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David against Goliath? The rise of coastal states at the Indian Ocean Tuna commission

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Tuna regional fisheries management organizations (RFMOs) have long suffered from the domination of distant water fishing nations (DWFNs) in decision-making processes. The Indian Ocean Tuna Commission (IOTC) is no exception. In recent years, coastal states of the Indian Ocean (IO) have tried to change this dynamic - led by countries like the Maldives, Kenya, South Africa, and Australia - to deliver greater benefits to the region, including East Africa. These countries are gathered under the informal group of G16 and have increasingly improved their involvement in the IOTC. Here, we ask how the rise of the G16 benefited coastal States through participation and collective understanding in the Indian Ocean. To do this, we analyzed proposals submitted by the G16 for conservation and management measures and the participant lists of the Commission meetings in the past ten years. Our results show that, individually and collectively, the G16 has played a significant role in shaping the IOTC's rules. The coastal States have established a good representation, with only a handful of Members absent in some years. Unveiling the efforts of coastal countries is essential to guide further capacity building in the region in terms of negotiations. We also call for international oversight of the actions of DWFNs, such as the EU, whose efforts often differ markedly from their claims of being sustainability champions. The G16's work is essential to keep the coastal States of the Indian Ocean in the driver's seat for managing Indian Ocean fisheries to benefit future generations.

KEYWORDS

ocean equity, fishing opportunities, transboundary, tuna, overfishing, Indian Ocean, coastal states, regional cooperation

Introduction

Regional Fisheries Management Organizations (RFMOs) are tasked with managing highly migratory fish stocks, those that are present in both national waters of multiple countries and the high seas. The transboundary behaviour of these fish stocks means their management can only be possible through cooperation and collaboration between States. Recognizing this, the 1982 United Nations Law of the Sea Convention [UNCLOS (UN, 1982)] and 1995 UN Fish Stocks Agreement (UNFSA (UN, 1995)] mandate States with an interest in these stocks to be a member of RFMOs and cooperate, conserve, manage and use resources sustainably. While some Regional Fisheries Bodies have advisory capacities, others, including tuna RFMOs, have the mandate to adopt legally binding measures.

Despite their critical importance in managing fishing activities in our ocean, RFMOs have often been criticized for their lack of success in achieving the mandate laid out in UNCLOS and UNFSA (Cullis-Suzuki and Pauly, 2010). This slow pace of progress has been attributed to the complex biological characteristics of tuna species, scientific uncertainties, gear complexities, economic and social importance of the fishery to different actors, geopolitics, pace of consensus-based decision making and the complexity and ambiguity of international legal instruments (Bailey et al., 2013; IOTC, 2016b; Yeeting et al., 2016; Andriamahefazafy, et al., 2019; Friedman, 2019; Fischer, 2020; Haas et al., 2020; Schiller et al., 2021; Sinan et al., et al., 2021). This makes tunas – one of the most traded highly migratory species groups – more susceptible to the 'tragedy of the commons' (McWhinnie, 2009) and it is perhaps not surprising that the status of IOTC fish stocks continues to decline (IOTC, 2016a; IOTC, 2021).

Until the late 20th century, the ocean space, and in particular where tuna fisheries take place, was dominated by the "global north", especially advanced economies such as Japan, and prominent member States of the European Union like Spain and France. These countries have relatively high economic power and levels of development especially in global fisheries (FAO, 2022) and have enjoyed this wealth freely (Mancke, 1999). With geopolitical wave of countries gaining independence this dominance over tuna grounds steadily diminished (Bell et al., 2017) while new entrants to the fisheries also increased in particular from the Asian fleet with countries such as China and South Korea. Further, with the creation of Exclusive Economic Zones (EEZs) under UNCLOS and the dissipation of marine resources in the global north, the strategy of marine wealth accumulation changed to undertaking distant water fishing and developing 'fishing access agreements' or 'sustainable fisheries partnerships' to access developing country waters subsidized by public funds (Andriamahefazafy, et al., 2020; Sinan, 2021).

The Indian Ocean is one of these ocean spaces where Distant Water Fishing Nations (DWFNs) operate in the EEZs of coastal countries but also in the high seas. Apart from access agreements, public funds are also used for construction and modernizing vessels to travel fast distances, and to subsidise fuel and other operational costs (Sumaila et al., 2019; Sinan, 2021). These DWFNs have been accused of paying lip service to the importance of sustainability and benefits arising from this access to resources developing countries, but when it comes to practice, the focus is on wealth accumulation instead (Andriamahefazafy, et al., 2020). Furthermore, these DWFNs claim that these fisheries access agreements provide government revenue to develop coastal countries and enable them to use the resources at maximum sustainable levels (Iheduru, 1995; Le Manach et al., 2013). However, for coastal countries on the ground, the results are unfair competition, reduced size of fish, reduced revenues for local fishers and lack of seafood self-sufficiency (Iheduru, 1995; Gegout, 2016; Andriamahefazafy, et al., 2020; Nash et al., 2022). This extraction of resources has continued often at times with the acceptance, willingness and participation of the coastal developing countries. Furthermore, in order to compete in capitalist markets, some developing countries have duplicated or aspire to use the same extractive methodologies utilized by the DWFNs even though they might end up losing eventually. DWFNs have been important actors in the IO including as development aid partners for developing coastal states. They have also been involved in fisheries in the IO since the 1980s contributing to revenues in coastal countries though access agreements and employment through canneries and usage of ports of the region.

