Ex post evaluation – Central America

Sector: Natural Resource Protection (CRS code 41030 Biodiversity)
Project: (A) Financial contribution to the fiduciary fund „Fondo para el Sistema Arrecifal Mesoamericano (Fondo SAM)“ (BMZ-No. 201136613)*
(B) Protection of marine resources Central America I (BMZ-No. 2007 66 667)**
(C) Financial contribution to the fiduciary fund Fondo SAM for the protection of coral reefs (BMZ-No. 2014 68 594)***
(D) Protection of marine resources Central America II (BMZ-No. 2010 66 836)***
Implementing agency: Fondo para el Sistema Arrecifal Mesoamericano (Fondo SAM or Mesoamerican Reef MAR Fund)

Ex post evaluation report: 2021

in EUR million	Project A (Planned)	Project A (Actual)	B (Pl.)	B (Act.)	C (Pl.)	C (Act.)	D (Pl.)	D (Act.)
Investment costs (total)	15.3	15.85	6.3	8.8	8.4	8.2	6.3	9.28
Counterpart contribution	3.3	4.55	1.3	3.8	0.1	0.1	1.3	4.28
Funding	12.0	11.3	5.0	5.0	8.3	8.1	5.0	5.0
of which return on endowment	2.0	1.3	-	-	1.3	1.1	-	-
of which BMZ budget funds	10.0	10.0	5.0	5.0	7.0	7.0	5.0	5.0

*) Evaluation Sample 2017 **) 2020 ***) jointly evaluated given that the project is directly linked to Fundo SAM

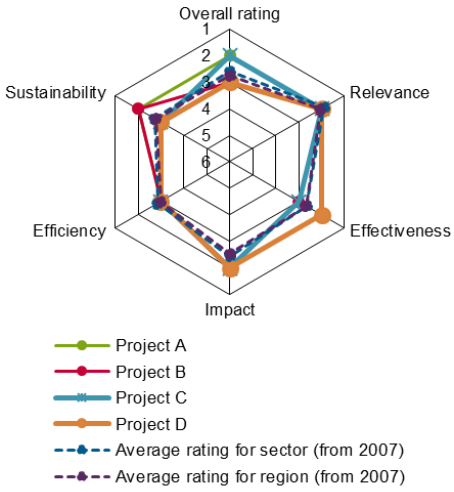
Summary: The Mesoamerican coral reef, second largest in the world, holds a vast biodiversity and multiple ecological functions. Given that the directly and indirectly human-induced threats to this ecosystem exceed the management capacities of the individual countries Mexico, Belize, Guatemala and Honduras, four national environmental funds initiated a regional fund in 2004 – MAR Fund. Project A included the capitalization of MAR Fund (EUR 10 million), activities to operationalize the fund, as well as generating returns from fund investment activities and allocation of these returns for administrative and operational costs of MAR Fund. Project C provided additional capitalization of the endowment fund (EUR 7 million) and was to finance small-scale projects for reef rehabilitation from the returns of the fund. Projects B and D encompassed direct investments in infrastructure and equipment, as well as management plans for 9 priority Marine Protected Areas (MPAs) in the Mesoamerican Reef ecosystem to consolidate effective Protected Area management.

Objectives: The objective at the impact-level (all projects) was to protect the natural resources and biodiversity of the Mesoamerican reef. The objective on the outcome-level of projects A and C was to capitalize the endowment fund of the MAR Fund in order to generate sufficient returns to ensure long-term financing for the protection of the eco-region and the effective management of its Marine Protected Areas. The intended outcome of projects B and D was the consolidation of 9 Protected Areas.

Target group: Project A: Population in and around the MPAs of the larger regional ecosystem, ca. 80,000 people. Project B: ca. 12,000 people within the same regional ecosystem, living in and around four selected Protected Areas: Yum Balam (Mexico), Port Honduras (Belize, including indigenous population), Punta Manabique (Guatemala) and Sandy Bay West End (Honduras). Project C: Population in and around supported MPAs, ca. 10,000 people. Project D: Population in the five supported MPAs, ca. 47,000 people, mainly Garifuna, Maya and Mestizos. Actual direct beneficiaries of program activities amounted to 7,600 people.

Overall rating: 2 - successful (A and C)
3 - moderately successful (B and D)

Rationale: Endowment Fund and direct investments in MPAs were suitable complementary measures. MAR Fund generated annualized returns on investment of 4.15 % (5.75 %) from the endowment A (C) in 2012-2019, slightly above the nominal return target of 4 % (USD inflation 1.61 %). Returns from endowment A allowed to cover MAR Fund's operational costs as planned and, additionally, financed Small Grants in 15 MPAs (USD 0.4 million; 2015-2019), implemented via local national organisations and NGOs. Returns from endowment C allowed for investments in reef restauration (USD 0.259 million), but systematic reef monitoring by the national governments is pending. Most successful outcomes of B and D were improved surveillance and monitoring capacities (infrastructure, equipment, training). Mangrove covers increased in some of the sub-regions between 2010 and 2019. See next page for main Lessons Learned.



Rating according to DAC criteria

Overall rating: 2 - successful (Projects A & C)

3 - moderately successful (Projects B & D)

Sub-rating:	Project A	Project C	Project B	Project D
Relevance	2	2	2	2
Effectiveness	2	3	3	2
Efficiency	3	3	3	3
Impact	2	2	2	2
Sustainability	2	2	3	3

Note: 1 being the best and 6 the worst; overall rating cannot be better than the sustainability rating

Lessons Learned

General

- The combination of endowment fund capitalization (A & C) and direct investments in Protected Areas (B & D) was very beneficial to create positive and visible outcomes quickly, while setting up the institutional and governance structure of MAR Fund. The endowments are permanent true endowments, meaning they will not be absorbed as long as inflation is offset and will sustainably continue to yield investment income to finance MAR Funds operational costs and small grants for Marine Protected Areas (A) and reef restoration (C).

Donor harmonization for effectiveness and efficiency

- Creation of segregated endowment accounts by donors is not efficient in the case of an Endowment Fund, as it increases transaction costs and limits the possibilities of a fund manager to buy growth-oriented financial instruments (require certain size). One big basket fund would be recommendable.
- MAR Fund endowment size is below 50 million USD, which would be a reasonable size according to KfW Guidelines for Endowment Funds in natural resource protection (2015); the complex structure with MAR Fund's approximately 25 different donors who do not coordinate in a structured way and who have different reporting requirements and numerous thematic programs are a main reason for MAR Fund's increasing cost for staff. MAR Fund should communicate the cost implications to donors, foster more harmonization and donors should critically self-assess any additional (reporting) requirements.

Endowment Fund Governance and Management

- The investment policy was too risk-averse in the first 4-5 years; shares of fixed income and cash instruments were too high. KfW, which comments investment policies and requests a role by its no-objection, should do more to standardize its approach to investment policies across Conservation Trust Funds (CTFs) since their investment objectives are very similar and their capital is generally invested in either the US or European markets.
- A more balanced power in the Board may ease joint fundraising efforts by avoiding blockades. MAR Fund should adjust its by-laws (which MAR Fund is currently attempting to do). The MAR Fund Board is characterized by a strong influence of the Founding Funds, as they have more power than "second-order Board members".

Political and financial sector context

- Natural resource protection in the Mesoamerican Reef does not only need financial resources, but also more political backing in terms of coherent sustainable development (tourism, no new gas/petroleum exploitation near Protected Areas - PAs, marine spatial planning, municipal wastewater and solid waste disposal). From an evaluation point of view, this does not require necessarily political

representatives on the Board, but MAR Fund may want to explore other possibilities to provide visibility opportunities for political decision makers (e.g. as speakers at conferences).

- In order to prioritize funding allocation even better to "close funding gaps of PAs" as described as Project B's objective MAR Fund should request from PAs more transparency about funding sources (government and donor funding) and budgets. WWF established a tool with MAR Fund to calculate funding gaps in 2013, which needs updating and reliable input data.

Implementation of activities in and around Protected Areas/ final beneficiaries

- Consider extending the duration of small grants beyond one year. Current specification is too small-scale to "close financial gaps" in Protected Areas and too short to yield sustainable outcomes. Update: The Board extended the project period in November 2020.
- Mexico: The division of regulatory and enforcement responsibility undermines the ability of these agencies to effectively manage and regulate fisheries and Marine Protected Areas (MPAs).

This evaluation covers four Financial Cooperation (FC) projects that were implemented with MAR Fund as project executing agency. The projects were implemented in **two different financing modalities**:

(1) Projects A and C were both **endowment fund capitalizations.**

(2) Projects B and D represent **direct financing for different Marine Protected Areas** in the Mesoamerican Reef.

In parallel, MAR Fund managed one further small endowment (French Fund for Global Environment - FFEM) and several grant programs by other donors.

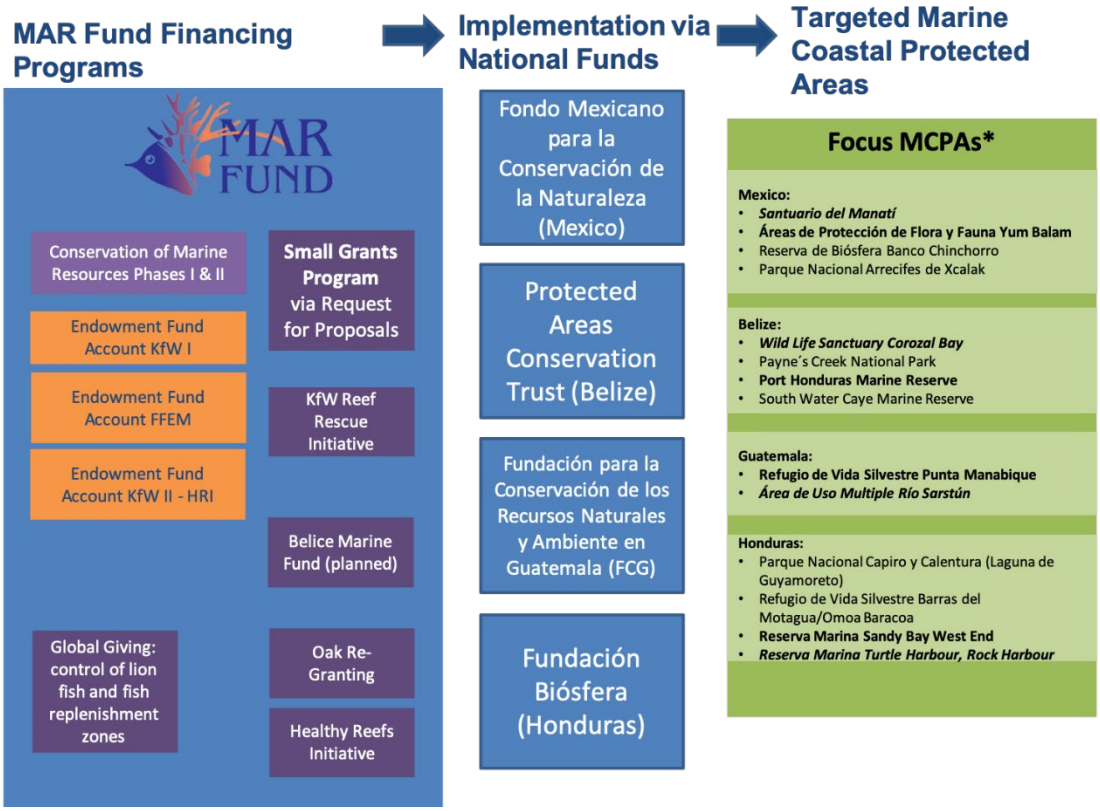
Overall context

The evaluated projects include contributions to the endowment capital of a Conservation Trust Fund (CTF, also called Endowment Fund in the following) with its own legal personality, in which other donors are involved as well and which makes numerous different financial allocations for natural resource protection (mostly small-scale projects). Against this background, less information about each individual small-scale project in Protected Areas was accessible to the evaluator, when compared to conventional, exclusively and directly FC-financed projects. The evaluation therefore does not refer to each individual commitment of the Endowment Fund, which cannot be examined in the context of a fund evaluation with the same level of detail as in evaluations of individual FC projects. The evaluation rather assesses MAR Fund, its portfolio, governance, achievements and challenges. A joint evaluation with the French Facility for Global Environment (FFEM) and the Agence Française de Développement (AFD) including a field mission had originally been planned. Due to the Covid-19 pandemic, the field mission had to be cancelled and the evaluation was conducted based on desk-study of project documents and secondary data, as well as remote interviews, in part jointly with FFEM's evaluator.

The Mesoamerican Reef (MAR) includes the Caribbean coasts of Belize, Guatemala, Honduras and Mexico and is the second longest barrier reef system in the world after the Great Barrier Reef. It holds a vast biodiversity and multiple ecological functions. Given that the threats to this ecosystem exceed the resource capacities of the individual adjoined countries and require cross-border management, four national Environmental Funds (three of them non-governmental) initiated a Regional Fund in 2002 - the Fondo para el sistema arrecifal mesoamericano (Fondo SAM or Mesoamerican Reef Fund - MAR Fund - in English), which is operational since 2005. It was created as a private, not-for-profit corporation in order to provide stable, reliable, long-term sources of funding for conservation and sustainable development activities in the Mesoamerican Caribbean Reef ecoregion. One of the main focuses of the MAR Fund is the development of an inter-connected network of priority conservation areas. It operates as a coordination mechanism for funding sustainable conservation actions by collecting and granting funds that are implemented via its four Founding Members (the "national Environmental Funds"), i.e. the Mexican Fondo Mexicano para la Conservación de la Naturaleza (FMCN), the Protected Areas Conservation Trust (PACT) in Belize; the Fundación para la Conservación de los Recursos Naturales y Ambiente en Guatemala (FCG) in Guatemala and the Fondo Biosfera (FB) in Honduras. There is split responsibility between the MAR Fund,

which approves grants in support of PA management and the national Environmental Funds, which oversee implementation of the projects/activities that are financed.

