sector suggested that perhaps it would be more appropriate if this goal were rephrased as "not restrict the ability to develop products" related to MGR, rather than "foster." Interviewees in the developed State group indicated that they did not believe that product development linked to MGR from ABNJ would

[5]According to Part II of the President's aid to negotiations (June 2019), one of the objectives of this Part is to "*build the capacity of developing States Parties, in particular least developed countries, landlocked developing countries, geographically disadvantaged States, small island developing States, coastal African States and developing middle-income countries, to access and utilize marine genetic resources of areas beyond national jurisdiction.*"

happen, and as such this goal was not relevant in the context of BBNJ negotiations. In addition, in the unlikely event that products were to be developed, this would then be considered more as a potential side-effect rather than as a goal of the genetic resource system. Standard deviations were greater than half of the average for the developed State group and for the civil society group, indicating moderately significant differences of opinion represented by participants in these groups.

Safeguarding of investments was considered to be of similar importance to the goal of fostering product development on MGR. Standard deviations were greater than half of the average for the scientific research community, private sector and developed State group, indicating moderately significant differences of opinion represented by participants in these groups. Participants from the scientific research community and developed States noted that they do not see the safeguarding of investments as relevant in the context of BBNJ, presumably because they do not foresee commercial interest in development of products or processes related to MGR from ABNJ. According to private sector interviewees, whilst the safeguarding of investments is important as prerequisite for technological development associated with MGR, they do not see this as an aim or purpose of the genetic resource mechanism as such. Nonetheless, the developing State group indicated that investments must be safeguarded, otherwise no one will invest.

Protection of Intellectual Property (IP) related to MGR from ABNJ was generally considered to be of lower importance across the stakeholder groups. Whilst many interviewees acknowledged that the option to protect IP was important, they also felt that the BBNJ negotiations and resultant instrument were not the appropriate context or fora in which to deal with the details of this issue. Developed States indicated that measures related to the protection of IP should not be included in this instrument, firstly because the intention of this instrument is not focused on IP and secondly so as not to interfere with ongoing IP discussions coordinated by the World Intellectual Property Organization (WIPO) and World Trade Organization (WTO). One participant mentioned that they would, therefore, prefer Article 12 on "intellectual property rights" in the current draft treaty text to be deleted (Presidents aid to negotiations, June 2019). This view was also expressed by participants from the private sector, scientific research community and civil society. Participants representative of the private sector indicated that the protection of IP is an important incentive to promote innovative R&D, progression through the value chain and is also needed in order to advance technology which may be linked to conservation and sustainable use. As such, they would like to see these rights maintained and safeguarded and not impacted by a potential new ABS system in ABNJ. However, they also noted that the protection of IP should not form a part or objective of or an objective of an ABS system within the BBNJ instrument. The same reasons apply to the safeguarding of investments. Developing States acknowledged that the prevailing position amongst developed countries was that IP protection falls outside the scope of the BBNJ instrument. However, they also felt that IP protection was important and should be addressed during negotiations in some way (IISD, 2019). Nonetheless, they also mentioned that the potential new genetic resource ABS system should not change the current state of IP rights. Standard deviations were greater than half of the average for the scientific research community, private sector, developed State group, and civil society, indicating moderately significant differences of opinion represented by participants in these groups. These differences in opinion may reflect varying perspectives in terms of, not only whether it is important to have the option to protect IP related to MGR, but also whether this aspect should form part of a potential genetic resource framework for ABNJ.

Differences of opinion between developing and developed States appears to be greatest with regards to perceived importance of fostering product development on MGR, safeguarding investments and protection of IP. These results may be expected given previous discussions related to these topics during BBNJ negotiations (IISD, 2019). However, alignment of the scientific research community, civil society and private sector with developed States in terms of the relative low importance of these three issues compared to other goals, represents a new insight resulting from this study. Developing States alone perceive these three goals to be important. This difference in viewpoint may be related to the prevailing perspectives within national jurisdiction. With regards to the utilization of genetic resources under existing frameworks, such as the Nagoya Protocol and the Plant Treaty, the provider countries are mainly developing countries (Nijar, 2011). As such, the authors hypothesize that a similar mentality, based on previous experience when dealing with genetic resources, may be transferred to the BBNJ context.

Seven additional goals of the potential new genetic resource system for ABNJ were also proposed by interviewees. Participants representative of the private sector suggested the following three goals: facilitating access to MGR; no burden on access for R&D, and; need to be harmonized with other workable ABS mechanisms. One individual from the developing State group noted that legal certainty could be an important additional goal to consider. Interviewees from the developed State stakeholder group suggested that capacity building and inclusivity of SIDS and LDCs could be worthwhile goals to include. One interviewee representative of civil society proposed the potential inclusion of a goal regarding genetic resource policy development.

Access to MGR From ABNJ

Analysis of the President's aid to negotiations (June 2019) and a review of the literature lead to identification of eight elements and options in terms of governing access in ABNJ (see **Table 3**). A description of five of the access elements considered in this study (regulatory/governance mechanism, material scope, mechanisms to trigger access, utilization scope, facilitated access), and why they might be important, can be found in Sirakaya (2019). Three additional access elements in this study, which were not considered by Sirakaya (2019), include:

- **Should access to MGR from ABNJ be regulated?**

Interviewees were asked whether they felt that access to MGR from ABNJ should be either "yes" regulated, or "no"

not regulated as part of an ABS framework, and any reasons behind their decision.

- **Should access involve a monetary cost (such as an access fee)?**

Interviewees were asked whether they felt that it would be a good idea for access to MGR from ABNJ to involve a monetary cost (such as an access fee), and any reasons behind their decision.

- **What geographical scope would be most appropriate?**

Interviewees were asked to consider which geographical scope they felt would be their first, second and third choice in terms of appropriateness for applying to access to MGR from "ABNJ," either "seabed only," "different for seabed and high seas" or "same for both seabed and high seas" (Art 87 and 136, UNCLOS).