At the Indian Ocean Tuna Commission (IOTC), the RFMO in charge of tuna fisheries management in the region, these complexities and entanglements have had substantial impacts on decision-making and often created a divide between DWFNs and coastal states or even amongst coastal states. Despite these differences, a group of Indian Ocean coastal States (G16 like-minded coastal States group) has been working collectively since 2011 to raise their collective bargaining position and to improve the understanding of, and build capacity in, science and tuna fisheries management.

Our paper seeks to describe the nature of the rise of G16 and asks whether this has helped to contribute to increase in participation and collective understanding of the issues in the Indian Ocean. Based on these results we elaborate on some of the challenges for the G16 in the years ahead.

Methodology

Study area and scope

The IOTC is an offshoot of the Indian Ocean Fisheries Commission (IOFC) which was established in 1969 (Sinan and Bailey, 2020). Almost 25 years later, in 1993, the IOTC was established as an Article XIV body of the Food and Agriculture Organization of the United Nations (FAO) Constitution[1]. The bodies established under Article XIV are considered as projects for the FAO, but in the case of IOTC, the FAO allowed a greater autonomy to IOTC compared to other Article XIV bodies (Sinan and Bailey, 2020). IOTC's management boundaries reflect FAO's Ocean management areas: area 51 (Western Indian Ocean) and area 57 (Eastern Indian Ocean: Figure 1). As an RFMO, the IOTC is a rule-making international organization. The *Agreement for the Establishment of the Indian Ocean Tuna Commission*, the IOTC's constituent Treaty, permits the Members of the Commission to adopt conservation and management measures for the region's tuna and tuna-like fisheries (IOTC, 1993). The IOTC's rule-making powers relative to the region's high dependence on tuna for its economic security means the IOTC has the potential to significantly affect both the region's fisheries and its people.

Unlike tuna fisheries in the Pacific or Atlantic that are dominated by industrial operations, artisanal fisheries take a greater proportion of the tuna catch in the Indian Ocean (Sinan, 2021). This is despite the fact that the IOTC Agreement Area comprises about 34% EEZs and 66% high seas areas. The Indian Ocean Tuna Commission is key to the strategic and economic interest of the region's coastal States. Around 70 per cent of the Commission's Membership are developing coastal States who rely on the tuna resources of the Indian Ocean. Among members, there is a significant variation in fisheries management objectives. These objectives include food security, local trade, export and import, fisheries processing, access to foreign vessels, and employment in fisheries processing and fishing sector (Sinan et al., 2021). While countries negotiate to conserve and manage the stocks, there is a significant influence from powerful member States to exert influence and lead to a lack of transparency in decision making (Fischer, 2020). These include economic sanctions, national security concerns, trade measures, and development projects not related to fisheries management (Sinan et al., 2021). Non-profits, government organizations, retailers, wholesalers, and other intergovernmental organizations also influence fisheries management. Moreover, 2/3rd of the IO's coastal States are also ranked below the global average in corruption indices and there are alarming practices of corrupt activities within the IOTC decision-making processes (Sinan et al., 2021).

The G16 includes Australia, Bangladesh, Comoros, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Oman, Pakistan, Seychelles, Somalia, South Africa, Sri Lanka, Tanzania and Thailand[2]. Some countries, like the Maldives and Mozambique, joined G16 before becoming Members of the IOTC. The G16 initially called itself 'like-minded coastal States' before calling itself the Group of Like-Minded Coastal States, named for Article XVI of the IOTC Agreement which protects coastal State rights, from 2013 (IOTC, 2013), and 'G16 Group of Like-Minded Coastal States' from 2016. 'G16' first gained recognition in IOTC lexicon in 2018, in the context of a Technical Committee on Allocation meeting, and then the 2018 annual Commission meeting (IOTC, 2018).

While the G16 is not established by Treaty, it operates collectively to build support and capacity of its coastal States and to strengthen regional solidarity including through developing joint proposals for IOTC, building capacity at the national and regional level, upholding coastal State sovereign rights and improving information sharing (G16, 2022). The G16 met for the first time on 15 February 2011 in the margins of the first Technical Committee on Allocation Criteria (TCAC), a working group established under the auspices of the IOTC through Resolution 10/01 in March 2010. The World Wide Fund for Nature provided support to this first preparatory meeting. The G16 gathered to discuss the guiding principles that, in their view, should underpin the way the IOTC determined how to distribute ("allocate") tuna quota between its Members (IOTC, 2011). By 2012, the G16 was meeting regularly ahead of IOTC meetings. G16 held 32 meetings between its inception and April 2022, its 11th year of operation. During this time, G16 progressively advanced its presence, coordination, and influence in shaping the IOTC.

Assessing levels of cooperation and participation

Conservation and management measures (CMMs) define how Member countries act on the management of target and non-target species of a fishery. CMMs can cover a broad range of topics, including management and compliance. These measures can impact the economic viability of the fishery at both a national and regional level, impact the future sustainability of the resources, impact small administrations by imposing new regulatory burden or affecting distributional equity (the way benefits derived from the fishery are distributed between IOTC Members). Subject to specific objection procedures in the IOTC

1 under the provisions of Article XIV of the FAO Constitution, the FAO Council may approve and submit to Member Nations agreements concerning questions relating to food and agriculture which are of particular interest to Member Nations of geographical areas specified in such agreements.