Figure 1: MAR Fund Funding Programs and national Environmental Funds - FC target MPAs



Source: FCE, own elaboration based on MAR Fund information. * Since 2016, additional priority MPAs are: MX - Cozumel Island: Arrecifes de Cozumel National Park / Arrecifes de Cozumel Flora and Fauna Protection Area / Selva y Humedales de Cozumel State Reserve / Laguna Colombia State Ecologic Park; BZ - Gladden Spit Silk Cayes Marine Reserve; GU - Bocas de Polochic Wildlife Refuge; HN - Archipelago Cayos Cochinos Marine Natural Monument

The purpose of the MAR Fund is defined by its legal articles as "to provide financing for conservation and sustainable development activities in the Mesoamerican Caribbean Reef Eco-region with Belize, Guatemala, Honduras and Mexico". The mission of MAR Fund is to generate revenues, attract investments and provide financing for conservation and sustainable development activities in the Mesoamerican Barrier Reef System. It further monitors and evaluates impacts of its financing and is therefore an important stakeholder for the knowledge transfer within the region.

Relevance

The Mesoamerican Barrier Reef System is one of the most diverse and most productive biomass systems in the world and provides valuable natural resources for its inhabitants. It is approximately 1,000 km long and hosts a population of almost two million people, of which almost one million depend directly on the integrity and resilience of the reef for maintaining their livelihoods and their contributions to the national economies of the four countries. Threats to biodiversity and natural resources within the Mesoamerican Barrier Reef System are both natural and anthropogenic. According to the MAR Fund strategic plan for 2019-2023, as well as the vision document of 2017, the challenges have remained relatively constant over the last 10 years.[1] They include internally (i.e. locally and regionally) generated threats like over-fishing

[1] Source: Threats to the Mesoamerican Barrier Reef System are set out in the "Mesoamerican reef 2017 - A vision for the Future" and the Strategic plan for 2019-2023, correspond with scientific literature, e.g. Andersson, A., Venn, A., Pendleton, L. et al, Ecological and

(esp. by illegal fishing and poor law enforcement), unsustainable coastal development (which leads to clearing of mangroves and wetlands, deforestation and decreasing water quality)[2], inland land clearing and agriculture. Externally (i.e. globally) generated threats tend to worsen within the region: The Caribbean in general has experienced rapid ocean warming and acidification as a result of global climate change that will continue and accelerate in the future. The IPCC Report (2019) stated that coral reefs are considered to be the marine ecosystem most threatened by ocean warming and acidification, even if global warming is limited to 1.5 °C above pre-industrial levels. Rising temperatures lead to coral bleaching, diseases and mortality of corals.[3] Coral reefs produce sediments (sand) and contribute to the protection of coasts. In addition, they buffer wave impacts and thus further contribute to shoreline protection (IPCC 2019). While the mentioned threats are mainly anthropogenic, natural threats (likely aggravated by anthropogenic factors) include diseases such as the coral disease "síndrome blanco" or stony coral tissue loss disease, which can transform colourful coral structures that took hundreds of years to grow into lifeless skeletons covered with algae in a matter of weeks. It was discovered in June 2018 and destroyed more corals in the first six months than had been lost in the previous 40 years.[4]

The "backbone of MAR Fund" (quote by its director María José González) is to provide support for a consolidated and effectively managed network of Marine Protected Areas. Marine Protected Areas and sustainable resource management in the local economies have been chronically lacking funds. Thus, the projects are relevant both for the subjects they cover and for the needs of the main stakeholders and beneficiaries (MAR Fund, Member Funds, Marine Protected Areas, communities). The projects are consistent with the mission of MAR Fund and its Member Funds seeking regional and innovative solutions to critical issues in the Mesoamerican Barrier Reef System through significant and long-term financial support.[5] Further, the consistency of the project with environmental and national government policies is generally good. The activities of the Fund support the regional environmental strategy of the Central American Commission for Environment and Development (Comisión Centroamericana de Ambiente y Desarrollo - CCAD, composed of representatives of the Environment authorities), particularly with regard to the expansion of Marine Protected Areas and the regional coordination of their management (Estrategia Regional Ambiental Marco 2015-2020). CCAD is also represented on the Fund's Board of Directors. However, it remains an open question whether the Environment Ministers feel their positions are represented by the CCAD representative. The MAR Fund is furthermore coherent with the Action Plan for Marine Conservation and Sustainable Fisheries (2018) and the Strategy for Latin America by the German Federal Ministry for Economic Cooperation and Development, as well as with the International agenda for adaptation to climate change, in particular with Article 7 of the Paris Agreement ("global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change", 2015).

The MAR Fund priority Protected Areas were selected in order to cover a high percentage of conservation targets. In 2006, MAR Fund conducted a participatory process in order to prioritize which of the over 65 Protected Areas in the MAR the Fund should focus on: Coastal and Marine Protected Area managers, a CCAD representative, as well as NGOs and academic institutions in natural resource protection from the four countries participated. Criteria for prioritization included biodiversity parameters (e.g. number of species, endangered species), socio-economic factors, governance systems of Protected Areas, availability of basic funding for the management of the PA. Some countries decided to allocate more funding to those PAs with less funds, some to those with more funds. As a result of the prioritization process, the Small Grants program SGP and "Natural Resource Protection", Phases I and II (Projects B and D) financed via FC funds focused on 14 Marine Protected Areas, as shown in Figure 1.

Whereas Projects A and C focused on the long-term financial stability of MAR Fund (covering administrative and operational costs), Projects B and D focused on securing biodiversity and ecological functions more directly via financing in sum nine Marine Protected Areas (major part of the financing of B and D)

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socioeconomic strategies to sustain Caribbean coral reefs in a high-CO2 world, Regional Studies in Marine Science 29 (2019) 100677: 4.

[2] The HRI 2016 Eco Audit rated Coastal Zone Management (CZM) efforts as “average to poor”. CZM is considered one of the most critical management needs within the region, balancing the need for economic development, sustainable livelihoods and long-term ecological sustainability.

[3] Source: Andersson et al. 2019: 4.

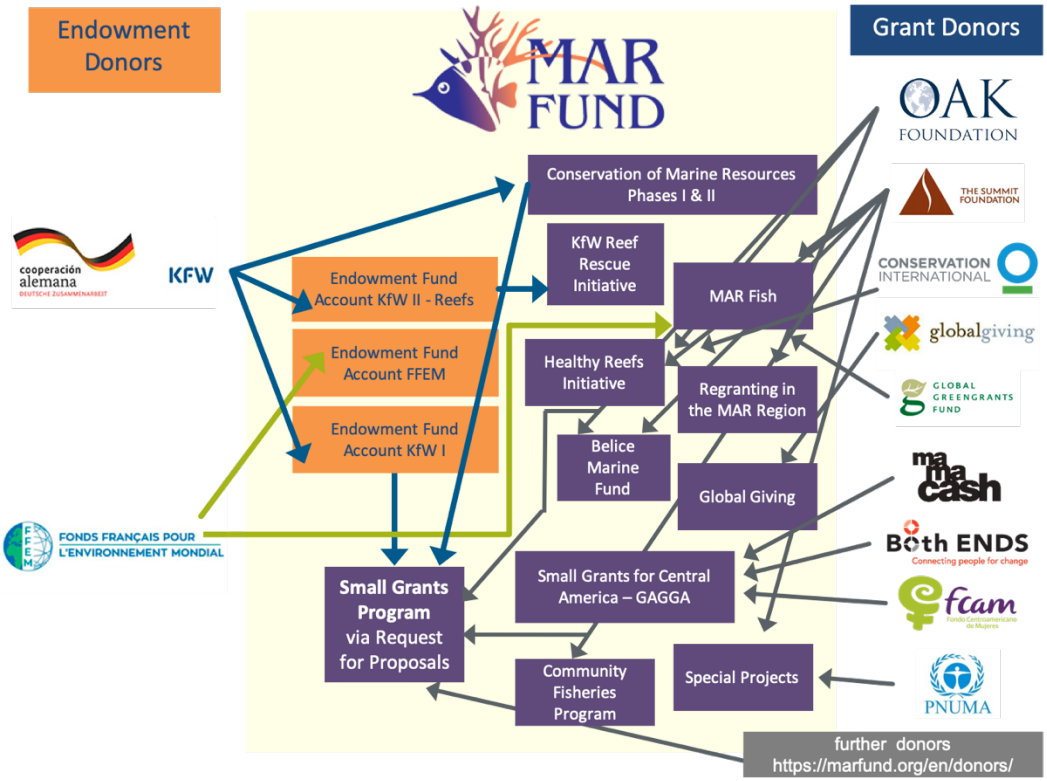
[4] https://sustainabletravel.org/fighting-coral-disease-mesoamerican-reef/

[5] According to the Strategic plan for 2014-2018, the mission of the fund is to enable "transnational solutions to critical Mesoamerican Reef issues through providing meaningful, long-term financial support and trustworthy reef management advice so that future generations can enjoy and benefit from a thriving reef system".

and small-scale short-term (one year duration) projects in additional Marine Protected Areas and their surroundings (the so-called "Small Grants Program", SGP). In the following, both intervention logics will be discussed. Other donors' grant contributions were channelled in their majority directly to specific thematic programs (cf. Figure 2).

In 2016, the prioritization process was repeated based on more information and the awareness that PAs do not develop in a smooth progression, but experience ups and downs (e.g. fluctuating budgets or fluctuating relationships with local communities or private tourism developments) that can cause setbacks to the progress. Furthermore, new information on coral bleaching entered the prioritization process. All this resulted in a new set of a total of 28 priority sites (including the previous ones) based on national and then regional workshops. Since 2017, the Small Grants Program focuses on 18 Priority Protected Areas and their surrounding communities, i.e. the original 14 plus four additional ones.

Figure 2: Donors' fund allocation (orange=endowment; purple=sinking grant funds), 2012-2017



Source: FCE, own elaboration based on MAR Fund information.

Eligible for funding under the Small Grants Program are Protected Area management entities (governmental/NGO), academia and community groups. Requests for proposals under the SGP were issued by MAR Fund jointly for funds from different donors. Between 2012 and 2017, six requests for proposals took place. Proposals are evaluated by the grant and evaluation committee and prioritized based on relevance of the project in terms of alignment with MAR Fund objectives, design and coherence of the proposed measure (measurable results, implementation across multiple stakeholders, capacity building, alignment with regional strategies, building on current work, demonstrating real community participation, community resilience; logical relationship between activities and desired results, resources necessary to achieve the results). The targeting both of priority MPAs and of projects seems to be adequate, but the decision basis could be made more transparent (e.g. documented scoring along criteria).

Specific relevance of Projects A and C

The first assumption of the intervention logic was that regional biodiversity and natural resources can only be protected via a regional approach, as ecosystems are not delimited by borders of nation states. In addition, national contributions for conservation and natural resource protection were insufficient. MAR Fund

as an institution was already established as a promising actor in the region at the time of project appraisal and the assumption was that through the **returns of the Endowment Fund (A), administration and operational costs of MAR Fund would be covered. This would then allow the MAR Fund to concentrate on fundraising and attract additional donor contributions for direct financing in and around Marine Protected Areas** in the ecoregion. With a potentially increasing Endowment Fund, more income would be available for financing the network of Protected Areas, sustainable community fishing practices, scientific research, and capacity building with local organizations. Large-scale direct financing for Protected Areas via the endowment capital (as would be possible with a sinking fund) or the income of the Endowment Fund A was not intended. **Returns from endowment C were to be allocated for reef conservation and restoration measures.** This intervention logic is adequate, but depends on the following prerequisites: (i) Market conditions, investment policy and fund management allow for relevant generation of returns; (ii) fund allocation (targeting) benefits the most relevant Marine Protected Areas in an effective way; (iii) funds are allocated to the most relevant needs in marine natural resource protection and (iv) government budget allocations do not decrease and (v) MAR Fund successfully mobilizes additional funds. The Protected Areas prioritized by MAR Fund (cf. above) are consistent with those ecological sites that should be a focus of conservation efforts according to a science-based ecoregion marine conservation assessment in 2008.[6]

Overall, the theory of change of MAR Fund is logical. The combination of capitalizations of an endowment fund (A and C) with additional grant financing of MPAs can be regarded as a **suitable set of instruments** to achieve the envisaged objectives and outcomes. Compared to traditional project grants or loans, an Endowment Fund offers the possibility of a long-term generation of additional revenues from the financial contribution, even after the end of the project. Furthermore, it should be emphasized that MAR Fund alone cannot target all factors threatening the ecosystem. For instance, sustainable regulation and spatial planning, law enforcement and fishery policies are necessary complements to successful natural resource protection, and thus require action by national governments in parallel.

Specific relevance of Projects B and D

One of the main pillars for conserving the Mesoamerican Reef has been continuous and long-term support for Protected Areas. In the face of scarce government budgets for all public services, the four countries were and are not in the position to generate the political and social backing to provide more government budget funding for Protected Areas and for effectively managing natural resources. In this context, the concept of co-management systems has become quite common in Central America, particularly since the 2000s. Co-management is characterized by Non-Governmental Organisations (NGO) that manage Protected Areas based on agreements with the government and involving local communities, with an underlying assumption that co-managers will raise additional funding. Financial gaps had been identified at appraisal as one of the root challenges for effective management of Protected Areas. Available budget funds typically allow for financing of staff, operating and maintenance costs, but not of investments and activities.[7] The projects therefore aimed at consolidating a certain amount of prioritized Protected Areas (cf. Figure 1).[8] Contrary to the initial suggestion by MAR Fund to fund all of the 14 priority Marine Protected Areas, the available FC funds were concentrated on a sub-selection of nine (B + D) of these areas in order not to disperse funds to even smaller amounts.[9] It was foreseen to consolidate Marine Protected Areas with financing of their core functions (including infrastructure and equipment, Component 1), which would then increase their effort for natural resource protection, which was further supported by Component 2 (financing of economic infrastructure, tourism, development of management plans for fishing areas, community participation etc.). Further, the project sought to increase regional cooperation and

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[6] Source: The Nature Conservancy, WWF and USAID 2008: "Ecoregional Assessment of the Mesoamerican Reef. Marine Conservation Plan", Guatemala.