Regulation/Governance of Access

Among the options provided for question 2a (see interview in **Supplementary Material**), respondents preferred access to be regulated. However, interviewees from the scientific research community, developed State group, civil society and private sector strongly indicated that they would prefer access provisions in terms of "governance" or "policy," rather than "regulation." The reason for this is that the term regulation is viewed as too strong legally speaking. The term "governed" can be interpreted more broadly, whereas regulation may require specific legal "Acts" or other documents to be complied with. Participants from developed and developing States indicated that they would prefer access to be regulated/governed (rather than not regulated/governed), because this would give legal certainty in terms of who is doing what and with which materials. Two interviewees from the developed State group suggested that instead of regulating "access" to MGR, they would prefer only the regulation of "collection" of MGR (*in situ*). A few participants from the scientific research community and private sector expressed uncertainty in terms of whether they would like access to be regulated/governed or not. Participants suggested that it may be valuable to consider regulating access for conservation purposes, but perhaps not for ABS purposes necessarily. Participants recounted problems experienced in terms of dealing with the regulatory framework of the CBD and Nagoya Protocol, particularly in terms of administrative burdens and associated procedures which can be lengthy and costly. Therefore, interviewees felt that if regulation of access in ABNJ incurred similar burden, then perhaps it would be preferable to avoid this as much as possible and focus instead on benefit-sharing, conservation and sustainable use of BBNJ. Questions were also raised in terms of who one would need to ask/notify for access and how this would work at the international scale.

Regulatory/Governance Mechanism

On average, all stakeholder groups preferred a notification mechanism to a permit. Interviewees indicated that access provisions should involve a light-touch, notification approach, with the requirement or condition to record certain access elements, perhaps coupled with facilitated information exchange, but should not take the form of an authorization procedure. One interviewee from the developed State group added that pre-cruise information could be submitted (not as a permit or notification) to a potential new secretariat or clearing-house mechanism with regards to the collection of MGR from ABNJ, followed by post-cruise notification (e.g., a cruise report to be submitted within a few months after return) which could then be linked to benefit-sharing. Participants from developed States also suggested that notification would be preferable to "no regulation" in order to provide transparency regarding activities associated with MGR from ABNJ. Interviewees described previous experiences when dealing with permits as part of existing ABS regulations and noted that this can act as a blocking mechanism to restrict some forms of access and/or activities. In addition, obtaining permits in the context of the Nagoya Protocol can be complicated, challenging and burdensome in terms of time, energy and administrative requirements on the user of genetic resources as well as on the decision-making authorities, who may not know on what basis they can give a permit. In addition, questions were raised regarding who would be the potential permitting authority in the context of BBNJ, who would check this, what would the process be, and would this decision have to go through a conference of the parties (COP). Alternatively, members from developing States, developed States, and the private sector explained that a notification system would be more straightforward, practical, workable, efficient, and less burdensome than a permit mechanism. Two interviewees from the developing State group preferred the permit system for reasons of greater control, leverage, and vigilance. However, one of these individuals admitted that they were unsure whether UNCLOS provisions would allow for a permit-based system and that it would likely be unacceptable for other stakeholders.

Material Scope

Stakeholder scores indicated that the first choice for material scope was "*in situ* and *ex situ* access." Interviewees indicated that "*in situ* and *ex situ*" would provide a suitably broad scope and interpretation of MGR. Participants from the private sector and the developed State group suggested that it would be useful to consider the inclusion of the following phrase: "*in situ* and *ex situ* (material collected *in situ*) after entry into force of the agreement, in line with the CBD and Nagoya Protocol." Interviewees from all groups, apart from the developing States, expressed concern with inclusion of the term "*in silico*." The term "*in silico*" still lacks clarification in terms of scientific definition and scope. One interviewee suggested that instead of the term *in silico*, perhaps it would be more appropriate to consider "digital sequence data." The potential implications of regulating *in silico* access are also unclear. Furthermore, the interviewee felt that at present it appears very difficult to link the raw MGR material to the data and to trace access to *in silico* MGR. In addition, questions were raised regarding how we would regulate access to *in silico* information which is currently freely available via open access databases. Other concerns with inclusion of "*in silico*" included the potential for retroactive application. If MGR are accessed *in situ* before the treaty enters into forces, but are used after entry into force, this may represent the type of scenario with potential

for a very broad application of the ABS mechanism. As such, the mechanism could become unclear and unworkable. Alternatively, one interviewee from the developed State group proposed that *in silico* access could be a form of benefit sharing, with the requirement to share data such as genetic sequence data (GSD).

The second choice according to stakeholder scores was "*in situ, ex situ*, and *in silico* access." This option was favored by the developing State group. Participants from this group suggested that a broader scope would be better as this may have an impact on the benefit-sharing. In other words, if we consider as broad a scope as possible regarding MGR, then the variety and quantity of benefits to share could perhaps also be greater. However, if we are unable to trace MGR from ABNJ through to the *in silico* phase, the impact on benefit-sharing may be questionable.

The third choice for material scope was "*in situ* access only." This option was preferred by the private sector and a few interviewees from the developed State group and the scientific research community. The main reason for this choice was the simplicity and workability. It was also suggested that *in silico* (and perhaps also *ex situ*) goes beyond the aim of the BBNJ scope. The aim is to conserve and sustainable use BBNJ, and it is unclear what impact regulation of *in silico* access/access to databases would have on biodiversity.

Access Trigger

The first choice for the access trigger, according to stakeholder scores, was "access for sampling," when MGR is collected from ABNJ. This trigger was seen as much more encompassing, more straightforward, simpler in terms of practical purposes and more workable than "access for utilization." Interviewees from all stakeholder groups, apart from the developing States, noted uncertainty of the potential definition of the term "utilization" in this context. It was suggested that we could use the same definition as that found in the Nagoya Protocol[6]. However, in the context of the Nagoya Protocol, many people have already experienced implementation challenges with this term at the national level. Questions were raised regarding whether we would need to draw a line between MSR and bioprospection, how this would be done and whether we would need to consider this if we opted for the "access for utilization" trigger. Scientists noted that triggering access at the point of utilization may also be challenging due to the potential gap in information by the time we reach this stage. MGR samples are sometimes stored in collections and unused for many years before they are utilized, by which time some information might have been lost. In addition, one interviewee mentioned that triggering access at the point of utilization could potentially lead to retroactive measures, since MGR samples already in collections were sampled prior to entry into force of the agreement. It is likely that provisions that incorporate retroactivity would be challenging to implement.

