

Investing in Sustainable Fisheries in the Dominican Republic



Evaluation of a Trust Mechanism

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For: Conservation International (CI)

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DRAFT

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Executive Summary

Business Case to Improve Billfish Conservation Outcomes in the Dominican Republic	
Area	Dominican Republic Exclusive Economic Zone (EEZ) - 269,165 km ²
Proposed Investment Amount	U.S. \$500,000 loan & \$500,000 Grant
Investment Term	10 years
Fishery/Species Focus	<u>Primary:</u> Billfish recreational sportfishers <u>Secondary:</u> Multispecies, commercial FAD fishers
Core Business Case Investments	<ul style="list-style-type: none"> Support the creation of a trust mechanism to secure a marine managed area to protect billfish spawning grounds and improve FAD management in the EEZ of the Dominican Republic
Potential Government Investment to Support Case <i>(not required for implementation)</i>	<ul style="list-style-type: none"> Implement co-management regulations Institute and enforce billfish harvest control rules Enforce fishing licensing system (a key step toward secure tenure for fishers) Digitally collect, record and analyze key fisheries data, i.e. landings; VMS
Fishery Stakeholders Benefitted	Estimated: approximately 500 fishermen
Targeted Environmental Returns: <i>Protecting and Restoring Fish Stocks</i>	<ul style="list-style-type: none"> Conserve of billfish spawning grounds to support stock recovery Improve use of “catch and release” practices
Targeted Social and Economic Returns: <i>Supporting Fishing Livelihoods</i>	<ul style="list-style-type: none"> Improve billfish sustainability and increased fisher incomes in the DR Reduce FAD-related conflict
Projected Financial Returns	6%



Contextual Analysis

The DR is an open access fishery, with minimal formal management of fisheries, minimal comprehensive data or analysis of fish stocks in the EEZ, and relatively weak enforcement of fishing regulations. The lack of these pre-requirements for sustainable fisheries investment success present a particular challenge to financing a transition to sustainable fisheries utilizing market based solutions.¹

There are estimated to be over 8,000 fishers and more than 3,000 vessels in the Dominican Republic (DR), of which 98% are considered to be artisanal. With the exception of lobster, the majority of the DR harvest is destined for the domestic market.² FAO food balance sheets show that domestic production is less than 80 % of domestic consumption.³

Recent Fishery Performance Indicators (FPI) completed by Conservation International (CI) and The Food and Agriculture Organization of the United Nations (FAO) identified a number of opportunities and threats to pelagic populations in the DR.⁴ With a focus on billfish, two primary user groups were identified as beneficiaries of healthy billfish stocks: recreational sportfishers and commercial FAD fishers (often artisanal).

Many of the participants in the recreational sector are professional sportfishers who invest heavily in premium equipment and vessels that pursue sportfishing year round, migrating to different waters and countries according to the fishing season. Four marinas in the DR host private sportfishing boats and charters.

Aside from these private boats that generally cater to experienced sportfishers who come to the DR specifically to fish, the recreational sector also includes a fleet of “informal” charter boats. These are often crewed by former commercial fishers transitioning into the recreational fishery due to the potential for improved economic outcomes and reported declines in harvest in the commercial fishery. This group serves the value-conscious tourists that come to the DR primarily to visit the all-inclusive resorts in the Punta Cana area. These fishers typically do not possess the necessary investment capital to deploy vessels with the gear, insurance and safety equipment associated with a professional sportfishing fleet. They are also, reportedly, responsible for higher levels of billfish mortality, due to the need to sell or consume billfish, compared to the professional sportfishing fleet who practice “catch and release”.

The commercial FAD fishers and the recreational sportfisher fleets both fish the FADs set by the commercial fishers, which is a source of conflict. Tournament participants and slip renters at Cap Cana and Casa de Campo pay a fee to the marinas that is estimated to collect approximately U.S. \$25,000 to

¹ Holmes, L., Strauss, C. K., de Vos, K., and Bonzon, K. 2014. *Towards Investment in Sustainable Fisheries: A Framework for Financing the Transition*. Discussion document. Environmental Defense Fund, The Prince of Wales’s International Sustainability Unit. <https://www.edf.org/sites/default/files/content/towards-investment-in-sustainable-fisheries.pdf>.

² Herrera, A., Betancourt, L., Silva, M., Lamelas, P. and Melo, A. 2011. *Coastal fisheries of the Dominican Republic*. In. S. Salas, R. Chuenpagdee, A. Charles and J.C. Seijo (eds). *Coastal fisheries of Latin America and the Caribbean*. FAO Fisheries and Aquaculture Technical Paper. No. 544. Rome, FAO. Pp. 175-217.

³ Data from the FAO Food Balance Sheets available at: <http://www.fao.org/faostat/en/#data/FBS>. The effect of the consumption of fish by tourists might not be fully accounted for in the data.

⁴ Gentner, B., Arocha, F., Anderson, C., Flett, K., Obregon, P., van Anrooy, R. 2018. *Fishery Performance Indicator Studies for the Commercial and Recreational Pelagic Fleets of the Dominican Republic and Grenada*. FAO Fisheries and Aquaculture Circular No. 1162. Rome, Italy. <http://www.fao.org/3/I8833EN/I8833en.pdf>

\$50,000 annually. This is purportedly paid to the FAD fishers to support their costs in making, setting and maintaining the FADs and to compensate them to not fish the FADs during billfish tournaments. Currently, these payments are typically informal and lack transparency. Complicating matters further, FAD fishers have engaged in “pirate”-like behavior—approaching sportfishing boats, demanding payment, money, food, etc., and creating a negative impression for sportfishers. Whether this is a cause or symptom of the opaque execution of the FAD-funding mechanism is not clear.

Value Proposition and Business Model

While no traditional business model was identified that would utilize a market and return generating mechanism to reward investors, the confluence of factors identified in the contextual analysis, combined with the overfished status of most billfish species and recent policy changes to establish a billfish spawning area, provide the basis for the establishment of a trust mechanism. The proposed trust mechanism would formalize and professionalize the payments from the recreational sportfishing sector, and, in collaboration with an appropriately constituted board, prioritize interventions to support billfish conservation, reduce conflict around FADs and, if possible, support the professional development of the informal charter fleet.

The trust mechanism considered, while not an “attractive business case” per se, is recommended to address the lack of transparency in the existing, informal payment system between the recreational fishery and the commercial FAD fishery. While the resources raised are considered modest in the context of enforcing an area closure to improve billfish spawning or improved FAD management, they do have precedent.

Financial and Risk Analysis

From a financial perspective, the key driver of the success of the trust mechanism is the rate of compliance achieved for collection of the user fee from the recreational fishery stakeholders. As demonstrated in this document, while low fees may encourage greater participation, they do not generate sufficient revenue to ensure the viability of the trust. A U.S. \$10 user fee per visitor trip at a 40% compliance rate, would generate U.S. \$1.3 million over 10 years (or approx. U.S \$130,000 per year). A U.S. \$50 user fee at a 40% compliance rate would generate over U.S. \$6 million over 10 years (or \$600,000 per annum on average).

Unfortunately, neither of these parameters are assured, particularly in the current context of reported collection amounts that range between U.S. \$25,000 – 50,000 and given the early stage nature of the proposed entity. Additionally, the acceptance of these fees may decline as they increase. For context, however, a 2018 willingness-to-pay survey of the regional recreational fishery indicated anglers were willing to pay U.S. \$280 up to \$439 per year to a government-administered fund in order to access sustainably-managed billfish.⁵

Other than the financial risk, a major risk to this approach will be the delivery or implementation risk of the proposed trust mechanism to meet its strategic objectives. A well-managed facility, with a highly

⁵ FAO. 2018. *Expenditure and willingness-to-pay survey of Caribbean billfish anglers: summary report*. Gentner, B. and Whitehead, J. FAO Fisheries and Aquaculture Circular No. 1168. Rome, Italy.

focused and targeted implementation plan designed not to exceed resources raised, is a worthy objective. This would be a significant improvement over the opaque and informal payment mechanism that currently exists between the recreational and commercial FAD fishers. Unfortunately there is no guarantee that such a mechanism will succeed.

Fortunately, the DR does possess local capacity focused on improving marine protected area management under the auspices of the Ministry of the Environment in an initiative developed by Blue finance. This initiative has already secured the support of the Ministry of the Environment and key tourism industry stakeholders to charge a visitor fee for near shore tourism activities. It anticipates working in geographies that overlap with the proposed area closure for billfish. As such, this initiative presents a valuable potential partner for the proposed trust mechanism.

Recommendation

The proposed trust mechanism is recommended if only to address the informal and opaque nature of payments between the recreational and commercial FAD fishery that currently exists. While not an “attractive business case” per se, it has a role to play in improving the transparency of payments, as well as supporting the establishment and enforcement of a billfish spawning area and improved FAD management. While forecasted revenues are modest, a precedent does exist for this model in the DR. Under the appropriate leadership, it may also evolve to incorporate supporting the professionalization of the local “informal” recreational charter fleet with the goal of improving billfish stock sustainability in the DR.

Given the operational, structural and financial risks identified in this document, the financial viability of the proposed trust mechanism is uncertain. In order to address this risk and ensure long-term success, we recommend that CI and the FAO explore collaboration with the aforementioned initiative developed by Blue finance. This may present an opportunity to achieve operational and geographic synergies given the common mission around marine protected areas.