[7] As the evaluation by AFD will focus on the two MCPAs in Belize and Guatemala, the present evaluation will focus on ZPEMWE and APFFYB.

[8] They were selected using parameters that measure the potential for promoting the conservation and sustainable use of natural resources, using components of biological diversity, socio-economic aspects, institutional capacity and favourable context.

[9] Phase I (B) included the Marine Reserve of Port Honduras in Belize, managed by the NGO Toledo Institute for Development and Environment (TIDE); Wildlife Sanctuary in Punta de Manabique in Guatemala, managed by the National Council for Protected Areas (CONAP); Special Marine Protection Zone - Sandy Bay West End in Honduras, co-managed by the NGOs Bay Islands Conservation Association (BICA) and Roatan Marine Park (RMP) as well as the Protected Area for Flora y Fauna Yum Balam in Mexico.

communication between Marine Protected Areas and to finance small initiatives under a Small Grants Program in other Marine Protected Areas as well (Component 3). The intervention logic is considered adequate: Resourcing (including funding reliability and adequacy, staff numbers and facility and equipment maintenance) is in general one of the weakest aspects of Marine Protected Areas management. A study from 2010 on management effectiveness in Protected Areas show a very high correlation between adequate inputs - especially adequate equipment and infrastructure - and the overall effectiveness score. It indicates that continued or increased financial and logistical support for Protected Areas, especially those in poorer countries, is an important component of increasing management capacity.[10] Further, the types of financed measures are relevant, which is supported by a review of Marine Protected Areas efficacy in the Gulf of California, Mexico, from 2012. It shows that insufficient no-take zones (i.e. Marine Protected Areas that do not allow any fishing, mining, drilling, or other extractive activities), lack of enforcement, poor governance, and minimal community involvement are limiting factors in Marine Protected Area efficacy.[11] The project measures highly correspond with these factors, as **especially enforcement, governance and community involvement were to be improved**. However, the relevance of the financing volume remains unsatisfactory. In Project B, only USD 3.4 million (via components 1 and 2, as well as via the Small Grants Program) were used for investments in the priority Protected Areas. The influence of the project could have been expected to be relatively small from the outset. At the end of the project, the financial gap even increased in two Marine Protected Areas (Mexico and Belize). So, even though the approach of financing Marine Protected Areas through MAR Fund can be appropriate for the core problem, the **plausibility of the theory of change is limited by the scarcity of financing per MPA despite the efforts to concentrate funds** on priority Protected Areas.

While a crucial ambition of Project B is to close financial gaps of Protected Area financing, data on financing sources of Protected Areas is not easily available; not even MAR Fund has access to data regarding which PAs receive funding from which sources. Fund allocation based on financial gap analysis thus requires in-depth studies by consultants. As opposed to many other Conservation Trust Funds (CTFs) in the world, KfW agreed with MAR Fund not to finance permanent staff or other core operational costs within Projects B and D. Thus, the financial gap assessment considers all costs that are necessary to keep the Marine Protected Area operational (staff, equipment, running costs of a "basic scenario") plus costs for expenses of an "ideal scenario", in which programs for alternative income generation of communities, environmental education and scientific monitoring and evaluation are conducted. The assessment then compared the expenses budgeted in 2011 for the period 2012-2016 with expected financing (yielding "expected financial gap") and with actual financing for this period ("actual financial gap", calculated in 2017).

Along the same three components, Phase II (Project D) supported five other prioritized Protected Areas in the four countries[12], but with an emphasis on Component 2 (sustainable use of natural resources).

Conclusion on Relevance (all Projects)

Overall (A, B, C, D), MAR Fund as well as its regionally coordinated support for management of priority Protected Areas are suitable instruments for achieving the conservation of marine ecosystems in the Mesoamerican Reef. MAR Fund concentrates on important natural protection goals and it was to be expected that it will contribute to their achievement, because its grant-making structure allows for financing of thematically different and periodically updated programs. This encourages adaptation of programs to changing threats to natural resources and needs of the local population, as well as attracting different donor types which prefer different granting mechanisms. A close cooperation with the scientific community, e.g. via the Healthy Reefs Initiative, helps to evaluate measures and to adapt strategic plans, as well as the distribution of scientific and practical knowledge throughout the region, which allows for continuous relevance of the projects.

The success of this project design depends on MAR Fund's ability to raise additional endowment and grant funds for on-the-ground marine resource protection in the long term. A limitation of the approach is

[10] Source: Leverington, F., Costa, K.L., Pavese, H. et al. A Global Analysis of Protected Area Management Effectiveness. Environmental Management 46, 685–698 (2010): 685.

[11] Source: Rife, A., Erisman, B., Sanchez, A., Aburto-Oropeza, O., When good intentions are not enough. Insights on networks of “paper park” marine Protected Areas. Conservation Letters 6 (2013) 200–212: 200.

[12] Reserva Estatal Santuário del Manatí (Mexico), Corozal Bay Wildlife Sanctuary (Belize), South Water Caye Marine Reserve (Belize), Área de Uso Múltiple Río Sarstún (Guatemala) and Zona de Protección Especial Marina Turtle (Honduras)

that the Small Grants Program in its current form is not ideally suited to achieve substantial outcomes and impacts of Protected Areas on its own because (i) MAR Fund lacks information about the real funding gaps of Protected Areas, (ii) the Small Grants Program typically provides grants of a one-year duration, which is very short for sustainable changes and can be seen as seed capital for innovative ideas that need follow-up financing rather than financing for basic PA activities, (iii) the endowment fund size is currently too small to expect substantial funding flows that exceed the MAR Fund administrative and operational costs; (iv) the scarce funds are dispersed to a relatively large number of Protected Areas, even after a well-elaborated prioritization process (average small grant size: 36,000 USD) and thus (v) cause proportionally high transaction costs for all involved parties. The advantage of the Small Grants Program is that it can involve more diverse stakeholders and can finance activities that benefit communities living in the vicinities of Protected Areas, while PA management authorities often do not have the mandate to work outside the PA boundaries. Thus, the SGP and the direct and medium-term (5-year) financing of PAs (B and D) were meaningful complementary measures. Summing up for all four projects, the relevance is rated as high (good).

Relevance rating: 2 (good; all Projects)

Effectiveness

The project objective at the outcome level was the capitalization of the Fund in order to generate sufficient returns to ensure long-term financing for the protection of the eco-region and the effective management of its Marine Protected Areas (Projects A). The project objective at the outcome level of Project C was, more specifically, to generate returns from the FC endowment capital to finance coral reef conservation and restoration measures ("Reef Rescue Initiative"). The objective at the outcome level of projects B and D was to consolidate selected Protected Areas and the medium-term conservation of natural resources in coastal and maritime areas. Achievement of the objectives is assessed based on the following indicators:

Indicator	Status 2010/11	Status 2020
Project A: Endowment capital I		
(1) By the time of project conclusion, the functions of MAR Fund are permanently secured	Status 2010/11: Not fulfilled Target: Fulfilled	**Fulfilled**, as purpose of the endowment fund is defined, statutes, contracts with partners and operations manual in place; Director and an asset manager are in place and act in accordance with the investment policy.
(2) By the time of project conclusion, financial means are permanently available for the protection of natural resources and environmental services in the Mesoamerican Reef	Status 2010/11: Not fulfilled Target: Fulfilled by project conclusion	**Fulfilled**. Until 2057, administrative and operative costs of MAR Fund can be met and returns can finance investments in the MCPAs (cf. final inspection report scenarios).
(3) Annualized nominal returns on invested capital (≥ 4 %)	Status 2010/11: Not fulfilled Target: Fulfilled	**Fulfilled**: MAR Fund met the return target (which does not consider USD inflation) Annualized return on investment (net of management fee) 2012-2019: 4.15 %.
(4) By the time of project conclusion, 60 % of priority MPAs	Status 2010/11: 40 % Target: 60 %	**Partly fulfilled.** Fulfilled in 2017, 2018

receive funds for individual activities annually		Not fulfilled in 2016, 2019 cf. Figures 5 and 6
Project C: Endowment Capital II - Reef Rescue Initiative		
(5) A sub-account of the Endowment Fund is capitalised and operationalised (million EUR)	Status 2010/11: not fulfilled; 0 EUR Target: 7 million EUR	**Fulfilled.** December 2019: 10.24 million USD
(6) Investments according to overall planning and available returns	Status 2010/11: not fulfilled Target: 0.2 million EUR	**Fulfilled.** 0.258 million EUR for reef restoration in Mexico, Honduras and Belize implemented (2020), of which 50 % from endowment fund returns and 50 % from other donors
(7) Annualized nominal returns on invested capital (≥ 4 %)	Status 2010/11: not fulfilled Target: ≥ 4 %	**Fulfilled.** Annualized return on investment (net of management fee, but not considering inflation) in 2019 since inception: 5.75 %.
(8) All four countries conduct activities for the rehabilitation of coral reefs and apply a monitoring.	Status 2010/11: Not fulfilled Target: fulfilled	**Partly Fulfilled.** Active reef restoration network established with > 60 governmental, non-governmental and academic organizations from the 4 countries; No systematic monitoring by governments yet.
Project B: Protection of Marine Resources Phase I		
(9) In 100 % (4) of promoted PAs, management plans were updated and implemented	Status 2010/11: 25 % (1) Target: 100 % (4)	**Fulfilled:** 100 % (4)
(10) In 4 promoted PAs, natural resource management plans are applied (#)	Status 2010/11: 1 Target: 4	**Fulfilled:** 4
(11) Financial gaps in the 4 prioritized Protected Areas do not increase	Target: ≤ 0 %	**Partly fulfilled.** Financial Gap 2017 compared to 2012: Punta de Manabique: - 45 % Sandy Bay West: - 1,362 % Yum Balam: + 122 % Port Honduras: + 82 %
Project D: Protection of Marine Resources Phase II		

(12) In 100 % (5) of promoted PAs, management plans were updated and implemented	Status: 60 % (3) Target: 100 %	**Fulfilled:** 100 % (5)
(13) In 5 MPAs, natural resource management plans are applied	Status: 0 % (0) Target: 100 % (5)	**Fulfilled:** 100 % (5)

Effectiveness of projects A & C - Endowment for MAR Fund capitalization

MAR Fund was successfully set up and fully operational at evaluation. The governance and structure of the fund conform to the "KfW Guidelines on capital funds for environmental and nature conservation (2015)": The purpose of the Endowment Fund is defined, statutes, contracts with partners and operations manual are in place. Further, in accordance with the investment policy, a non-discretionary arrangement exists with the asset manager that the Endowment Fund is managed jointly by a professional asset manager and the Investment Committee. The non-discretionary arrangement means that the Investment Committee takes the decision on individual investments, which may or may not be identified by the “investment advisor”. The Board of Directors supervises the administration of the Fund as a control organ and includes the founding Funds, further civil society representatives and one representative of the Central American Commission for Environment and Development (CCAD), which represents the Ministries for Environment of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panamá, Belize and the Dominican Republic[13]. Mexico is not part of this institution of the Central American Integration System (SICA), but its Ministry of Environment and Natural Resources signed a Memorandum of Understanding with CCAD in June 2020 to promote cooperation for joint actions for the management, protection, conservation, restoration and sustainable use of biodiversity and natural resources. In Belize (PACT is state-owned) and Mexico, the national funds have closer relationships with the current governments than in Honduras and Guatemala. In general, national governments have been providing the necessary approvals and endorsements for MAR Fund projects. Thus, MAR Fund has the minimum political backing necessary for its activities. From an evaluation perspective, it seems recommendable that MAR Fund should work more closely than in the past with governmental institutions, given that topics such as environmental regulations, law enforcement and sustainable (land use and marine) spatial planning are crucial for positive impacts on marine resources, but outside of the scope of MAR Fund. However, it does not seem necessary to include them on the Board, given that it is more difficult to practice duty of obedience and duty of loyalty to MAR Fund if a Board member has to represent the multiple interests of its government. In addition, the experience of Environmental Funds has shown that continuity and dependable participation of political representatives can be problematic. This is a well-known problem and it appears to have been the case with Belize, which has named a large number of Directors over the years unlike the other countries where representation has been stable. Notwithstanding, MAR Fund should indeed consider other ways to increase support and ownership by the national governments, e.g. by providing more opportunities for political representatives to obtain public visibility in the context of MAR Fund (e.g. as speakers at conferences). The business sector is not present on the MAR Fund Board but may become more relevant as MAR Fund is preparing a "Blue Economy Innovation Accelerator". From an impact point of view, engagement with the private sector is important e.g. regarding fishing and a sustainable tourism sector, including cruise ships. KfW and FFEM are purposely not represented on the Board. However, KfW (and FFEM) contractually defined their role by requiring the submission of relevant governance documents, e.g. investment policy, to KfW for no-objection.

In addition to the above-mentioned veto power, only Founding Members are eligible for seats as Officers of the Board. This two-tier structure is not helpful to balance interests in the Board.

A promised commitment by another donor, the Oak Foundation, over USD 10 million in endowment funds has not yet been realized, as it is conditioned on the successful mobilization of USD 15 million of additional donor endowment funds (10 million thereof for Belize). If the Oak Challenge is met, it would mainly benefit Belize's Marine Program (Oak wants only non-governmental institutions to be eligible). However, Belize's Member Fund on the Board resigned from the Board but not from the MAR Fund, in a tradition of

[13] These are the members of the Central American Integration System (SICA for its Spanish name)

blocking behaviour. In this situation, MAR Fund can operate, but cannot change its by-laws, which would require approval by all founding members.

