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INNOVATIONS FOR CORAL FINANCE

VERTIGOLAB
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INNOVATIONS FOR CORAL FINANCE

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VERTIGOLAB
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Vertigo Lab is a think-and-do-tank specialized in environmental management, policy evaluation, conservation finance and business development support. Comprised of a team of economists, engineers, biologists and policy experts, it has worked in many tropical contexts to improve coral ecosystem conservation and rethink its financing.

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EXECUTIVE SUMMARY

Coral ecosystems are of primary importance for many coastal populations, while being subject to many threats (Burke et al., 2011; Cesar et al., 2003; Spalding et al., 2016). Their conservation now and in the future requires more protection and more engagement from users and decision-makers.

One of the main barriers to conservation enhancement is that the funds currently needed to achieve effective, lasting conservation **significantly exceed the available funds.** An average US$ 270 million commitment per year for marine conservation was recorded between 2010 and 2016 (UN Environment, 2018). Meanwhile, the funds necessary to achieve the United Nations Convention on Biological Diversity target of having 20% of the ocean protected are estimated at **between US$ 4 and $8 billion per year in management costs only** (Balmford and Whitten, 2003; Bos et al., 2015).

Without appropriate funding, coral conservation will never achieve its objectives.

A new conservation financing approach is necessary to fill the financing gap

At the moment, funds to achieve conservation objectives come from government budgets, official development assistance (ODA) through multilateral and bilateral grants, and from foundations and corporate funding. Those present financing sources are not sufficient. Even if traditional financing sources were to increase their investments, it seems unlikely that they could fill the coral conservation gap on their own.

In the conservation world, **innovative financing mechanisms** are attracting increasing interest: they are known to have the capacity to partially **bridge this financing gap**, while at the same time addressing increasing interest among investors in "**green and blue" investments**. Designing and implementing such specific mechanisms for coral ecosystem conservation is a new subject, and work is needed to ensure the effective implementation of the ideas that we believe are best suited to addressing inherent challenges in this field. We thus believe innovation for coral finance should be a priority for experimental research and development on marine conservation.

Improving coral conservation calls for creative and innovative solutions and, accordingly, so does coral conservation finance.

Two main options have been identified to fill the marine conservation financing gap. On the one hand, coral ecosystems are **common goods.** In that sense, the financing of their conservation should be provided for in national budgets and involve the participation of all stakeholders who rely on such ecosystems at different levels. On the other hand, given the existing conservation finance gap and the increased appeal among private investors for socially and **environmentally oriented investments,** it seems that using private financing resources and forces to finance coral conservation could be a good supplement to public funding. Even though it seems unlikely that private investments could cover all needs for conservation activities, it could enable conservation stakeholders

to diversify their funding sources and hence attain economic viability. In addition, both private and public innovative mechanisms exceed the simple financing scope, as they are also likely to impact in their own ways the relationship investors have with their environment.

Most of the mechanisms analyzed in this report require a 'coral conservation reality-check': although they may have been tested in other conservation contexts (e.g. terrestrial), their effectiveness for coral conservation specifically has yet to be assessed. This report provides the necessary analysis for their development in coral conservation, but it is essential that they be tested in relevant contexts at the earliest opportunity. On this condition, we believe this report could contribute to a new vision of conservation finance for coral ecosystems: **coral finance.**

Innovation for coral finance should target public funding enhancement...

The report details seven mechanisms selected from among the most promising mechanisms for coral finance. They have the potential to greatly increase coral conservation earnings. Three of them aim to gather public conservation-oriented funds:

7 MECHANISMS have the potential to bridge the coral conservation financing gap

- **Green taxes** are public mechanisms designed to be applied to environmentally damaging activities, to either increase a general budget or support specific biodiversity-related activities.
- **Marine Biodiversity offsets** are the last step of the mitigation hierarchy aimed at reducing negative impacts of development projects on nature.
- **Debt-for-Nature Swap** (DFNS) is an agreement between an in-debt country and its creditors to finance national conservation projects by cancelling all or part of the commercial or external debt of the country.

... While seeking to involve private actors

The four other innovative mechanisms are private-led: they assume that individuals must choose to finance environmental protection. These mechanisms are more incentivizing than binding:

- **Payment for ecosystem services (PES)** is a tool to pay or compensate "providers" of environmental goods and services to encourage them to adopt new or modify existing behaviors in ways that maintain or increase the health or performance of ecosystem services.
- **Impact investments** are defined as investments made into companies, organizations, and funds with the intention of generating social and/or environmental impact alongside financial returns.
- **A green bond** is a form of debt security or legal contract for money owed that can be bought and sold between parties to finance projects that are linked in some way to the environment. Bonds have the potential to attract multisource funding and provide conservation funds at regional scale.
- **Parametric insurance** is a new form of insurance allowing near-immediate payouts, enabling more timely responses to stressors. Unlike traditional insurance mechanisms, allocated compensation is not based on post-event losses valuation in the field, but on the analysis of the behavior of a climatic variable highly correlated with the risk to be covered.