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Abbreviations and Acronyms

ABNJ	Areas beyond national jurisdiction
BET	Bigeye tuna
BUM	Blue marlin
CARICOM	Caribbean Community
CLME	Caribbean Large Marine Ecosystem (Project)
CRFM	Caribbean Regional Fisheries Mechanism
FAD	Fish aggregation device
FAO	Food and Agriculture Organization of the United Nations
FIP	Fishery Improvement Project
FPI	Fishery Performance Indicators
H&G	Headed and gutted
ICCAT	International Commission for the Conservation of Atlantic Tuna
IRR	Internal rate of return
IUU	Illegal, unreported and unregulated
LL	Longline
MT	Metric tons
NGO	Non-governmental organisation
OSPESCA	Central America Fisheries and Aquaculture Organization
RFMO	Regional fisheries management organization
SAI	Sailfish
SDG	United Nations Sustainable Development Goal
TBL	Triple-bottom line (referring to a business or project with not just a financial “bottom line” but also accounting for social and environmental outcomes)
UN	United Nations
WECAFC	Western Central Atlantic Fishery Commission
WHM	White marlin
YFT	Yellowfin tuna

Introduction

This report outlines the findings from efforts to develop a business case for the sportfishing and commercial fish aggregating device (FAD) fisheries in the Dominican Republic (DR) that would ultimately benefit the declining billfish stocks in the region.⁶

While no traditional business case was identified during the course of this work, a trust mechanism was identified as a potentially appropriate response to address the constraints and challenges associated to billfish conservation in the context of the commercial and sportfishing communities. Two interventions in particular are highlighted – the implementation of a spawning area closure and improvements in FAD management. A third intervention related to professionalizing the “informal” recreational charter fleet is reviewed in the appendices.

The contextual analysis section of this document provides an overview of the relevant fisheries in the DR. The sections that follow discuss the proposed value proposition, provide a financial and risk analyses for the proposed trust mechanism and present a recommendation for next steps for consideration.

All monetary figures are in U.S. dollars, unless otherwise noted.

Contextual Analysis

Three factors are important to take-away from the contextual analysis: 1) there is little formal management of the fisheries of the DR; 2) related to the first point, there is little comprehensive data or analysis of stocks in the EEZ of the DR; 3) the DR is highly reliant (up to 80 %) on imports of fish to meet domestic demand. None of the pre-requirements for sustainable fisheries investment success⁷ are present in the DR. The contextual analysis that follows expands upon each of these points and others, but they are mentioned here to highlight the constraints to development of triple-bottom line enterprises.

Conservation International (CI) and The Food and Agriculture Organization of the United Nations (FAO) recently commissioned Fishery Performance Indicator (FPI) assessments of the commercial FAD and recreational billfish fisheries in the DR from which the contextual analysis herein originates, unless otherwise noted.⁸

There are estimated to be over 8,000 fishers and more than 3,000 vessels in the DR, of which 98% are considered to be artisanal. Besides the FAD fishery, the most important fisheries are lobster, shrimp, conch and reef fish. With the exception of lobster, the majority of the harvest is destined for the

⁶ Related work to identify business cases in Grenada and for the formalization of the Western Central Atlantic Fishery Commission (WECAFC) into a regional fisheries management organization (RFMO) was also carried out as part of this consultation.

⁷ Holmes, L., Strauss, C. K., de Vos, K., and Bonzon, K. 2014. *Towards Investment in Sustainable Fisheries: A Framework for Financing the Transition*. Discussion document. Environmental Defense Fund, The Prince of Wales’s International Sustainability Unit. <https://www.edf.org/sites/default/files/content/towards-investment-in-sustainable-fisheries.pdf>

⁸ Gentner, B., Arocha, F., Anderson, C., Flett, K., Obregon, P., van Anrooy, R. 2018. *Fishery Performance Indicator Studies for the Commercial and Recreational Pelagic Fleets of the Dominican Republic and Grenada*. FAO Fisheries and Aquaculture Circular No. 1162. Rome, Italy. <http://www.fao.org/3/I8833EN/I8833en.pdf>

domestic market.⁹ FAO food balance sheets show that domestic production is less than 80 % of domestic consumption.¹⁰

In addition to the commercial FAD fishing fleet, a well-established, professional, recreational sportfish fleet operates in the DR. The participants in this fishery invest heavily in premium equipment and vessels that pursue sportfishing year round, migrating to different waters and countries according to the fishing season. Four marinas host private sportfishing boats and charters. Aside from these private boats that generally cater to experienced sportfishers who come to the DR specifically to fish, there is also a fleet of “informal” charter boats, often crewed by former commercial fishers serving the value-conscious tourists that primarily come to the DR to visit the all-inclusive resorts in the Punta Cana area. These fishers typically do not possess the necessary investment capital to deploy vessels with the gear, insurance and safety equipment associated with a professional sportfishing fleet. They are also, reportedly, responsible for higher levels of billfish mortality, due to the need to sell or consume billfish, compared to the professional sportfishing fleet who practice “catch and release”.

The commercial FAD fishers and the recreational sportfishers fleets both fish the FADs set by the commercial fishers, a reported source of conflict.

Table 1 Findings, in brief¹¹

	Recreational Sportfishers	Commercial FAD Fishermen
Target species	Multispecies - recreational sportfishers target billfish, especially blue and white marlin	Commercial FAD fishermen target dolphin, wahoo, mackerels, billfish and tunas, primarily yellowfin
	<i>Other important fisheries in the DR not included in the recent FPI assessment include spiny lobster, queen conchs, coral reef fish and others.</i>	
Stock status	Yellowfin tuna, blue marlin, and white marlin are overfished, but sailfish, bluefin tuna, and dolphinfish are not identified as overfished, but there is a high degree of uncertainty in estimates and decreasing trends in catch of bluefin	
Gear	Trolling	Handgear (trolling and drop lines)
Vessels	Estimated at 250, but varies with the season, ¹² vessels are typically 10-20m in length that pay a fee for fishing the FADs set by commercial fishers	At least 258 vessels of 5-8 m in length with 30-40 HP outboard engines which set and commercially fish FADs
Trips/Landings	Of the two marinas with accurate records that reported data, nearly 3500 billfish were caught and released by sportfishers in 2016 on 1483 trips	Approximately 1300 tons of pelagics were landed for local consumption in 2016
Exports, 2016	N/A	7500 tons, for all fishery products
Fishers	1000-1500	Over 500 up to 1000, estimated
Management	Open access; fishing license and vessel safety inspection are required	

⁹ Herrera, A., Betancourt, L., Silva, M., Lamelas, P. and Melo, A. 2011. *Coastal fisheries of the Dominican Republic*. In: S. Salas, R. Chuenpagdee, A. Charles and J.C. Seijo (eds). *Coastal fisheries of Latin America and the Caribbean*. FAO Fisheries and Aquaculture Technical Paper. No. 544. Rome, FAO. Pp. 175-217.

¹⁰ Data from the FAO Food Balance Sheets available at: <http://www.fao.org/faostat/en/#data/FBS>. The effect of the consumption of fish by tourists might not be fully accounted for in the data.

¹¹ Unless otherwise noted, all information was sourced from the recently completed FPIs for the DR and Grenada. Gentner et al., 2018.

¹² Herrera et al., 2011.

FPI scores for the FAD fishery indicate poor scores for most output indicators, a measure of the wealth generation of the fishery. Scores include a 2 out of 5 for the percentage of stocks overfished and 3 out of 5 for degree of overfishing. Both the FPIs and the FAO “Coastal fisheries of the Dominican Republic”¹³ report indicate that fishing in the DR is seen as an “employer of last resort” or “marginal activity”, respectively. Whether by cause or effect, commercial FAD fishing is poorly developed on the island, with poorly developed regulation, handling, and cold chain all contributing to low wealth generation.

Figure 1 FPI output scores by TBL Indicator for the commercial FAD fishery of the Dominican Republic



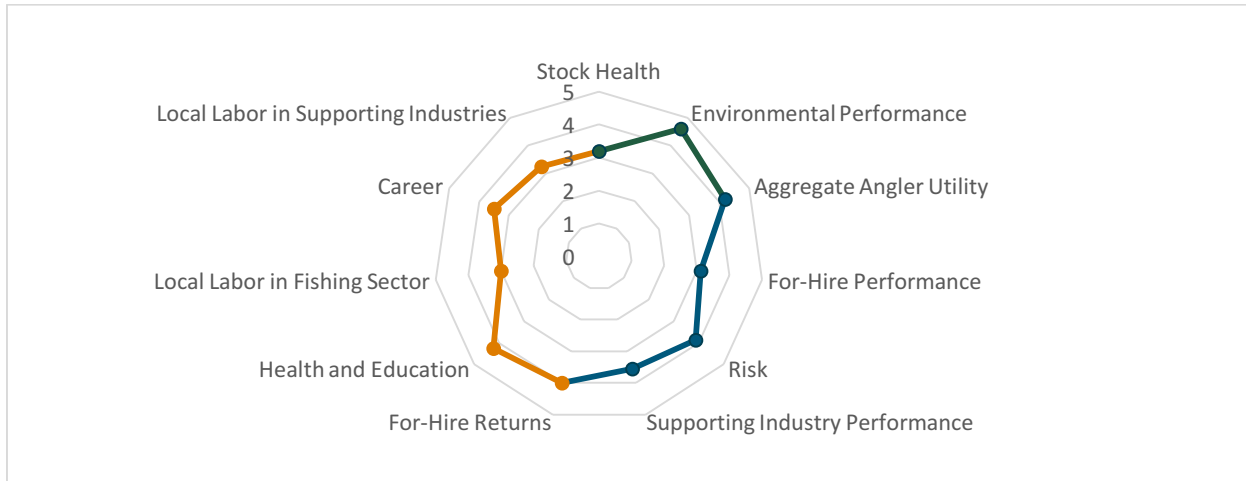
Indicators by color: Green = Ecology; Blue = Economics; Community = Orange

In comparison, the recreational fishery scored the same for stock indicators mentioned above, and lower for local labor. The stock health score is based on the lower overall health of most billfish stocks compared to tunas and other fish that are more actively targeted by the FAD fishermen.