2 Indonesia withdrew their membership in 2021.

FIGURE 1
IOTC Membership and IOTC area of competence for managing tuna and tuna-like species identified by the shaded area. Yellow-shaded countries are full members of the IOTC (Sinan, 2021).

treaty, these measures are binding at international law on the entire Commission's membership. In IOTC, the CMMs are adopted based on proposals submitted by a member State or a group of Member States (sponsorship) when there is a collective agreement among those States. Thus, to understand the cooperation and collective understanding of the G16 Member States, we analysed the proposals submitted by Members for CMMs since the inception of G16 in 2012 to 2021. To identify the level of cooperation we tabulated the year, details of the proposals, including the proponent, the sponsoring Members, the intended conservation and management use of the proposal. To analyse the level of success, each proposal was earmarked with the adoption as a CMM (1) and rejection (0) by the IOTC Commission. The details of the proposals and the adopted CMM details were sourced from IOTC website (www.iotc.org). Our research brings novelty with its focus on the cooperation of coastal states through CMMs. Other studies on CMMs have mostly been thematical, for example: comparing RFMOs regarding fishing capacity (Aranda et al., 2012) or the implementation of the precautionary principle (de Bruyn et al., 2013), or looking at bycatch management at the IOTC (Martin and Shahid, 2021).

To understand the participation of the G16 member States, we tabulated and analysed the meeting participants (name of the participant, country and the year of participation) from the published IOTC Commission meetings reports. We looked at participation because it provides an idea of the evolution of coastal states in terms of involvement with the IOTC proceedings. To this end, we analysed each delegation, looked at the size of delegation and highlighted the number of delegates that have been consistently present in the past 10 years. We only focussed on the Commission meetings as it is the rule making body of the organization and the level of participation in scientific meetings by developing countries might be affected by the lack of qualified scientists even though there is a willingness to participate (Sinan et al., 2021). Schiller (2021) conducted a similar analysis to understand the level of participation of Member States in Western Central Pacific Fisheries Commission (WCPFC). Based on the results from the analysis, anecdotal evidence in the literature, we present two distinct challenges for the G16 going forward in the discussion. These challenges were further developed based on published reports of the meetings, circulars issued by the IOTC secretariat and published literature.

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Results

Cooperation among coastal States

Due to the geographic situation and economic dependence, G16 Members have both the most to gain from well-managed tuna fisheries, and the most to lose if poor decisions are made (including decisions which remove benefits from the region). G16 Members have individually and collectively played a significant role in shaping the IOTC's rules. A total of 162 conservation and management measures were proposed to the IOTC Commission by one or more Members from 2012-2021. Of these, 85 proposals were initiated by G16 Members, or about half of proposals made in that timeframe (Table 1). Furthermore, out of these 85 proposals, 24 were co-sponsored with other G16 Members. The European Union accounted for almost all of the non-G16 Member proposals.

Despite the economic challenges and 'low power' challenges that are characteristic of developing States (Campling and Havice, 2013; Nanda et al., 2021), particularly Small Island Developing States, the G16 has a strong track record of success in shaping the IOTC rules and norms to benefit the region. Of the 85 proposals made, 56 proposals were adopted (either in whole, or in part), equating to a 66% success rate in that period. Fifteen of 20 G16 Members have made at least one proposal to the IOTC since the G16 formed (Table 1).

TABLE 1 Summarizes the number of proposals made by each G16 Member.

G16 Member	Number of proposals	Frequency
Australia	23	Every year from 2012-2020
Bangladesh	0	
Comoros	3	
India	0	
Indonesia	10	Every year from 2016 – 2020
Iran	0	
Kenya	8	Sporadic between 2016 and 2020
Madagascar	1	Once in 2018
Malaysia	0	
Maldives	34	Every year from 2012-2021 inclusive
Mauritius	18	Every year from 2012-2018 inclusive
Mozambique	16	Sporadic between 2012 and 2020
Oman	2	Once in 2018
Pakistan	3	Sporadic between 2018 and 2021
Seychelles	23	Every year from 2012 - 2019
Somalia	5	Sporadic between 2018 and 2021
South Africa	14	Every year from 2017-2021 inclusive
Sri Lanka	3	Sporadic between 2016 and 2020
Tanzania	7	Sporadic between 2016 and 2021
Thailand	0	

Some of the region's smallest fisheries administrations, such as the Seychelles, Maldives, Mozambique and Mauritius have made a significant contribution to advancing the region's interests. The Maldives has sponsored the most proposals and is the only G16 Member to have made a proposal every year since the G16 formed (Table 1)[3]. Indonesia and South Africa were relative latecomers to developing proposals, tabling their first proposals in 2016 and 2017 respectively, but have consistently made proposals every year since. Kenya has contributed variously, with 8 proposals since 2016. Bangladesh, India, Iran, Malaysia, and Thailand have not proposed any measures during this period. India and Iran's participation in the IOTC meetings has not been consistent and Bangladesh joined the IOTC in 2022.

G16 Members have made proposals on a wide range of topics such as shown in Figure 2. In some cases, the same (or similar) proposal has been made in multiple years with different G16 proponents[4]. In other cases, G16 Members have proposed different amendments to the same conservation and management measures[5]. There are no documented reasons explaining why Members do or do not submit proposals. There could be a range of contributing factors including capacity (too difficult to dedicate time to developing and prosecuting a proposal), political (not wanting to 'take over' an issue that a bilateral partner has typically led) or implementation (not desiring a change in management).

