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Governing Distant-Water Fishing within the Blue Economy in Madagascar: Policy Frameworks, Challenges and Pathways

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Abstract: Madagascar's vast oceanic space hosts distant-water fishing (DWF) fleets from Taiwan, Japan, South Korea, Spain, France and others since the 1960s, making DWF a substantial component of the blue economy. Considering this extensive experience of managing DWF activities for more than 60 years, this paper explores the existing policy frameworks and challenges regarding managing DWF. The results show while it is well equipped legally, the country is struggling to implement its national policies and laws while continuing to adopt new management frameworks. This is due to a limited coherence on long-term policy making and policy implementation, resulting in a mismatch between the two, and a paradoxical vision that promotes DWF without the means to monitor fishing activities and their impacts. The existing institutional settings and governance frameworks make change possible in Madagascar's approach to DWF. To improve the management of DWF, this paper outlines four pathways. These include (i) a greater attention on the implementation, harmonisation and evaluation of existing policies and projects; (ii) continuing efforts on transparency for DWF operations and contract negotiations; (iii) realigning aspirations and policies with local needs; and (iv) taking better advantage of measures adopted at the regional Indian Ocean level to improve national management of DWF. An efficient implementation of an improved policy and legal framework could contribute to strengthening the governance of DWF activities toward sustaining national benefits while preserving coastal livelihoods.

Keywords: fishery governance; national legal framework; tuna fishing; distant-water fishing nations; transparency

Key Contribution: Despite the challenging socio-economic and political context in Madagascar, the management of distant-water fishing is based on a rich and evolving policy framework. Managing distant-water fishing in developing coastal states like Madagascar requires addressing challenges of institutional misfits, transparency and capacity towards monitoring, control and surveillance.

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1. Introduction

With more than 1.2 million km^2 of an exclusive economic zone (EEZ), Madagascar hosts important marine resources. Due to its large land mass and vast population, fisheries represent a smaller part of GDP compared to agriculture [1]. However, it is still an important source of revenue for the national budget, and it is a key pillar for Madagascar's blue economy policy [2]. Moreover, coastal populations depend on fisheries for livelihoods and protein intake. They are highly vulnerable and often have no alternative source of revenue. A little over 50% of the total Malagasy population of 26 million live within 13 coastal regions [3,4]. State revenues from fisheries are generated through the issuance of various fishing licenses and permits to fish, transport, sell and export marine products. A large part of state revenues come from fees associated with tuna fishing access agreements, which represent the Ministry of Fisheries' primary income source. In 2018, when all DWF fleets were active, fishing access agreements generated around EUR 3 million in revenue [5].

Tuna caught from distant-water fishing (DWF) is also the second most exported fishery product, representing 17% of exports in 2016, just after shrimp [6].

Distant-water fishing in the waters of Madagascar started with exploratory fishing by Japanese and Taiwanese ships in 1955 looking for yellowfin and albacore tuna around Madagascar [7]. In the 1980s, the European fleet entered Madagascar's EEZ and started fishing tuna and associated species under fishing access agreements, followed by agreements with Asian countries and companies from Japan and Taiwan. The largest DWF stakeholders are Asian fleets, mainly Taiwanese, Japanese and South Korean, with 121 licensed vessels in 2018 [5]. They account for the largest part of the tuna catch in the EEZ [8]. However, they do not land in Madagascar so there is limited information available regarding their operation. The Asian fleets are composed of longliners that catch tuna and associated species like swordfish. In 2016, their catch was estimated at around 6000 tons by the former tuna statistic unit [9]. Species of sharks are also caught as bycatch, although there is no updated data available to establish the proportion of such catch. The European Union (EU) fleet is the second largest stakeholder in Madagascar's EEZ and the most well-known by the Malagasy public. The EU fleet is the only fleet that lands in Madagascar. While it is not a legal obligation, it is incentivised in the access agreement by a reduction in licence fees if there is landing in a Malagasy port or processing company. In 2018, 61 European fishing vessels, mainly Spanish and French, were authorised to fish in the Malagasy EEZ [5]. While it records the highest catch of all fleets in the Indian Ocean, estimated at more than 210,000 tons in 2016 [10], the EU fleet has a lower catch in the waters of Madagascar, with 2600 tons in 2016, less than half of the Asian fleet's catch [9]. The EU fleet consists mainly of Spanish and French vessels [11,12]. The EU fleet is composed mainly of purse seiners but also has longliners that operate on the eastern side of Madagascar's EEZ from the island of La Réunion. Available reports from the former statistic unit estimated that the annual catch of tuna by foreign industrial fleets in Madagascar's EEZ is around 10,000 tons per year [9].

DWF activities are managed at the national level by the ministry in charge of fisheries. As of 2022, this is the Ministry of Fisheries and blue economy. The ministry oversees the adoption and implementation of legal and policy frameworks while also concluding fishing access agreements. Two units are particularly relevant for distant-water fishing: the Tuna Fisheries Unit and the Centre for Fisheries Surveillance. The Tuna Fisheries Unit oversees industrial and semi-industrial activities and administers fishing access agreements and licenses. The surveillance centre undertakes the monitoring control and surveillance of fishing activities within the EEZ. Various civil society organisations and NGOs are also indirectly involved in DWF management. The WWF, for example, funded policy initiatives including two strategies for the management of tuna fisheries; CSOs also take part in consultations of stakeholders including during the 2022 negotiation of the EU agreement renewal (pers. obs.).

With the long-term involvement of DWF fleets in the waters of Madagascar, the government also adopted various frameworks to establish the modalities of DWF and manage these fishing activities. This paper aims to analyse the governance of distant-water fishing (DWF) in Madagascar. To do so, it looks at three aspects: the policy framework for managing DWF in the country, the challenges faced by stakeholders and some proposed pathways to make DWF more relevant to national needs within the blue economy narrative in Madagascar. This paper brings an important contribution to the literature on DWF, which often pictures developing coastal states as rather passive actors when it comes to managing DWF activities. It shows that Madagascar has made various policy efforts to manage DWF although such efforts have not always been coordinated or monitored for their impacts on management and local livelihoods.