Interviewees suggested that perhaps it might be useful to consider inclusion of both triggers, with different benefits to be shared with each. According to interviewees, access for sampling could constitute the first form of access, triggering the sharing of benefits such as capacity-building or research results, with access for utilization as the second form of access, at a later stage in the value chain and associated with the sharing of other forms of benefits.

Utilization Scope

All stakeholder groups agreed that the definition for utilization should include both R&D activities, rather than research only or development only. However, this could depend on what is included in the scope of regulation/governance and on the definition of research and of development. Whilst the scientific research community expressed an interest in avoiding a framework for basic research, so as not to hamper MSR and promote benefit-sharing, interviewees from most stakeholder groups explained that it is very difficult to separate or distinguish between basic, non-commercial research from R&D with potential commercial intent, and should therefore not be attempted here. In addition, since the definition for utilization under the Nagoya Protocol encompasses both R&D, it may be better to harmonize with this rather than create complication by assigning a different definition for the utilization of MGR from ABNJ (if the term "utilization" is to be included). However, one interviewee from the private sector suggested that the term utilization in the context of BBNJ should not create requirements during research or development or R&D. Instead, they would prefer to completely enable R&D and not to regulate this activity. This could be in line with activities linked to the International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA], 2001). Furthermore, the interviewee stated that under the ITPGRFA, users of genetic resources simply sign up with a standard material transfer agreement (SMTA) at the time of access and there is no heavy regulation or burden on the user of genetic resources during R&D. They felt that something like that could be preferable for the private sector in the context of BBNJ.

Facilitated Access

According to stakeholder group scores, there was a preference for the option to facilitate access, rather than no facilitated access at all. The term "facilitated access" was difficult for most interviewees to describe or define. More than half asked for an explanation of what facilitated access meant. However, most agreed that it was a broad concept whereby the barriers to access MGR, such as time, financial cost, administrative burden, transparency, legal certainty, knowledge, skills, and equipment, are lowered.

Interviewees from both developing and developed States suggest that it may be simpler to opt for just one process – either access should be facilitated in all cases, or not at all. Alternatively, facilitated access could be considered as a way of lowering the barrier of entry for developing States, perhaps as a form of benefit-sharing. Facilitated access could vary depending on whether this is linked to *in situ*, *ex situ*, or *in silico* MGR. For *in situ* access to MGR, pre- and post-cruise

[6]According to the Nagoya Protocol, "'*Utilization of genetic resources*' *means to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in Article 2 of the Convention*" (Nagoya Protocol, 2011).

notification could facilitate access by raising awareness of who is doing what, where and with which materials or equipment. This could support scientific cooperation and coordination, by providing the opportunity for developing State scientists to join research cruises, and perhaps also to build capacity and transfer technology. For *ex situ* MGR, facilitated access could take the form of open access to MGR. It could also be related to covering costs of access, such as for the postage of MGR samples to developed countries. Facilitating access to *in silico* MGR may be a bit more complicated. One interviewee from the private sector suggested that in the context of ABNJ, facilitated access could also take into consideration potential special or emergency situations[7]. For example, in cases where research, such as environmental monitoring, is needed for conservation and sustainable use purposes, then perhaps access to MGR should be facilitated.

One interviewee from the developed State group suggested that instead of "facilitated access," we should consider the phrase "promoted access." In the context of ABNJ, there have not been any access obligations to date. Therefore, the requirement for facilitated access at present could be questioned.[8] By instead considering promoted access, we can then look at how the instrument could help to make more MGR information available, for example through collaborative projects. This would help to encourage and promote access to MGR, thereby enhancing our collective scientific knowledge in terms of BBNJ.

Monetary Cost

Across stakeholder groups there was a slight preference for no additional monetary costs to be associated with access to MGR from ABNJ. Interviewees from the scientific research community, private sector and developed as well as developing States noted that a monetary cost would be very challenging to implement for a variety of practical reasons. In addition, a monetary cost could add an additional barrier to access, particularly for researchers from developing countries, but also for public research institutes, small- and medium-size companies and other less resource-rich users of genetic resources. Access to MGR from ABNJ is typically already a very expensive procedure, particularly when involving a scientific research expedition. Therefore, it may be difficult for scientists to pay additional fees, and could even discourage or disincentivize access or R&D. However, a few interviewees from all groups mentioned the possible merits of a monetary access cost. It may be worthwhile considering the possibility of a monetary access cost at certain stages in the R&D value chain, perhaps for the non-scientific community, if this provides the opportunity to preserve value and spread costs associated with initial access/research (e.g., cruise costs). This could take the form of a one-off fee (with no subsequent costs), of a pre-set and limited amount. The money could be paid into a common, global fund for the purpose of conservation and sustainable use. Nonetheless, questions still remain in terms of who would organize and run the global fund (the fund first would need to be set up) and how the money would be used or distributed.

Geographical Scope

According to stakeholder scores, the first choice for geographical scope is "same for both seabed and high seas." Interviewees from all groups noted that it would be very complicated in practice to distinguish between MGR from the seabed and the high seas, since organisms exist in both environments. As such, it would be more straightforward to consider and deal with MGR from both areas in the same manner. The other two options for geographical scope, "different for the seabed and high seas" and "seabed only" were classified by most interviewees as equally undesirable. "Different for seabed and high seas" was slightly more preferable to "seabed only," which was the least favored option. Half of the participants from developing States selected "different for seabed and high seas" as their first choice, in order to respect existing provisions under UNCLOS, such as the common heritage of mankind principle which applies to "the Area and it resources"[9].