Innovation for coral finance should also focus on business-model development

However, these most promising innovative financing mechanisms are not the only missing link to bridging the coral conservation financing gap. They will become a powerful tool for coral ecosystem conservation only if they are used as part of integrated models, taking into account inherent conservation needs and helping conservation managers and decision-makers to develop a new vision of financial sustainability.

For this reason, using a **new approach based on a more business-like vision and strategy,** in synergy with the development of these new financing mechanisms, seems a necessary step. To do this, we believe it is necessary to follow a standard, recognized approach to business model development. This approach relies on a business model canvas, which seeks to address four key questions in developing the model (see below). Addressing these is very likely to enable conservation actors to articulate appropriate financing mechanisms aimed at achieving true sustainability.

4 QUESTIONS to address in developing a business model for coral conservation

1. Which stakeholders comprise your **key beneficiary group**?
2. What service/benefit do you offer to your targeted stakeholders (your **proposition value**)?
3. What are the main **activities, partners and resources** you need to mobilize to reach your coral ecosystem conservation objectives?
4. How much **funding**, and from which **sources**, do you need to reach your coral ecosystem conservation objectives?

Addressing the many coral contexts through specific integrated conservation models

Starting from this premise, the report develops four models adjusted to different coral ecosystem conservation financing patterns, and discusses them:

- The **coral economy model** states that coral supports a whole local economy, and the main stakeholders benefiting from it should be involved financially in their conservation. The main financing mechanisms of this model are Payment for Ecosystem Services and biodiversity fees, which can be coupled with investments from external key partners. One important co-benefit of such a model is that it is likely to have a range of positive impacts on more than its identified "customer" segments, as improved services will be distributed to the whole area, and prompt other users to engage in conservation.
- The **national legacy model** recognizes that corals are a public good that should be protected by public involvement at national level. The mechanisms for financing conservation in this model are essentially public and eased through changes in regulatory frameworks. They first include the development of green taxes and fiscal instruments, but

also marine biodiversity offsets, which can be a powerful tool to generate revenues despite questions of acceptability, especially if the funds are well earmarked. For countries with less-developed fiscal systems, DFNS is also an option in this model. Designing a hybrid model mixing different mechanisms may allow countries to raise capital from a wide range of sources to achieve their national legacy objectives through a diversified financing portfolio.

- **The built-to-last model** assumes that coral conservation will be permanent only if the population living in or nearby the protected area can fulfill their basic needs in a way that is sustainable. A micro-finance approach is favored to help all financed projects to reach different levels of self-sufficiency. Philanthropists and individual or institutional donors could support local entrepreneurship, and support micro-credit and small loans institutions to help projects start up. If such a model proves itself to be sustainable and cost-efficient, and given the increasing interest among financial markets in impact investments, impact investors could get involved in the capitalization phase by investing in the micro-credit institution. Track records of financed projects and micro-credit institutions could help attract those investors, once financial and risk guarantees are better assured than at the beginning of the process.

- The **blue infrastructure model** is based on the recognition that coastal populations and the built capital on the shore is protected by coral reefs, mangroves and seagrass meadows against extreme weather events and other climate change impacts. The innovative mechanisms used to finance conservation in this model can include parametric insurance financed by identified and willing-to-pay stakeholders (tourism operators, coastal populations, governments, etc.) as well as payment for ecosystem services. Such a model is focused on the provision of one specific coastal protection service. The appeal of this model is that protection provided by those ecosystems will not only maintain or increase the specific targeted service, but also benefit a wider range of economic and non-economic ones. For greater efficiency and to address a broader range of issues, a stronger "blue infrastructure" model could be designed with the two main revenue streams (parametric insurance revenues and PES) targeting different impacts on connected coral ecosystems.

4 business models

for financing coral conservation open to dozens of other customized ones, still to be invented.

Coral ecosystem threats are global, the financing of their conservation should be too

Ultimately, once specific business models have been selected by coral conservation stakeholders, the question of channeling and managing those funds becomes central. Complex financial engineering mechanisms, involving different kind of structures, are necessary to collect and allocate conservation funds. **Conservation Trust Funds** are one of these.

Given the similar challenges faced by coral ecosystems worldwide, and the urgency to protect coral reefs stated by many experts and governments (Hugues et al., 2017; UN Environment et al., 2017), it could even be necessary to take a further step by implementing a **world conservation fund dedicated to coral conservation** to better address global issues. This structure could channel innovative financing mechanisms introduced in this report, but also test conservation business models in pilot sites, to develop new practical approach in the field and so accelerate the pace of coral conservation.