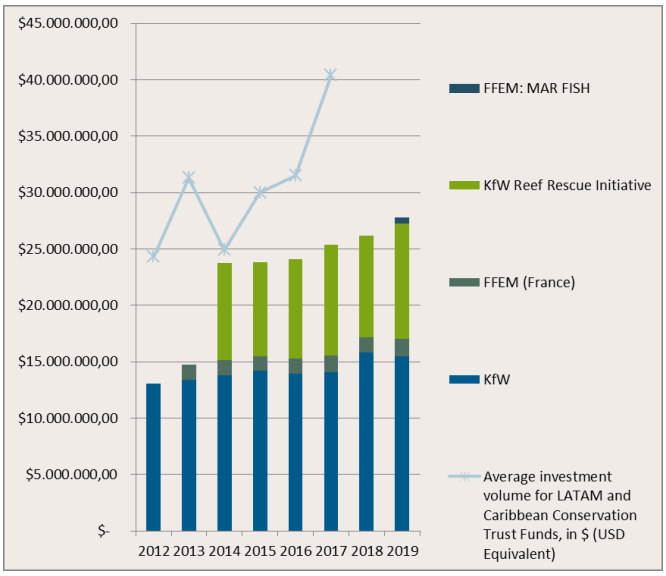
The Oak case demonstrates a weakness of MAR Fund in fundraising, as MAR Fund has so far not been able to meet the targets of its Fundraising Plan (2007). MAR Fund had originally aimed at targeting American philanthropists to raise additional endowment capital; however, this has not materialized yet. Possible reasons may include (US) philanthropists' preferences to earmark accounts for tax and visibility reasons and the two-tier structure of the Board. The new Strategic Plan 2019-2023 has a significant fundraising aim. At the same time, the endowment capital that was provided by the French FFEM, another bilateral donor, was a success for MAR Fund.

MAR Fund manages a portfolio volume of 27.81 million USD (December 2019), which is a medium-sized Fund for Conservation Trust Funds.[14] In December 2019, the value of the KfW contribution to the endowment fund had increased to 15.5 million USD (endowment A) and 10.24 million USD (endowment C), which represented 94 % of the total endowment fund volume.

Annual fluctuations and "bad years" with low return, e.g. in 2015, were compensated by a favourable exchange rate in 2012 and higher revenues since 2015. These annual fluctuations did not influence the functioning of Marine Protected Areas, as the fund did not finance their core activities.

MAR Fund holds separate accounts for different endowment contributions, i.e. different accounts are managed for the two different endowments by KfW and another one for the endowment by the FFEM. The annualized investment return since inception was 4.15 % (5.75 %) for the KfW Endowment Fund of Project A (C) and 4.57 % for the total of all endowment contributions to MAR Fund (December 2019), net of the management fee, but not considering inflation. The annualized rate of USD inflation for the period 2012-2019 was 1.61 %. According to an analysis of 33 Conservation Trust Funds internationally in 2018, their 5-year average return between 2013 and 2017 was 5.72 %, compared to a significantly weaker performance of 3.87 % by MAR Fund for the same time period. The two main reasons for this relative underperformance were an initially unfavourable (too conservative) structuring of the Endowment Fund and an initially large portfolio in Mexican Pesos. For example, until 2014 more than 35 % of the portfolio was held in cash and only 20 % in equity.

Figure 3: Average conservation trust fund (CTF) capital value vs. MAR Fund, 2012-2019



Source: Own compilation based on MAR Fund and CTIS data (Conservation Trust Investment Survey for Calendar Year 2017, 2018

[14] Source: Conservation Trust Investment Survey for Calendar Year 2017, 2018.

Figure 4: Annualized Return since Inception (%)								
	2012	2013	2014	2015	2016	2017	2018	2019
MAR Fund	**3.52**	**2.81**	**2.14**	**-0.43**	**1.61**	**4.05**	**2.72**	**4.57**
KfW Portfolio		2.81	2.24	0.92	1.65	3.63	2.59	4.15
FFEM Portfolio			-2.01	-3.17	-0.66	3.14	1.79	4.07
Reef Rescue Initiative				-0.18	2.02	5.59	3.27	5.75
MAR Fish								0.64
Source: Annual reports by the asset manager (Report 2012-2014 and 2015-2019)								

Cash and fixed income asset classes usually return less than stocks and bonds.[15] Nevertheless, this early preference for cash over equity changed over time, reflecting a more risk-friendly investment strategy, though still quite conservative. In 2015, over 40 % of the portfolio was held in equity, the shares of cash decreased and those of preferred stocks increased. Current allocation is roughly 60 % equity, 40 % fixed income.

FC projects have not been mainstreamed regarding investment policies of natural resource protection Endowment Funds in the past: for example, in the Democratic Republic of Congo, a much larger equity cap of 80 % is accepted for the investment policy.

The main investment decisions were based on the instructions by the Investment Committee and focused rather on the regular revenue stream of fixed income instruments than on an asset allocation that balanced income and growth. A larger horizon would have considered a higher share of asset classes with more potential for growth, e.g. equity and alternative investments. This was likely due to the increasing operational cost of MAR Fund, which were to be covered by the returns of the endowment. The portion of returns that goes into small grants for natural resource protection activities on the ground is relatively small compared to the operational costs of MAR Fund (as expected). However, volatility is linked to equity. Thus, a good investment management should not look at individual years, but take a longer-term perspective, i.e. at annualized returns over the 10-year-period. While donor contributions from FFEM and KfW were made in EUR, the decision to convert those contributions to US dollars was based on anticipated strong returns from the US financial market and the fact that the MAR Fund is a US-registered non-profit with a clear tax exemption on its US investment earnings. Holding a portion of the portfolio in Mexican pesos was a practice originating from the arrangement whereby the Fondo Mexicano's own Investment Committee provided advice to the IC of the MAR Fund, while the latter was building its own IC in the first years. There was no intention to use income in pesos for the MAR Fund's grant operations even though grants were made to several Mexican grantees. It was not reasonable for MAR Fund to have such a large portfolio in Mexican pesos (portfolio share of 19.4 % in 2013, decreasing to 10 % in 2016 and to 1% in 2017) until 2019, because MAR Fund does not allocate funds only in Mexico, but also in countries of the region with other currencies. Performance of the peso-denominated portfolio was relatively close to the target net return of 4 % when calculated in MXN, however, the overall return on each account was pulled down by a steady and considerable decline of the MXN against the USD. During the period end-2012 to end-2017, the MXN declined by 51.2 % against the USD. When the MAR Fund wished to cash in MXN-denominated assets, the MAR Fund also encountered difficulties selling the MXN-denominated assets that had been purchased early in the endowment because the MAR Fund is a US and not a Mexican entity.

In general, however, it should be emphasized that an earmarking and thus requirement for separate endowment accounts is counterintuitive to the general idea of an Endowment Fund to generate returns for natural resource protection. MAR Fund had to create different accounts, given that FFEM chose not to finance any administrative costs (spending policy differed from KfW's; academia and government institutions were also not eligible for funding from FFEM endowment returns; despite a common investment policy of KfW and FFEM) and requested a separate financial reporting accordingly. Separate accounts increase transaction costs and reporting efforts and constrain the investment options of an

[15] Average annualized return for cash from 2008 to 2017 for example was 0.4 %, in comparison to 4.3 % for treasury bonds and 10.3 % of stocks (Source: CTIS 2018.).

Environmental Fund manager to those financial products that can be bought for relatively smaller amounts and thus may also limit the growth potential of the portfolio, as mentioned by the Fund manager during evaluation. A separation of endowments (separate account for each donor contribution instead of just one) can thus only be justified if donors are willing to sacrifice on outcomes and impacts in order to strictly define and report different purposes for the spending of funds. If downstream uses of funds are harmonized between donors, transaction costs can be minimized and returns maximized. The lack of harmonization, especially between FC and FFEM, also poses additional hurdles to the Oak Challenge. This is because Oak Foundation wants MAR Fund to adjust the investment policy to allow for more risk (and thus return), which could mean greater use of the asset class of "alternative investments". This in turn would be made easier by a pooling of endowment funds. Raising endowment is in general a difficult task, as many donors want to finance visible activities directly. In addition, MAR Fund is still struggling to successfully attract additional funds from private donors.

MAR Fund generated a total cash flow since inception (2012-2019) of USD 5,696,283, of which USD 3,753,903 were generated by KfW endowment A, USD 1,641,532 by KfW endowment C and USD 300,848 by the FFEM endowment.

One strength of MAR Fund and factor of success is the highly motivated and competent Executive Director and technical team who provide far more than only a functioning financing mechanism; national Environmental Funds and the final beneficiaries receive advice and capacity building by MAR Fund, wherever possible.

The funding for Protected Areas from endowment returns was provided via an annual Requests for Proposal for the Small Grants Program. From 2015 to 2018, a total of USD 0.4 million of the KfW endowment capital return was used to finance over 15 MCPAs via the Small Grants Program. Map 1 shows the distribution of the Small Grants financing amounts across different Protected Areas within the Mesoamerican Reef Ecoregion between 2012 and 2019.

Figure 5: Small Grants Financing amounts per Marine Protected Area, cumulated 2012-2019

No.	Protected Area
1	Arrecifes de Cozumel National Park
2	Arrecifes de Xcalak National Park
3	Bacalar Chico Marine Reserve
4	Banco Chinchorro Biosphere Reserve
5	Bocas del Polochic Wildlife Refuge
6	Cuyamel Omoa National Park
7	Gladden Spit and Silk Caye National Park
8	Half Moon Caye and Blue Hole Natural Monument
9	Laguna Guaimoreto Wildlife Refuge
10	Laughing Bird Caye National Park
11	Paynes Creek National Park
12	Port Honduras Marine Reserve
13	Punta de Manabique Wildlife Refuge
14	Rio Sarstun Multiple Use Area
15	Sandy Bay West End Special Marine Protection Zone
16	Santuario del Manati State Reserve
17	Sian Ka'an Biosphere Reserve
18	South Water Caye Marine Reserve
19	Turneffe Atoll Marine Reserve
20	Turtle Harbour / Rock Harbour Special Marine Protection Zone
21	Yum Balam Flora and Fauna Protection Area

Sources: KfW FC E own elaboration.
Data: GADM, Online: https://gadm.org/download_country_v3.html; Natural Earth, Online: https://www.naturalearthdata.com/downloads/; Protected Planet: WDPA, Online: www.protectedplanet.net; MAR-Fund: Small Grants Program. No geodata were available for the "Cayman Crown Site" protected area in Guatemala.

With the returns from the second KfW endowment (Reef Rescue Initiative) and as expected at appraisal, measures for protection and restoration of reefs amounting to USD 0.7 million (2015-2019) have been financed. As planned, measures included also knowledge exchange and improvement of legislative and political framework conditions, as well as an Emergency Fund (Fondo de Emergencia, consisting of cash and fixed income) for reef restoration after natural disasters. It is regularly filled with RRI endowment returns. It amounted to almost USD 140,000 in September 2020 and was used for the first time in fall 2020 (Mexico). Building on the Mexican pilot developed by The Nature Conservancy, MAR Fund is additionally working on the development of parametric risk insurance for the four MAR countries. In addition, MAR Fund financed Reef Rescue (restoration) projects (C) in Mexico, Honduras and Belize so far, selected under the Small Grants Program (USD 0.258 million or 36 % of financed activities). Mexico and Belize are leaders for reef restoration and for Belize, funding from the Belize Marine Fund is foreseen. MAR Fund has developed a Training Guide for Coral Reef Restoration and videos of that reef restoration guide. The national governments have not yet implemented a strategic monitoring of reef conservation. Currently, MAR Fund is developing a Regional Restoration Protocol together with a partner organisation and an Emergency Response Regional Protocol, which includes reef restoration and addresses damages to reefs caused by vessel impacts.

Effectiveness of Projects B and D - Direct investments in Marine Protected Areas

Projects B and D financed four (B) and five (D) Marine Protected Areas directly and both included the same three components.

Component 1 was based on the investment needs of the targeted Marine Protected Areas. The component allowed them to invest in infrastructure and equipment that was required to perform effective control and surveillance and institutional strengthening of the park administration to address illegal exploitation of natural resources, e.g. illegal fishing.

Component 2 included the development of activities to strengthen **participatory management** of natural resources by communities, community development plans for natural resource use and protection.[16] The potential of the small-scale projects for the target group remained quite limited. Some activities for alternative income generation of communities in and around Protected Areas were implemented, but the promoted activities do not all seem to be business models that are sustainable without external support and many were affected negatively by the pandemic. From Project B, three activities continued after the project ended, including the beekeepers of Roatán (increased production in 2020), a women's community restaurant and community tourism in Belize.