While there is clear evidence of strong commitment and willingness to shape the rules governing the region's fisheries at the individual country level, there is also clear evidence that cooperation in proposed conservation and management measures has been a major factor in the G16's engagement in the IOTC. For example, even from as early as the G16's inception in 2011, there are examples of G16 countries with different direct interests cosponsoring proposals where they

3 Notably, this also means the Maldives has made a proposal each year since becoming an IOTC Member.

4 For example, the mobulid and manta rays proposal was initially proposed by the Maldives and the Seychelles in 2017, and again in 2018 with minor amendments by the Maldives, Seychelles, Mozambique, Australia and South Africa. The Maldives proposed the measure again in 2019, again with minor amendments, where it was finally adopted.

5 For example, many G16 Members have proposed amendments to the yellowfin tuna conservation and management measure. These amendments vary at, at times indicate opposing views between G16 Members.

FIGURE 2
Category of proposals submitted by G16 Member States from 2012 – 2021. The width of the pie represents the number of the proposals submitted by each Member State.

share a view: for example, the Maldives, Mauritius, and the Seychelles cosponsored proposals on the precautionary approach, and interim target and limit reference points for skipjack tuna in 2012[6].

In 2018, the highest level of multi-country sponsorship occurred, where 14 G16 Members co-sponsored a proposal on socio economic indicators (adopted), 8 G16 Members co-sponsored a proposal on vessel chartering (adopted), 11 G16 Members co-sponsored a proposal on how tuna resources should be allocated to each IOTC Member (no consensus), and 5 G16 Members co-sponsored a proposal to protect mobulid and manta rays (no consensus).

Notably, some G16 Members are more likely to cooperate on a bilateral or trilateral level, whereas other G16 Members are more likely to join major, multi-country G16 efforts. There are clear trends showing frequent cooperation between Seychelles, Maldives, and Mauritius; Australia and the Maldives; Maldives and Mozambique; and Maldives and South Africa. The Maldives has the highest frequency of co-sponsorship. Mozambique, Maldives, and South Africa consistently co-sponsored major, multi-country initiatives. Conversely, G16 Members such as Comoros, Tanzania, Indonesia, Pakistan, Madagascar, Somalia was more likely to join major, multi-country initiatives than to propose their own proposals or to cooperate bilaterally.

There is merit to both approaches. Frequent bilateral or trilateral cooperation ensures that there is a consistent G16 presence on the agenda and serves as a clear reminder of the region's stake in these fisheries. However, high levels of co-sponsorship, particularly on issues of high regional importance (such as allocation of tuna resources) has clear strategic benefits. For example, if 14 G16 Members co-sponsor a resolution, that demonstrates that nearly 50% of the IOTC Membership supports a proposal before the formal meeting has even commenced. More broadly, both approaches demonstrate high levels of collectivism and unity despite national differences in view.

6 The 1st performance review of the IOTC identified the lack of modern fisheries management principles and approaches such as the use of precautionary approach in the IOTC agreement. The proposal intended to mandate the Commission to apply the precautionary approach in accordance with relevant international agreements. The proposal on interim target and limit reference points proposes interim target and limit reference points for stock assessments until the Commission develops species specific reference points.

However, as observed by Sinan et al. (2021), some of the proposals submitted by Member States are to protect or to regulate their national interests and fishing fleet. Thus, the mere number in increase in proposals does not necessarily elicit an increase in sustainability of the stocks. The consensus nature of decision-making makes the conservation and management measure diluted enough to ensure everyone's interests are protected.

Participation of G16 States to the IOTC

Considering the differentiated socio-economic contexts of G16 Members (Sinan et al., 2021), the participation of Members to the commission meetings has been a key part of the building and sustaining of the group. An analysis of the list of delegates since the inception of the G16 in 2012 highlights that G16 Members have shown good representation. This has also been facilitated by the existence of meeting participation funds within the IOTC to sponsor the presence of two representatives from developing coastal states. Australia and China have voluntarily contributed to the meeting participation fund on top of the IOTC budget allocation.

Most G16 Members have been regularly represented at IOTC commission meetings with only a handful of Members absent in some years. A total of 523 different delegates have participated in IOTC meetings of which 58% of the delegates participated only in 1 meeting. Only 31 delegates from 14 different countries participated in five or more Commission meetings in the last 10 years (Figure 3). The average composition for G16 members is around 5 delegates with a minimum of 1 delegate in some years (cases of Bangladesh, India, Iran, Kenya, Pakistan, Somalia, and South Africa) to a maximum of 38 (case of Indonesia as a host country in 2017 and online in 2021) as shown in Table 2. All G16 Members except Bangladesh (which was only a full IOTC member in 2018) have had delegates that attended the annual IOTC Commission meeting at least two consecutive years, with a handful of countries with the same delegates in the past 7 to 10 years. Countries such as Maldives, Mauritius, the Seychelles, and more recently Indonesia have shown the most consistency in their participation, with delegates present during four to 10 IOTC sessions (Figure 3). This participation aligns with the high number of proposals submitted by these countries amongst G16 Members. It also emphasizes the importance of tuna fisheries to these countries and their commitment to the management of the resources.