Overall scores for the recreational fishery were fair to good, with lower scores reflecting the relatively fewer local hands hired, and that much of the gear used in the fishery is bought overseas (and thus low local purchases of gear).

¹³ Herrera et al., 2011.

Figure 2 FPI output scores by TBL Indicator for the recreational fishery of the Dominican Republic



Indicators by color: Green = Ecology; Blue = Economics; Community = Orange

Fishery status

Fishery stock data for tunas and billfish are available from International Commission for the Conservation of Atlantic Tunas¹⁴ (ICCAT), the regional fisheries management organization (RFMO) for tuna; country level stock assessments for other fisheries are not available. Note that the stock status indicators are for the entire stock, and, as these are cosmopolitan pelagics, this reflects Atlantic-wide conditions for the stock. The landings in the DR are estimated to be 1300 tons of pelagics for domestic consumptions. These implications are discussed in more detail in the following section that discusses the value proposition and business model.

Table 2 Stock status of species targeted by commercial FAD and recreational sportfishers

Species	Overfished?	Overfishing Occurring?	Rebuilding?
Yellowfin tuna ¹⁵	Y	N	May be recovered
Blue marlin ¹⁶	Y	Y	See ICCAT summary
White marlin ¹⁷	Y	Not likely	None listed ¹⁸
Sailfish ¹⁹	Uncertain	Uncertain	None listed ²⁰
Dolphinfish, king mackerel, wahoo and others in the Small Tuna Species Group ²¹	Unknown	Unknown	Unknown

¹⁴ <http://www.iccat.int/en/assess.htm>

¹⁵ http://www.iccat.int/Documents/SCRS/ExecSum/YFT_ENG.pdf

¹⁶ http://www.iccat.int/Documents/SCRS/ExecSum/BUM_ENG.pdf

¹⁷ http://www.iccat.int/Documents/SCRS/ExecSum/WHM_ENG.pdf

¹⁸ ICCAT Marlin Stock Rebuilding Plan: <https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-05-e.pdf>

¹⁹ http://www.iccat.int/Documents/SCRS/ExecSum/SAI_ENG.pdf

²⁰ ICCAT Marlin Stock Rebuilding Plan: <https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-05-e.pdf>

²¹ https://www.iccat.int/Documents/SCRS/ExecSum/SMT_ENG.pdf

Table 3 Summary of selected fisheries in the Dominican Republic.²²

Pelagic Fleet-type	Target Species	Number of Participants/vessels	Product Market	Landings	Revenue	Management
FAD (<i>hand-gears, trolling and drop lines</i>)	<u>Primary:</u> Dolphinfish, king mackerel, wahoo, cero mackerel, billfish, blackfin tuna, yellowfin tuna (YFT)	8600 fishers total across all fisheries. At least 258 boats set FADs and fish them (estimate from three regions only and likely an underestimation)	100% Local Consumption	1300 tonnes	?	Management of fisheries is limited to enforcement of fishing licenses. The product quality is very low as few boats use ice. The fish landing infrastructure is poor. Many captains and crews are perpetually in debt to the fish buyers/boat owners. Captains have low incomes. Vertically integrated businesses do better. Very short supply chains often completely vertically integrated.
Recreational (<i>big game trolling</i>)	The Dominican Republic is one of the premier billfish fisheries globally <u>Primary:</u> Blue marlin, white marlin, sailfish <u>Secondary:</u> Dorado (DOL), Kingfish (KNG) & others.	350 slips on the south coast are capable of hosting large sportfishing vessels. The local fleet follows fish from west to east seasonally. Peak season, there are many recreational fishing vessels from other countries. Estimates of the number of boats, effort or catch are not available.	100% Catch & Release for Billfish DOL, KNG, and YFT consumed or sold to client/local consumption	Two largest marinas keep accurate effort and catch statistics. These two marinas account for 1483 trips in 2016 catching and releasing nearly 3500 billfish	If all 1483 trips from the two marinas were charter trips, revenues can be estimated at being between U.S. \$2.2 and U.S. \$ 4.5 million	Licenses required for private and for-hire captains; the licenses are the same as those for commercial fishermen and allow for fish sales. There is no delineation in the licenses to identify recreational fishers. The license is tied to the vessel, not to the angler. No other regulations exist for recreational fisheries.

²² Gentner et al., 2018.

Fleet

Both the recreational and FAD fisheries experience seasonal fluctuations and it is unlikely that all vessels or fishers are active throughout the year. The overall DR commercial or subsistence fleet is estimated to have 8,600 fishers and although fishing licenses are ostensibly required, the fishery is largely unregulated. The commercial FAD fishery is comprised of primarily artisanal fishermen, who typically spend a large portion of the year in debt to their employing boat owner and/or fish buyer. The FPIs report that CODOPESCA estimated in 2011 to 2012 that at least 258 vessels set FADs and fish them, and note that this is likely an underestimate. They typically use a wood, fiberglass over wood, or all fiberglass boat (panga) that costs approximately \$2,300 to 2,700 when new; is 5 to 8 meters in length; crewed by 2 men; and with a single 30 to 40 horsepower outboard engine. They increasingly use droplines baited with live bait that has been caught by trolling or bait-fishing, to better target large pelagics for harvest. Each vessel owner typically sets five to ten FADs which are replaced nearly continuously given their rudimentary construction. Of the FAD fishers, as many as sixty percent are owner-operator vessels and the remainder are owned by vertically-integrated buyers, typically other fishers or former fishers.²³

Figure 3 Commercial fishermen landing sailfish in Barahona, Dominican Republic. Photo credit Roy Bealey.



The number of recreational sportfishers is uncertain and variable, with many transient vessels travelling to DR in peak season to target billfish; lower bound trip limits were estimated to be 1,500 in 2016. Like the artisanal FAD fishery, the fishery is largely unregulated. There are 350 boat slips for these vessels to occupy, located at four private marinas. Most vessels are about twelve meters in length, with 984 horsepower in total per vessel. Both charter and private vessels usually have a hired captain and mate. Charter prices at the sportfishing marinas average \$3,000 or more per day and clients typically book multiple days. In contrast, more value-conscious tourist oriented charters in Punta Cana are increasingly offering “split charters” (multiple, unaffiliated individuals and groups booked on one vessel) for around \$1,500 total or \$200 per person. These twenty to thirty vessels, part of the “informal” fleet are reported to be in poor condition and, unlike the other sport vessels, they do not practice “catch and release” of any fish, including billfish. These fish are sold to cover costs and improve profit margins in this less professionalized sector of the recreational fishing fleet, for which most captains and crews are often former commercial FAD fishers.

As previously mentioned, the commercial FAD fishers and the recreational sportfishers fleets both fish the FADs set by the commercial fishers. Tournament participants and slip renters at Cap Cana and Casa de Campo pay a fee to the marinas that collectively totals an estimated U.S. \$25,000 to \$50,000 per year

²³ Gentner et al., 2018.

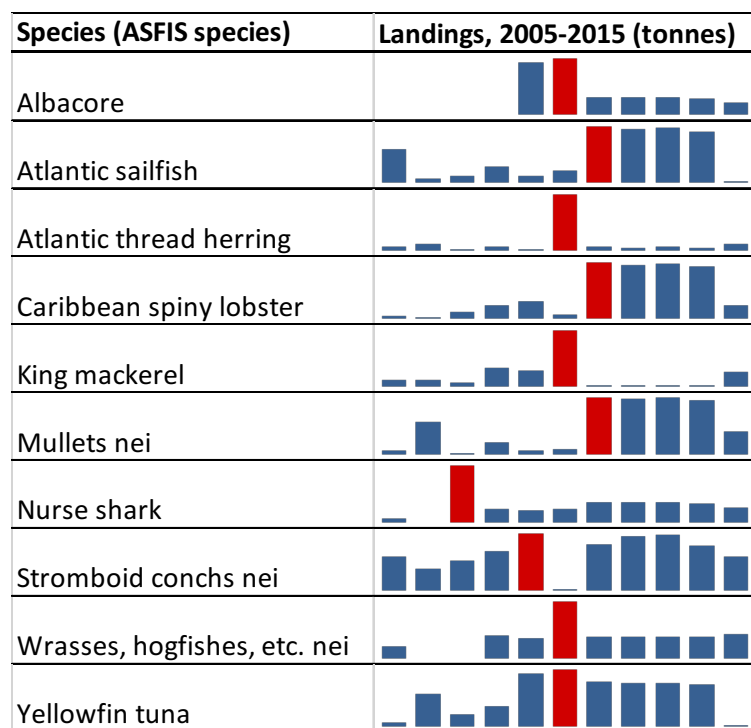
that is supposed to be paid to the FAD fishers to support their costs in making, setting and maintaining the FADs; these payments lack transparency. It is unclear who receives the payment, on what terms and conditions and for what purpose. The FAD fishers, who are not formally organized, have also engaged in “pirate”-like behavior—approaching sportfishing boats, demanding payment, money, food, etc. Whether this is a cause or symptom of the execution of the FAD-funding mechanism is not clear.