Benefit-Sharing Associated With MGR From ABNJ

In order to gather stakeholder perspectives on benefit-sharing, interviewees were asked to consider the potential beneficial impact as well as the potential burden on their stakeholder group associated with different benefit-sharing options. Analysis of the President's aid to negotiations (June 2019) and a review of the literature lead to identification of six elements and options in terms of governing benefit-sharing in ABNJ (see **Tables 4**, **5**). A description of five of the benefit-sharing elements considered in this study (non-monetary benefit-sharing, monetary benefit-sharing, pre-set conditions versus case-by-case negotiation, trigger for benefit-sharing, option to renegotiate or change conditions regarding ABS obligations), and why they might be important, can be found in Sirakaya (2019). One additional benefit-sharing element in this study, which was not considered by Sirakaya (2019), includes:

- **Should benefit-sharing take place on a voluntary or a mandatory basis or depend on the type?**

Interviewees were asked whether they felt that benefit-sharing linked to MGR from ABNJ would be more appropriately considered on a voluntary or a mandatory basis, or both voluntary and mandatory depending on the types of benefits shared (President's aid to negotiations, June 2019).

In addition, the monetary benefit-sharing element in this study also considered two additional options:

- **Milestone payments (Nagoya Protocol, 2011)**

[7]Article 8 of the Nagoya Protocol describes special considerations, such as facilitating access for "*imminent emergencies that threaten or damage human, animal or plant health.*"

[8]According to Art 15.2 of the CBD, "Each Contracting Party shall endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention." This suggests that the term "facilitated access" may apply to specific uses of genetic resources, or groups of genetic resource users. This connotation could perhaps be avoided by using the term "promoted access" as an alternative.

[9]Art 136 on common heritage of mankind, UNCLOS (1982).

Interviewees were asked to consider how much of a potential beneficial impact and burden milestone payments may have on their stakeholder group.

- **Joint IP rights (Nagoya Protocol, 2011)**

Interviewees were asked to consider how much of a potential beneficial impact and burden joint IP rights may have on their stakeholder group.

Non-monetary Benefit-Sharing – *Potential Beneficial Impact*

Among the options provided for question 3a (see interview in **Supplementary Material**), respondents indicated that capacity building is the form of non-monetary benefit-sharing with the greatest potential beneficial impact (see **Table 4**). Capacity building is a very broad concept, and the potential for positive impacts associated with this form of benefit-sharing will depend on what type is being considered. Nonetheless, interviewees from the developing State group noted that capacity building overall could be useful to build long-term capability to access and utilize MGR. For most developing States, it is unlikely that sharing of raw data would have a very positive impact, especially if the data is received in a format which requires specific tools to process and work with it. However, coupling of data with capacity building may provide a useful means of enabling more States/stakeholders to make use of all forms of benefits that might be shared, as well as to utilize MGR and take part in subsequent innovation processes (Collins et al., 2019). Representatives from the private sector also agreed that capacity building could have a positive impact on their stakeholder group, as well as for the general scientific community as part of scientific information generation. One representative indicated that their organization is already involved in capacity building on a voluntary basis. For example, they train scientists in their lab facilities and sponsor them to move between their labs across different countries around the world. However, participants from the developed State group noted that the capacity building option could perhaps be separated out from the benefit-sharing section and may be better dealt with in the capacity building part of the treaty. This would help to keep the system as simple as possible.

The non-monetary benefit-sharing option with the second-greatest potential beneficial impact, according to stakeholder scores, is sharing of research results. Interviewees from the developed State group explained that it would be very positive to share as much as possible, including research results, but it may be a matter of feasibility. The potential for positive impact related to sharing of research results may depend on what exactly is included. This concept could be very broad and may lead to concerns regarding IP rights. Sharing of biochemical information was viewed by stakeholders as the option with the least potential beneficial impact. This may be linked to the requirement for capacity in order to make use of this type of information.

Non-monetary Benefit-Sharing – *Potential Burden*

Sharing of metadata received the lowest score across stakeholder groups in terms of potential burden, followed by sharing of GSD. The greatest potential burden was associated with technology transfer.

According to the scientific research community, sharing of metadata and GSD is something that scientists already do. This appears to be a relatively straightforward procedure, and it is considered scientific best practice to share this type of data amongst the community via open databases. One scientist indicated that it would likely not be too complicated to share this data with everyone globally and would be a matter of organization and standards. Under the assumption that the BBNJ agreement describes requirements to share metadata and GSD in keeping with current practices, through the same current channels (and not through other systems), then interviewees do not foresee any additional burden on the scientific community. However, if data sharing becomes required through other channels/systems, this would create an additional negative burden[10]. Representatives from the private sector agreed that depositing GSD into databases would not be too difficult. When scientists in the private sector publish or file a patent application, they have to put it into a database. However, private sector participants raised concerns with sharing of data as a result of private rather than public funding. Mandatory requirements to share confidential information and/or data which goes beyond current practice would not only be a burden for this stakeholder group, but may also act as deterrent for accessing MGR from ABNJ. According to private sector stakeholders, we need to keep in mind aspects such as IP protection, incentives to invest and protection of their competitive advantage.

Interviewees from developed States highlighted the importance of only sharing those data that are actually useful. Furthermore, interviewees indicated that we have too much data and information, and the challenge is to make use of it and to find what is worthwhile focusing on. If we encourage the sharing of all metadata, this may simply be too much information and could become unhelpful by clogging the system.

With regards to technology transfer, interviewees from developed States, the private sector and the scientific research community acknowledge the potential for burden on their stakeholder groups. The degree of burden, in terms of financial cost and administration, will depend on the type of technology, the conditions, how it is funded and how the transfer is managed. However, the funding required for technology transfer is likely higher than for the other benefit-sharing options. Participants also noted concerns regarding IP issues. In addition, it was suggested that technology transfer would need to be conducted on a voluntary basis and with mutually agreed terms between the technology provider and the receiver. This was suggested by an interviewee who stated that they assume we cannot force people to transfer privately owned technology. Furthermore, the interviewee felt that if this was forced, it would likely fail the capacity development purpose, since technology may be transferred out of context with no appropriate absorptive capacity in the receiver State. From the private sector perspective, it

[10]See Rabone et al. (2019) for a detailed explanation of scientific best practice in accessing MGR and how this can be considered during BBNJ negotiations to promote conservation and sustainable use of marine biodiversity, as well as allow for greater sharing of MGR for research.

is important to keep in mind the need to recoup investments because without this, investment is likely to be discouraged. As such, participants from the private sector indicated that they would consider technology transfer on commercial terms, but perhaps not if it is forced and free. Participants from developing States and civil society do not foresee any burden that applies to them.