2. Materials and Methods

This paper is based on two methods. To analyse the policy frameworks available for DWF, a review has been undertaken of national laws and policies relevant to distant-water fishing between 2012 and 2022 in Madagascar (Table 1) and of the content of the United Na-

tions Convention on the Law of the Sea (UNCLOS) related to DWF. The review includes a presentation of the relevant texts as well as observations on their implementation, based on publicly available information and interviews. From the review, some challenges emerged that were also raised by stakeholders. Stakeholder insights were gathered from 40 interviews undertaken in Madagascar in 2017 and 2018. While interviews dated from 2017 and 2018, the author continued to have informal exchanges with various stakeholders interviewed either through expert advice to the NGOs and the Ministry of Fisheries (between 2019 and 2022) or fieldwork in fishing villages (in June 2022). There was no substantial change of views noticed regarding the insights shared in this paper. Actors included 22 local fishers based in four coastal towns (referenced in the text as ArtFisher for artisanal fishers operating offshore, SSFisher for small-scale fishers operating within coastal waters and AssoFisher for a fishing association representative), 13 government officials from local to national levels (referenced as GovRep in the text) and 5 NGO staff members working in fishery management (referenced as NgoRep in the text) (see Supplementary Material S1 for more details on the interviews). These stakeholders were chosen based on their long-term involvement in fishery management (more than 5 years for government representatives and NGOs) and for their involvement in offshore fishing activities or knowledge on these activities for the fishers. The stakeholders were asked three open questions: what they knew about DWF in the Malagasy EEZ (for fishers and NGOs), what were the actors and policies related to DWF (government officials) and what were their perspectives on the challenges and future regarding fishery management in Madagascar (all actors). The section on challenges is presented through the lens of institutional misfits [13] and transparency in fishery governance [14] as two complementary angles when looking at policy implementation in DWF. After the analysis of frameworks and challenges, a discussion section presents potential pathways towards improving DWF management. These pathways were inspired from solutions provided by the literature on institutional misfits and fishery governance. They were adapted to the case of Madagascar by mobilising insights from the interviews and perspectives from the author.

Table 1. List of national laws and policy reviewed.

Name of the Legal Document	Adoption Year	Area Covered by the Text
National strategy on the management of tuna fisheries in Madagascar [1]	2014	Main priorities for the management of DWF and improvement of governance
Law n° 2015-053 of December 2nd 2015 regarding the Fishery and Aquaculture Code [2]	2015	Modalities of DWF
Blue Policy paper [3]	2015	Main vision and aspirations for DWF in Madagascar
Law n° 2018-025 regarding maritime zones in the maritime space under the jurisdiction of the Republic of Madagascar [1]	2018	Contextualising fishing activities in the exclusive economic zone of Madagascar
Updated national strategy on the management of tuna fisheries in Madagascar [1]	2021	Updated priorities and actions for the management of DWF
Fisheries Transparency Initiative Standards [4]	2021	Standards regarding transparency of DWF agreements and modalities of operation
Malagasy blue economy strategy for the fishery and aquaculture sector	2022	Improvement of fishing access agreements and the fight against IUU fishing.

[1] Collected through email exchanges with the Ministry of Fisheries. [2] https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC162704/ (accessed on 23 February 2022). [3] https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC163970/#:~:text=Madagascar%20(Niveau%20national)-,Lettre%20de%20Politique%20Bleue.,principales%20orientations%20jusqu\T1\textquoterighten%202025 (accessed on 23 February 2022). [4] https://www.fiti.global/fiti-standard (accessed on 5 July 2022).

3. Results

3.1. Analysis of National and International Legal and Policy Frameworks Governing Distant-Water Fishing in Madagascar

3.1.1. The Fishery and Aquaculture Code (2015)

At the national level, this code provides the legal basis for allowing DWF in Madagascar's EEZ. While Article 25 states the conditions for national fleets to undertake fishing in the EEZ (including a national registration and being chartered by a Malagasy owner or entity), Articles 26 to 40 state the conditions under which foreign vessels can undertake fishing in Madagascar's EEZ. Table 2 presents the key articles that govern these fishing activities.

Table 2. Relevant clauses in the fishery law regarding DWF by foreign fleets.

	Content	Ref. in the Law	Comments on Implementation (as of September 2022)
Modalities of fishing	- Fishing zone must be beyond the territorial waters	Art. 26	- These modalities of fishing are present in the existing template of fishing access agreements and all EU public agreements - Art. 28, 30 and 31 relate to IUU fishing. White et al. (2021) [8] established that there is some DWF within marine protected areas while WWF (2023) [15] also established that more than 2500 metric tonnes of tuna catch might be under-reported in Madagascar. This evidence shows limited compliance with these legal clauses by DWF vessels.
	- Fishing must comply with existing management plans and national navigation laws	Art. 28 and 31	
	- Vessels must maintain a logbook of catch, fishing area, landings and any other information required by the ministry	Art. 30	
	- Ministry can reserve certain fishing areas to the national fleet	Art. 34.b	
	- Mandatory compliance of vessels with international and national laws	Art. 35.c	
Content of access agreements	- Parties who can enter into access agreements: country, organization of countries, fishing association, fishing company	Art. 35.a	The elements prescribed in Art. 35b are present in the existing template of fishing access agreements used by the ministry. These elements are also present in all EU public agreements. Agreements that allowed for a consultation also included a clause mentioning that agreements might not be renewed in the case of a lack of respect of the agreements' terms or lack of respect of fishing modalities as presented above.
	Mandatory key contents of agreements: - Number and types of vessels allowed - Payment and access fees - Vessel marking requirements - Mandatory communication of catch data - Flag state obligation to ensure compliance with agreement by vessels and assistance with monitoring and control - Penalties in case of non-compliance with agreement terms	Art. 35.b	
	- Madagascar must align with countries of the Indian Ocean region regarding terms and conditions of agreements	Art. 36	Implemented through the adoption of the Southwest Indian Ocean Fisheries Commission (SWIOFC) guideline for minimum terms and conditions on fishing access agreements in 2018
Fishing licenses	Content of licenses: - Types and quantity of fishing gear and equipment - Authorized periods and areas of fishing - Authorized quantity and minimum size and weight of species caught - Restrictions on bycatches and discards - Boarding of vessels by observers and scientists	Art. 38	- Only the EU public agreements include a reference to quantity of species caught through a reference tonnage that can potentially be caught - The rest of these items are present in the existing template of fishing access agreements and included in all EU public agreements