Landings

The DR has numerous important fisheries; however, given the significant backlog in data entry and imprecise record for pre-2011 landings, productivity is difficult to assess. (Figures 3 and 4 are included as examples of the erratic reported landings.) There are no regulatory limits to landings in the pelagic fisheries (with the exception of a shark harvest ban). More than twenty different gears are used to land fish at more than 200 coastal sites.²⁴

Fisheries important for both commercial and subsistence purposes include: spiny lobster, white shrimp; queen conch; reef fish (snapper, grouper, crabs, molluscs, etc.); pelagics; billfish; squid; crab; and ornamental fish.²⁵ Of these, pelagics and billfish are the most likely to be landed while fishing FADs. The amount of overlap between the fisheries is not well documented.

Figure 4 Landings of the Dominican Republic, 2005-2015, with high points indicated.²⁶



Five out of ten high points for landings (red bars) in these graphs occurred in 2010, the most recent year with reported data due to the backlog in entries. Note that these are on individual scales. The graph below (figure 5) has the relative landings.

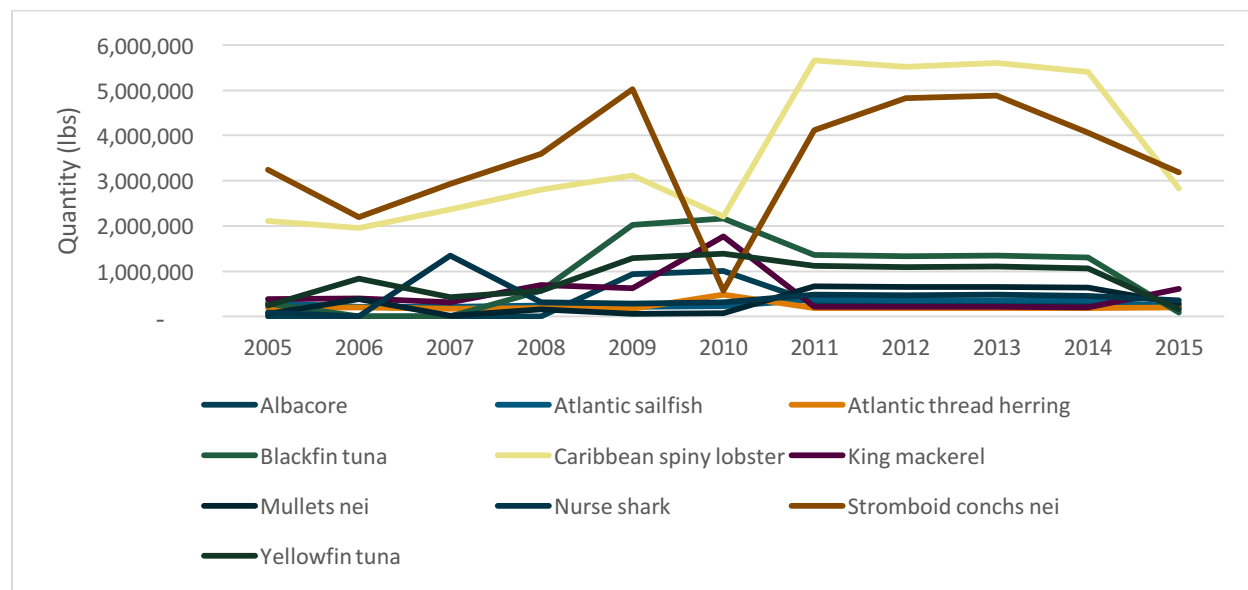
²⁴ Herrera et al., 2011.

²⁵ Herrera et al., 2011.

²⁶ FAO. 2017. Fishery and Aquaculture Statistics. Global production by production source 1950-2015 (FishstatJ). In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 2017. www.fao.org/fishery/statistics/software/fishstatj/en

FAD fisheries in the south of the country, where the majority of FADs are deployed, are subject to biological seasonality. Sailfish are generally captured during the first quarter and the first half of the second quarter; followed by dolphinfish season during the second quarter to the first part of the third quarter; and the remainder of the year is dominated by yellowfin tuna. The main blue marlin season is approximately February through May, while the white marlin run March through June, conditions can be prohibitively rough early in the white marlin season on the east coast. King mackerels are found more often in the second half of the year.

Figure 5 Landings of the Dominican Republic, 2005-2015²⁷



Infrastructure

In general, the FAD fishery landing sites are in poor condition, whereas the sportfishing infrastructure is very good as it targets high end tourism clients. The FPIs noted that local fishers typically do not carry ice on board their vessels; very few freezers and freezing technology exist; those that do are rudimentary and there are no HACCP certified facilities. Due to the international nature of tourism in the DR and the recreational billfish sector, most sportfishers come to the DR by air. The important infrastructure features that are in good condition include boat slips, air connections and roads.

The well-developed air and road infrastructure and lack of transparency in the markets could be potential leverage points for value recovery in the commercial FAD fishery. Most landing locations have only one buyer and if there is more than one, fishers are often indebted to one of them, hence tying them to that buyer. More transparency in the market, coupled with higher prices for improved quality may be used as incentives for changes in practices and potentially improve fisheries management, a beneficial circle of wealth creation in the fishery. This option is considered in the appendices.

Management and Governance

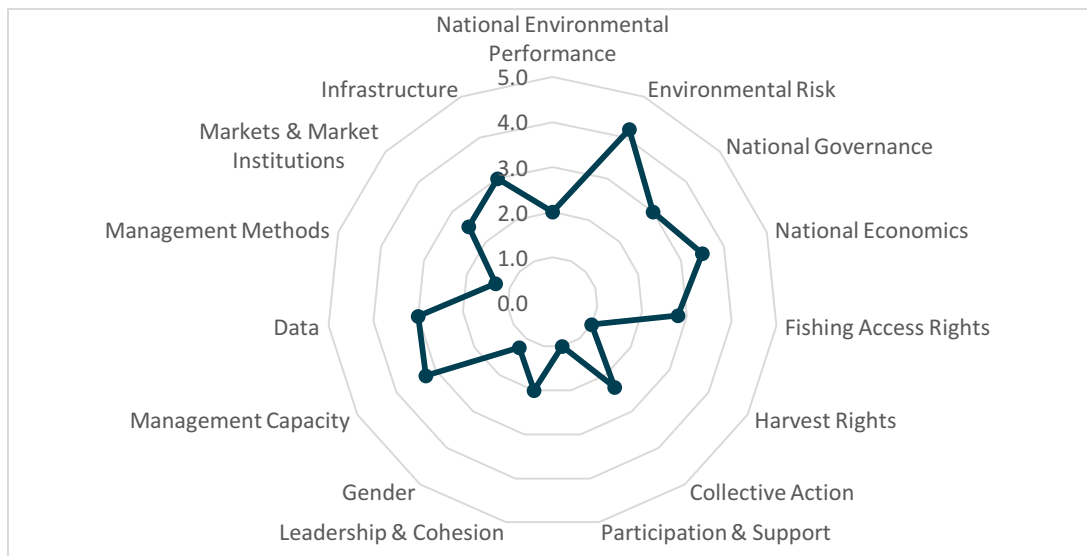
All fisheries in the DR are open access. Fishermen must acquire a fishing license, and vessel registration. El Consejo Dominicano de Pesca y Acuicultura (CODOPESCA), the fisheries authority of DR, collects

²⁷ FAO. 2017. Fishery and Aquaculture Statistics. Global production by production source 1950-2015 (FishstatJ). In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 2017. www.fao.org/fishery/statistics/software/fishstatj/en

fisheries landings data at each landing location through government-employed enumerators. The data is captured using paper logs, and there is a digital data entry backlog to 2011. Additionally, before 2011 data was recorded by species groups, not by individual species. Given these data difficulties, the erratic reported landings (see figures 3 and 4, above) are unsurprising and should be viewed as a generality, not a definitive account.

Wealth creation in the fishery (part of the FPI Inputs) scored low due to a lack of restrictions to fishery access (no rights-based management), lack of management or enforcement, poor market transparency as well as lack of fisher organization and participation along-with poor to no participation by women in the sector. Bright spots include the less distortionary fishery subsidies compared to Grenada and good road and air infrastructure. Data confidence is mixed; while the enumerator system is comprehensive, the paper logs, data entry backlog, and lack of professionalization of the enumerators pulled the score downward.

Figure 6 FPI input scores for the FAD fishery of the Dominican Republic



Organizational capacity

The level of organization in the artisanal fishery is low, and this is true nationwide. The FPI document notes that the fishers have mixed scores due to not having recognized leaders and open conflicts exist at some ports between owner-operators and hired captains and crew. There has been limited success of fishery co-management initiated by NGOs.²⁸ No suitable investable entities were identified in this sector.

In contrast, by the nature of sportfishing, there are higher levels of organizational capacity but this is not uniform and it does not necessarily exist at the fisher level. There are four marinas that host private boats and charters, which means that these fishers are at least geographically concentrated with an overarching group managing the marina. The charter boats serving the value-conscious tourists that visit

²⁸ Herrera et al., 2011.