Monetary Benefit-Sharing – *Potential Beneficial Impact*

Research funding was viewed as the form of monetary benefit-sharing with the greatest potential beneficial impact (see **Table 4**). This was followed by joint ventures. The options viewed as having the least potential beneficial impact were the access fee per sample and milestone payments.

Research funding is viewed as a priority for interviewees from the scientific research community. Participants from developing States indicated that research funding would also help to meet requirements for capacity building in developing countries. One representative from the private sector noted that research funding may be considered more as a destination of payments, rather than a form of monetary benefit-sharing as such. Nonetheless, they agreed that this type of funding could be useful but would depend on what the research is for and how much of the monetary benefits would be directed to this. Ideally this would be research focused toward the objectives of the treaty, such as conservation and sustainable use of BBNJ. One interviewee from the developed States group also stated that research funding could be positive if directed toward research on MGR/BBNJ. However, other participants in this stakeholder groups suggested that we should not limit our vision only to the conservation and sustainable use of BBNJ. Instead, respondents suggested that it may be more appropriate to listen to what developing countries want, and perhaps it would be useful for scientists in these countries to research MGR within their national jurisdiction. Furthermore, interviewees felt that not only would it be difficult to differentiate and limit the scope of research to ABNJ only, but this would also not benefit developing States as much as it might otherwise.

Two interviewees from developing States noted that the degree of beneficial impact linked to research funding will depend on where this money comes from; either money generated as a result of utilization of MGR from ABNJ, or additional money from other sources. Interviewees suggested that if funding is derived from additional sources, this could have a very positive impact on this stakeholder group, but if it is depleting a fund generated from utilization of MGR from ABNJ, then this could be negative. The reason given for this is that money generated from utilization and deposited in the fund should be left to the receiver States to decide whether it should be used for research or for education or other purposes.

Joint ventures[11] were scored on average as the option with the second-most positive potential impact. According to developed States interviewees, the degree of impact linked to joint ventures will depend on the associated conditions. If these are conducted on a voluntary basis and there is a common interest between partners, then this could be positive, particularly if it increases involvement in research. However, if mandatory, this could be negative. One participant from the private sector conveyed uncertainty that a joint venture would actually be considered as a monetary benefit (if in the form of a partnership), because they do not always lead to commercial products or financial return. In addition, the interviewee emphasized that joint ventures should not be mandatory, and should be considered case-by-case, otherwise we would risk this option becoming unworkable. However, it was suggested that the process itself could be beneficial as a form of capacity building and in terms of collaboration and training.

The access fee per sample and milestone payments were considered as the two options having the least potential beneficial impact. According to the scientific research community, private sector and developing State groups, the access fee could be somewhat positive if it worked well, if it was considered only as a one-off payment without excessive bureaucracy and ensured funds. As with all options, the impact would very much depend on the details of how this is set up. However, if it involved administrative burden and researchers were required to pay, this could be negative as it may act as a barrier to research. In addition, many participants felt that both the access fee and milestone payments would not be feasible. Overall interviewees from the scientific research community, private sector and developed States indicated that the negative impacts associated with burden (see section below) linked to both options would outweigh the potential benefits for the system as a whole.

An additional monetary benefit-sharing option was proposed. One participant from the developed State group suggested the option of a "voluntary trust fund"[12]. This interviewee did not foresee the possibility of any monetary benefit-sharing options as part of the BBNJ agreement. However, according to this individual, a voluntary trust fund could be the only potential option. A voluntary trust fund would enable the private sector to make contributions. This would not necessarily be tied specifically to the private sector or the commercialization of products from MGR, but rather open to all on a voluntary basis. Furthermore, the interviewee felt that this could be a way of encouraging private sector involvement and may also help to finance organizational tasks to implement the agreement in the context of ABNJ. It was suggested that the trust fund could be used for sharing of monetary benefits for the benefit of the whole treaty.

Monetary Benefit-Sharing – *Potential Burden*

Among the options provided for question 3d (see interview in **Supplementary Material**), respondents indicated that the option with the least potential burden is the salaries (e.g., Ph.D. researchers), followed by research funding. The greatest potential burden was associated with milestone payments.

[11] In this article, the term "joint ventures" is used in a general, broad sense and not in the corporate or legal manner.

[12] A large variety of trust funds exist in the UN system, supporting a wide range of goals. Contributions are often voluntary, and funds are distributed to States, international organizations or UN agencies. An example of a biodiversity-conservation related trust fund is the Global Environment Facility (GEF), which has contributed 20 billion USD toward biodiversity conservation since its inception in 1992.

Many interviewees from the developed State group and private sector stated that they found it difficult to distinguish between the potential benefits and burdens of these options for their stakeholder groups, because according to them the overall impact would generally be negative. In addition, respondents suggested that the degree of burden (as well as potential beneficial impacts) will depend on the associated details and how this will be done. According the interviewees, the same applies to all forms of benefit-sharing. Participants from developing States, the scientific research community and civil society do not foresee any relevant burden that applies to them in this context.

In terms of salaries and research funding, interviewees from the developed State group acknowledge that these options will be somewhat difficult because of course they require funding, which is a cost to society. However, apart from the cost, other organizational details were not considered to be too complicated. In addition, the long-term positive impacts would outweigh the initial burden in terms of adapting to new bureaucratic processes. One participant noted that it would be unrealistic to expect no burden in terms of change to current procedures as a result of implementing the agreement.