Another interesting aspect of delegation composition is the number of advisers within a delegation. The number of advisors in the delegation provides unique insights into the capacity constraints of Member States but also in their participatory approach. These advisers can include government officials, academics, industry, NGOs and other advocates. Here the G16 Members have been highly disparate ranging from none at all for some years for countries like Comoros, India, Iran, Oman, Pakistan, Somalia, and South Africa to up to 12 to 22 and 36 advisers for Seychelles, Thailand, or Indonesia, respectively (details are in Supplementary Table). This figure is also higher when coastal countries host the meeting (the case of Indonesia in 2017 or Thailand in 2018). In comparison, DWFNs delegations have had between 8 (case of China and Japan) to 21 advisers (case of the EU) on average. The transition to online meetings in 2020 and 2021 also increased the number of advisers for most

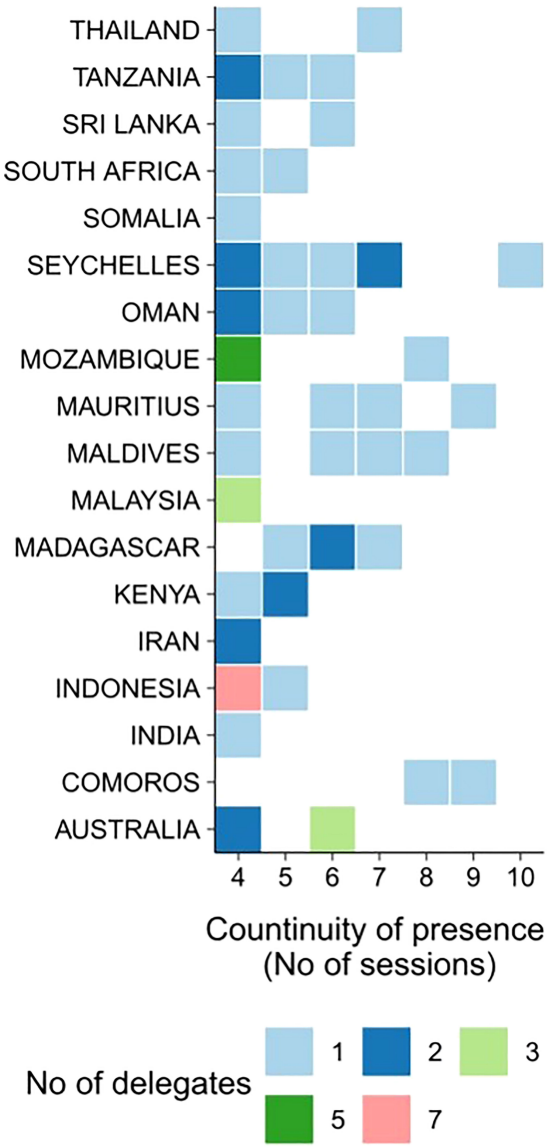

FIGURE 3
Extent of continued presence of G16 delegates for more than 2 consecutive annual sessions of the IOTC Commission meetings between 2012 and 2021.

TABLE 2 G16 Members and participation patterns of delegates (number of individual delegates and average delegation size per year) from 2012 - 2021.

Row Labels	Continuity of delegate	Number of delegates in 10 years	Average delegation size
Australia	6	48	10
Bangladesh	1	7	1
Comoros	9	3	2
India	4	25	4
Indonesia	5	85	15
Iran	4	10	2
Kenya	5	19	4
Madagascar	7	22	5
Malaysia	4	29	5
Maldives	8	29	6
Mauritius	9	37	9
Mozambique	8	20	6
Oman	6	12	3
Pakistan	2	8	2
Seychelles	10	41	10
Somalia	4	9	3
South Africa	5	17	4
Sri Lanka	6	31	6
Tanzania	6	33	6
Thailand	7	40	6

Continuity is measured by the maximum number of years a delegate from the country has participated in the time period.

G16 countries from 2 to 6 times the number before 2020. Tanzania for example had 12 advisers in 2021 compared to an average of 2 before. Comparatively, DWFNs followed similar trends with up to 63 advisers for the EU in 2021. The increase in participation during online meetings suggests that G16 Members are willing to involve more of their national capacity into IOTC negotiations but are often limited by the means to attend meetings in person. The online setting has provided more opportunities for involvement to G16 Members; however, it also came with challenges such as the legalities of votes of delegates behind screens (Circular 2021-48 on the adoption of proposal IOTC-2021-S25-PropE_Rev2 on Fish Aggregating Devices (FAD) management). From a participatory approach, a higher number of advisors shows that G16 Members are increasingly seeking advice from a broader range of stakeholders to improve their decision-making at the commission meetings and also in their proposals. Our personal observations have shown that various advisers from NGO representatives to academics have advised G16 countries on proposal contents and provided knowledge on technical aspects raised during the negotiations.

The integration of fishing industries and local fishers within delegations has also brought different practices within G16 Members. The majority of G16 Members apart from Bangladesh, Kenya, Mozambique, Pakistan, Somalia, South Africa, and Tanzania have representatives of their fishing industry within their delegations. This can include representatives of local fishers and companies and exporters like in most delegations, representatives of flagged vessels for Mauritius and Seychelles, or representatives of foreign fishing fleets operating within the coastal state's EEZ such as the case of Madagascar. The number of representatives from the fishing industry within delegations varies from 1 or 2 representatives to more than half of the delegations (case of the Seychelles only, having both local fishers, flagged vessels and foreign fleets' representatives). Compared to DWFNs' delegation, the EU delegation follows the trend of the Seychelles with a high number of fishing operators. The industry representation is less pronounced for other DWFNs like China or Japan. The integration of the fishing industry within delegations has allowed G16 Members to have the interests of their local fleets represented, however, this has not been systematic for all delegations which mostly represent larger scale operations and at times DWFNs' operators.