Table 2. *Cont.*

	Content	Ref. in the Law	Comments on Implementation (as of September 2022)
Fishing licenses	Conditions under which licenses will not be renewed: - Proven engagement of vessels in IUU activities - Vessels not complying with regional measures - Vessels without valid registration - Vessels without an authorization to fish beyond their flag state waters - Vessel owner or fishing company convicted of a fishery-related offence 5 years before license application - Non-compliance with national regulations and management plans	Art. 40	White et al. [8] reported that there is some illegal fishing within marine protected areas and territorial waters while authorities interviewed mentioned such occurrences have been limited over the years. WWF [15] also indicated that more than 2500 metric tonnes of tuna catch might be under-reported in Madagascar. If these fishing operators are identified, it could impact the renewal of their fishing licenses.

The Law n° 2015-053 of 2 December 2015 on the fishery and aquaculture code also specifies that the ministry has the right to adopt bylaws for further regulation, including modalities for granting, renewing, suspending and cancelling licenses to vessel operators. In 2016, the Malagasy government issued a decree to continue implementing the fishery law and provided more details on potential terms, including for access agreements such as encouragement for landings at ports, training of local fishers, infrastructure building, technology transfer and fishery development (Art. 18 of Decree 2016-1492 regarding the reorganization of marine fishing activities). As of 2022, despite the existence of access agreements (Table 4), some of these measures notably increase landings at ports and technology transfer did not materialise and remain in the realm of aspirations of the ministry in charge of fisheries. In the past 10 years, landings at ports have decreased rather than increased in the country [9]. Infrastructure building and training of local fishers have been ongoing under donor-led projects such as the World Bank South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFISH2) allocating more than USD 20 million in building human and institutional capacity necessary to implement policies and management plans regarding fisheries [16]. The impact of these initiatives on the development of the sector is yet to be seen.

3.1.2. The Blue Policy Paper (2015)

In 2015, the Ministry of Fisheries adopted a Blue Policy paper (lettre de Politique bleue) outlining the objectives of the ministry regarding the "blue economy" in the fishery sector. It also included the core principles that should govern the fishery sector, which were ensuring the sustainable management of fisheries' resources, increasing the productivity and economic contribution of the sector, improving the food and nutritional security of small-scale fishers and fish farmers, fulfilling the national demand for seafood and promoting transparent and accountable governance [2]. Each of these principles were accompanied with proposed implementation measures. Under Section 10 of this policy, industrial fishing is considered one of the main engines to increase the productivity and economic contribution of the fishery sector. At the national level, measures to achieve this goal include promoting and supporting a national fleet focused on high commercial species such as tuna and demersal species. The ministry, therefore, wanted to improve its overall business framework and encourage new private investments. As of 2022, this was only partially achieved by the exploration of flagging 10 Chinese vessels to increase productivity (Table 4 below). In fact, the number of vessels within the national fleet has decreased from eight vessels in 2013 to five vessels in 2019 [17].

At the DWF level, the ministry aimed to improve economic benefits from fishing access agreements. The Blue Policy paper demonstrates the ministry's goal of gradually harmonizing agreements by standardizing their duration of validity, their access fees and their terms of implementation. As of 2022, this can be considered as achieved by the ministry through the adoption of a licence-fees grid by the government. The grid was, however, not applied to the latest EU agreement, which nonetheless included higher fees compared to past EU agreements. For standardization, the ministry already had a template for fishing access agreements that applies to all non-EU agreements.

3.1.3. The National Strategies for the Management of Tuna Fisheries (2014 and 2021)

In 2014, the ministry in charge of fisheries, with funding from the WWF, adopted a national strategy for tuna fisheries, which are the main industrial fisheries in Madagascar's EEZ. The ministry and various stakeholders adopted an updated strategy in 2021. The 2021 strategy set up five key areas for the management of tuna fisheries. These are mostly like the areas identified in the 2014 strategy and include the following:

Ensuring coherent, transparent and responsive governance of tuna fisheries (already present in the 2014 strategy).

Making all statistics and other necessary information available to the ministry for more informed management of tuna fisheries (already present in the 2014 strategy).

Improving the attractivity of Malagasy ports for foreign industrial fleets.

Developing the national tuna fishery.

Ensuring that the exploitation of tuna resources and the development of fisheries do not harm the environment and marine ecosystems (already present in the 2014 strategy).

Each area specifies measures to be undertaken such as building the capacity of the ministry and its statistical unit (the latter was, however, undermined by the dissolution of the unit later in the same year), clarifying legal texts, maintaining the presence of DWF fleets, developing a national fleet and reducing the environmental impacts of tuna fisheries.

In Table 3, the 2014 and 2021 tuna strategies were evaluated by comparing indicators of success against results as of 2022. As can be seen concerning DWF, most of the measures are either ongoing, partially implemented or not yet implemented. This shows that although Madagascar is aware of which measures are needed in its fishery sector, including for DWF, the country continues to struggle to fully implement its policies and laws.

3.1.4. Law Regarding Maritime Zones in the Maritime Space under the Jurisdiction of the Republic of Madagascar (2018)

In 2018, the government introduced legislation to define the maritime space under Madagascar's jurisdiction and permitted activities based on international law. Territorial waters were established at 12 miles from the baselines (low-water line or geodesic lines) and within which Madagascar has sovereign rights. The contiguous zone extends to 24 miles from the baselines and allows the state to prevent and pursue offences. The text sets the EEZ at 200 miles from the baselines, an area within which any occurring activity must comply with existing national laws such as the fishery code or the mining code. The legislation also specifies that Madagascar will engage in marine spatial planning following its national needs and the development of a "blue economy" (Art. 21). Furthermore, new conservation and exploitation measures within Madagascar's marine space are subject to environmental assessments (Art. 22). A strict interpretation of this legislation would mean that while existing DWF is accepted, new fleets arriving in Madagascar's EEZ could be subject to environmental assessments. Drafts of fishing access agreements shared with civil society in 2022 did not include such a clause (pers. obs.).