Milestone payments were viewed as the monetary benefit-sharing option with the greatest potential burden in terms of administrative and financial requirements. Interviewees from both developing and developed States explained that milestone payments would require monitoring or track-and-trace systems which would be very challenging to manage. Also, uncertainties were raised regarding when and whether these payments would even be made. Overall, it was suggested that this option would create legal uncertainty, particularly for industry, and according to interviewees any potential benefits would be outweighed by the negatives.

Voluntary or Mandatory Basis

According to stakeholder group scores, the greatest perceived positive impact is associated with benefit-sharing on both a voluntary and mandatory basis depending on the type (see **Table 5**).

It was suggested that non-monetary benefit-sharing should be happening already, so theoretically this would not be (too much) of an additional burden on the scientific research community if it were to become mandatory. However, this would depend of course on associated conditions. Interviewees from the developed State group agreed with the scientific community and also considered it appropriate for non-monetary benefit-sharing to be mandatory. One interviewee from the developed States group noted that there may be scope to consider monetary benefit-sharing on a voluntary basis. In this case, it would be important to consider how the broadest possible range of voluntary contributions could be captured. Representatives from the private sector generally preferred the voluntary option, because this would provide more flexibility. Nonetheless, they also understood that this may lead to no benefits being shared. The impact of a voluntary and mandatory benefit-sharing system depending on type would depend on exactly what requirements are made mandatory.

Interviewees from developing States would prefer that there is a core, minimum selection of benefits that must be shared, so as to incentivize and ensure that benefit-sharing takes place. It was suggested that beyond this core, additional benefit-sharing could be on a voluntary basis. In addition, a minimum mandatory requirement could help to provide some legal certainty for the private sector in terms of what is required from the users of genetic resources. Participants also noted that whilst precise words regarding benefit-sharing requirements on a voluntary or mandatory basis may not end up written in the treaty text, perhaps something to that effect could be included so that some benefits are shared as a bare minimum, with other options that could be shared in addition and on a voluntary basis.

Pre-set Conditions Versus Case-by-Case Negotiation

All stakeholder groups considered pre-set conditions as more favorable than case-by-case negotiations. This is because, given the multilateral context, pre-set conditions may be much more straightforward and practical. It was suggested that case-by-case negotiations would be far too inefficient, time-consuming and burdensome, as well as require adequate capacity to fulfill the administrative requirements. Questions were raised in terms of who the users of genetic resources would negotiate with if this was on a case-by-case basis. Interviewees from the private sector recounted experiences when dealing with case-by-case negotiations linked to existing genetic resource frameworks and noted that it was very difficult to negotiate access and to find someone who is able to negotiate/grant access or decide on the conditions. Alternatively, dealing with pre-set conditions linked to the SMTA under the ITPGRFA was described as a much more straightforward process. Therefore, perhaps lessons could be learnt from this and applied to the BBNJ context.

The developed State group preferred pre-set conditions, provided these take a light-touch approach, are not too prescriptive and assuming that this involves non-monetary benefit-sharing options only. One interviewee suggested that if monetary benefit-sharing is to be considered, this would be more appropriately dealt with on a case-by-case basis. However, it is unclear how exactly pre-set or case-by-case conditions would work in the multilateral BBNJ context and whether conditions should actually be written in the treaty text or decided at a later stage. The most appropriate option may depend according to specific types of research, products or sectors. Overall, it remains uncertain whether such conditions will be considered in the treaty text, but if they are then it may be more appropriate to consider these as a minimum requirement of pre-set conditions, perhaps with voluntary, additional conditions on a case-by-case basis, depending on the types of activities taking place.

Trigger for Benefit-Sharing

According to stakeholder group scores, the trigger for benefit-sharing with greatest potential positive impact is at the point of sampling, followed by at the point of commercialization. At the time of application for IP rights was considered as the least positive option (see **Table 5**).

Most interviewees acknowledged that different types of benefits could accrue along the value chain, such as non-monetary benefits in the initial phases, possibly followed by

monetary benefits at later stages. As such, stakeholder groups generally agreed that non-monetary benefits could be shared at the point of sampling. Participants from the private sector noted that for simplicity, at the point of sampling would be the clearest option, since this is the stage at which it is most straightforward to link to genetic resources. It can be more complicated to link genetic resources to stages further along in the value chain as this would require the creation of a monitoring/track-and-trace system.

At the point of commercialization was considered the most appropriate point to potentially share monetary benefits, because at this stage the genetic resource user will know whether the product developed will be commercially viable or not. However, participants from the developed States group indicated that sharing of benefits (including monetary benefits) at stages after sampling would be unfeasible. This would require a monitoring or track-and-trace system which they consider would likely be too burdensome and costly to be worth the investment of setting it up.

At the point of application for IP rights was the least positive option according to stakeholder perspectives. This is because application for IP is not a guarantee of commercial products or financial return. This stage is considered far too early in the innovation chain. Therefore, the value of linking benefit-sharing to the point of IP application appears very questionable.

Overall, it appears that sharing of non-monetary benefits at the point of sampling, followed by monetary benefit-sharing (if generated) at the point of commercialization may be the most appropriate approach to take.

Additional options for the trigger for benefit-sharing were suggested. One interviewee from the developed State group proposed adding the option of "at the point of notification of the benefits on the clearing house mechanism." This option would mean that once when a researcher returns from ABNJ with their samples, they conduct their research and once they are finished using the samples (within a time limit), there should be an obligation to publish a notification of the benefits on the clearing house mechanism. One interviewee from the civil society group suggested considering "at the point of notification of access." A scientist could provide metadata prior to a cruise taking by notifying a clearing house of the fact that a cruise will take place on a specified date, in a particular location, using a specific variety of instruments and for which proposed purposes. This could be used to help raise awareness of free spaces available on the research vessel for additional scientists from developing countries to join.

Option to Renegotiate or Change Conditions Regarding ABS Obligations

According to stakeholder scores, the most positive perspective would be to have the option to renegotiate/change conditions, particularly with change of user intent, as opposed to not having the option at all.