Discussion

While the above results show that G16 members are actively involved in the management of tuna resources at the IOTC, the G16 faces several challenging dynamics between member States and other entities that can undermine its current efforts. We discuss two of the main challenges that we have identified in more detail in the next two sections.

Coastal States vs DWFNs

The divide between coastal developing States and DWFNs has been evident since development of the UNCLOS and has continued in subsequent legal instruments. These tensions have now evolved in RFMOs and in particular in the Indian Ocean (Abolhassani, 2017). Coastal States in particular the developing coastal States want space to develop their tuna fisheries, while DWFNs wants to maintain and reward from their investments (Sinan et al., 2021). This is particularly evident in the ongoing allocation negotiations for future fishing opportunities (Andriamahefazafy, et al., 2020; Sinan and Bailey, 2020).

Since 2010, the IOTC has held negotiations to agree on how to allocate shares (quota) of key tuna stocks between its Members. Allocation negotiations in RFMOs are complex and sensitive. There is a strong legal foundation to these negotiations because of the different rights and responsibilities under international law that need to be respected – for example, the rights of coastal States over their exclusive economic zones, the rights of developing States and the rights of all States to fish on the high seas. However, the discussions about 'who should get what' are intensely political, particularly when there is an

expectation that large-catching nations (generally, but not always, highly developed States) should be allocated a smaller quota than what they are currently fishing, and because of the different bilateral relationships between Members. Various authors have written about IOTC's allocation process (see Seto et al. (2020); Sinan and Bailey (2020)), so a detailed analysis is not provided here.

Strategically, the allocation negotiations are crucial for G16 Members. While the economic dependence on tuna varies across the G16 Membership (Sinan, 2021), the negotiations are inextricably linked to the economic stability of the region. For some G16 Members, the allocation negotiations are essential to preserve livelihoods and jobs as they are today. For other G16 Members, who have lacked the capacity to develop fisheries, the allocation negotiations represent a key pathway to future development. In some cases, G16 Members sell access to their EEZs to foreign fishing vessels, and so allocation is also linked to each G16 Member's ability to raise revenue. Each G16 member is, in essence, competing against every other Member of the IOTC for the best possible share of tuna. However, G16 Members have united on the key principles, committed to ensuring the best possible collective deal for coastal States. In fact, as noted above, allocation was the key driving issue that led to the establishment of the G16 in 2011.

Even though there is a clear divide between the two groups, there are also partnerships with some of the developing countries and DWFN in the Indian Ocean. For example: in 2019 when South Africa submitted an amendment to the Resolution on Vessel Chartering in the Indian Ocean, they partnered with Japan in the development (Japan did not officially co-sponsor the proposal in its submission phase, but subsequently supported it during the plenary of the Commission). Even though these are rare, the G16 could build upon these existing relationships and bridge substantial divides.

Coastal States vs Coastal States

The G16 also both benefits and suffers from its own internal diversity. Despite the fact that the group describes itself as a group of "like-minded coastal states of the Indian Ocean", unity can be difficult to find especially when topics of discussion are seen as affecting national interests. There are two struggles that G16 faces within its Members. The first one is the differentiated socio-economic contexts of G16 Members. From developed countries like Australia, to middle income countries like Seychelles, and least developed ones like Madagascar. Some countries are also Small Island Developing States highly dependent on fisheries including tuna for their livelihoods and security while others have larger land masses more dependent on agriculture than fisheries.

The recent discussions in the IOTC on interim yellowfin tuna measure has portrayed some of these emerging challenges and the strength of G16 Members. In 2015, the scientific Committee determined the yellowfin tuna measure in the IOTC is overfished (Figure 4) and a 20% reduction of catches compared to 2014 levels is needed for the stock to recover in ten years. Even though measures have been adopted (based on G16 Member proposals) by the Commission since then, the stocks continue to decline. In 2021, the Scientific Committee concluded that in 2020 the stock was fished nearly 100,000t above the maximum sustainable yield of 349,000t (IOTC, 2021).

In the earlier years of the yellowfin tuna measures, a special emphasis was given by G16 member States to exempt small-scale fisheries from the measure (vessels below 24m) (Figure 4). There was a cohesive united front among all G16 Members to protect the small-scale fisheries. However, as catches from these fleets that were exempted continued to increase dramatically, there was a push back to include all vessels regardless of size. Following the failure to adopt a yellowfin rebuilding measure in a Special Session in 2021, three months later, in the regular Commission meeting, a measure was adopted based on development status, vulnerability and catch levels (Figure 4). For countries with a higher catch level and higher developmental status gets a larger reduction compared to developing countries. Vulnerable countries such as Small Island Developing States and least developed countries had the least cuts. The negotiation was tough due to a diverse fisheries objective of coastal States and finally lead to five G16 member States to object to the adopted measure in 2021 (Figure 4). In the letter of Objection, Somalia stated:

"The large-scale industrial fishing of the developed and distant water nation purse seine fishing fleets that targeted fishing of yellowfin tuna is the biggest responsible factor in the depleted stock of yellowfin tuna we experience today. The proposed allocation of catch structure over seen by IOTC must be based on the needs of the fishery by the coastal states, who have the sovereign rights for the management of tuna fishery stocks in their EEZ, and not on historical catch by industrialized states which have no border and have the luxury to move operations to the current fishing locations that is lucrative for their fisheries campaign…"

Indonesia also withdrew from the G16 membership over the disputes during the negotiations of yellowfin tuna. The different fisheries management objectives within the G16 would be a significant challenge going forward in particular to a tuna fishery important for food security and economic benefits for coastal communities. However, the recognition of the emergence of sub-coalitions or groupings based on these management objectives within the G16 is crucial. Working within and outside the coalitions in particular within the G16 to find areas of common ground despite the differences would be important to maintain stability and protect the livelihood of the coastal communities.