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CASE STUDIES

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ACRONYMS

AOSIS: Alliance Of Small Island States
BBOP: Business and Biodiversity Offsets Program
BNMP: Bonaire National Marine Park
CBD: Convention on Biological Diversity
CBI: Climate Bond Initiative
CEA: California Environmental Associates
CI: Conservation International
CIESIN: Center for International Earth Science Information Network
COA: Communities of Ocean Actions
CTF: Conservation Trust Fund
DFNS: Debt-for-Nature Swap
EEZ: Exclusive Economic Zone
EU: European Union
FONANPE: Fondo Nacional Para Aréas Naturales Protegidas por el Estado
GDP: Gross Domestic Product
GEF: Global Environment Facility
GIIN: Global Impact Investing Network
GSIA: Global Sustainable Investment Alliance
IBRD: International Bank for Reconstruction and Development
ICRI: International Coral Reef Initiative
IEEP: Institute for European Environmental Policy
IIED: International Institute for Environment and Development
IMROP: Institut Mauritanien de Recherches Océanographiques et de Pêches
IUCN: International Union for Conservation of Nature
LECZ: Low-Elevated Coastal Zone
MAR: Meso American Reefs region
MAVA: MAVA Fondation pour la Nature
MPA: Marine Protected Area
NGO: Non-Governmental Organization
ODA: Official Development Assistance
OECD: Organization for Economic Co-operation and Development
PES: Payment for Ecosystem Services
PNMS: Palau National Marine Sanctuary
PPP: Public-Private Partnership
SDG: Sustainable Development Goal
SeyCCAT: Seychelles Conservation and Climate Adaptation Trust
SIDS: Small Island Developing States
SWIOFish: South West Indian Ocean Fisheries Governance and Shared Growth Project
TNC: The Nature Conservancy
UNCLOS: United Nations Convention on the Law of the Sea
UNCTAD: United Nations Conference on Trade and Development
UNDP: United Nations Development Program
UN Environment: United Nations Environment program
USAID: United States Agency for International Development
USP: University of the South Pacific
WWF: World Wide Fund for Nature

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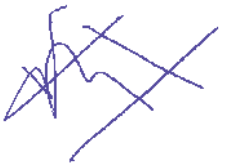
FOREWORD

XAVIER STICKER

French Ambassador for the Environment



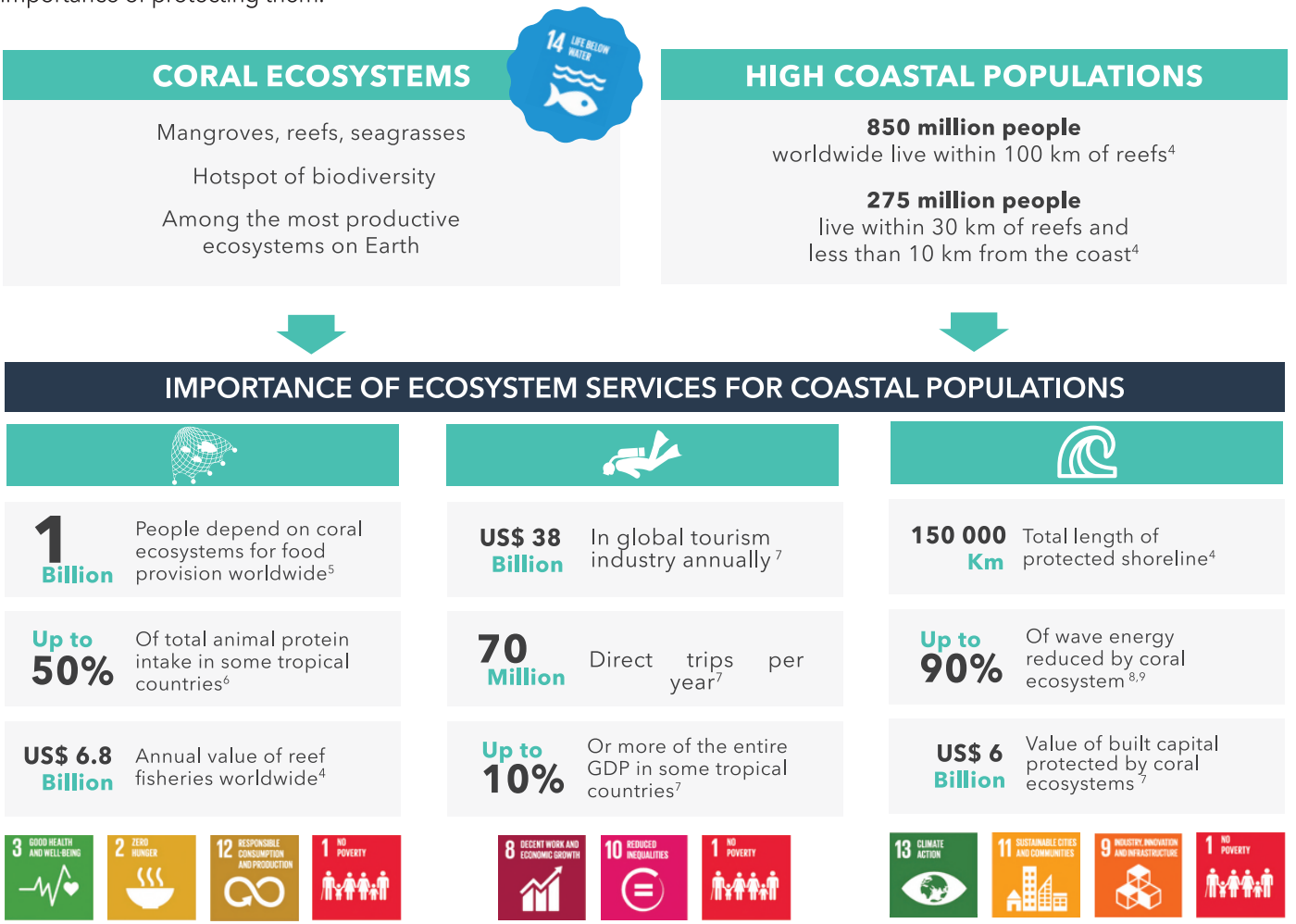
Among many environmental challenges that modern societies must address worldwide, conservation of ecosystems is especially urgent, to moderate biodiversity loss and, at the same time, maintain a wide range of ecosystem services essential for many populations. Marine and coral ecosystems are particularly at stake; they are of primary importance for many coastal populations, while being subject to many threats. Conservation now and in the future requires an improvement of conservation approaches and activities, to help decision-makers and managers diversify their responses to specific and broader challenges. One of the main barriers to conservation efficiency is that the funds currently needed to achieve adapted conservation objectives significantly exceed the funds allocated for this purpose. This phenomenon is called the conservation funding gap.