It was noted by the scientific research community that they would like to encourage secondary and/or third-party usage of genetic resources as much as possible. As such, an ABS framework which supports this principle would be desired. Scientists described past negative experiences when working with genetic resources and complying with existing ABS mechanisms which either did not include the option to change conditions or which did include it, but in a manner which was very difficult to work with. This has caused scientists in some situations to discard material because it was too complicated or not possible to change conditions regarding ABS obligations.

Interviewees from all stakeholder groups highlighted the importance of keeping in mind that change of intent can and often does take place and that it will be important to build sufficient flexibility into any potential mechanism so as not to lock researchers into only one type of use or to freeze activities due to inability to change user or intent. However, the private sector highlighted their need for legal certainty in order to promote investment. If a company invests money into research which is based on certain conditions, they would be happy with the option to voluntarily change conditions, but it could become problematic if these conditions might change without their request (i.e., if mandatory changes of conditions are suddenly imposed). In other words, it is important for private sector stakeholders to know the conditions up-front, at least up to pre-determined points. It was also suggested that a balanced ABS system could consider including similar options to those related to IP protection, such as the options for termination, exhaustion, and expiry. With regards to the Plant Treaty (ITPGRFA), one private sector interviewee raised concerns with regards to signing an SMTA because it appears to be a perpetual contract and without a termination clause. This issue is now being addressed in the revised draft of the SMTA[13]. Lessons learnt from this could be applied to the BBNJ context.

Questions were raised in terms of who such contracts would be negotiated with, who would fund this and whether these types of contracts would even be feasible in the context of MGR from ABNJ. These types of contracts are used under the Nagoya Protocol where we have bilateral agreements, but this may not be applicable or in scope of the multilateral BBNJ agreement. Instead, interviewees stated that they did not envisage a regulatory body or authority who might negotiate contracts, but that everyone would be able to gain access to MGR directly through a clearing house mechanism.

Interviewees from developed States, developing States, private sector, and civil society acknowledged the importance of flexibility in terms of ABS obligations, but also stated that it could be much simpler and less burdensome without an option to change conditions. Provisions linked to renegotiation or change of intent would demand a burdensome monitoring system which would be costly and challenging to manage. In addition, this type of system could lack transparency and may become unworkable. Alternatively, perhaps conditions could be designed as part of a system so that they are all-encompassing and broad enough to capture and apply to all eventualities. Perhaps different terms could apply to different types of use. This way we would not need to actually change conditions as a result of change of user or intent, and would not restrict the potential use of MGR from ABNJ.

[13] http://www.fao.org/3/ca5050en/ca5050en.pdf

DISCUSSION

MGR, including questions on the sharing of benefits, remains the most complicated and immature element in the BBNJ package, and to date few detailed solutions have been suggested (Voigt-Hanssen, 2018). Indeed, results presented here confirm that each stakeholder group continues to perceive the influence of implementing ABS options in ABNJ differently compared to the other groups. It is therefore understandable that delegates involved in the UN negotiations may have difficulty in reaching agreement on this specific topic. However, the results in this article do indicate clear consensus on the importance of a number of goals related to a potential new genetic resource mechanism for ABNJ. Conservation and sustainable use of BBNJ have been highlighted by stakeholders in this study as the two goals they consider to be most important; these goals are directly linked to the overarching goals of the BBNJ negotiations. It would be appropriate, therefore, to review the (access and) benefit-sharing options as a means to attaining these goals.

Continued MSR and enhanced global biodiversity knowledge is vital to promote conservation and sustainable use of BBNJ. For example, genetic data are important components for tracking migratory movements and connectivity of marine species, which can feed into biodiversity conservation efforts by helping to design MPAs or marine reserves (Bell, 2008; Pawlowski et al., 2018; Closek et al., 2019; Dunn et al., 2019). It is critical, therefore, that any access provisions, such as notification of access/collection of MGR, do not create an excessive burden which may hinder activities conducted by the scientific research community, so that we can continue to build on our collective knowledge regarding marine biodiversity and how best to conserve it (Harden-Davies and Gjerde, 2019). It may be useful for the scientific research community to raise awareness and encourage adoption of best practice procedures for curating marine biological collections and for sharing of samples and data. This "best practice" could be considered and adopted in the agreement, so as to encourage sharing of MGR, whilst simultaneously limiting additional burden on scientists (Rabone et al., 2019). This may not only facilitate access to MGR but could also be viewed as an important form of benefit-sharing (Broggiato et al., 2018). By encouraging sharing and promoting opportunities to conduct R&D on MGR from ABNJ, scientific knowledge with the potential to conserve and sustainably use BBNJ will be enhanced (Harden-Davies and Gjerde, 2019). In addition, benefit-sharing in this manner, coupled with the required capacity building and technology transfer, could play an important role in contributing toward greater equity between States in terms of opportunities to utilize MGR from ABNJ in the future.

Building on national and regional collections could also help to support this effort (Leary et al., 2009). Scientific interest in MGR has grown over recent years, and so have the number and quantity of samples and data in collections (Haefner, 2003; Leary et al., 2009; Rabone et al., 2019). Such collections are also of potential interest to the private sector (Leary et al., 2009). Collaborative projects between members of the scientific research community and the private sector, perhaps in the form of joint research projects or even joint ventures, could be useful for advancing R&D with goals of conservation and sustainable use (Morgera, 2018b). It has been suggested by Ardron et al. (2014) that cooperation, both intra- and inter-sectorally as well as between sectors and conservation agreements is required to ensure the conservation and long-term sustainable use of marine biodiversity in ABNJ.

Whilst conservation and sustainable use have been identified as the most important stakeholder goals in terms of a potential genetic resource mechanism for ABNJ, it appears that these goals are not considered as important to stakeholders in areas within national jurisdiction (Sirakaya, 2020). Alternatively, according to Sirakaya (2020), goals such as "legal certainty" and "providing transparency" are two of the most important goals for stakeholders when considering ABS in areas within national jurisdiction. Interviewees in this study appear to agree on the low relative importance of "safeguarding investments" and "protection of IP." Indeed, these two goals were listed as the least important out of the twelve considered. In addition, divergence in terms of perspectives within the stakeholder groups was also greater for these goals than for the other ten (see **Table 2**).