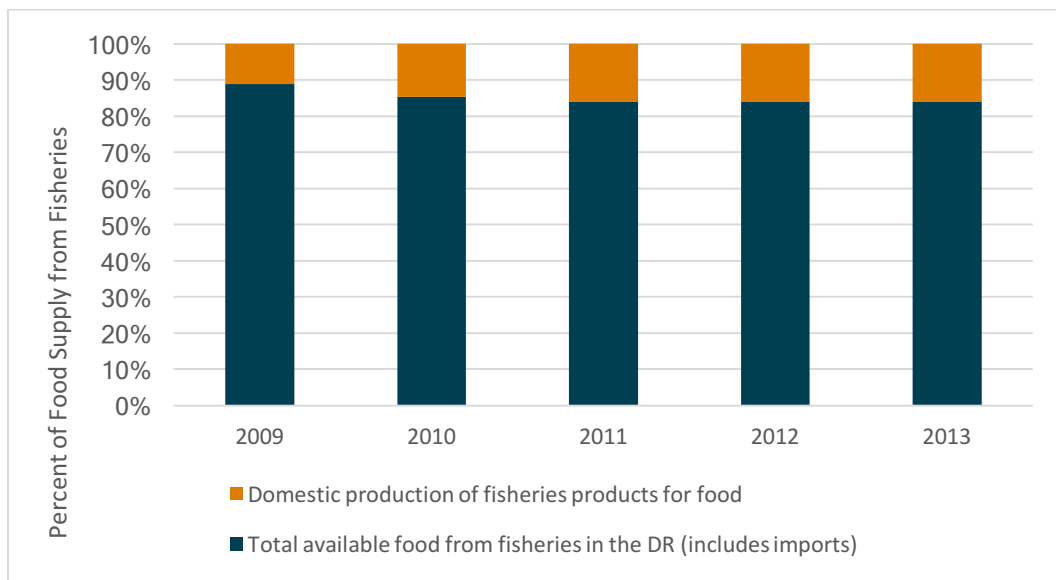
the all-inclusive resorts in the Punta Cana area operate fairly independently of each other with no overarching organizational affiliation.

Market potential

Seafood

The figure below graphically shows that the DR imported over eighty percent of their fish supply for human consumption from 2009 through 2013.²⁹ This may present an opportunity for domestically landed stocks to replace imported product consumed in the DR. This scenario is considered in this document.

Figure 7 Dominican Republic, Domestic production of fishery products compared to total available food products from fisheries (domestic production plus imports)



Sportfishing

Recent work by Gentner Consulting Group to assess opportunities in the recreational sportfishing sector to create value through management reforms included data from two marinas in the DR. Records kept in 2016 identified a combined 173 vessels from Casa de Campo and Marina Cap Cana that took 1,483 trips through which 3,466 billfish were released. Considering there is another major marina – Club Nautico – and the informal charters in Punta Cana to consider, the number of recreational sportfishing trips is estimated at minimum 1,500, but likely at least over 2,000. Part of the same work identified self-reported fishing trip expenditures by non-residents that averaged \$7,436 and \$10,409 for charters (n=19) and private boats (n=24), respectively. These same fishers reported an average of 9 trips per year, which lasted an average of 16 days each, with 13 days spent on private boats and 3 on charter boats.³⁰

²⁹ <http://www.fao.org/faostat/en/#data/FBS>

³⁰ Gentner, B. Draft. *Final Report: Economic Impact Analysis of Commercial and Recreational Fisheries in the Western Central Atlantic*. Final grant ending report prepared for Conservation International. Service Agreement #60030333.

Stakeholder engagement

Figures 2 and 5 reflect the Output and Input score summaries for the FPIs, respectively. The FPI document notes that the commercial FAD fishers have mixed scores due to not having recognized leaders and conflicts occur at some ports between owner-operators and hired captains and crew. There is very little formalized engagement of stakeholders with regards to the management of the fishery.

The recreational fishers scored higher for social cohesion and leadership due to having several key fishery leaders. It scored similarly low to the commercial sector on collective action, participation, and support due to the low number of fishermen's organizations, although there is at least one that does lobby government and pro-actively tries to manage FAD conflict.

As referenced earlier, there are reported conflicts between the commercial and recreational fishers. Purportedly, two of the marinas are collecting fees from recreational fishers and paying the FAD fishers so they can continue to set FADs, which attract game fish. Both the recreational sportfishers and commercial FAD fishers target the pelagic game fishes that aggregate around these FADs, which are typically deployed by the commercial sector stakeholders. These payments appear to be based on informal agreements, lack transparency, and may not be going back to the fishers responsible for setting the FADs. This may represent an opportunity to establish a trust mechanism in order to transparently manage payments between the two fisheries, in a way that achieves the currently lacking sustainably-managed fishery outcomes.

Investable entities

To make an investment to promote the economic, environmental, and social sustainability of fisheries in the DR, an investible entity must exist and should meet basic criteria for successful enterprise management, including the requirements identified in Appendix A. None of these criteria were met by any fisher or fishing organization in the commercial FAD fishery. Several, if not most, were met by various entities in the recreational fishery.

One potential entity, with an aligned mission related to marine conservation, was identified. Blue finance is an NGO operating under the institutional and technical umbrella of the United Nations Environment Programme (UNEP) with the objective of ensuring sustainable management of marine habitats by developing new investment models and funding streams to address the gap in marine funding conservation; Blue finance is active in the DR. They report currently having four other public-private partnerships in last-stage development in the Caribbean. Partners include Althelia-Mirova, Conservation Capital, Deloitte, Ropes and Gray (lawyers) and GRID-Arendal.³¹ Appendix F includes a brief press release for the Blue finance initiative in the DR.

Value Proposition and Business Model

In general, there are three potential value proposition for sustainable fisheries:

- Improving **stock health** leads to a more abundant resource that supports higher long-term yields and makes fish less costly to find and to catch
- Increasing **operational efficiency** reduces the cost of fishing and delivering fish through the supply chain, improving profit margins and thus improving the returns from fishing as a whole

³¹ <http://blue-finance.org/>

- Increasing **market value** through improved market access, certification, branding and long-term partnerships returns more value to fishers³²

Given the open access nature of the DR fisheries, the status of the stocks, and the highly fragmented nature of the FAD fishery, any fishery investments must be considered cautiously. Under these circumstances, efforts to improve market value or operational efficiency are considered highly likely to increase effort, and result in further stock depletions. Therefore, priority should be given to investments that directly improve stock health along with creating a return on investment.

Two scenarios were considered for the purposes of this document:

Scenario 1 – Export Substitution

Scenario 2 – Conservation Trust

Export Substitution

While it may seem intuitive to improve and utilize domestic seafood landings in lieu of seafood imports, the reality is more nuanced. The open access nature of the fishery and the relatively weak enforcement of fishing regulations mean that there was a high assessed risk of exacerbating overfishing should domestic markets prove viable. The poor quality of domestic fisheries infrastructure, along with the competition from seafood imports present significant business challenges to a successful business case. This is not to say that a specialized domestic vendor of seafood would not succeed. However, given that the risk of improving the domestic market would likely result in overfishing in an open access and unregulated system, it is not a recommended approach. Please refer to Appendix B for further discussion on this scenario.

Conservation Trust

This scenario considers the development and establishment of a transparent trust mechanism to aggregate funds from the tourism and recreational sportfishing sector and to use these resources to develop the capacity and implement solutions to address the drivers of stock health.³³ It would serve as a forum to identify, prioritize, and address marine conservation challenges.

A key driver of the success of this model is the rate of compliance achieved for collection of the user fee from the recreational fishery stakeholders. Research indicates there is precedent for this model, albeit at modest levels of income. As demonstrated in the analysis below, while low fees may encourage greater participation, they do not generate sufficient revenue to ensure the viability of the trust. A U.S. \$10 user fee per visitor trip at a 40% compliance rate, would generate U.S. \$1.3 million over 10 years while a U.S. \$50 user fee at a 40% compliance rate would generate over U.S. \$6 million.

Unfortunately, neither of these parameters are assured, particularly in the current context of reported collection amounts that range between U.S. \$25,000 – 50,000 and given the early stage nature of the proposed entity. Additionally, the acceptance of these fees may decline as they increase. For context, however, a 2018 willingness-to-pay survey of the regional recreational fishery indicated anglers were

³² Holmes, L., Strauss, C. K., de Vos, K., and Bonzon, K. 2014. *Towards Investment in Sustainable Fisheries: A Framework for Financing the Transition*. Discussion document. Environmental Defense Fund, The Prince of Wales's International Sustainability Unit. <https://www.edf.org/sites/default/files/content/towards-investment-in-sustainable-fisheries.pdf>.

³³ Wilderness Markets. 2016. *Connecting the Dots: Linking Sustainable Wild Capture Fisheries Initiatives and Impact Investors*. Wilderness Markets. <http://www.wildernessmarkets.com/our-work/connecting-the-dots/>

willing to pay U.S. \$280 up to \$439 per year to a government-administered fund in order to access sustainably-managed billfish.³⁴ Please refer to Appendix C for additional background on the revenue assumptions.

Table 4 Projected ten year revenue at various assumptions

10 Year Revenue						
Compliance Rate	User Fee					
	\$ 10.00	\$ 20.00	\$ 30.00	\$ 40.00	\$ 50.00	
40%	\$ 1,302,188	\$ 2,604,376	\$ 3,906,564	\$ 5,208,752	\$ 6,510,940	
50%	\$ 1,627,735	\$ 3,255,470	\$ 4,883,205	\$ 6,510,940	\$ 8,138,675	
60%	\$ 1,953,282	\$ 3,906,564	\$ 5,859,846	\$ 7,813,128	\$ 9,766,410	
70%	\$ 2,278,829	\$ 4,557,658	\$ 6,836,487	\$ 9,115,316	\$ 11,394,145	
80%	\$ 2,604,376	\$ 5,208,752	\$ 7,813,128	\$ 10,417,504	\$ 13,021,880	

The financial viability of this option will be determined by the costs of overhead and administration on the one hand, and the costs of specific conservation interventions adopted on the other hand.