In the conservation world, we hear a lot about innovative financing mechanisms that could bridge this financing gap while at the same time addressing increasing interest among investors for "green and blue" investments. Designing and implementing specific mechanisms for coral ecosystem conservation is a new subject. This report has been commissioned by the International Coral Reefs Initiative (ICRI) to explore some of the most promising ideas that we believe are best suited to addressing inherent coral ecosystem conservation challenges. Even if most of them still need to be developed in the field, we hope this report will contribute to a new vision of conservation finance for coral ecosystems: coral finance.

After providing an overview of specific applications of financing mechanisms to coral ecosystem conservation, the report explores potential business models for coral financing. Innovative financing mechanisms can only become a powerful tool for coral ecosystem conservation if they are used as part of integrated models, taking into account inherent conservation needs. Starting from this premise, the report develops four models adjusted to different coral ecosystem conservation financing patterns and discusses them. Finally, the report concludes with practical recommendations for managers and decision-makers.

THE URGENT NEED FOR CORAL ECOSYSTEM PROTECTION

Coral ecosystems' inherent characteristics mean they are of primary importance for many coastal communities (see figure 1 below), by providing of a wide range of ecosystem services[1] (Cesar et al., 2003) that make those ecosystems contribute to 10 Sustainable Development Goals[2] (SDG) . The global population in the Low-Elevation Coastal Zones[3] (LECZ) is expected to grow from 600 million in 2000 to an average of 1.2 billion in 2060 (Neumann et al., 2015). Therefore, both the number of people benefiting from those SDGs and the external pressures on those ecosystems will increase, reinforcing the importance of protecting them.



CONTRIBUTION OF CORAL ECOSYSTEMS TO 10 SUSTAINABLE DEVELOPMENT GOALS

Figure 1: importance of coral ecosystem services for coastal populations, 2017

[1] As defined in the Millennium Ecosystem Assessment, ecosystem services are the benefits people obtain from ecosystems, including provisioning services (e.g. food and water), regulating services (e.g. flood and disease control), cultural services (e.g. spiritual, recreational, and cultural benefits), and supporting services (e.g. nutrient cycling).
[2] SDG: 17 global goals devised by UNDP and adopted in 2015 to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda (un.org). The goals are interconnected and have specific targets to be achieved in 15 years.
[3] Low-Elevated Coastal Zones: the land area and the total and percentage population, by country, that is located in various low elevation coastal zone bands ranging from 1m to 20m elevation above mean sea level (CIESIN/Columbia University, 2013).
Infograph references: [4.] Burket et al., 2011 [5.] Quaas et al., 2016 [6.] FAO, 2014 [7.] Spalding et al., 2014 [8.] Lugo-Fernandez, 1998 [9.] Ferrario, 201

FINANCING CORAL ECOSYSTEMS TODAY

The major part of funding dedicated to coral ecosystem protection today originates from government budgets, Official Development Assistance (ODA) through multilateral and bilateral grants, and from philanthropy through foundations and corporate funding.
Based on a recent study by UN Environment and ICRI (UN Environment et al., 2018), **US$ 1.9 billion was committed between 2010 and 2016, which represents an average US$ 270 million a year for this period.** This originated from international agencies, government agencies and foundations, making up a total of 60 funders[10] .

Government budgets form the most important proportion of coral ecosystem conservation funding today. This is used primarily to cover core protection costs (staff and running costs). **Official Development Assistance[11]** (ODA), which covers bilateral and multilateral assistance, notably through the Global Environmental Fund (GEF), represents the main complement to these national budgets (CEA, 2017). ODA is primarily spent on specific projects aimed at, for instance, increasing resilience, developing marine protected areas (MPA) networks, and creating designated areas in which the entire ecosystem is protected in all its ecological diversity.