Component 3 included support for **regional knowledge transfer** between Protected Areas and funding for the Small Grants Program. It mostly supported projects benefitting communities in and around Protected Areas. Projects are selected for funding by the Small Grants Program via public competitions (Request for Proposals, cf. section "Relevance"). Regarding the envisaged knowledge transfer, experiences from the program as well as from other Protected Areas in the region were processed, systematised and published in various forms, particularly on the following topics: establishment, management and monitoring of fish protection zones, infrastructure in marine Protected Areas and monitoring of water quality. Nevertheless, exchange via regional events for administrators of the nine Coastal Marine Protected Areas (CMPAs) remained scarce. Especially this component could have realized a regional added value via increasing synergies and the distribution of innovative solutions developed in the individual national Protected Areas.[17]

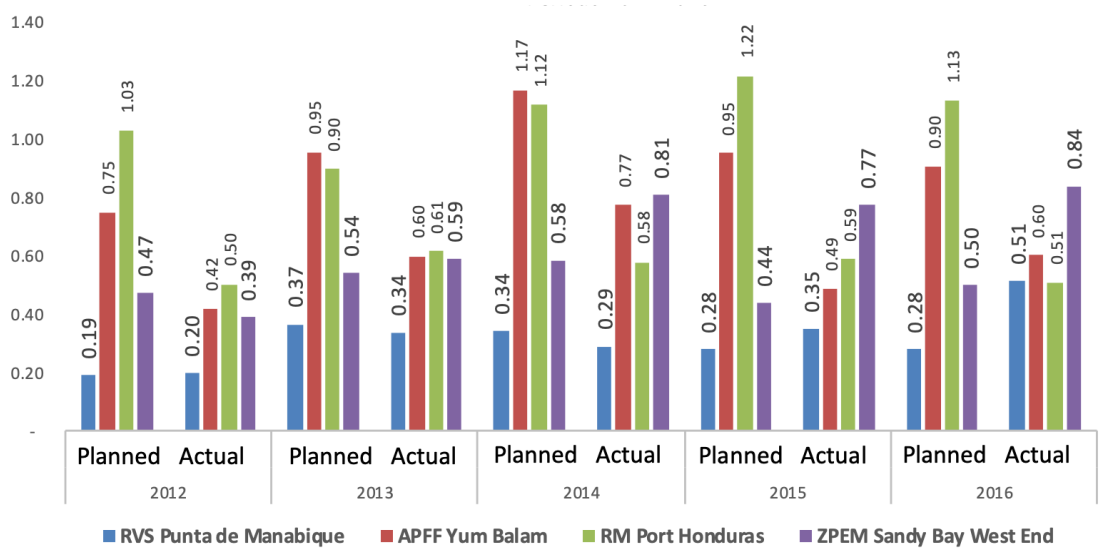
The **financial gaps** were supposed to be narrowed in order to improve effective PA management in Project B (cf. indicator 11). In Yum Balam and Sandy Bay WestPort Honduras, the financial gap increased by 120 % and 80 %, respectively. Compared to the projected financial gap for the four Protected Areas in 2012, FC contributions would have been able to cover all Protected Areas except for Port Honduras (see Figure 6). However, financial gaps of all Protected Areas increased significantly until 2017 compared to the projection, leading to remaining financial gaps in two Protected Areas. Regarding the importance of FC contributions to the Protected Areas budget, they made up 33 % of total financing resources for 2012

[16] E.g. sustainable charcoal production, environmental norms for fishery and tourism and environmental education measures.

[17] Example of Environmental monitoring: Connectivity Network established by MAR Fund in the interests of bringing administrators and scientists together to research the reproduction and migration of invasive alien species, commercial fish and herbivores.

to 2016 in all Protected Areas except for Wildlife Sanctuary in Punta de Manabique (49 % of all FC contributions; 30 % for remaining three Protected Areas).[18] Notwithstanding the failure to fulfil the indicator of stabilizing financial gaps, FC contributions still represented an important share of income for the Protected Areas.

Figure 6: Projected and actual budgets by MPAs, in million USD, Project B



Source: Consultant Report on behalf of MAR Fund. March 2018. "Estimación de la brecha financiera en las áreas protegidas de intervención del Proyecto Fase I"

Notwithstanding initial planning, **Protected Area management plans** were only introduced and formally adopted for two priority Marine Protected Areas. But even without their formal adoption they were used by local organisations for operational planning in three further Marine Protected Areas. Application of management plans was sometimes hampered by the governance structures and lack of resources for implementation. For example, in Yum Balam, a fishing management plan for four different species in the vicinities of the peninsula of Yucatan in Gulf of Mexico and Caribbean was developed. Its implementation and use were challenged by the fact that CONAPESCA does not have any staff for monitoring and enforcement of these management plans.

Overall, Management Effectiveness in the promoted MPAs and institutional governance in the sector relevant for effective management have neither significantly improved nor deteriorated: Regarding management performance, an evaluation report from 2017 shows that there were no significant changes in management effectiveness (assessed were context, planning, inputs, processes, results and impacts). In total, management effectiveness results were acceptable (on a range between 0.54 to 0.78 in 2017 on a scale from 0 to 1, according to a management effectiveness index elaborated within the project[19]). Both external and internal factors made the improvement of management indicators difficult, for example the lack of institutional support by the authorities to apply legal instruments. In those areas that are administrated by government entities, even staff for basic administration is lacking. For this reason, the available staff can only implement parts of the activities foreseen in the management plans. **Projects B and D were based on a financial gap analysis that assumed that basic operational costs of MPA functioning were covered without the help of MAR Fund/ FC. This assumption did not materialize. FC funds were used for additional infrastructure and equipment, but financial gaps e.g. for some staff and petrol remained.**

[18] Source: Informe final brecha financiera Fase I. In 2014, FCFC contribution even made up 46 % of financing resources. Also, FC'sFC financial participation in the area has made it possible for the Federal Government to spend an average of more per hectare per year on environmental protection than the national average in Mexico. By 2016, the national average expenditure will be US$2.57, while APFFYB's expenditure will be around US$3.89 per hectare -> US$389 per km² -> which is in the range of the estimated annual maintenance costs for MPAs of that size.

[19] Rapid Evaluation of Management Effectiveness for protected areas in Mesoamerica, with a few adaptations.

Regarding law enforcement for effective natural resource protection, **most of the Marine Protected Areas have effective cooperation with law enforcement agencies in place, while in Mexico, governance structures of marine areas and resources make it more difficult to enforce appropriate control and vigilance** in the protected area. In Mexico, the National Commission of Aquaculture and Fisheries (CONAPESCA) oversees fisheries regulations and the National Commission for Natural Protected Areas (CONANP) manages Protected Areas. However, CONANP does not have the jurisdiction to directly enforce the regulations they create within Protected Areas. Instead, enforcement of rules is the responsibility of the Federal Agency for the Protection of the Environment (PROFEPA), whereas fisheries regulations are enforced by CONAPESCA, both with support of the Navy. The division of regulatory and enforcement responsibility undermines the ability of these agencies to effectively manage and regulate fisheries and Marine Protected Areas. Combined with low presence this loose enforcement has spawned a culture of noncompliance by stakeholders.[20] CONANP has to sign an agreement with PROFEPA for enforcement to occur in the Marine Protected Area.

A particularly important positive outcome was that MAR Fund supported the establishment of **22 no-take zones, i.e. fish replenishment zones (RZs)**, in nine Marine Protected Areas, each one with at least one critical habitat. Some are not legally established yet, but they are already operated as such, most as an initiative of fishermen. In most of these zones, local communities participate in monitoring and sometimes detect illegal fishermen coming in. A successful regional outcome driven by the Healthy Reefs Initiative was effective protection of parrotfish in Belize, Mexico and the Bay Islands of Honduras. Fish biomass has developed better there than in Guatemala, where fish replenishment zones are least established. Data by the Healthy Reefs Initiative (cf. Section "Impact") clearly show fish have increased within the RZs in the past decade, but not in open fished areas. These RZs are replenishing some fishing areas, but they cover only 3% of sea in the Mesoamerican Reef ecoregion, which is not sufficient to reseed the remaining 97 %.

In some cases, effective Marine Protected Area management was hampered by **conflicting interests and complaints** of different stakeholders that are economically active in the coastal program regions, where tourism development is a lucrative source of income for some.

A prominent example occurred in Yum Balam: In 2016, the subzone "La Ensenada" of Yum Balam in Holbox, Mexico, was supposed to be turned into a 20-year forest recovery sub-zone by a decree by CONAP in accordance with the management plan of Yum Balam. This would have forbidden any activities that lead to changes in the aquifer and any new settlements. In the same year, protests including a fire in the area surged, claiming that the management plan would represent an expropriation of land. Interests opposing the environmentalists' proposed tourism developments (large hotels) on Isla Grande and in Chiquilá (El Universal Online, 17.01.2019)[21]. According to information by MAR Fund, the fire was set intentionally because the management plan only allowed the construction of 800 houses for visitors, while 22 complaints were placed by a small group of people who had bought land there for tourism development before the protection. The complaints are being processed and two had been resolved in favour of CONAP (status 2020).

On the positive side, MAR Fund activities between 2012 and 2019 have yielded good outcomes regarding **knowledge production and dissemination on the state of the Mesoamerican Reef Ecosystem**: more data on reef health is now available e.g. via the Healthy Reefs Initiative (cf. Section "Impact") and its publicly available score cards, as well as water quality data and key species monitoring in some cases.

The analysis of effectiveness (A, B, C, D) allows the following conclusion: The objective of the MAR Fund according to its by-laws is to provide long-term "financing for conservation and sustainable development" in the MAR region. It is undeniable that **MAR Fund has effectively set up a functioning financing mechanism to generate positive annualized returns** slightly above nominal expectations and to allocate funds to relevant on-the-ground projects. Limitations to effectiveness have been a too conservative investment policy (A, C) and are currently posed by challenges in Board governance. Overall, the effectiveness of project A is rated "good" (successful). Project C is rated as "moderately successful", given that systematic reef monitoring and political backing of the reef conservation and restoration activities were not fully achieved. The effectiveness of project B is rated "satisfactory" given that management effectiveness

[20] Source: Rife, A., Erisman, B., Sanchez, A., Aburto-Oropeza, O., When good intentions are not enough . . . Insights on networks of "paper park" marine Protected Areas. Conservation Letters 6 (2013) 200–212: 204ff).

[21] https://www.eluniversal.com.mx/estados/presentan-controversia-contra-declaracion-de-area-protegida-en-quintana-roo accessed 7.8.2020; 800 houses according to MAR Fund

and financial situations of the PAs improved but was short of expectations. Project D achieved its indicators and is rated "good" (successful). Most of the PAs supported by MAR Fund received part of their funding from the Small Grants Program and partly from direct investments. According to the PA managers, both financing modalities complemented each other: the SGP allowed to cover activities in and around PAs, while the direct investments allowed bigger changes in natural resource protection infrastructure and equipment.

Effectiveness rating: 2 (Project A); 3 (C); 3 (B) and 2 (D)

Efficiency

Regarding the efficiency of the projects, the evaluation differentiates between the **production efficiency** (financial performance of the Fund) and the **allocation efficiency** (allocation of returns on investment by projects A&C and of direct financing via projects B and D).

An advantage of Endowment Funds derives from the capacity to concentrate several donor contributions, which increases efficiency, transparency and harmonisation of the allocations. According to KfW's Guidelines for Natural Resource Endowment Funds (2015), a **reasonable minimum size for an endowment fund** is USD 50 million. MAR Fund is still below this threshold. After the initial capitalization of the endowment fund by FCFC, MAR Fund was able to mobilize additional endowment capital by FC (incl. Reef Rescue Initiative USD 8.6 million in 2014) and FFEM (USD 1.37 million in 2013 and USD 0.5 million in 2019 for "MAR Fish"). This led to an increase of the endowment capital by over 112 %. The German Financial Cooperation is by far the most important donor. Besides FFEM, MAR Fund attracted no other donor funds for endowment capital (cf. challenges in fundraising in section "Effectiveness"). MAR Fund has only spent 0.13% of its budget (**fundraising expenses/total expenses**) on fundraising over the past five years. This seems too little, putting an inordinate strain on the Executive Director and limiting the outreach that will be needed to meet the Oak Foundation Challenge (cf. above). Investment in fundraising by hiring a Development Officer and full-time Communications Officer is planned by MAR Fund, which is positive if it yields results. At the same time, this staff will add to MAR Fund's payroll.

The asset performance suggests a satisfactory efficiency of the Fund. Since inception, the Endowment Fund was able to generate positive returns (total returns after expenses USD 1.7 Million, 2019). Cf. section "Effectiveness" for an analysis of the annualized returns. MAR Fund was able to generate a total cash flow of USD 5.5 million from the endowments (December 2019).

The transaction costs for achieving the results mentioned above are adequate. The total costs quota (total expense ratio, TER) of the Fund (total operational costs compared to the Endowment Fund value) was on average 1.63 % and ranged between 0.64 and 4.52 % between 2012 and 2019. As comparable data for Conservation Trust Funds was not available, approximate values of a recent microfinance investment vehicle survey by Symbiotics were used for a plausibility check: Compared to the cost structure of fixed income funds (3 %) and mixed funds (2.7 %) of these microfinance investment funds, the cost ratio of MAR Fund is quite low. Costs for the financial advisor and the bank depot corresponded to 0.203 % of the endowment capital, which is quite low compared to the average consultant fee range for Conservation Trust Funds.[22] The relatively low fees reflect the preferential investment management fee that was negotiated based on the established relationship of the financial advisor with the Mexican National Fund. According to the KfW Guidelines for endowment funds for natural resource protection (2015), transaction costs are considered to be reasonable if operating costs do not exceed 20 % of gross return. As MAR Fund's administrative costs increased significantly from USD 90,000 in 2012 to USD 1.1 million in 2019 (of which USD 345,000 approved operation budget from the endowment revenues), this benchmark was always not achieved. MAR Fund's operating budget expenses, which are covered by FC, and overhead provided by project donors and include personnel, consultants, travels, communications, memberships and administrative expenses, increased steadily from USD 0.2 million in 2012 to USD 0.57 million in 2019, summing up to cumulated expenses of USD 3.3 million over a period of eight years. 49 % of total expenses were financed by FC endowment returns (USD 1.65 million). MAR Fund has experienced growth in staff to cover the increasing number of programs under management. Personnel thus represented the biggest share of the operational budget (61 %), which is within the typical range of 50 to 70 % of the operational budget of Conservation Trust Funds. MAR Fund has not established a minimum grant amount that

[22] Source: CTIS 2017. Consultant fee from of 0.55 % for domestically invested funds to 0.64 % for US-based advisors.

is necessary to justify the additional reporting requirements that have come with each new donor program. Administrative expenses increased to a larger extent with the second FC endowment (Reef Rescue, C) than planned at appraisal.