With regards to benefit-sharing, results presented in this article indicate that all stakeholders agree that non-monetary options will result in positive impacts, with varying degrees of associated burden. However, there was a strong difference of opinion between stakeholder groups in terms of beneficial impacts and burden associated with monetary benefit-sharing options. Interviewees from developing States are the only stakeholder group to suggest that all monetary benefit-sharing options will have a positive impact on them (see **Table 4**). This perspective is understandable because, should monetary benefit-sharing become a requirement, the developing States would likely be the main beneficiaries. However, interviewees from the developed State group indicated that they do not believe that monetary benefits will be generated as a result of utilization of MGR from ABNJ and, therefore, did not foresee the possibility of monetary benefit-sharing, only non-monetary. As such, interviewees from the scientific research community, private sector and developed States indicated that a requirement to share monetary benefits may entail a high degree of burden, outweighing the potential benefits for the system as a whole. It is important to ensure that the burden does not outweigh the potential positive impacts linked to utilization of MGR from ABNJ, as this may serve to disincentivize MSR and other R&D activities, thereby leading to the generation of no benefits (monetary or non-monetary) to be shared at all (Correa, 2017). As such, a fair balance will need to be found between the right to use MGR from ABNJ and the responsibility to share benefits (Harden-Davies and Gjerde, 2019).

As stated in the paragraph above, interview results presented in this study reveal stakeholder perspectives on benefit-sharing options in terms of potential for beneficial impact versus burden. This is useful as a first step to understand which options may represent a more desirable balance in

providing positive results with as little associated burden as possible. The next step in determining more clearly which benefit-sharing options provide the most desirable balances, in terms of the ratio of positive impacts versus associated burden, will be to take consider the importance of key benefit-sharing factors. Factors may include the number and type of beneficiaries affected, the benefit-sharing goals (such as contributing toward conservation and sustainable use of biodiversity), the benefit-sharing impacts (such as duration and enhanced local employability), burden on the users of genetic resources, and burden on the regulator (Tvedt, 2013; Morgera, 2018a; Harden-Davies and Gjerde, 2019).

Overall, stakeholder perspectives highlighted in this study in terms of ABS options appear to align with the "double light" approach to ABS, or the "share the science" model, as described by Voigt-Hanssen (2018). Options which facilitate access to and utilization of MGR from ABNJ, particularly in the case of developing States, to participate in scientific research which contributes toward achieving the goals of conservation and sustainable use would be the options to pursue (Morgera, 2018a). This may require a greater focus on coupling of benefit-sharing with appropriate forms of capacity building (Voigt-Hanssen, 2018). It has been suggested that capacity building should build countries' human and institutional capital and ability to transform and apply scientific knowledge and technological knowhow (Mohammed, 2017). Therefore, by coupling benefit-sharing with capacity building, absorptive capacity will be enhanced, and users will be equipped with the skills and technology required to make use of MGR (Mohammed, 2017; Broggiato et al., 2018; Voigt-Hanssen, 2018).

Finally, in order to achieve the overarching goals of the new agreement related to conservation and sustainable use of BBNJ, it is important that potential ABS provisions related to MGR are linked to and support the other three elements of the package. These other elements are ABMT, including MPAs; EIA, and; capacity-building and transfer of marine technology (UNGA Res. 72/249, UN Doc. A/Res/72.249, 24 December 2017, para. 2.). The element related to MGR, including questions on the sharing of benefits, does not directly address the above-mentioned goals. Therefore, since MGR represent a component of marine biological diversity, it would appear appropriate that if raw data is required as part of the other elements (such as an MPA or EIA) in order to conserve and sustainably use these resources, that this information should be shared and incorporated into the MGR element, and vice versa. Connectivity and complementarity between elements, to the degree that is feasible and appropriate, may therefore represent a further aspect through which the desired BBNJ-related goals can be attained (Ardron et al., 2014).

CONCLUSION

Through discussions with stakeholders, perspectives on different goals and options in terms of access and of benefit-sharing for a potential new genetic resource mechanism for ABNJ were clarified. All stakeholders agree that the most important overarching goal in terms of ABS for ABNJ, and of the treaty as a whole, is the conservation of marine biological diversity of ABNJ, as well as sustainable use. It is, therefore, important for this to be kept in mind when negotiating every part of the new instrument, including the ABS options, in order to ensure that we attain these objectives as much as possible.

In terms of access to MGR from ABNJ, stakeholders favored a light-touch "governance" approach, potentially with a notification of access pre- (and possibly also post-) collection of material *in situ*. The preferred material scope was *in situ* and *ex situ* access, with access for sampling as the preferred trigger. In addition, interviewees agreed with inclusion of provisions regarding facilitated or promoted access to MGR and a material scope which applies in the same manner to both the seabed and the high seas. Stakeholders agree that mandatory sharing of some non-monetary benefits, confined to those that are considered "useful," would be a good idea and should be triggered at the point of sampling. In addition, non-monetary benefit-sharing should be coupled with the appropriate forms of capacity building in order to enhance absorptive capacity and equip users with the skills and technology required to make use of MGR. This will maximize potential positive impacts of benefit-sharing. Should monetary benefit-sharing be considered, this could be on a voluntary basis and triggered at the point of commercialization.

Finally, in order to achieve the overarching goals of the new agreement related to conservation and sustainable use of BBNJ, it will be important that potential ABS provisions related to MGR are linked to and support other elements of the package. Understanding of these preferences, together with reasons (as outlined above) and differences of opinion between stakeholder groups, will be useful for delegates to consider when negotiating the BBNJ instrument as well as during subsequent implementation processes. By appreciating the different viewpoints and priorities, delegates will be better equipped to negotiate the remainder of the issues related to MGR and to reach mutually acceptable compromises and, ultimately, a new BBNJ agreement.

DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/**Supplementary Material**.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JC and TV conceived the idea for the manuscript. JC completed the data curation, formal analysis, investigation, developed the research methodology, and, led the writing and editing of the manuscript. All authors contributed to this process and approved the final version of the manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fmars.2020.00265/full#supplementary-material

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