Philanthropy also plays an important role in covering coral protection expenses. Many foundations have set coral ecosystems as one of their priorities for intervention, but their involvement is not sufficient to secure basic conservation, such as MPA recurring costs.
From a broader perspective, coral ecosystems benefit from substantial donor attention. Hence recently, **over 90 voluntary commitments were made for coral reefs** (Un Environment et al. 2017). They included activities aimed at their protection, management and restoration, as well as the maintenance of tangible benefits for coastal communities from coral reef fisheries and tourism. The projects funded largely addressed climate change resilience, together with biodiversity conservation, MPA management and fisheries management.

In a few examples, conservationists have tried to put in place **self-financing solutions** to cover their expenses. These mostly consist of user-right fees[12] (entrance fees for visitors, fishing licenses, concessions for tourism operators, etc.) and may represent, in some cases, an important contribution to the overall budget of MPAs. Bonaire (see box 5 in section Payment for Ecosystem Services, below) is one of the most famous examples of an MPA with a high proportion of self-generated revenues.

Despite these important international commitments scientists nevertheless agree that coral ecosystems have never degraded at such speed, under the joint pressure of local human activities and climate change. The numerous commitments seem not to have translated into sufficient conservation actions in the field, or may have failed to address this degradation.

Current coral ecosystem conservation financing actors cannot bridge the financing gap alone

The coral conservation financial gap remains important, and finding new and long-term financial mechanisms is necessary to make conservation instruments less dependent on philanthropic individuals and organizations. However, though the literature on the mechanisms to bridge the financing gap is dense with presentations and recommendations on innovative financing mechanisms, it should be stressed that it only introduces existing mechanisms and how they work for nature conservation in general, without showing yet the ways they can be adapted practically to coral ecosystem protection in particular. **This report proposes strategies and lists some innovations that might contribute to a renewed approach to coral conservation,** in the hope that this may better respond to current and future pressures.

[10] Dataset of 340 funded projects.
[11] Official Development Assistance (ODA): government aid designed to promote the economic development and welfare of developing countries. Aid may be provided bilaterally, from donor to recipient, or channeled through a multilateral development agency such as the United Nations or the World Bank. Aid includes grants, "soft" loans (where the grant element is at least 25% of the total) and the provision of technical assistance (OECD.org).
[12] Other sources of self-generated income may be developed in the future, depending on ecosystems' characteristics, such as bioprospecting (see section Payment for Ecosystem Services and biodiversity fees).

THE INSTRUMENT OF PROTECTION: WHAT SHOULD BE FINANCED?

Sustainable financing for coral ecosystems is not only about collecting as much money as possible to ensure that they are protected. First, it is necessary to identify and agree upon what activities should be implemented.

Without being exhaustive, some of the key activities that need financing are the following:

Creation and development of marine protected areas (MPA)

Providing support to coral protection activities through MPA is the major financing need for coral protection, MPA being the most important tool to ensure coral protection worldwide (Burke et al., 2011). Increased and multi-source investments to support MPAs' design and implementation, as well as for operational and managing activities, are required to ensure their sustainability.

Suppression of external pressure factors (marine pollution and land threats)

Most often, MPAs do not have the capacity to address threats coming from the land (pollution, sediments) or from the open sea (oil spills, for instance). Reducing the pressures on coral ecosystems originating from land and marine activities should become a key aspect of sustainable financing of coral protection.

Sustainable fisheries

The deployment of fisheries that do not overexploit coral fish stocks and do not destroy nursery and spawning grounds such as mangroves and seagrass meadows requires very specific financing (EKO, 2014; Holmes et al., 2014), together with MPA activities (UNCTAD, 2016).

Sustainable tourism

Tourism is an important economic sector in many coral islands and coastal countries (Burke et al., 2011). Although it may bring a high volume of foreign currencies into local communities (Spalding et al., 2017), tourism has also strong negative impacts on ecosystems on which it depends (Burke et al., 2011; Shivlani, 2007). The development of better tourism practices, by both users and providers, as well as ecotourism strategies, requires financing from and involvement of both the public and the private sectors.

Restoration of coral ecosystem:

The restoration of ecosystems (reef restoration, mangrove reforestation) is estimated to bring the same amount of protection for coastal populations as man-made infrastructure (seawalls, breakwaters), while being more resilient, less expensive and providing a wider range of ecosystem services (Ferrario et al., 2014). ICRI encourages coral ecosystem restoration as a means to increase climate resilience, once threats have been addressed and reduced (ICRI, 2017). This nevertheless requires specific investment financing tools and the mobilization of material and human resources, inside and outside MPAs.

5 KEY ACTIVITIES need financing to improve coral ecosystem conservation

This first breakdown of key activities should assist practitioners and managers in targeting specific financing mechanisms in relation to the specific needs of coral conservation. Therefore, this typology of key conservation activities is highly relevant to the rest of this report.