Regarding **allocation efficiency**, funding of Protected Areas by projects A and C was made via the Small Grants Program. **From 2012 to 2019, a total of USD 3 million was available for Requests for Proposal, which was used for projects in 17 Protected Areas** (cf. Figure 5). Returns by the FC Endowment Fund were made available for the first time in the 8th Request for Proposal in 2015, three years after the capitalization of the Fund. The returns generated from FC endowment available for the Small Grants Program increased significantly since 2017 up to USD 0.405 million in total in 2019. As the Funds' performance increased significantly since 2016, a continuous use of returns for the Small Grant Program in the future can reasonably be expected. In addition, using USD 2.5 million provided by MAR Fund, the SGP leveraged[23] the amount of USD 3.6 million in obligatory own contributions of MPAs between 2012 and 2019.

Project B mostly provided direct financing for four priority Protected Areas (USD 3 million), whereas 9 % (USD 0.52 million) of the financial contribution of project B was channelled via the Small Grants Program. project B financed 17 % of the total funding available for the Small Grants Program between 2012 and 2019. From the financing available for the request for proposals for small grants, 10 % of the total amount available were used by the national Member Funds to cover their administrative and monitoring costs; 5 % by MAR Fund central office to cover its administrative costs. Administrative and monitoring costs therefore amounted to USD 142,000 for KfW Endowment Funds and project B, which are adequate for environmental protection projects.

Costs for **project D** amounted to EUR 9.3 million (+ 48 %), 9 % of which for implementation consultant services (EUR 0.8 million). In addition, consultancy services within operational activities were delivered (1 million EUR). Further management costs (staff, organisation, office equipment, material, logistics, travel cost for technical and administrative monitoring) by MAR Fund and other institutions involved in the implementation (e.g. national funds) as well as external services (annual audit) amounted to EUR 1.9 million. In sum (with implementation consultant), EUR 2.7 million (30 % of total costs) accrued for coordination and management of the project, which is relatively high compared to other natural resource protection projects with a less complex implementation structure.

The granted amounts were not completely evenly distributed among the four countries, with Mexico receiving 38 % of the SGP funds, Belize and Honduras each 22 % and Guatemala 15 %. An even regional distribution is generally sought by MAR Fund, which is reflected by the even distribution of total grants available via all MAR Fund programs (e.g. Special Grants Program and Global Giving), while respecting the competition of projects based on quality and the above-mentioned criteria.[24]

Regarding **donor efficiency**, it has to be stated that MAR Fund's approximately 25 different donors are not coordinated in a structured way, not even the two biggest and bilateral donor institutions, KfW and FFEM. This has created a very complex system of different thematic programs, where MAR Fund is trying to accommodate every donors' special wishes, while compromising on efficiency for the sake of fundraising. On a positive note, the Annual Reporting has been a joint reporting by MAR Fund to all donors. Synergies between KfW and FFEM are not sufficiently tapped and donors should strive for more harmonisation, ideally towards basket financing without strictly segregated accounts. As KfW and Agence Française de Développement have signed the Mutual Reliance Initiative (operational guidelines 2013), recognizing each other's processes, it may be a possibility for FFEM to join harmonisation efforts in the future.

Between 2012 and 2019, MAR Fund implemented grants in the amount of USD 5.587 million on behalf of donors other than FC and FFEM, such as Summit Foundation, UNEP, Oak Foundation and others, a large part of which was allocated directly to Marine Protected Areas and communities in and around them.

In general, efficiency may also have been increased by targeting a lower number of Protected Areas with higher amounts each and lower transaction costs. However, due to political reasons, MAR Fund understandably tried to balance this trade-off between regional coverage and lower overheads. Regional

[23] It cannot be assessed here whether these leveraged funds were financially additional or would have been available for the MPA even without MAR Fund's grants.

[24] Total Regional breakdown of total grant volume by each program: Regional (18%), Belize (24%), Guatemala (16%), Honduras (19%) and Mexico (23%).

coverage was especially sought by the four National Funds and also influenced the decision on the prioritized Protected Areas. A rough "back of the envelope" approach comparing the Endowment Fund approach with direct investments in MAR Fund Protected Areas suggests that using the funds for direct investments into Protected Areas instead of endowment capital would have allowed for higher allocations in the first year, but would not have allowed for a long-term financing and funding on the regional level. Thus, the two mechanisms cannot be compared systematically.

In general, the production efficiency of the Endowment Fund, especially the quality of the investment portfolio, increased since project appraisal with a less conservative investment policy and can be rated as satisfactory. A clear limitation to efficiency is the very complex and costly implementation structure of MAR Fund's multiple earmarked donor programs, while by far the largest financing share originated from FC. Regarding the allocation efficiency, one can conclude that MAR Fund is able to generate additional funding for protection of biodiversity, which would otherwise not have been realized. With these funds, MAR Fund manages to support the work of very small grassroot organizations with limited absorption capacity working with local communities. MAR Fund is providing much advice and technical expertise to such institutions and thus is much more than a mere financing mechanism, which justifies the complex implementation structures to a certain extent.

Efficiency rating: 3 (all projects)

Impact

The objectives at the impact level were the protection of natural resources and biodiversity (from overuse and climate change) and of ecological functions of the Mesoamerican reef (all projects). The indicator "area of mangrove forests and seabed grasses" was defined at appraisal and applied at evaluation to assess the spatial development of these two specific ecosystems. No impact indicators were defined at appraisal for the endowment capital contributions, Projects C and A. An additional indicator was amended at evaluation: the Healthy Reefs Index (HRI), which is an index derived from data on live corals, fleshy macroalgae, commercial fish and herbivorous fish in the four program countries. It is published biennially by the Healthy Reefs Initiative and is supported by MAR Fund. All indicators below provide information about the status of achievement of impact objectives of all Projects.

Projects B: and D Protection of Marine Resources Phases I and II - Direct Investments in MPAs			
Indicator	**Target**	**Status at appraisal**	**Status at evaluation**
Area of mangrove forests and seagrass beds in the promoted PAs is maintained (ha)	**Phase I (B)** Target: ≥ 28,000*	**Phase I (B)** Status 2010/11: 28,000 ha* (mangroves + seagrass)	**Phase I (B)** **Fulfilled in sum.** 29,202 ha*, of which: Mangroves: 8,198 ha (+ 0.5 %) Seagrass: 21,104 ha (+ 3.2 %)
	Phase II (D) **Mangroves** Target: 47,000 h **Seagrass beds** Target: 21,000 ha	**Phase II (D)** **Mangroves** Status 2008: 33,240 ha **Seagrass beds** Status 2008: 5,090 ha	**Phase II (D)** **Mangroves: Fulfilled.** 59,723 ha (2020) **Seagrass beds: Fulfilled.** 29,300 ha (2020)

*Source: MAR Fund (2018). Final Report (Project B); consistent with FCE own calculations

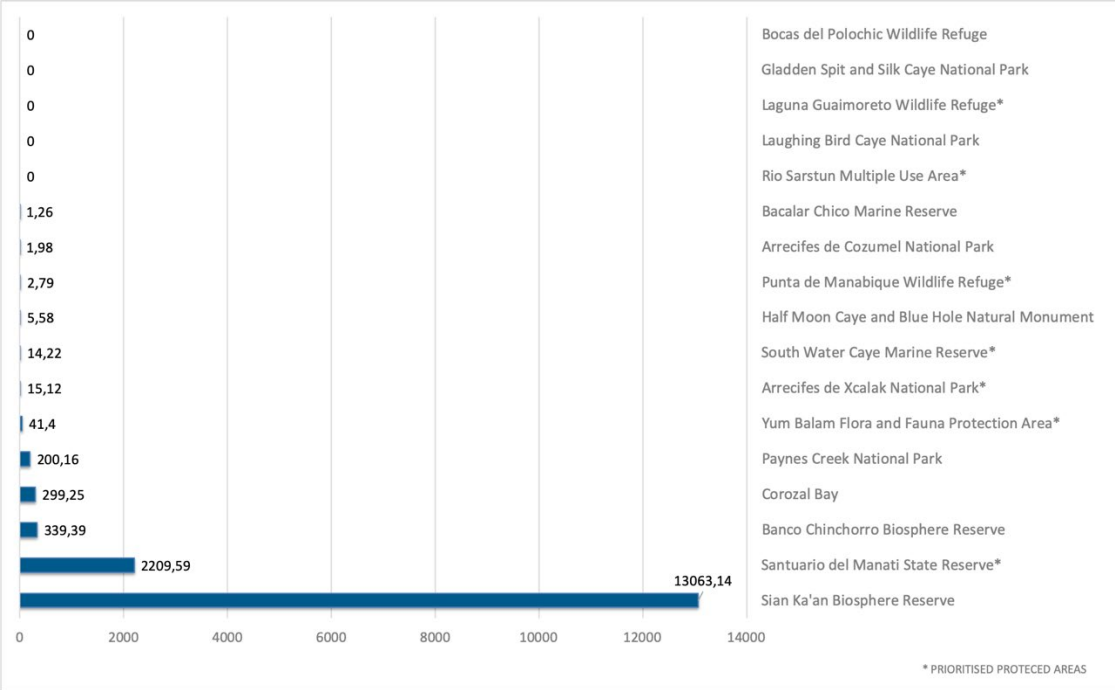
Mangroves hold important ecosystem functions as they help to protect coasts from erosion, store substantial amounts of carbon, provide breeding grounds for fish and other animals and thus are also a source of livelihoods and nutrition. Thus, the spatial extent of mangroves in Marine Protected Areas are an

adequate indicator to learn about the development of coastal ecosystems. The analysis of satellite data allows to compare the development of spatial mangrove cover in the project regions, and in each Marine Protected Area, across different years. MAR Fund contracted a consultant to conduct an assessment of the mangrove cover development of the nine Marine Protected Areas supported under Projects B and D. The results are displayed in the above table and indicate that in both phases, **the targets to increase mangrove cover between the time of appraisal and final project inspection were even exceeded**, when looking at the sum of mangrove areas in the promoted MPAs. **The same was the case for the spatial extension of seagrass beds**, an ecosystem that often develops alongside coral reefs and are vital for the health of such reefs. They consist of over 50 species of marine plants are a habitat to several endangered species.

Within this evaluation, we triangulated this monitoring data from Projects B and D by analysing the development of mangroves with the satellite image derived data product by Global Mangrove Watch (GMW) and extended the analysis to cover also the MPAs promoted under the Small Grants Program (also A and C). Figures 7 and 8 show the calculated gains and losses of mangrove cover in hectares between 2010 and 2016 (the most recent available data by GMW) for all MPAs supported by MAR Fund with Projects B, D and/or the Small Grants Program. In sum, the result is positive as well. **However, the area of mangrove cover increases in hectares is lower in our calculations derived from the GMW satellite-based data than in the data produced by the project and show that the mangrove cover increased only in some of the MPAs between 2010 and 2016**, while it decreased in others: For example, the mangrove cover increased by 13,063 hectares (+14.6 % in 2016 compared to mangrove cover in 2010, SGP) in Sian Ka'an Biosphere Reserve in Mexico, by 2,209 hectares in Santuario del Manatí (+10 %, Project D) and decreased by 391 hectares in Turneffe Atoll Marine Reserve in Belize (-5 %, SGP) and by 8 hectares (-42 %) in Cuyamel Omoa National Park (SGP) in Honduras. The relative changes (in %) show how strongly the total areas of mangrove cover differ between the MPAs.

Figure 7: Mangrove cover gains by Protected Area (A, B, C, D), 2010-2016 (in ha)

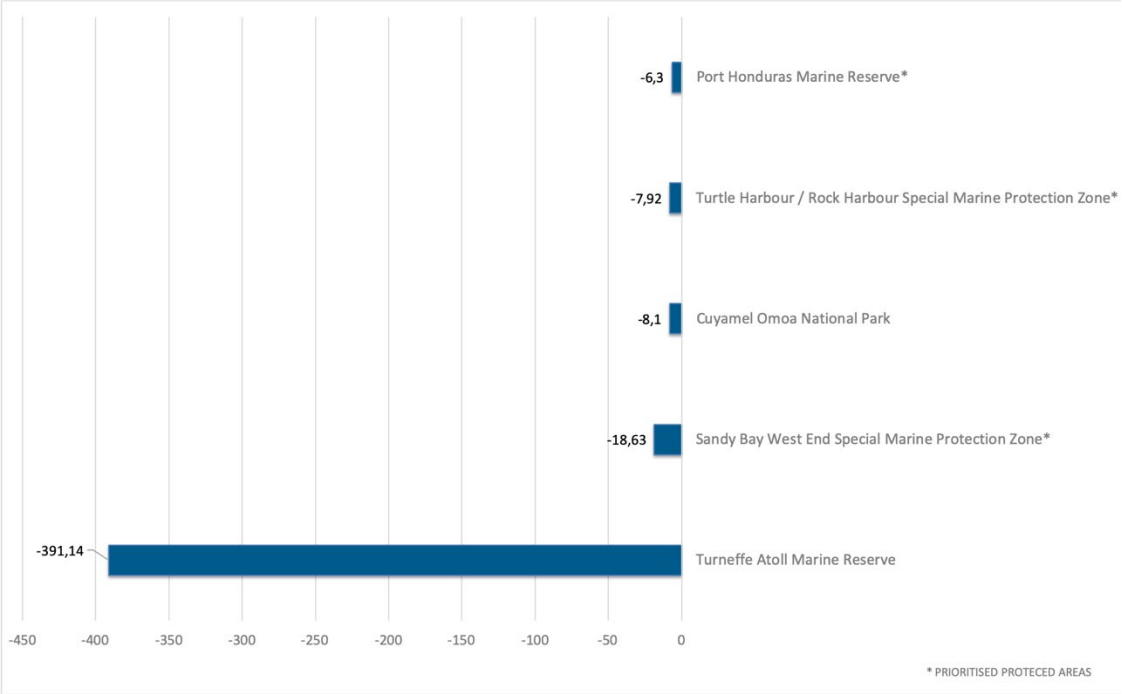
All depicted PAs received some MAR Fund funding (larger direct investment or Small Grant)



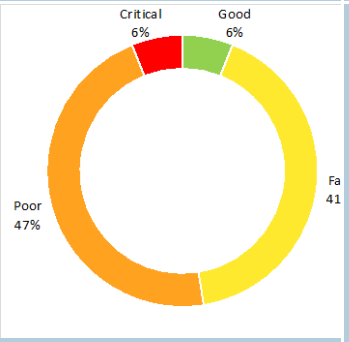
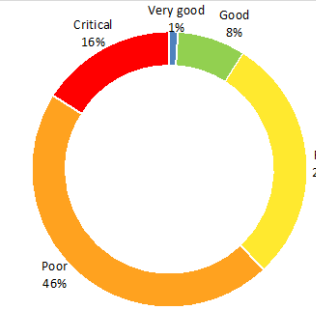
Source: KfW FC E own calculation, spatial statistics. Data: GADM, online; https://gadm.org/download_country_v3.html; Natural Earth, Online; https://www.naturalearthdata.com/downloads/; Protected Planet; WDPA, Online: www.protectedplanet.net; MAR Fund; Small Grants Program. Mangrove data product: Bunting P et al. (2018). The Global Mangrove Watch – a New 2010 Global Baseline of Mang rove Extent. Remote Sensing 10(10): 1669. doi: 10.3390/rs1010669; 25 m spatial resolution maps of mangrove extent. Note: "The overall accuracy for mangrove extent was 94.0 % with a 99 % likelihood that the true value is between 93.6–94.5 %, using 53,878 accuracy points across 20 sites distributed globally."