Table 3. Evaluation of the tuna strategies against indicators as of September 2022.

Key Elements of the Strategy	Indicators of Success	Year of Activity Launch	Achievement as of September 2022	Comments
Activities in the 2021 strategy				
R.1.2. Establish and operationalise a fishery consultation platform to align with the reform to improve fishery management in Madagascar	• Platform in place and active	2021	Ongoing [1]	• A platform of observers and CSOs is convened for access agreements and other similar processes; the platform still needs to be officialised.
R.2.1. Strengthening statistical and information systems	• Data collection mechanism • Capacity-building plan for statistic units	2022	Partially implemented	• This key activity has been stalled by the dissolution in 2021 of the statistic unit and the unit of socio-economic data on fisheries.
R.1.3. Systematic publication of licences, royalties and bilateral agreements	• Publications	2022	Partially implemented	• There have been publications on the Facebook page of the ministry, although they are not systematic with their content.
R.1.4. Reviewing the way fees are calculated	• New access-fee grid	2021	Implemented	• A new grid was adopted by the government in 2021. However, it was not used for the 2022 EU agreement since EU agreements in the Indian Ocean region were subject to a harmonised mode of access fees calculation, different to the grid.
R.5.1. Promote the implementation of the Environmental Impact Assessment (EIA) decree on fishing activities (fishing agreement)	• EIA conducted before DWF activity	-	Not implemented	• No mention of EIA in the three agreements concluded in 2022.
Activities in 2014 tuna strategy also present in 2021 strategy				
R.1.5. Improvement of agreements on fisheries by harmonizing these agreements at the national level	• Definition of a national model of agreements • Revision of agreements according to this model	2019	Ongoing	• The 2012 model needs to be updated and aligned with existing guidelines. • One of the blue economy projects aims to establish a new template.
R.1.3. Establishing a chart of dissuasive sanctions; classifying sanctions by fishery and type of offence	• Establishment and validation of a chart • Recording offenses	-	Not implemented	• Chart not established yet.
	• Using IOTC referral protocol to report IUU cases	2014	Ongoing	

Table 3. *Cont.*

Key Elements of the Strategy	Indicators of Success	Year of Activity Launch	Achievement as of September 2022	Comments
R.3.3. Strengthening MCS systems in Madagascar and in the region: VMS data, port inspections, offshore control, observer program, information exchange in the region	• Number of controls/inspections • Number of offences identified • Exchange of information	2014	Ongoing	• Madagascar takes part in regional missions and hosts the centre for data management of IOC countries. • The SADC Regional Fisheries Monitoring, Control and Surveillance Coordination Centre charter was signed in 2022.
R.3.1. Increasing landings, trans-shipments and stopovers of DWF fleets in Malagasy ports by consulting operators and service providers	• Landing at Malagasy port	-	Not implemented	• Since both strategies have been adopted, landings have not increased in Malagasy ports.

[1] As of the time of the revision of this paper (June 2023), this activity has now been implemented through the adoption of a bylaw (16026/2023) officialising the establishment of a consultative platform for the management of fisheries.

3.1.5. Commitment to the Fisheries Transparency Initiative in 2021

In September 2021, the Malagasy government via the ministry in charge of fisheries publicly declared its commitment to join the Fisheries Transparency Initiative (FiTI). The FiTI gathers 12 standards of transparency including on foreign fishing access agreements, large-scale fisheries (vessel registry, payments for fishing, recorded catch data) and beneficial ownership. The FiTI was launched in the country in May 2022. In addition to assessing the status of Madagascar on the standards, the FiTI also establishes a platform with all relevant stakeholders in the sector to exchange information including on DWF activities. While not a written legal or policy text, the FiTI still represents an important policy instrument for the country implementing its current vision of transparency in fisheries. Considering the recent adoption of this instrument, it is not possible, at the time of the submission of this paper, to assess the level of implementation of the standard by Madagascar. Joining the initiative involves committing to assessing adherence to the standard, which will be presented in transparency reports validated by the FiTI.

3.1.6. The Malagasy Blue Economy Strategy for the Fishery and Aquaculture Sector (2022)

In 2022, the ministry in charge of fisheries adopted its blue economy strategy, validated by national stakeholders. The strategy has two components that are highly relevant to DWF, which are the improvement of fishing access agreements and the fight against Illegal, Unreported and Unregulated (IUU) fishing. Activities linked to fishing access agreements included the establishment of a fishery agreement and operation analysis unit, increasing the added value of access agreements and improving ports and processing infrastructures at ports. Regarding IUU fishing, activities include the implementation of the national plan to combat IUU fishing, the establishment of mechanisms to combat IUU fishing and the strengthening of regional cooperation. The implementation of this strategy is yet to be seen. Considering the recent adoption of this policy, the level of implementation cannot be assessed. Although, the recent WWF report (2023) on IUU fishing in the Southwest Indian Ocean reflects that IUU remains an important challenge for Madagascar to address.

3.1.7. The UNCLOS as the International Instrument Framing Access by Distant-Water Fishing Nations (1982)

The most relevant international framework for distant-water fishing is the United Nations Convention on the Law of the Sea (UNCLOS). Through UNCLOS, countries were granted a bundle of rights regarding natural resources within their national waters: the right to access, use and manage resources within those limits, the right to determine who can have access and use rights and the right to lease or sell those rights. In addition to demarcating geographical boundaries, the UNCLOS established the right of distant-water fishing nations (DWFNs) to access resources in coastal countries' EEZs. The UNCLOS also prescribes the need for regional cooperation for the conservation and management of migratory species or shared stocks (Article 118). This led to the creation of regional fishery management organisations such as the Indian Ocean Tuna Commission (IOTC), to which Madagascar is a party since 1996.

Article 62 of the UNCLOS prescribes that if coastal countries are not able to fully exploit their marine resources, they can establish access agreements with DWFNs to exploit these resources. From UNCLOS, various types of fishing access arrangements developed between DWFNs and coastal states. They range from bilateral agreements with governments, industry associations or fishing companies to the allocation of access and/or reduced licensing costs in return for vessel flagging or investments in the country. Fishing access agreements determine the terms of access to tuna fishing grounds within the EEZ. They set the fees to be paid in exchange for access, and they specify the number of vessels that can be licensed to access the EEZ, the accessible fishing area, the species that can be fished and other conditions such as the obligation to install satellite devices onboard vessels.