INNOVATE WITH FINANCING MECHANISMS

Based on a literature review and interviews with experts and practitioners from both the coral protection field and conservation finance, this report lists a number of innovative financing mechanisms and aims to provide an overview of the opportunities they represent for future coral protection financing. These mechanisms are presented in figure 2 below.

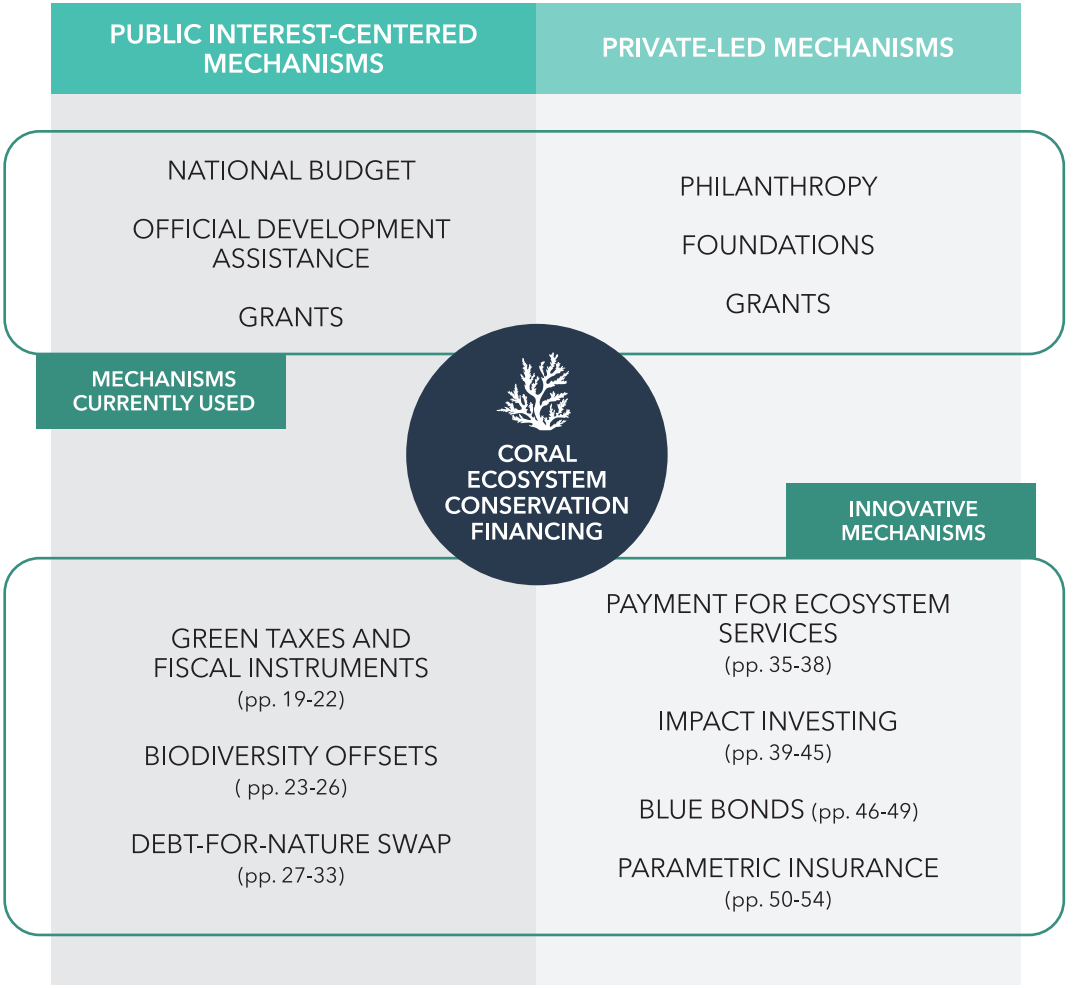


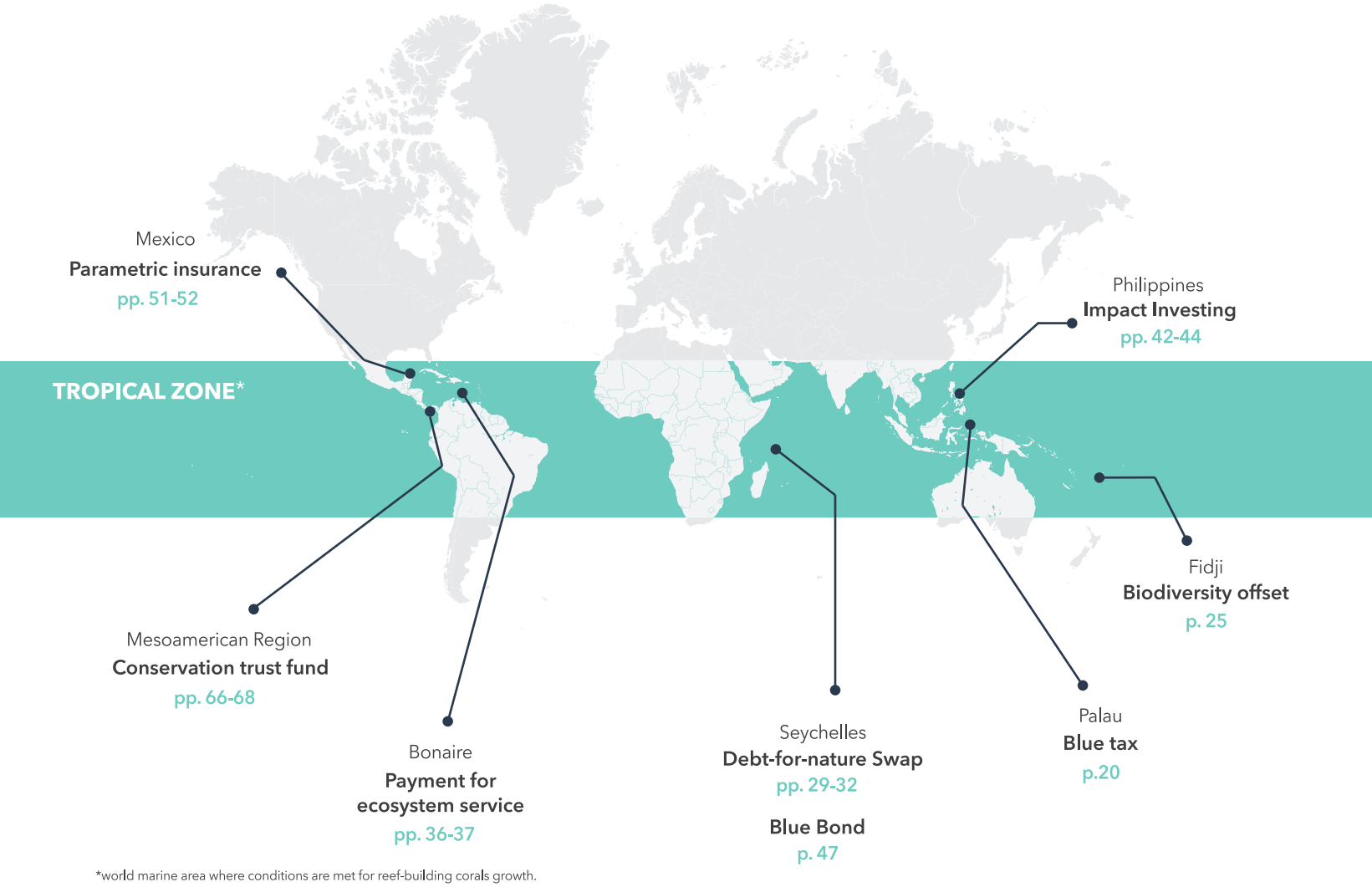
Figure 2: Presentation of innovative financing mechanisms for coral conservation

The 7 mechanisms for financing coral conservation selected for this review follow two different trends:

- **Public interest-centered mechanisms:** Environmental issues are addressed locally as societal challenges. Thus, conservation is seen as a **matter of public interest,** and all actors in the society (individuals, industries, state) must be involved in it.

- **Private-led mechanisms:** Participation in conservation financing is not coerced; funders are **incentivized to finance conservation measures.**

A practical case study related to marine conservation illustrates each mechanism. All of these are presented in figure 3, below.



*world marine area where conditions are met for reef-building corals growth.

Figure 3: Map of practical case studies illustrating innovative financing mechanisms, 2017

As shown in the sections below, most innovative financing mechanisms are already used or in pilot phase for terrestrial conservation purposes. Regarding marine conservation however, application is, for most of them, still at an early stage (see table 1 below).