Figure 8: Mangrove cover losses by Protected Area (A, B, C, D), 2010-2016 (in ha)

All depicted PAs received some MAR Fund funding (larger direct investment or Small Grant)



Sources: cf. Figure 8

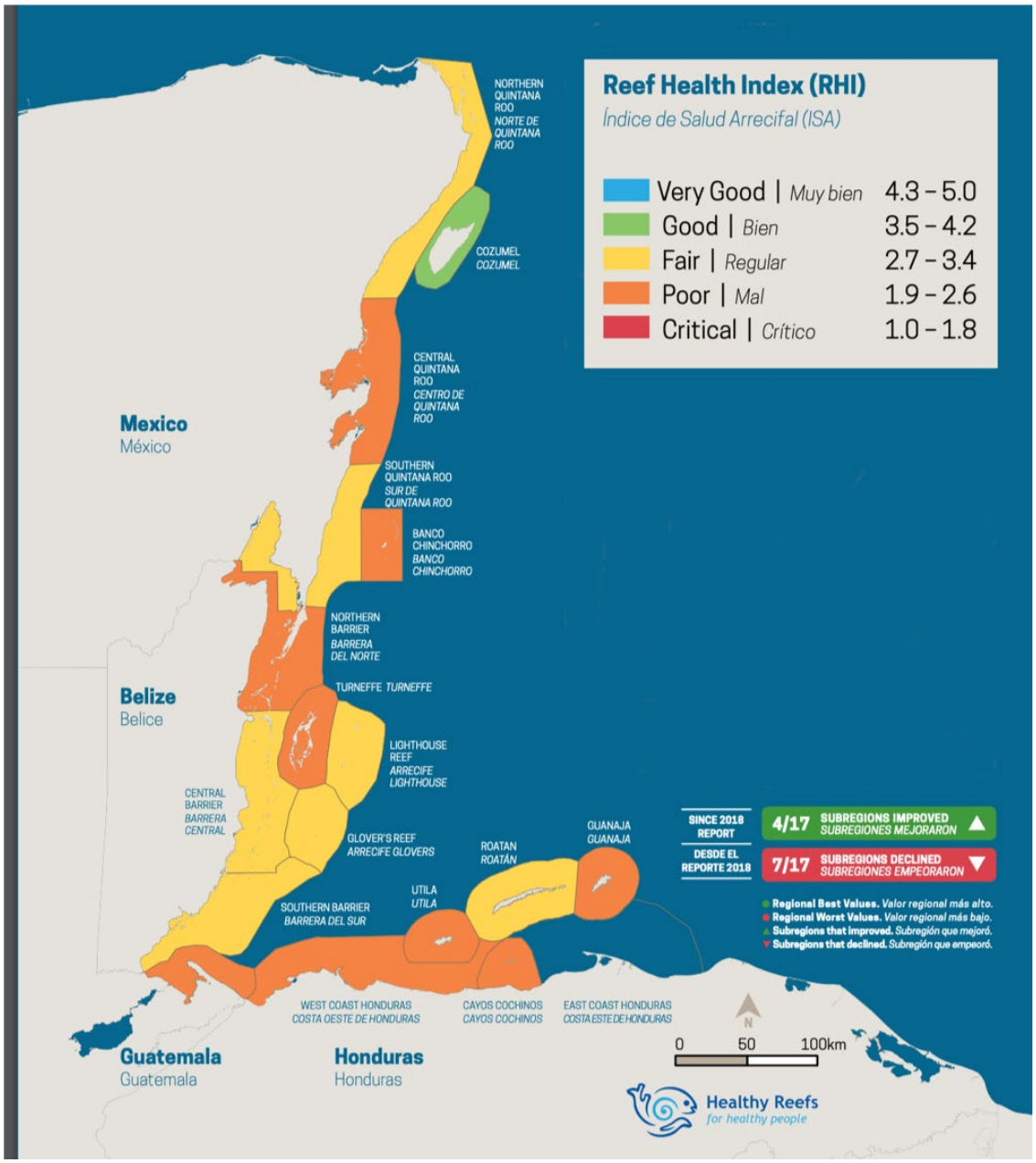
Indicator amended at evaluation (all Projects): Healthy Reefs Index			
Indicator	**Target**	**Status at appraisal** Mesoamerican Reef Report Card 2008	**Status at evaluation** Mesoamerican Reef Report Card 2020
Percent of Reefs in Different Conditions according to the Healthy Reefs Index[25]	Improvement	 Based on: 326 sites, 7 indicators	 **Mixed results: improvements on some sites, deteriorations on others.** Based on: 286 sites, 4 indicators

Given that MAR Fund aims at protecting the natural resources of the Mesoamerican Reef ecoregion, the Reef Health Index was chosen at evaluation to assess how the reefs in the whole ecoregion have

[25] Consists of four indicators (2020): coral cover (>40% very good; <6 % critical;) fleshy macroalgae cover (>1 % very good; >25 % critical); herbivorous fish biomass (3,290G/100m3 very good; <990g/100m3 critical); commercial fish biomass (1,620 g/m3 very good; <390 g/m3 critical), Source: https://www.healthyreefs.org/cms/report-cards/, retrieved on 11.12.2020.

developed between the time before FC project appraisals and the time of evaluation. Data of the **Healthy Reefs Initiative** (supported by MAR Fund and 69 other organisations) **shows a slight improvement of the reef conditions over the past 15 years, from an average index of 2.3 (poor) in the MAR region in 2003 to 2.5 (poor) in 2018**. However, there were **fluctuations across the sub-regions**, years and different indicators. In addition, the annual publications differ slightly with respect to the number and locations of sites covered and the way in which the data is displayed, making comparisons between years more difficult. Between 2018 and 2020, four out of 17 sub-regions improved and seven declined in terms of reef health (cf. Figure 9).

Figure 9: Reef Health Index by sub-region, Report Card 2020 (vs 2018 Report)



Source: Healthy Reefs (2020). Mesoamerican Reef Report Card, Evaluation of Ecosystem Health. www.healthyreefs.org

Figure 10: Healthy Reefs Index in selected Sub-Regions (B, D), Comparison 2012 and 2020

▲= improvement ▼ = deterioration

Selected (Sub-) Regions	Examples of included MPAs	Report Card 2012	Report Card 2020 (Data 2018)
MEXICO			
North. Quintana Roo ▲	Protected Area Flora y Fauna Yum Balam	2.6	2.8
GUATEMALA			
Coastal Guatemala Honduras ▼	Refugio de Vida Silvestre Punta Manabique	2.3	2.0
BELIZE			
Southern Barrier Complex ▲	Marine Reserve of Port Honduras	2.3	3.3
HONDURAS			
Roatán ▼	Special Marine Protection Zone - Sandy Bay West End	3.0 (Outer Bay Islands)	2.8
Utila ▼	Turtle Harbour/Rock Harbour Special MR	2.6 (Inner Bay Islands)	2.0

Critical (1.0 - 1.8)
Poor (1.9 - 2.6)
Fair (2.7 - 3.4)
Good (3.5 - 4.2)
Very Good (4.3 - 5.0)

Source: Healthy Reef Initiative Report Cards 2012, 2020; https://www.healthyreefs.org/cms/report-cards/, 11.12.2020

The indicators for the sub-regions of Northern Quintana Roo in Mexico (sub-region Protected Area for Flora y Fauna Yum Balam) and of Southern Barrier Complex in Belize (sub-region in which the Marine Reserve of Port Honduras is situated) improved between 2018 and 2020.[26] Data for Roatan in Honduras (sub-region of Special Marine Protection Zone - Sandy Bay West End) and for Guatemala in general (no data collection on sub-regions) show a slight deterioration between 2018 and 2020. The index value for the sub-region of Roatan is still the best in Honduras (2.8) and the indicator for commercial fish populations even increased within the sub-region to 2.8 in 2018 and has to be seen in the context of a general deterioration of the results for the country. Honduras' HRI decreased significantly from fair (3.0) in 2018 to poor in 2020, mainly because of dramatic reductions in commercial fish. It is the only country in the region where parrot fish is not protected nationally. Guatemala's HRI in general remains poor (2.0) and the lowest regionally. Critical commercial fish biomass is the primary concern there, likely related to unsustainable fishing gear, poor fisheries surveillance and lack of replenishment zones. In general, indicators by the Healthy Reefs initiative indicate a positive, but weak correlation with sufficient financing for Protected Areas and improved biodiversity in half of the respective sub-regions.

Regarding unintended impacts, one of the questions assessed was whether MAR Fund substituted national budget funds. A **conceivable crowding-out of national subsidies by the MAR Fund can be precluded**, as MAR Fund contributions are still small and key staff and basic operational costs of Protected Areas are not financed by German Financial contributions or respective endowment returns, which would trigger false incentives for national financing. However, due to a lack of transparency regarding financial contributions to Protected Areas by the respective national budgets, a quantitative analysis of the development of national budget contributions to PAs was not possible. Technical staff in the natural resource protection is very fond of the **effectiveness of co-management of Protected Areas by NGOs**. However, even before MAR Fund was created, governments in Guatemala, Honduras and partly Belize had delegated the PA management work to NGOs with the implication that **governments steer themselves away from their responsibility of protecting the public good of national natural resources**. Based on information available, Fondo Mexicano has been successful in mobilizing public budget funds for PAs and Belize has a financing mechanism via tourism in place. Honduras and Guatemala, on the other side, are behind international best practice.

[26] The Southern Barrier Reef even had the best reef health in Belize in 2020, although it decreased in 2018.

Another question regarding **unintended impacts** was, how MAR Fund manages **social, environmental and climate risks** in its portfolio. As agreed upon during project appraisal, in 2012 the **investment strategy** was reviewed concerning a set of **sustainability criteria**. Due to the small size of the investment portfolio, the use of the International Finance Corporation (IFC, private arm of the World Bank Group) exclusion list was chosen to be the most cost-effective procedure. The application of the IFC Exclusion list for projects with financial intermediaries was agreed with KfW. Further, “additionally and gradually, divestment from oil and coal-related instruments” was planned according to the Investment Policy of MAR Fund. During the 10th Investment Committee meeting in 2019, the committee members agreed to divest from fossil fuels and invest in "green" instruments. The IC approved selling the Pemex bond (Mexican petroleum company), given that the IFC exclusion list names petroleum production as a non-eligible investment. Fondo Mexicano's own environmental and social safeguards (ESS) qualified for GCF funding, PACT has their own ESS as well and has applied for GCF funding. MAR Fund is currently working on its own environmental and social risk management system.

Another positive long-term impact is likely to originate from the **MAR leadership program**, which brings together people of a new generation of leaders in natural resource protection from the four countries. The **networking and exchange of experiences** allows for a regional transfer of lessons learnt; e.g. according to our interview partners some Hondurans learned about good practices in other countries and came back motivated to replicate what they had seen.

Despite this achievement, **institutionalized regional cooperation and coordination in the Mesoamerican Reef still leave room for improvement**. Until 2015, three regional events took place, in which the administrators of the four CMPAs had the opportunity of meeting each other, elaborated a lionfish strategy in 2014 and a manatee monitoring workshop in 2015. More intergovernmental (cross-border) cooperation in the future is desirable. A good example was the regional initiative to measure the presence of the invasive species of lionfish and to combat it jointly.

Structural impacts in Latin America were achieved by MAR Fund even beyond the Mesoamerican Reef through regional cooperation: MAR Fund's lessons learnt, particularly on which mistakes to avoid regarding Board governance and on operational and granting structures, were relevant in the establishment of the "Fundación Pacífico", a new regional fund (founded, but not operational yet) in Costa Rica, Panamá, Colombia and Ecuador and the Caribbean Biodiversity Fund, according to KfW operational department.