The second struggle is the alignment of some G16 Members with the position of DWFNs like the EU. This alignment is also impeding on finding unity within the G16. It leads some coastal

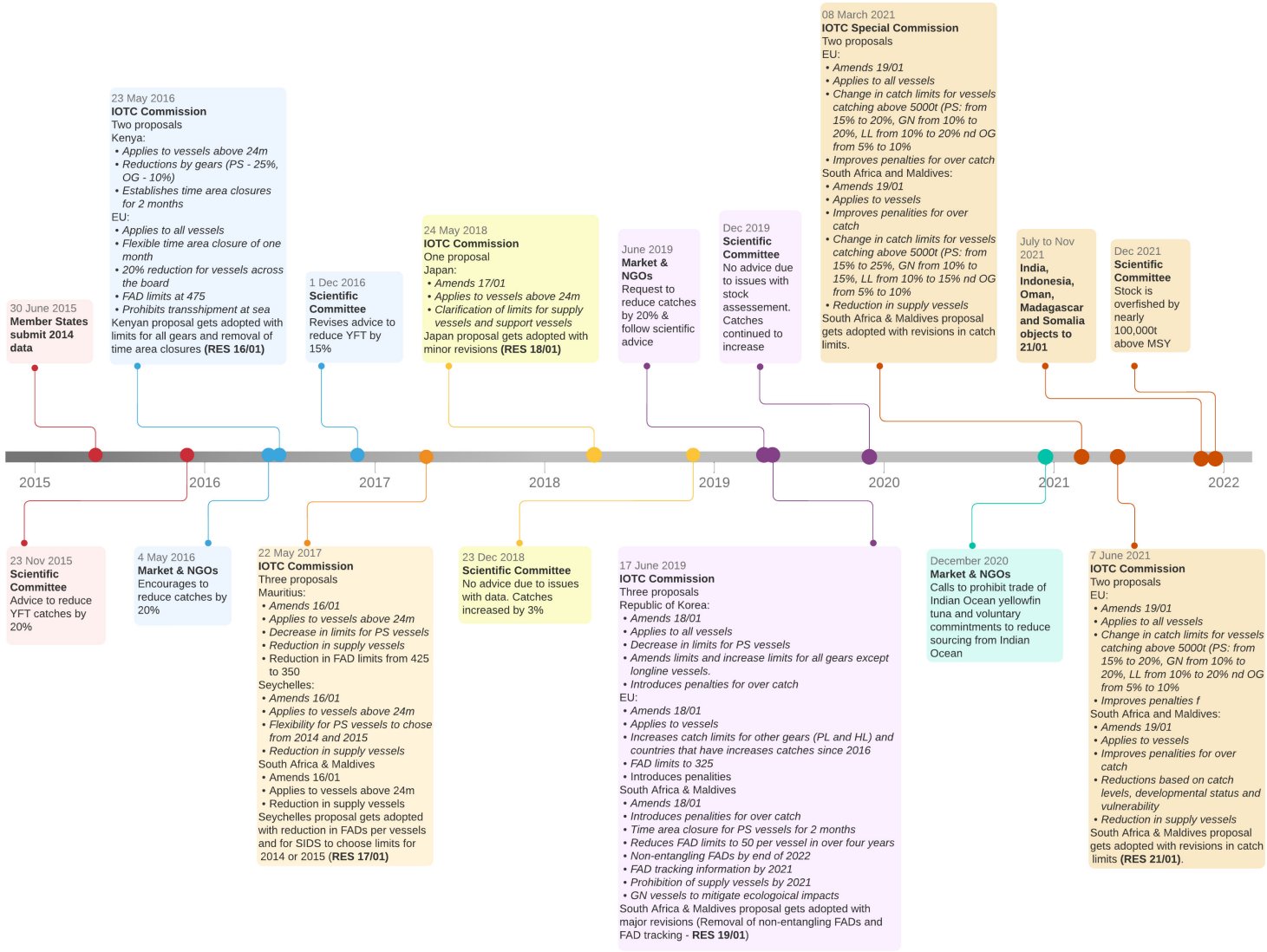

FIGURE 4
Evolution of IOTC scientific advice, NGO involvement and measures adopted to rebuild the yellowfin tuna stock. The IOTC scientific committee declared the IOTC yellowfin tuna was overfished in 2015 and the stock continues to be overfished seven years later. The information was sourced from the IOTC scientific reports, IOTC Commission reports and letters submitted by NGOs and industry during this period.