Table 1: Innovative financing mechanisms and marine conservation: untapped potential

FINANCING MECHANISM	MARINE CONSERVATION USE
Green taxes and fiscal instruments	Mainly national-scale tourism taxes (e.g. Palau, Dominican Republic)
Biodiversity offsets	Six countries already have national marine biodiversity offsetting policies in place (Australia, Canada, Colombia, France, Germany, USA)
Debt-for-Nature Swap	One swap in place (Seychelles); other countries in negotiations (Granada, Jamaica)
Payment for Ecosystem Services	A few marine cases (e.g. Bonaire, Mauritania)
Impact Investing	A few cases targeting sustainable fisheries (e.g. Philippines, Chile, Brazil)
Green and blue bonds	One bond issued so far (Seychelles, pilot phase)
Parametric insurance	One case (Mexico, pilot phase)

1 REINFORCE USE OF "PUBLIC INTEREST-CENTERED MECHANISMS"

Public-interest-centered mechanisms are defined as financial instruments aimed at gathering public conservation-oriented funds through legislation. Three such mechanisms are discussed, focused on involving three different societal actors in coral conservation funding:

- **Green taxes and fiscal instruments.** These are intended to raise environmental funds mainly from **individuals**;
- **Biodiversity offsets.** These are intended to raise funds in the form of compensation from **nature-damaging industries and public development institutions**;
- **Debt-for-Nature Swaps (DFNS).** These are a wider legal mechanism, developed on a **broader scale** (in a creditor-debtor scheme), but always targeting national public interest-oriented objectives.