It may be entirely reasonable to assume that costs will be minimal during the early years. However, this will need to be balanced against the need to ensure transparency, accountability and value to the recreational sportfishers and commercial FAD fishers.

For the purposes of this document, we have evaluated the hypothetical cost of a spawning area closure and a modest budget to improve FAD management due to the conflict associated with this resource.

Spawning Area Closure and FAD Management

The focus of this intervention is the establishment, management, and enforcement of the already proposed billfish spawning area in the first year of the fund’s operation. Please refer to appendix C for the revenue assumptions and appendix D for the assumptions data and 10 year cash flow of this approach.

A 2009 resolution from the office of the Secretary of State for the Environment and Natural Resources of the Dominican Republic recognized an area on the eastern coast as important for the biological health of blue and white marlins and sailfish. Only trolling gear is permitted for marlins and sailfish in this area, and any marlins or sailfish raised must be released in the same area, without delay or harm. The area was delineated as a perpendicular line from the mouth of the Nisibón River (coordinates UTM 523596 E, 2097983 N) to the limits of the waters territorial (12 nautical miles) of the DR, and following the coast line until connecting with another line perpendicular to the coast, in Punta Espada (coordinates UTM 562540 E, 2040903 N).³⁵ This incorporates the waters off the eastern part of the island popular for tourism in Punta Cana.

The financial model provides estimated budget amounts related to the start-up costs for the trust as well as estimated ongoing management and enforcement costs of the proposed spawning area. Consisting of resources only necessary to support a spawning area closure (see Appendix D), it does not include any payments to fishers, vessel management systems (VMS) or fisher professionalization

³⁴ FAO. 2018. *Expenditure and willingness-to-pay survey of Caribbean billfish anglers: summary report*. Gentner, B. and Whitehead, J. FAO Fisheries and Aquaculture Circular No. 1168. Rome, Italy.

³⁵ Resolución Medio Ambiente, No 24-2009. Secretaria de Estado de Medio Ambiente y Recursos Naturales. 2009.

(although both those interventions would support implementation of this case). It includes an investment in patrol vessels, training and administration at startup of U.S. \$500,000, and ongoing administrative and operating costs of U.S. \$480,000. This is focused almost entirely on enforcement.

With a \$30 user fee, the trust is able to achieve a positive cash flow in year 4, and may not require additional fundraising over ten years. However, it will fully utilize the initial U.S. \$1 million raised at the startup, consisting of a U.S. \$500,000 grant and U.S. \$500,000 loan. The loan is repaid over 10 years at a 6% rate of interest.

Also included in this option are limited resources to improve the management of FADs, considered a significant source of conflict in this fishery. This would consist of the proactive registration and management of FADs.

In this component, a total of 800 FADs are registered by requiring a numbered sticker identifying the owner or a system similar to the U.S. uses for lobster or crab floats that is unique to each owner. It would record information such as construction type, date placed, coordinates. A budget of U.S. \$40,000 is proposed in the first year, followed by \$20,000 in the second year. Enforcement activities are shared with the area closure enforcement budgets (see Appendix D).

The entity's core maintenance and enforcement resources perform the necessary tasks of maintaining this FAD monitoring system and using gathered information to promote the sustainable and efficient use of FADs among both artisanal and recreational sportfishing sectors. As FADs are one of the significant sources of conflict in this fishery, establishing and implementing a FAD management system should be considered an early first step to improving management of the fishery.

Financial and Risk Analyses

It is challenging to meaningfully conduct a financial or risk analysis associated without a specific business case. That acknowledged, as with any wild capture fishery, the inherent risks to resources wholly within a natural system are potentially the largest challenge to not only financial but environmental and social returns. Governance, social, and financial risks also exist. For any potential investment in the region, some common risks will remain consistent, including:

- Overharvesting
- Weak management
- Water pollution
- Habitat degradation
- Conditions associated with climate change such as increased temperatures, acidification, etc.

The impact of not implementing measures within a broader framework of fisheries reform may be significant, as improvements in operational efficiency and improved market value will likely result in increased mortality, as detailed by Hoydal.³⁶ Declining catch levels for billfish and other species are likely to negatively impact food security and employment, recreational fishery tourism value, as well as overall incomes, livelihoods and export earnings across all fishery stakeholders.

³⁶ FAO. 2016. "Findings of the independent cost-benefit assessment of the options for strategic re-orientation of WECAFC" by Kjartan Hoydal. FAO Fisheries and Aquaculture Circular. No. 1117. Bridgetown, Barbados.

In addition to the above, this case has significant risks associated with:

- **Structure** – developing the appropriate and legal structure capable of effectively engaging the recreational sector and ensuring the transparent remittance of funds between the two sectors will be challenging. This will require significant local support and commitment from a range of stakeholders to be effectively implemented. The likelihood of its success is directly related to the availability of operational capacity.
- **Credit Risk** – considering the lack of established cash flows and equity in the proposed mechanism, credit risk is significant. This may be mitigated through the use of grant funding and/or guarantee mechanisms.
- **Execution Risk** – ensuring the trust mechanism has the capacity to achieve its mission and objectives will be highly dependent on the operational capacity of the trust. In the absence of an effective and trusted executive and management, it will be challenging to ensure stakeholder buy in. This may be mitigated by engaging or developing local capacity with experience in this sector.
- **Regulatory Risk** – levying a fee without express permission from the relevant authorities will present a challenge. This may be mitigated by working with entities that have already received legal permission to levy these fees.

Economic, social and environmental costs and benefits

Like financial and risk analyses, assessing the economic, social, and environmental costs and benefits is difficult at this time; but, creating a trust structure or tackling any of the proposed interventions should have some high level benefits. These may be defined through the lens of the United Nations Sustainable Development Goals (SDGs).

SDG alignment

The primary relevant goals are SDG 12 – Sustainable Consumption and Production and SDG 14 – Life Below Water.

SDG 12 – Sustainable Consumption and Production

Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty.³⁷

Key targets include the sustainable management and efficient use of natural resources; the reduction of food waste; encouraging companies to adopt sustainable practices and to integrate sustainability information into their reporting cycles as well as support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.³⁸



³⁷ <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>

³⁸ <https://www.un.org/development/desa/disabilities/envision2030-goal12.html>

SDG 14 – Life Below Water

As the FAO states, “ Fisheries....offer ample opportunities to reduce hunger and improve nutrition, alleviate poverty, generate economic growth and ensure better use of natural resources.”³⁹

SDG 14 specifically calls for improving access for small scale artisanal fisheries to marine resources and markets. Under this SDG, the FAO is addressing the following relevant indicators:⁴⁰



- **Proportion of fish stocks within biologically sustainable levels**
 - o Taking proper account of fishing effort and mortality through improved data collection and traceability and then using that to advocate for appropriate fishing effort and methods in all fisheries, would reduce landings of billfish, thus reducing mortality of this depleted stock. In the short-term, this would be an indirect effect. In the long-term, assuming appropriate management and governance, this would be directly affected.
- **Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing**
 - o Implementing a data collection and traceability system, would provide a basis to reduce illegal, unreported and unregulated (IUU) fishing, improve compliance with ICCAT requirements and U.S. and EU seafood import monitoring requirements.
- **Sustainable fisheries as a percentage of GDP in small island developing states (SIDS), least developed countries and all countries**
 - o Improving support services (best practices for handling, processing, etc.), leading to overall increased quality of product for domestic consumption and export in the region is expected improve overall economic value of fishery products. In locations like Grenada and the DR, fisheries are a small part of national GDP with much room for increase in value without an increase in volume.
- **Progress by countries in adopting and implementing a legal, regulatory, policy, or institutional framework which recognizes and protects access rights for small-scale fisheries**
 - o By improving data aggregation and strengthening the capacity of domestic fisher organizations, the proposed initiatives builds local capacity to recognize and protect access rights for fishers and for the relevant nations to comply with ICCAT requirements

Recommended timescale

Given the apparent progress made by the Blue finance initiative under the Ministry of the Environment, it would appear that initiative has a more robust timescale in comparison to establishing a new, independent trust. In either case, a structured approach to testing pilot projects such as this should be undertaken to continue forward momentum in the region.

³⁹ <http://www.fao.org/sustainable-development-goals/goals/goal-14/en/>

⁴⁰ <http://www.fao.org/sustainable-development-goals/goals/goal-14/en/>

Replicability and scalability

Once a model that can effectively engage the recreational fishery in support of conservation and fishery management has been developed, structured, and tested in the DR, ideally with mission aligned partners such as Blue finance, more informed decisions can be made regarding replication and scale. The overall process proposed here provides a means for assessing potential models. If implemented, the approach proposed in the DR would provide valuable lessons for replicability and scalability across the region in some of the most data poor and weakly governed fisheries. Lessons learned from this and related projects such as the one being considered in Grenada should be used to implement similar projects in other geographies and fisheries in the WECAFC region, while parties are simultaneously bringing together the case for an RFMO.

Recommended solution

The proposed trust mechanism is recommended if only to address the informal and opaque nature of current payments between the recreational and commercial FAD fishery. While not an “attractive business case” per se, it has a role to play in improving the transparency of payments currently being made, as well as supporting the establishment and enforcement of a billfish spawning area and improved FAD management. In due course, and under the appropriate leadership, it may also engage in supporting the professionalization of the local recreational charter fleet with the goal of improving billfish sustainability in the region.