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states to not co-sponsor some G16 proposals that could impede on the fishing activities of DWFNs. This has been the case for example for some G16 Members not supporting the Kenya proposal on drifting fish aggregating device (DFAD) management which would impact the fishing activity of European vessels in the IO including in the EEZ of these coastal states (IOTC, 2021). The measures that are proposed and discussed the management DFADs include DFAD time-area closures, limitation on the number of DFADs and the use of supply vessels in the deployment and retrieval of FADs, and improved transparency in DFAD data. There are four countries that at times show this alignment which is Comoros, Madagascar, Mauritius, and the Seychelles. These countries have fishing access agreements with DWFNs including the EU and others like Japan, Rep. of Korea or China that bring revenues to the national treasury and the fisheries departments. Countries like the Seychelles are even more deeply entangled with DWFNs as part of their national fleet consists of French, Spanish or Taiwanese owned and operated fleets flagged under the Seychelles and Mauritius (Campling, 2012; Vyawahare, 2021). As highlighted in Vyawahare (2021) for the case of the Seychelles for example, out of the 16 purse seine vessels flagged to the Seychelles in 2020, 11 were owned by Spanish fishing companies and 5 were owned by one French fishing company. This puts the country in a challenging position regarding conservation and management measures that might affect its flagged industrial vessels. The political implications of having fishing access agreements have been documented as influencing decision-making of coastal states wanting to maintain the incoming of revenues but also creating dependency on DWFN for funding of fisheries related activities. The four islands of western Indian Ocean are also reliant on DWFNs for general development aid especially countries like Madagascar or the Comoros (Aqorau, 2015; Andriamahefazafy, et al., 2019). Actors such as the EU or Japan are major donors in East African countries and islands, various roads, infrastructure and buildings including those linked to fisheries in both Madagascar, Mauritius or the Seychelles were built through funding from these DWFNs (Andriamahefazafy, 2020). When discussions become heated at the IOTC it is not unusual for these coastal countries to receive diplomatic letters and warnings from entities like the EU reminding them the importance of the partnership with the EU and the need to align or not impede with the EU position (pers. obs.). Such 'divide and conquer' strategy of DWFNs has impeded some of the efforts of other G16 members in advancing certain proposals submitted at the commission. Furthermore, aid dependency of some coastal states of the G16 is a structural obstacle to the current journey of the G16 countries to unity.

Conclusion

In the past ten years, the G16 has paved its way towards improved leadership from coastal countries and more involvement in IOTC decision-making. The interest of coastal countries towards the management of fisheries within and adjacent to their EEZs has become a national necessity for at least half the G16 Members relying on the fisheries for their national revenues and for food security, and important part of the future for all G16 Members, whether directly or indirectly. However, the challenges at hand are substantial including managing the divide with and dependency to DWFNs or the differentiated aspirations of the G16 Members.

The G16 should play an important role in achieving sustainable tuna resources in the IOTC. To build this strength, three key measures could be explored. First is to reinforce unity through country cooperation on tuna beyond IOTC negotiations. There is a lot to be learnt between countries on the management or development of tuna fisheries. Strengthening these bonds could help G16 Members align better especially when it comes to management and focus on long term, strategic gains, particularly with respect to allocation. This includes strengthening tangible collaborations amongst countries through trade and sharing experiences in the fisheries and fostering regional solidarity. These include forming sub-coalitions based on similar objectives and to link up with the larger coalition- the G16. Second, renewed efforts to fully comprehend the underlying causes of lack of cooperation by G16 Members and address it early enough before any IOTC session. This could be particularly useful for G16 Members proposing conflictual proposals and could be applied to the yellowfin tuna or drifting DFAD management measures where member countries have diverse fisheries objectives. As some of the coastal States rely extensively on the use of DFADs, these measures will have an impact and continuous dialogue is crucial to maintain the stability and integrity of the G16. Third, reinforce the common goal of the group to strengthen the link between the future of the resources and the people of the Indian Ocean. Non-collaboration of G16 Members in the long term could be detrimental to achieving management measures that benefit the tuna resources of the region and local communities reliant on the resources. Ensuring the sustainability of the tuna resources of the Indian Ocean also requires drastic structural changes at IOTC that we have raised before in Sinan (2021). This includes reforming the IOTC to be more autonomous in its decision-making and reducing the bureaucracy that often delays decision-making or requires various high levels of negotiation capacity. Furthermore, the alignment of some G16 members with DWFNs within fisheries (linked to access agreements, licensing or flagging), and beyond fisheries (through developmental aid and programs) poses significant risks for the long-term sustainability despite the coordination and cooperation of G16 members. While challenging, these particular coastal countries need to see the alignment with the G16 as more beneficial for the future of the tuna resources and the livelihoods of local communities. Ultimately, what is required is a real shift in DWFNs paradigm to better understand the aspirations of coastal States and let go of historical entitlement.

Data availability statement

Data used in the paper were all from publicly available data and reports. The raw data supporting the conclusions of this article will be made available by the authors without undue reservations.

Author contributions

HS: Concept, writing, data collection, analysis illustration and editing. MA: Concept, writing, data collection analysis, and editing. KR: Concept, writing, data collection, analysis and editing. All authors contributed to the article and approved the submitted version.

Conflict of interest

HS participated in IOTC meetings as a country delegate advisor and chairs the Committee on Administration and Finance in IOTC during the research period. HS worked and represented the Government of the Maldives in IOTC meetings prior to his research. KR participated in IOTC meetings as a country delegate advisor to the Australian Government prior to her research.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fmars.2022.983391/full#supplementary-material

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