Fishing access agreements are based on the assumption that countries have established their capacity to exploit their resources and can lease the surplus that they are not able to

fish to DWF nations. Considering its challenging socio-economic context, which is similar to that of other developing countries, Madagascar was and is still not able to determine its capacity to harvest its marine resources. Similarly, its surplus has not been determined. In the case of offshore marine resources such as tuna or swordfish, which are targeted species in fishing access agreements, Madagascar relies on regional assessments at the Indian Ocean level by the Indian Ocean Tuna Commission (IOTC).

A range of stakeholders has legal access to Madagascar's EEZ through fishing access agreements. These include countries but also fishing associations and specific fishing companies. In 2019, operators from six countries were fishing in the waters of Madagascar: Spain, France, South Korea, Taiwan, Japan and China [5]. Most of the catch in the waters of Madagascar is caught by South Korean and Taiwanese longliners (6000 tons in 2016, mostly albacore, yellowfin and bigeye tuna), followed by European purse seiners (2600 tons in 2016, mostly skipjack, yellowfin and albacore). The remaining 1400 tons are caught by European, Japanese and Malaysian longliners [9]. The purse seiners operate in Madagascar's EEZ mainly between March and June, whereas longliners operate between October and March, especially in the eastern and southern parts of Madagascar's EEZ.

Madagascar has two types of fishing access agreements with DWF nations (Table 4). There are private agreements that are not accessible to the public (as of the time of the submission of this paper). Confidentiality of fishing access agreements has been practiced since the start of DWF within the EEZ and is commonly seen in other countries as well despite that such opacity has often been criticised [18]. There are also public agreements, of which the EU agreements are the only case and in line with the Common Fisheries Policy requiring transparency for all public EU agreements. Between 2016 and 2022, there have been between six and nine active agreements every year. Interestingly, Spain and France access the EEZ through a public access agreement between Madagascar and the EU with some of their operators (ANABAC and OPAGAC) also having private agreements with the Malagasy government through vessels flagged to Mauritius or Seychelles. In 2017 and 2018, only Spanish vessels were landing in Madagascar [9]; pers. obs.

Table 4. Types of access agreements with DWF fleets in Madagascar.

Party of the Agreement	Flag State	Type	Type of Vessel	Nbr of Vessels	Status (as of September 2022)	Comments
European Union	Spain and France	Public	Purse seiners	32	Signed [1]	4-year agreement
			Longliners	33		
Interatun	Seychelles/Mauritius	Private	Purse seiners	5	Signed	2-year agreement
Japan Tuna	Japan	Private	Longliners	10	Signed	2-year agreement
Dae Young Fisheries	South Korea/ Taiwan	Private	Purse seiners	3	Applied for renewal	
		Private	Longliners	72	Applied for renewal	
ANABAC	Seychelles/Mauritius	Private	Purse seiners	6	Applied for renewal	
OPAGAC	Seychelles/Mauritius	Private	Purse seiners	6	Applied for renewal	

Source: Data collected from public sources and governmental documents by September 2022 [5,19]. [1] At the time of the revision of this paper (June 2023), this agreement has not been enforced yet as it was in the validation process by the EU parliament.

Fishing access agreements represent a dilemma for the country. Madagascar's Ministry of Fisheries relies heavily on revenue from access agreements, representing approximately 80% of the department's revenue [6] and funding a majority of governmental activities. At the same time, Madagascar's access agreements have been highly criticized over the years. Le Manach et al. [20] reported that over the years, the EU has not paid a fair price for accessing the Malagasy EEZ as it did not consider the inflation nor currency devaluation

or the landed value of tuna. Carver [21] reported on the opacity of the agreements and the potential risks to local fishers. Andriamahefazafy et al. [22] also showed that these agreements generate aid dependency and limit the geopolitical power of Madagascar in negotiating management measures regarding tuna fisheries at the Indian Ocean level. Gorez [23] argued that fishing access agreements could be a serious threat to the livelihoods of local fishers. Such critics are not unique to the case of Madagascar. More global research has raised similar issues. Access agreements contribute to the depletion of fish stocks, constitute a threat to national economic development and affect local fishing communities including by hindering food security [24–28].

Regarding conservation and management measures (CMMs) adopted at the IOTC, 59 CMMs were active as of September 2022, 56 being binding resolutions and 3 being recommendations [29]. These CMMs cover a vast array of topics from data reporting and management of certain gears to catch limits and harvest strategies. According to the compliance report of Madagascar, the country had 17 non-compliance issues, 10 of them being repeated non-compliance occurrences. These relate to a lack of data reporting regarding national catch and lack of data reporting regarding certain species of IOTC such as shark, marlin or sailfish [19]. Madagascar was, however, compliant for obligations linked to reporting of vessels in the EEZ, notably by complying with the obligation to provide the list of foreign vessels licensed in the EEZ and information on access agreements (the latter consisting of providing a list of signed agreements (ibid.)). Madagascar also participates actively in the negotiation of CMMs at the IOTC, although its stance has been variable depending on topics. Madagascar, for example, co-sponsored a ground-breaking resolution on the management on drifting fish aggregating devices [30] while it also objected to the resolution on the rebuilding plan for yellowfin tuna, which has been overfished since 2015 [31].

3.2. Governance Challenges Linked to Distant-Water Fishing in the Malagasy Waters

Madagascar faces various socio-economic and political challenges, such as high rates of poverty and corruption, which have greatly impacted its institutional efficiency [32]. In this context and adding other factors such as geopolitics, managing DWF remains a challenge for Madagascar. The country suffers from various inadequacies between policy making, implementation and local realities, also known as misfits in the socio-ecological systems literature [13,33] as well as implementation challenges found in the literature of fishery management mainly around transparency and the challenge of fighting IUU fishing [14,34].