Given the operational, structural, and financial risks identified in this document, the financial viability of the proposed trust mechanism is uncertain and is likely modest. In order to address this risk and ensure long-term success, we recommend that CI and the FAO explore collaboration with the aforementioned initiative developed by Blue finance. This may present an opportunity to achieve operational and geographic synergies given the common mission around marine protected areas.



Appendix A – Basic Successful Enterprise Criteria

To make an investment to promote the economic, environmental, and social sustainability of fisheries in the DR, an investible entity must exist and should meet basic criteria for successful enterprise management, including the requirements below:

- Legally recognized by the country of the DR
- Experienced management (at least two years of operations)
- At least two years of profitable operations
- Current and viable financial plan, including annualized investment returns, financing history, financial projections (profit and loss/balance sheet), and collateral
- Current and viable operational plan, including strong customer base, clear value proposition, geographic and business risk mitigation strategies, scalability, a well-developed and tested business case, firm-level and market-level upgrading strategies and premiums (including certification options), and market analysis
- Activities will have measurable and meaningful environmental and socioeconomic outcomes for the local community
- Clear opportunities to create value by improving the supply chain
- Meaningful engagement of local fishers in influencing management and fishery access
- Strong recognized leader or leaders in the fishing community who influence management and stakeholders
- Financial model based on the biology and fishing efforts for the fishery that shows returns

Appendix B - Scenario 1 – Export Substitution

As noted in the contextual analysis, the domestic commercial fishery in DR appears a good opportunity to meet some of the seafood demand currently being served by imported seafood. The DR's large and well established tourism industry represents a good potential market for locally sourced seafood, in keeping with several consumer market trends.

The reality is significantly more complex. As referenced in the contextual analysis section on infrastructure, the commercial FAD fishermen rarely carry ice onboard their vessels and cold chain facilities are rudimentary⁴¹ Because of this, domestic landings are of poor quality since once outside safe handling temperatures, seafood deteriorates rapidly, quickly losing quality and sanitation. In the absence of an organized cold chain to deliver landed products to processors or to market, product continues to decline in quality until it is eventually no longer suitable for consumption, leading to wastage that ultimately required greater harvest rates to achieve profits equal to a more effective value chain. Furthermore, the FPIs and project research revealed that while landings are low value, they compete with still relatively cheap imports, and there is insufficient margin to justify the additional investment that would be necessary to organize fishers, improve onboard storage and handling, and secure market access. Until these prices can be improved, it will be difficult to justify either market or value chain based investments.

Finally, given the relatively low prices of imports, it was not possible to demonstrate a financial incentive that would justify changes in practices or management to achieve any measure of sustainability in fisheries. Rather, given the open access nature of the fishery and the relatively weak enforcement of fishing regulations, there was a high assessed risk of exacerbating overfishing should domestic markets prove viable. That is, improving the domestic market would likely result in overfishing.

⁴¹ Gentner et al., 2018.

Appendix C – Trust Revenue Assumptions

For the purpose of this document, a visitor fee per angler trip is proposed. This is charged to non-resident anglers fishing in the DR. This fee is consistent with similar recreational fishing fees in other tourism destinations. Cabo San Lucas charges \$46 per annum, while Costa Rica charges \$50 for the year.⁴² It is also well within with the willingness-to-pay survey of the fishery, which indicated anglers were willing to pay U.S. \$280 up to \$439 per year to a government-administered fund.⁴³

The number of visitors who would be subject to this fee are more difficult to discern due to a range of variables. While numbers from the main marinas are relatively well documented, the total number of visitors is expected to be higher due to the twenty or so unregulated, unofficial “pirate” charter operators that run split charters, working the beaches or used by the all-inclusive resorts.⁴⁴ A key component of the enforcement and transition activities will be to professionalize these operators and to ensure their clients are paying the angler fee, as well as prices that don’t require billfish harvest sales to provide adequate profit margins.

For the purposes of the model, we assume a total of 7,000 boat trips per year, at the lower end of the estimates prepared by the Gentner Consulting Group.

For the purposes of the model, we assume only 50% of visitors eligible to pay the fee actually pay this fee in year 1, a proportion that gradually increases to 75% by year 5.

⁴² Gentner, B. Personal Communication. July 2018.

⁴³ FAO. 2018. *Expenditure and willingness-to-pay survey of Caribbean billfish anglers: summary report*. Gentner, B. and Whitehead, J. FAO Fisheries and Aquaculture Circular No. 1168. Rome, Italy.

⁴⁴ Genter et al., 2018.

Appendix D – Trust Start up Assumptions

Revenue

	Annual
Recreational Visitors	28,400
Boat Trips	7,100
Avg. Visitors Per Trip	4
<i>Year-1 Trips</i>	<u>3,550</u>

User Fee	\$ 30
Growth Rate Visitors	3%
Annual Fund Appreciation	3%

Compliance %, Year 1	50%
Compliance %, Year 2	60%
Compliance %, Year 3	65%
Compliance %, Year 4	70%
Compliance %, Year 5+	75%

Investments

Loan	500,000
Grant and Donations	500,000

Patrol Vehicles	300,000
Training	100,000
Promotion and marketing	-
Administration and Office	100,000
<u>Total Investments</u>	<u>\$500,000</u>
<u>Left over for fund</u>	<u>\$500,000</u>

Expenses

	Annual
Personnel, salaries and benefits	200,000
Enforcement	200,000
Marketing and Publicity	40,000
Maintenance	40,000
<u>Total</u>	<u>\$480,000</u>

Inflation and Increases	3%
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Financing

	Annual
Interest Rate	6%
Years to payback	10
<u>Loan Payments</u>	<u>\$67,934</u>

Discount Rate	5%
Royalties	0%

Appendix D – Trust - Spawning Area Closure & FAD Management (10 Years)

Dominican Republic

	Start	Year, 1	2	3	4	5	6	7	8	9	10
Start-Up Capital	\$ 1,000,000	-	-	-	-	-	-	-	-	-	-
Loan	\$ 500,000										
Grants and Donations	\$ 500,000										
Start-Up Costs	\$ 500,000	-	-	-	-	-	-	-	-	-	-
Patrol Vessels	\$ 300,000										
Training	\$ 100,000										
Promotion and Marketing	\$ -										
Administration and Office	\$ 100,000										
Operations	\$ (161,934)	\$ (55,798)	\$ (9,650)	\$ 39,229	\$ 90,967	\$ 96,314	\$ 101,828	\$ 107,517	\$ 113,364	\$ 119,400	
Revenue from Permits	\$ 426,000	\$ 526,536	\$ 587,516	\$ 651,672	\$ 719,145	\$ 740,700	\$ 762,908	\$ 785,790	\$ 809,348	\$ 833,625	
Compliance	50%	60%	65%	70%	75%	75%	75%	75%	75%	75%	
Non-Resident Visitors	28,400	29,252	30,129	31,032	31,962	32,920	33,907	34,924	35,971	37,050	
Expenses	\$ 587,934	\$ 582,334	\$ 597,166	\$ 612,443	\$ 628,178	\$ 644,386	\$ 661,079	\$ 678,273	\$ 695,984	\$ 714,225	
Payments to Fishers	0 vessels	-	-	-	-	-	-	-	-	-	
Harvester Professionalization	0 vessels	-	-	-	-	-	-	-	-	-	
VMS Systems	0 vessels	-	-	-	-	-	-	-	-	-	
FAD Management	800 FADs	40,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	
Running the Fund		480,000	494,400	509,232	524,509	540,244	556,452	573,145	590,339	608,050	
Loan Payments		67,934	67,934	67,934	67,934	67,934	67,934	67,934	67,934	67,934	
Royalties Paid		-	-	-	-	-	-	-	-	-	
Trust Fund, Balance	\$ 500,000	\$ 350,637	\$ 304,333	\$ 303,525	\$ 352,316	\$ 455,073	\$ 566,307	\$ 686,429	\$ 815,876	\$ 955,088	\$ 1,104,544
Base	500,000	338,066	294,839	294,682	342,754	443,282	551,387	668,136	793,945	929,240	
Appreciation		12,571	9,494	8,843	9,562	11,791	14,920	18,293	21,931	25,848	
CAGR			-7%	-5%	0%	5%	8%	10%	11%	12%	
Buying Power	\$ 375,000	\$ 262,978	\$ 228,249	\$ 227,644	\$ 264,237	\$ 341,305	\$ 424,731	\$ 514,821	\$ 611,907	\$ 716,316	\$ 828,408
NPV											\$ 373,184
Cash Flows From Operations		(149,363)	(46,304)	(808)	48,791	102,757	111,235	120,121	129,448	139,212	149,456
Grant Expense											

Appendix E – Additional Conservation Interventions

In addition to the proposed spawning area closure and the proactive registration and management of FADs, additional conservation interventions recommended include the registration of fishers and the use of fisher conservation agreements.

Fisher Conservation Agreements

In this intervention, fishers are engaged directly and encouraged to sign formal co-management conservation agreements that engage a form of compensation for following practices that are mutually agreed with stakeholder representatives and the trust mechanism board. These agreements should promote billfish sustainability and sustain or improve the value of both sport and artisanal FAD fishing. Billfish harvest reduction agreements, potentially seasonal, with linked agreed modes of co-operating around FADs among sport and artisanal fishers may form base agreements.

Benefits

Fishers who are transitioning into the recreational charter industry are provided support to professionalize their vessels. This includes securing the necessary insurance along with life jackets, safety equipment and communications.

Discussion

Depending on the total number of vessels and fishers targeted, and the types of interventions proposed, the costs of this option can rapidly escalate. There is a risk that the additional costs will not result in commensurate increases in revenue in the trust mechanism, resulting in an increased negative cash flow.