Overall, the impact of the endowments (projects A and C) is rated as "good" (i.e. successful), as it is in line with the expectations of the Endowment Fund and without any significant shortcomings. The impacts of projects B and D are rated as successful, given that, in sum, mangrove cover and seagrass beds areas increased in the targeted areas according to the project data (principal indicator for impact assessment of these projects). The data collected by the Healthy Reefs Initiative showed improvements of overall reef health and coral cover for some of the sub-regions of the nine MPAs supported under projects B and D, while others deteriorated. The HRI data also shows that particularly coral cover improved in the sub-regions, where projects B and D took place. A causal relation of biodiversity developments (Healthy Reef Index) and project activities neither be proven nor denied. Many factors have an impact on the complex ecosystem and some indicators are more impacted by the activities supported by MAR Fund than others. Coral bleaching for example is more driven by global warming, while fish biomass is more influenced by enforcing fishing quota. However, **in the face of the strong external negative impacts by global warming on the Mesoamerican Reef, any slow-down in reef ecosystem deterioration can be considered a success.** In addition to providing a reliable source of funding for activities of managing Protected Areas, MAR Fund is able to operate as a platform at national and regional levels for conservation actions, financing, and supporting policies that conserve biodiversity.

Impact rating: 2 - successful (all Projects)

Sustainability

Sustainability of Projects A and C

MAR Fund has developed from an insufficiently financed institution into a small, but stable financier in the region. Nevertheless, the size or growth of the endowment fund is a crucial factor for the scope of financial sustainability of MAR Fund. The following factors would have positive impacts on financial sustainability if they materialize (cf. section "Effectiveness"): 1) **Fundraising of additional endowment capital**, 2)

Harmonization of donor requirements and pooling of funds (no earmarking), 3) a **more growth (risk) oriented investment strategy** and 4) **systematic recapitalization**, i.e. offsetting of USD inflation.

The long-term strategy of the MAR Fund for 2019-2023 reflects the willingness of the Board to increase own funds; the plan is to double the endowment of USD 27.8 million (December 2019) to USD 51 million in the next years. Fundraising is planned to be increased by MAR Fund by hiring a development officer and full-time communications officer and to achieve the Oak Challenge. It would be beneficial if MAR Fund could attract somebody to the board with good prospects of mobilizing endowment funds. In order to achieve long-term plans of the fund in the future, the financial performance must be at least maintained and the endowment fund should be increased as planned. Further, MAR Fund plans to continue the flexible Small Grants Program (at least USD 250,000 annually), which offers a continuous and reliable funding for regional projects.[27] Despite the low amounts of the Small Grants, they are crucial for the acceptance by local communities of a natural resource protection agenda, as local neighbouring populations are an important target group of Small Grants. Unfortunately, the measures for alternative income generation of local communities within projects B and D did not generate substantial durable impacts (cf. section "Impact").

Against the benchmark of current best practice of endowment funds, MAR Fund should pay more attention to systematic recapitalization, i.e. to ensure that inflation is offset. There has been recapitalization of MAR Fund by reinvesting part of the returns, but it did not follow a certain pattern. Between 2012 and 2019, MAR Fund recapitalized almost an annual average of 1.5 %, while the annualized inflation rate was 1.61 %.

Sustainability of Projects B and D

Component 1: The infrastructure financed in the nine Marine Protected Areas is adequately maintained and likely to continue to be in use. However, some representatives of PA management stated that limited financial resources for operational costs such as fuel have reduced recently the scope in which the surveillance and monitoring equipment and infrastructure can be used.

Component 2: The income-generating activities for local communities are mostly not very sustainable, given that they are no business cases, i.e. they do not finance themselves but depend on external financing. The relationships between MPA management and local communities has been characterized by ups and downs and some MPA representatives stated that local communities' acceptance for conservation activities has decreased once programs for alternative income generation ended.

Component 3: The established knowledge transfer formats can be considered sustainable, as MAR Fund has established a good regional network and continues to organize and finance regular exchanges on different topics relevant to the region. MAR Fund continues to follow up on and strengthen the no-take zones. For instance, MAR Fund organized virtual workshops in 2020 to standardize monitoring of no-take zones and now will follow up with those that will begin applying the methodology. Through the Sustainable Fisheries Network, technical support is provided to the no-take zones. Water quality samples continue to be taken in five of the nine target Protected Areas. The fire brigades continue to apply the knowledge acquired during the workshops.

Sustainability aspects concerning all Projects

In general, national financing of Mesoamerican Reef protection is subject to fluctuations. A major risk for sustainability of activities in the Marine Protected Areas is their financial dependence. Marine Protected Areas are still very dependent on national budget attribution.[28] Most Protected Areas do not have fiscal responsibility for their financing, only PACT in Belize is able to finance costs by revenues from tourist fees. Still, environmental conservation and protection efforts are not a political priority in Mexico, Belize, Honduras or Guatemala, which is demonstrated by essential budget cost cuts for CONANP (Mexico) and

[27] Programs designed to benefit local communities is in general a weakness of protected area management, which is why the continuation of the program is highly recommended (Leverington, F., Costa, K.L., Pavese, H. et al. A Global Analysis of Protected Area Management Effectiveness. Environmental Management 46, 685–698 (2010): 692).

[28] CONANP's resources show a decline in allocations, especially in 2015, due to a drop in tax revenues caused by the fall in oil prices, which affects the budget of all ministries and secretariats of the Mexican government. Actual expenses from 2012 to 2016 were 39 % lower than projected.

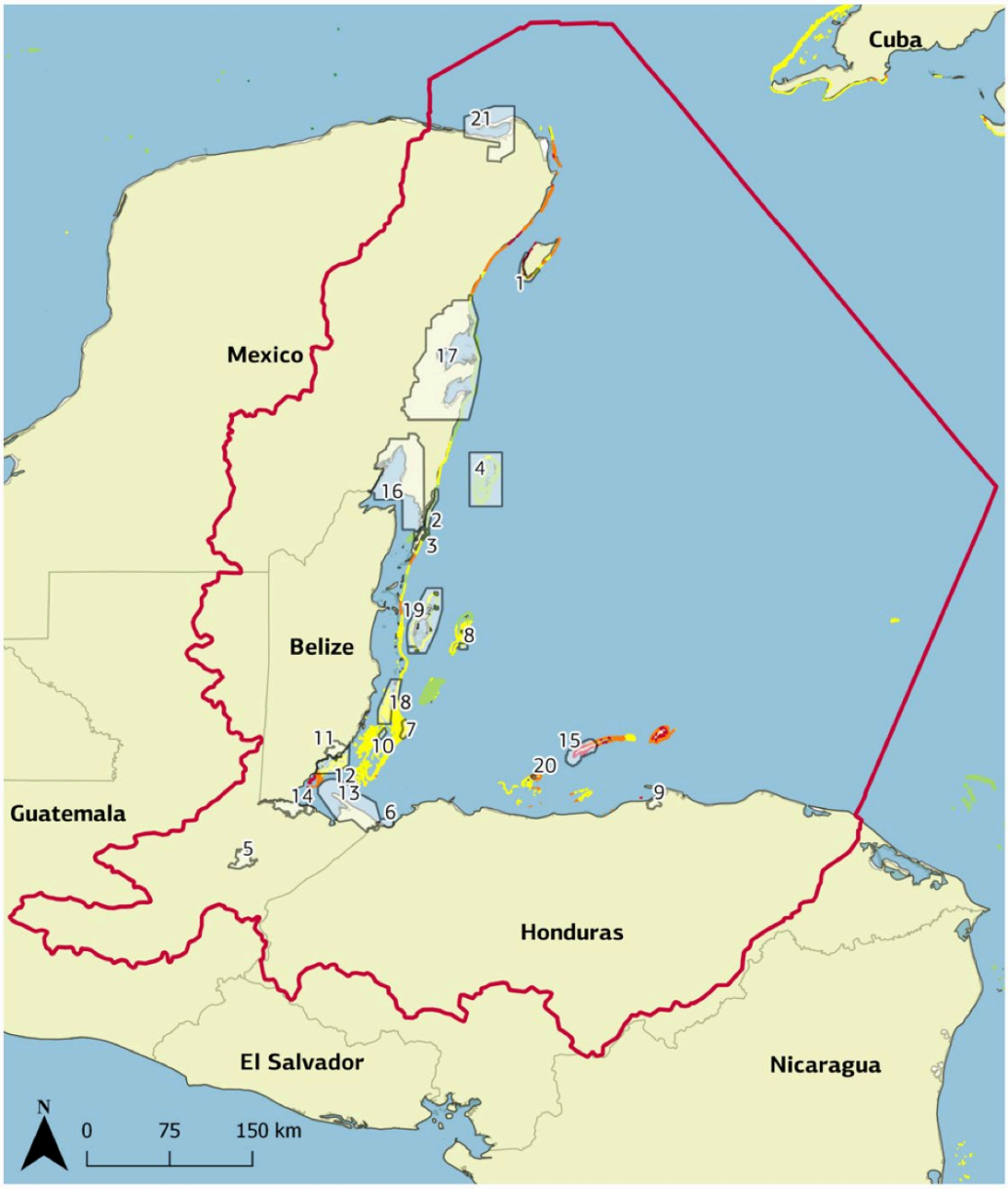
CONAP (Guatemala). In addition, the **global pandemic Covid-19** has affected all countries and Protected Areas negatively; revenues from tourism are lacking and governments struggle to finance Covid-19 relief measures. Governments budget too little for conservation and discussion now is how they can be incentivized to provide more funds, for instance by highlighting the interrelations between ecosystem health, animal health and human health amid the pandemic. The available financing in the sector is not sufficient to effectively manage the Marine Protected Areas and marine reserves. MAR Fund therefore remains essential for regional protection of biodiversity. Furthermore, biodiversity monitoring activities that were financed by MAR Fund are likely to continue where research centres and universities are directly involved or conducted by MAR Fund's Connectivity Network.

MAR Fund has been evolving and is **tackling recognized fields for improvement**, as the fundraising strategy, governance reform initiatives and the elaboration of an own environmental and social sustainability guideline demonstrate. MAR Fund's strategic plan also includes to expand its portfolio: A Blue Economy Accelerator, which is a monitoring and evaluation protocol, is planned and includes support for plastic reduction (solid waste) and wastewater treatment in coastal areas. It is wise to tap the funds that may be available, as the "Blue Economy" and waste-free oceans are popular with donors. MAR Fund activities may draw on Blue Action Fund financing in the future, which is supported by the German government. At the same time, a collaboration with municipal solid waste disposal and wastewater utilities will be essential for such endeavours to be sustainable.

Risks for the natural resources of the Mesoamerican Reef are increasing, as data and a projection for 2030 by the World Resources Institute shows, cf. Map 4. The WRI analysis includes the following local threats: Coastal development, pollution of water catchment areas, offshore oil exploration and drilling (oil spill in the Gulf of Mexico in 2010), marine pollution and related damage as well as overfishing and destructive fishing[29]. These threats can and should be tackled by the governments of the region. The global threats covered in the analysis include thermal stress (rising sea temperatures that can lead to the bleaching of coral reefs) and ocean acidification (driven by increased CO_2 levels that can reduce coral growth rates).

[29] Burke, L., Reytar, K., Spalding, M., & Perry, A. (2011). *Reefs at risk revisited*. World Resources Institute.

Figure 11: Reefs at Risk 2030 - Projection by World Resources Institute



No.	Protected Area
1	Arrecifes de Cozumel National Park
2	Arrecifes de Xcalak National Park
3	Bacalar Chico Marine Reserve
4	Banco Chinchorro Biosphere Reserve
5	Bocas del Polochic Wildlife Refuge
6	Cuyamel Omoa National Park
7	Gladden Spit and Silk Caye National Park
8	Half Moon Caye and Blue Hole Natural Monument
9	Laguna Guaimoreto Wildlife Refuge
10	Laughing Bird Caye National Park
11	Paynes Creek National Park
12	Port Honduras Marine Reserve
13	Punta de Manabique Wildlife Refuge
14	Rio Sarstun Multiple Use Area
15	Sandy Bay West End Special Marine Protection Zone
16	Santuario del Manati State Reserve
17	Sian Ka'an Biosphere Reserve
18	South Water Caye Marine Reserve
19	Turneffe Atoll Marine Reserve
20	Turtle Harbour / Rock Harbour Special Marine Protection Zone
21	Yum Balam Flora and Fauna Protection Area

Legend

- Mesoamerican Reef Ecoregion
- MAR-Fund Protected Areas

Reefs at Risk (2030)

- Low
- Medium
- High
- Very High
- Critical

Sources: KfW FC E own elaboration. Data: Burke L, Reytar K, Spalding M and Perry A (2011). Reefs At Risk Revisited. Washington (USA): World Resources Institute, Online: www.wri.org/publication/reefs-risk-revisited; GADM, Online: https://gadm.org/download_country_v3.html; Natural Earth, Online: https://www.naturalearthdata.com/downloads/; Protected Planet: WDPA, Online: www.protectedplanet.net; MAR-Fund: Small Grants Program. No geodata were available for the "Cayman Crown Site" protected area in Guatemala.

A stronger political buy-in of the four national governments and their regional authorities was recommended in the section "Effectiveness". Such political backing will continue to be a pre-requisite for effective land management, ecological engineering and marine spatial planning, which will be of special importance for sustainable impacts (Andersson et al. 2019: 10). The current concentration is on reef reconstruction and protection, without sufficient focus on territorial management. MAR Fund has been very successful in working with highly motivated technical staff in small-scale projects and has established good relations with natural resource protection stakeholders in the four countries, particularly in the non-governmental and academic sphere. The next step may be to put marine resource protection higher on the political agenda of the four countries.

In a nutshell, the sustainability of the endowments to MAR Fund (projects A and C) is rated as "good" (successful) given that the positive impacts from the well-functioning Endowment Fund are likely to continue given the continuous financial flows and well-established effective processes of MAR Fund and its dedicated team. Actual positive impacts on natural resources may even increase in the future if additional endowment capital is attracted. The sustainability of the direct investments in the nine MPAs of projects B and D is rated as moderately successful, given the mentioned limitations regarding alternative income generation and sustainable financing of the most basic MPA operations, e.g. limited fuel restricting possible patrols - an unfortunately typical finding in evaluations of Protected Area projects.

Sustainability rating: 2 (Projects A and C); 3 (B and D)

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being **relevance, effectiveness, efficiency** and **overarching developmental impact**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).