3.2.1. Spatial and Social Misfits of DWF Policies

The first governance misfit that Madagascar faces is the spatial misfit, within which the institutional arrangements and policies adopted do not match the spatial scale of the socio-ecological system to be managed [13,35]. Due to Madagascar's large landmass and EEZ, DWF policy adopted at the national level can be challenging for coastal regions. When new laws are passed, the country has limited resources to ensure outreach at the regional and local levels. Regional representatives of the ministry are given the text of the law, while coastal communities are often informed through the work of NGOs in the country. Fishers interviewed presented anecdotes of encountering large vessels when going offshore without any knowledge about the legalities or modalities of DWF in the EEZ. Local and regional needs are often difficult to convey at the national level, where laws are developed. The state has limited resources to consult local communities; the ministry's regional offices are only located in the main cities. They are mainly in charge of the registration of all fishers and fishing vessels and implementing projects specifically targeted to their region (GovReps 4, 6 and 8). Over the past 10 years, various NGOs have reached out to isolated fishing communities and undertaken projects to organize fishers into fishing associations and cooperatives to amplify their voice at the national level (NgoReps 1, 3 and 5). The Ministry of Fisheries validated that approach in the 2015 fishery code by giving fishing

associations the right to manage fishing resources at the local level through management transfers. However, the question of representation within associations remains an issue, as not all fishers want to be part of an association, leading to some associations having a short life span or being dominated by local elites in the fishing villages (ArtFisher 10, SSFishers 6 and 8). Therefore, to develop its policies and laws, the ministry relies on inputs from the NGOs working within fishing villages and from well-established or trusted fishing associations and cooperatives.

The spatial misfit also manifests with the paradox of priorities that the state faces between DWF and small-scale and artisanal fisheries. As seen in the analysis of the tuna strategies in the previous section, developing the domestic and DWF industrial sector remains a key priority for tuna fisheries in Madagascar. In this context, the impact of DWF activities on small-scale and artisanal fishers is not considered. On the other hand, the socio-economic contribution of small-scale and artisanal fishing to the local and national economy is less known and less visible in the national balance of benefits provided by different sectors of fisheries. Fishers have long demanded more support for their activities as resources continue to deplete [36]. Such a limited inclusion of local needs has often led to regulations and policies which, while they acknowledge the importance of local fisheries and fishing communities, are either difficult to implement at the local level or opposed by fishers. As a solution, the Ministry of Fisheries often passes bylaws and implements regulations. Currently, there are still some legal texts under development aimed at implementing the 2015 fishery code. Given the challenging context, these may add to the existing backlog of legal texts to establish and implement.

Madagascar also faces a social misfit within which views at different levels do not match the institutional arrangements in place [13]. This usually manifests with fishers' mistrust of the government including the ministry in charge of fisheries. Local fishers often see the government as a repressive rather than collaborative entity, one that often intervenes in fishing communities to prosecute offences and illegal activities (views shared by two to three small-scale fishers in each of the four coastal towns). Furthermore, fishers have very little knowledge of the contribution of fishing access agreements to their livelihoods even though some projects for local fisheries are funded by such agreements. Most fishers interviewed often talked of the need to improve their fishing equipment and vessels or the supply chain. The ministry has only been able to respond to these demands intermittently through projects that, once implemented, are not guaranteed to be monitored. The dependency on donor funding also limits the ability of the state to have a long-term vision for the various sectors of fisheries. As an illustration, 10 years ago (as of the submission of this paper), Madagascar received funding from the African Bank of Development to build landing sites for local fishers in various coastal villages. As of 2020, very few of these landing facilities were operational and they are currently managed by private-sector entities through a contract with the state government. This demonstrates the persistent challenge in Madagascar to ensure consistency in initiatives for fisheries. The impact of the recent efforts of the current ministry that has offered better support to local fishing communities is yet to be seen in the medium and long term.

The social misfit also manifests with the continuous adoption of legal text and policy fuelled by the various interests behind policy making. From the 1993 fishery code to the 2015 code and the blue economy strategy for the fisheries and aquaculture sector, improvements have been made to address issues regarding not only DWF. The adoption of new policies and laws is often influenced by various interests at the national level and aided by the willingness of the ministry in charge of fisheries to demonstrate its active involvement in policy change to various NGOs and funders. The tuna strategies, for example, were funded with support from the WWF as part of its own regional strategy to sustainably manage tuna fisheries in the Western Indian Ocean region. By passing recent laws on the maritime zone, the Malagasy government made a strong statement about national sovereignty. The adoption of a blue economy strategy for the sector and the creation of a blue economy department in 2021 was also a political signal to highlight

the importance of fisheries for the economy. The ministry's core staff navigates these competing interests and initiatives to ensure the continuity of programs. The difficulties in implementing sustainable programs in Madagascar mean that new laws and policies keep being adopted with a limited evaluation of their effectiveness (NgoReps 2, 4 and 5).

3.2.2. Pertaining Issues of Transparency and Accountability

In fishery management, a lack of transparency and accountability in DWF can constitute a substantial barrier in advancing sustainable fisheries [14,37,38]. In both the signing and the implementation of fishing access agreements, significant issues remain. For the past 12 years or so, NGOs and CSOs have been asking the Ministry of Fisheries to open the negotiations of agreements to observers to ensure transparency and accountability and to eliminate the risk of corruption. Since 2018, the ministry has finally complied with these demands, but only slowly and only for EU negotiations (NgoRep 4). A group of experts comprising of CSOs, academics and advisors was also invited to prepare and observe the negotiation of the latest EU agreement, which started in 2019 [39]. While this was a substantial step, it was not replicated for the negotiations of other agreements, especially with Asian operators, which remain behind closed doors as of September 2022. Some members of civil society organisations were asked to provide comments once through email in 2021 regarding the renewal of the Japan Tuna agreement without any further follow up (pers. obs.).