Based on the modest revenues and the need to establish an effective entity, we propose this intervention is prioritized once the trust mechanism has been stabilized.

Press release

27 feb 2018

Blue Finance Brings Together Public & Private Sectors in the Dominican Republic to Sustainably Manage 8000 km² of Marine Habitat.

A Public Private Partnership (PPP) agreement was signed on February 23rd 2018, for co-management of the second largest Protected Area of the Dominican Republic. The co-management body, a non-profit company, is expected to hit the triple bottom line: social, environmental and economic via the creation of new job opportunities in the Blue Economy sector for local populations, the conservation of critical ecosystems and basic financial returns.



The company will receive major financing for its initial capital expenditures from international impact investors. In time, it is expected to be financially sustainable and generate its own incomes from user fees and innovative tourism models.

The Sanctuary "Arrecifes del Sureste" is almost 8000km², covering just around 100 km coast and encompassing vibrant coral reef ecosystems, several major urban centers and 2 of the country's primary tourism centers (receiving >4M visitors annually).

The non-profit company is comprised of 2 local conservation NGOs, 2 local foundations of the major tourism holdings in the country and other associations. The company will be responsible for hiring and managing the staff to carry out the activities agreed to by the Government, within the co-management agreement for a period of 10 years. This will be carried out with no increase in public debt, as the body will purchase required equipment and pay personnel for the Sanctuary. The company itself will be guided by a multidisciplinary Advisory Council, of public and private citizens. An independent, internationally recognised institution will audit the performance of the consortium annually.

Implementation of all activities will be guided by the annual work plans, prepared by the co-management body and approved by government. These activities, with collaboration from existing institutions include: Improving the health of marine habitats, Monitoring, Zonation and Enforcement, Community engagement & Livelihood enhancement, Support to tourism activities, Maintenance, Management and Marketing.

Initial capital expenditures are expected to be provided by the Sustainable Ocean Fund, an impact investment fund managed by Althelia, dedicated to creating, accelerating, and executing sustainable fishery, aquaculture and coastal conservation projects globally, whilst applying best-in-class social and environmental governance.

Impact Investment in marine conservation (SDG14) is a new concept, with investors, investing in enterprises that can deliver conservation actions and improved livelihoods for local stakeholders, in addition to basic economic returns. The industry has been quickly growing during the last 5y and the volume of private capital committed to conservation is increasing annually (>35% p.a.).

In the Dominican Republic, Blue finance has been working closely with the Minister of Environment and Natural Resources of the Dominican Republic, Francisco Dominguez Brito who spearheaded the project. His strong support and that of his team has been a critical element in the success of this endeavour. Blue finance received sterling support from the FGPC (Fundacion Grupo Punta Cana). Several other local stakeholders (NGOs, tourism associations, foundations, fishery cooperatives etc) were also implicated in the process.

Blue finance will now assist in the implementation of the financial arrangements and establishment of a project management office within the co-management company, to ensure that the highest standards in MPA practice, tourism product development, community engagement and general management are met.



Map of the Marine Sanctuary 'Arrecifes del Sureste'

Blue finance



About Blue finance

Blue finance's objective is to ensure sustainable management of marine habitats by developing new investment models and funding streams to address the gap in funding marine conservation.

The NGO provides a diversified portfolio of impact investments in Public-Private Partnership (PPP) for the management of Marine Protected Areas. Each PPP contributes to SDGs n°14, 1, 8 and 13 and offers basic financial returns to impact investors.

In addition to the Dominican Republic PPP, 4 other PPPs are in last-stage development in Caribbean countries and new PPPs are being explored in the wider Caribbean and SE Asia.

Blue finance offers an experienced team with extensive practice in implementing public-private partnerships and expertise in conservation finance, coastal zone management, MPA management, coral reef ecology and tourism business development.

Blue finance operates under the institutional and technical umbrella of United Nations Environment (UNEP). Other partners include Conservation Capital, Althelia-Mirova, Deloitte, Ropes&Gray lawyers and GRID-Arendal.

In the Caribbean, projects are being developed with the Regional Activity Centre for the Protocol on Specially Protected Areas and Wildlife for the wider Caribbean (SPA-W-RAC) of the Caribbean Environmental Programme (CEP). In South East Asia, projects are being developed with the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA).

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DR Business case: Investing in Sustainable Fisheries in the Dominican Republic

Risks identified and addressed in the business case development process for the creation of a trust mechanism to secure a marine managed area to protect billfish spawning grounds and improve FAD management in the EEZ of the Dominican Republic, included Overharvesting, Weak management, Water pollution, Habitat degradation, Conditions associated with climate change such as increased temperatures, acidification, etc.

Potential impacts	Mitigation Recommendations	Monitoring of indicators
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<p>Environmental</p> <p>The catch of fish may increase due to better FAD fisheries management and reduced conflicts. Fishing per definition may have environmental impacts, particularly in case overfishing occurs, but also in terms of impact on aquatic biodiversity, bycatch of endangered, threatened and Protected species, as well as on habitats.</p> <p>Impact identified at the start of the business case development process included: Increased billfish harvests, Water pollution, Habitat degradation, Conditions associated with climate change such as increased temperatures, acidification, etc.</p>	<p>The business case aims to support the creation of a trust mechanism to secure a marine managed area (MMA) to protect billfish spawning grounds and improve FAD management in the EEZ of the Dominican Republic.</p> <p>The MMA would contribute to the reduction of billfish catches and the conservation of this species in the EEZ in the DR, but will also have a positive impact on the stock status in wider ABNJ, as the species is highly migratory.</p> <p>Recreational/sport fisheries promoted by the business case will be catch and release fisheries, which will reduce harvesting and mortality of billfishes.</p> <p>The FAD fisheries regulations supported by the project will ensure better management of the FADs, reduce bycatch, promote catch and release of billfish, reduce catch of juveniles, as well as reduce conflicts (see governance impacts)</p> <p>Climate change adaptation is not specifically addressed in the business case. The size of the MMA is sufficiently large to expect that the area will remain a spawning area for billfish for some more time. Further investigations in the mid-term will be required.</p>	<p>A fishery Performance Indicator study (FPI) was conducted for the fishery, which enables monitoring against the indicators applied in the FPI.</p> <p>The FADs regulation enforcement and the reports on monitoring and enforcement of the MMA will demonstrate the usefulness and impact of the regulation and the MMA on fish landings.</p>
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<p>Governance</p> <ul style="list-style-type: none"> - Weak Fishery Management - Inadequate Legal Framework in the Dominican Republic and particularly regulation of pelagic fisheries - Inadequate Monitoring and Enforcement of the fishery - Limited organization of fishers 	<p>Key interventions included:</p> <ul style="list-style-type: none"> ▪ The project has supported in the business case development process the review of the national fisheries legislation and the Government has taken this up. Currently (2019) the government has a draft fisheries (and aquaculture) act that is undergoing a stakeholder review process, supported by FAO legal assistance. ▪ Linkages have been established with ICCAT to share data and information on pelagic stocks covered by ICCAT (e.g. tunas and billfishes), which will contribute to implementation and (as necessary) update of regulations for FAD fisheries management. ▪ The institutional capacity at the CODOPESCA (Fisheries authority) is limited and it is not expected that this will change soon. Capacity building interventions are provided by various donors. ▪ The CODOPESCA is however supportive of instituting and enforcing billfish harvest control rules, improving its fishing licensing system, and improving data collection and analysis in fisheries. These actions will contribute to the success of the business case. ▪ The project has also worked on strengthening fisherfolk organizations in the DR, which has resulted in some better managed organizations of small- 	<p>Enacted FAD fisheries management regulations and fisheries and aquaculture act.</p> <p>Stakeholder meeting reports between recreational fisheries, small-scale commercial fisheries and government agencies.</p> <p>The draft fisheries act incorporates mechanisms for mediation and to resolve conflicts between sectoral stakeholders and with other sectors.</p>
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	<p>scale fishers. However, the business case will need to build linkages during implementation with the organizations for continuous capacity building, given the (likely) transition of staff and for succession planning of the leadership of these organizations.</p>	
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<p>Social. The business case noted some conflicts between the recreational and commercial fishers, which require to be resolved for successful implementation, as well as some fishers may not be interested in compliance with the business case arrangements</p>	<p>Key interventions identified include:</p> <ul style="list-style-type: none"> ▪ Incorporation of a mechanisms for mediation and to resolve conflicts between fisheries sector stakeholders and with other sectors in the new fisheries and aquaculture act. ▪ Stakeholder support will be increased through transparent payments from a formalized trust mechanism to compensate commercial fishers for improved FAD management. ▪ Stakeholder meetings to report on and discuss progress with the business case implementation and the trust will guarantee transparency. 	<p>Meeting minutes of stakeholder meetings. Annual (audited) reports of the trust.</p>
<p>Enterprise. Impacts identified at the start of the business case development process included: lack of transparency in payments in an informal system of transfers from recreational fishers to commercial fishers that is currently being tested.</p>	<p>The business case formalization through an notarized MoU or legalized contract and the establishment of the Trust will support the formalization (system) of the transactions.</p> <p>The transfers of funds from the trust to fisherfolk organizations will likely have a positive effect on membership and strengthen the organization of fishermen. Capacity building of the leadership of the fisherfolk cooperatives in the management and operations of a cooperative will help ensure the sustainability of the system, as well as transparency.</p>	<p>MoU or contract. Annual (audited) reports of the trust. Minutes of fisherfolk organization meetings and lists of participants.</p>