In terms of accountability, the public, including local fishers, is not aware of how many fishing boats operate within the EEZ or who is operating them. The surveillance and monitoring centre ('Centre de Surveillance des Pêches'—CSP) and local fishers recount anecdotes of fishers complaining about big vessels entering territorial waters and not knowing if they are legal or illegal (interview insights from ArtFishers 8, SSFishers 5 and 6, AssoFisher 2, NgoRep 1, GovRep 5). The limited knowledge about which agreements are currently in effect and which vessels are present in the EEZ exacerbates the mistrust between local fishers and authorities. Since 2021, the ministry has made more efforts to publicise the conclusion of fishing access agreements and licenses through publications on its Facebook page. The commitment to the FiTI was also a step towards better publications of information linked to DWF. A database of such information is also part of the requirement of the FiTI standards. A substantial challenge also remains in terms of transparency of DWF in Madagascar especially regarding non-EU vessels. These vessels do not land at Malagasy ports and have an unsatisfactory rate of logbook submissions (interview insights from GovReps 1, 2, 3 and 10). There is little information on their activities in Madagascar's EEZ. One has to refer to the reporting of parties to the IOTC to obtain an idea of non-EU catch volumes, and these data are only based on fleet reports, not observer data. The lack of transparency in the activity of Asian fleets hinders any attempt at improving the management of DWF. As seen in other studies, dark fleet operations can have severe impacts on fish resources and missing revenues from under-reported catches [15,40].

3.2.3. A Still Limited Capacity to Fight IUU Fishing

Regarding its capacity to fight IUU fishing through Monitoring, Control and Surveillance (MCS), the CSP's surveillance fleet includes 15 vessels (2 vessels operating in Madagascar's EEZ and 13 in coastal waters). The rest of its fleet is composed of small boats and four-wheel drive vehicles. In addition to these, the CSP uses aerial surveillance, has inspectors and runs an observer program.

While the creation of the CSP in 1999 and investments in its infrastructure and resources have contributed to the reduction in illegal fishing, the CSP's current resources are too limited to ensure surveillance of the entire EEZ. This is due to its limited financial resources and its struggle to mobilise more of the national budget (GovRep 13). To monitor activities within the EEZ, the CSP mostly relies on vessel captains honouring their obligation to turn on their vessel monitoring system (VMS) while inside the EEZ. Furthermore, a report presented to the ministry in charge of fisheries in 2022 by civil society also high-

lighted that some fleets also had poor AIS transmissions, which prevents the monitoring of their activities in the EEZ even more. Only aerial surveillance can provide a full picture of fishing activities within the EEZ. However, aerial surveillance is very expensive for the ministry. In 2017 and 2018, no aerial surveillance was undertaken, while only 74 days of actual surveillance out of 120 days of planned surveillance took place in 2017 [40]. The observer program, an important component of the CSP's MCS capacity, has not performed as needed mainly due to the reduced number of observers, from 30 to 17 in 2017 (pers. comm.). Observer coverage is also low at around 24% of the domestic fleet and 10% of foreign fleets [41].

To overcome the limitations linked to the fight against IUU, Madagascar has relied on regional initiatives such as the regional MCS program, funded by the Indian Ocean Commission, which allows the use of logistical resources between country members of the IOC to conduct regional monitoring and surveillance. Thanks to this, illegal fishing in Madagascar's EEZ is considered to be less prolific by enforcing agents at CSP and other similar MCS units based in Mauritius and Seychelles [22]. In 2022, the government also signed the SADC MCS charter that aims to establish a regional SADC Fisheries Monitoring, Control and Surveillance Coordination Centre (MCSCC) [42]. This regional centre aims to mobilise regional intelligence in the SADC region, build capacity of MCS units and establish joint surveillance activities of EEZs between the SADC countries (ibid.).

4. Discussion on Pathways towards an Improved DWF Policy Framework

From the analysis of the policy framework and challenges for managing DWF in Madagascar, four pathways are proposed to improve the governance of distant-water fishing in Madagascar. These are based on pathways suggested in the literature on institutional misfits and fishery governance, adapted to the case of DWF in Madagascar.

4.1. Address Policy Coherence and Improve Monitoring

Addressing policy coherence, from policy design to implementation, can allow various stakeholders to advance fisheries and marine resources management that considers diverse views and interests [43,44]. In the case of DWF management in Madagascar, such coherence could be achieved not only by harmonising policies and laws but also by ensuring that policies are effectively implemented at different levels. While Madagascar can indeed be seen as progressive in its adoption of laws, policies and regional measures, implementation remains a challenge, especially for the Ministry of Fisheries. While NGOs have attempted to fill the gap in various coastal areas, the ministry is the main player when it comes to implementing its laws and policies. As new laws, policies and strategies continue to be adopted, harmonising them with existing laws could help determine which policies can be implemented and where policy gaps exist. Moreover, outreach activities toward regional offices, fishing communities and DWF operators could improve knowledge regarding existing legal texts and policies amongst local stakeholders. Fishers interviewed felt that more dialogue with local authorities would improve their feeling of integration and being part of national policy making and implementation. Since the ministry in charge of fisheries communicates new laws and policies directly to DWF operators, the latter should be fully aware of existing texts, which would allow for strong penalties in the case of offences.

Another area that requires considerable improvement is monitoring and evaluation. Madagascar, like many other developing countries, has been a living laboratory of all sorts of development projects and initiatives [45]. These have often been short-lived, with limited consolidation of lessons learnt (ibid.). In this context, there is limited consolidated knowledge of what works and especially what does not. Like for the management of terrestrial resources, for example, failed initiatives are often not recorded, and stakeholders' experiences are often not shared [46,47]. A continuous monitoring system for policy initiatives and projects relating to the development of fisheries could prevent repeating past mistakes. To this end, monitoring and evaluation of activities that are funded through revenues from DWF would help understand if they contributed to the improvement of

the fishery sector. Stricter monitoring of DWF operations in the EEZ can also inform decision making on DWF management and contracts [48]. This could be achieved by improving observers' coverage along with ensuring their working conditions on vessels. All stakeholders working on data that were interviewed raised that better monitoring of catch data is needed, especially for non-EU fleets. This could be done through the implementation of more dissuasive sanctions in the case of late submissions of logbooks to the statistical unit. Finally, Madagascar is part of various initiatives that involve the sharing of data on fishing in the Indian Ocean; these data could be mobilised to inform the decision-making process during negotiations of access agreements. While the ministry's resources and funding might be limited, implementation, monitoring and evaluation activities could at least guide initiatives that can be effective or not for the future. Specific budget lines could be assigned to these activities while incoming revenues and funding could be directed towards such activities.

4.2. Realign National Policy and Actions with Local Needs

As DWF continues to face criticism at the national and global levels [26,27], its perpetuation in the waters of a developing country such as Madagascar remains paradoxical. Its contribution to the national economy, in particular fishing communities, is yet to be seen in tangible ways. To ensure that DWF has a limited negative impact on local livelihoods and communities, Madagascar's national policy and actions might need to be realigned with local needs. This could help address the spatial and social misfits identified in the challenges above. For example, the country could develop more long-term initiatives with the revenue from fishing access agreements and similar funding to promote activities that contribute to the well-being and livelihoods of fishing communities. The recent turn of the government towards flagging industrial vessels could be re-evaluated on the kinds and levels of benefits and trade-offs it brings to the economy and the coastal communities relying on fishing as a livelihood.

For artisanal and small-scale fishers, the combination of a steady decrease in marine resources and the need to focus on a day-to-day livelihood provides limited perspectives for long-term prosperity [49]. As national policies have begun to recognize the importance of artisanal and small-scale fishing, addressing broader socio-economic and political factors that prevent fishers from prospering could be beneficial. This includes rethinking the value of projects regarding fisheries based on intermittent donations of fishing gears and tackling the problem of sustaining livelihoods in the short and long term. This could also improve local fishers' trust in the state. Initiatives that improve learning exchanges in the management of marine resources among coastal communities exist [50]. These represent an avenue for the government to gain access to local fishers, although this also requires a strong willingness from the authorities to actively listen to the voices of small-scale fishers when they express their concerns.

4.3. Further Strengthen Transparency in DWF

The next suggestion aligns with several demands of NGOs at the national and international levels over the years to improve transparency in DWF, from negotiations to implementation and benefit sharing [51]. Transparency is also considered an important pillar of effective fishery governance [14]. Regarding negotiations of fishing access agreements, the efforts since 2018 to allow observers at EU negotiations represent a key step for Madagascar to open its negotiations to more transparency. This could be established as a practice to be applied to all types of fishing access agreements. Expanding transparency in negotiations would also help disassociate fishing access agreements from any development aid, which often influences negotiations and the development of aid flows in the country [52].

Another area where more transparency could be beneficial is regarding the use of revenue from DWF. An increased accountability in the allocation of funds could be achieved by publishing the multiyear plan for EU revenue dedicated to sectoral support and making

public any report on activities undertaken with these funds. Consultations with national stakeholders on fishery priorities could help the ministry obtain a clear and consistent list of activities. A look at the multiyear plan of the 2014–2018 EU agreement reveals that some activities did not fit clearly into traditional fisheries or capacity-building categories. Providing a clearer direction on allowable activities and the allocation of funds could facilitate the monitoring of implementation. Transparency in this area would also help the country comply with the FiTI standard on DWF.

A last area where improved transparency could help shape policy regarding the management of DWF is on the impacts of DWF on the resources and the coastal communities of Madagascar. There is limited knowledge on the potential competition over resources between DWF and national fisheries and a need for evidence on the impact of DWF on the marine biomass and ecosystems within the EEZ. Such evidence could help the government decide on the need to maintain, improve or stop DWF in Madagascar's waters. Transparency on the value added and the potential negative impacts of DWF is key to decision making for the Ministry of Fisheries.

4.4. Mobilise Measures Adopted at the Regional Indian Ocean Level

While aligning regional and national fishery policies can be a challenge for coastal states, measures adopted at the regional level such as the IOTC also represent an opportunity to improve fishery management at the national level [53]. As Madagascar is involved in various management initiatives at the Indian Ocean level, there are opportunities to improve the management of DWF by implementing regional measures. Since Madagascar has been engaged in regional surveillance and control for several years, two other opportunities could be mobilised further: a better integration of measures adopted at the IOTC, and the implementation of the Southwest Indian Ocean Fisheries Commission (SWIOFC)'s guidelines on minimum terms and conditions for fishing access agreements (see Supplementary Material for a summary of the key clauses). Through adopted IOTC resolutions, Madagascar has attempted to improve its tuna fishery management. Continuing these efforts will require more resources to be sustained in the longer term. Implementing the IOTC's conservation measures is not always a straightforward process including for developing countries like Madagascar [54]. Therefore, integrating IOTC resolutions into national laws and policies implementing resolutions and conservation measures requires more investment. Ideally, a national budget could be assigned to such a process. However, there are also venues within fishing access agreements and donor-led funding that could also be redirected to such efforts.

5. Conclusions

While DWF is fully a part of Madagascar's blue economy, the current analysis shows that Madagascar faces challenges in managing this segment of the fishery sector. These challenges are not uncommon in developing coastal states. They include a limited harmonisation of approaches and policies through the years. While the importance of local fisheries is increasingly acknowledged, this is often contradicted by governmental actions that aim to industrialise the sector including by continuing to conclude fishing access agreements or through flagging foreign industrial vessels. Despite these, the drive of the country to develop and adopt frameworks to manage DWF needs to be recognised. Moreover, national laws and frameworks are open to improvement, as they all specify the possibility of adopting specific legislation or measures to implement better policies (such as the tuna strategy). The recent commitment to the Fisheries Transparency Initiative presents great potential to improve transparency in DWF operations and governance if implemented thoroughly. Madagascar has accumulated extensive experience in dealing with DWF. In addition to ongoing efforts (as of early 2023), there are opportunities for improvement and there is an institutional setting to enable changes in Madagascar. This includes Madagascar's openness to adopt new regulations and policies when needed, and the continued interest of DWF fleets in fishing in Madagascar's EEZ. In its current political and economic situation and its

current drive for the blue economy, Madagascar would find it difficult to ban DWF in its waters. Therefore, DWF must be governed by a well-implemented coherent framework that can provide tangible benefits at the national level through revenue but also sustain coastal livelihoods and food security. A future reflection on the potential removal of DWF in the EEZ requires filling the knowledge and data gap on the contribution and impact of DWF. This could assist decision makers in weighing the value added by DWF compared to its impact on the future of the blue economy from the local to the national level.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/fishes8070361/s1, Key clauses of Southwest Indian Ocean Fisheries Commission (SWIOFC)'s guidelines on minimum terms and conditions for fishing access agreements.

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