1 a. Green taxes and fiscal instruments

A green tax is based on the "polluter pays" principle[13] : **consumers of products or services that damage the environment pay it with the intention of offsetting their negative impact.** Green taxes are designed to be applied to environmentally damaging activities, to either increase a general budget or support specific biodiversity-related activities. In countries where tax collection is functional, implementation of appropriate green taxes could trigger a significant breakthrough in conservation finance (Gobin and Landreau, 2017). Several fiscal tools have already proved very efficient in various countries around the world (Ibid), and Conservation Trust Funds (CTFs) in particular can serve as good channeling mechanisms (see section *A precious tool: The Conservation Trust Fund*, p. 65). Some advantages and inconveniences of such mechanisms are introduced in the table 2 below.

Table 2: Advantages and inconveniences of blue taxes and fiscal instruments

⊕	⊖
■ Provide **regular and reliable source** of revenue for conservation	■ Major challenges related to **earmarking** proceeds for conservation, and **transparency**
■ No need to set up a new collection system or bureaucracy	■ Social and economic challenges in introducing new tax (e.g. **acceptability**)
■ Can potentially create **"double dividends"** by lowering existing taxes (e.g. labor taxes)	■ Clear definition of nature-damaging products and services required
	■ Need for **strong institutional & fiscal capacity**

Green taxes specifically aimed at coral ecosystem conservation are referred as blue taxes in the rest of this section. A practical application of green taxes for marine conservation can be observed in Palau (see Palau case study p. 20).

A wide range of marine or nearshore activities impact coral ecosystems in different ways. A few general cases where blue taxes could be designed and implemented are introduced in figure 4 p. 21.

[13] First mentioned by the OECD in 1972, it was only in 1992 that the "polluter pays" principle was introduced in the UN Declaration on Environment and Development. Principle 16 stated that "National authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, considering the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment". To put it in a nutshell, the "polluter pays" principle assumes that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment (Grantham Research Institute on Climate Change and the Environment, 2014).

Example of a tourism-related blue tax – Palau

In 2015, Palau became the first country to close 80% of its Exclusive Economic Zone (EEZ) to extractive activities. In 2009, it had already implemented a green fee of US$ 15 per tourist, used for financing local communities' conservation efforts under the Protected Areas Network in Palau. This initiative raised approximately US$ 2.26 million in 3 years (IUCN, 2012).

In 2012, the green fee was increased to US$ 30 to improve the entire public water and sewerage system of Palau, and contribute to the endowment fund which will help Palau achieve its promise to effectively conserve at least 30% of the nearshore marine resources and 20% of the terrestrial resources by 2020 under the Micronesia Challenge[14] . The US$ 30 green fee will be merged with the US$ 20 departure tax and an additional US$ 50 to form the US $100 Palau visitor's fee, according to a decision taken by the senate in March 2017 ("House Bill No. 10-22-1, HD1, SD1").

The Palau visitor's fee will go into the Palau Security Fund, to be used first to finance projects related to aviation, transportation, immigration, and border security. The remainder of the fund will be disbursed at the discretion of the Palau Congress for "projects and undertakings that will ensure the security and well-being of the national and state governments". This announcement in 2017 created some doubts, as the Palau visitor's fee avoids specific earmarking. However, US$ 10 of the visitor's fee will be restricted and earmarked for the Fisheries Protection Trust Fund used to finance the Palau National Marine Sanctuary.

source: Kesolei in The pacific Note journal, 2017

[14] The Micronesia Challenge is a commitment by the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, Guam, and the Commonwealth of the Northern Marianas Islands to preserve the natural resources that are crucial to the survival of Pacific traditions, cultures and livelihoods.

EXAMPLES OF POSSIBLE BLUE TAXES

TOURISM-RELATED TAXES	INDIRECT IMPACT TAXES	RESOURCE-EXTRACTION TAXES
		
WHO/WHAT IS TAXED ?		
▪ Entry or departure fee ▪ Daily fee (based on overnight stays) ▪ Specific activity or entrance fee (scuba divers, to access an MPA, etc.)	▪ Products that can be harmful for coral ecosystems (plastic bags, etc.) ▪ Inland or offshore activities (agriculture, etc.)	▪ Industries extracting directly in the marine environment ▪ Industries with upstream extractive activities that may impact coral ecosystems
OPPORTUNITIES/LIMITATIONS		
▪ Most appropriate in high-value tourism destinations ▪ Importance of feasibility study (interviews with tourism operators and tourists) to assess the willingness to pay ▪ Study of local tourism market and direct regional competitors, to make sure implementation would not shift desire to travel	▪ Clear identification of which services and products are considered nature-damaging ▪ Connective nature of marine ecosystems makes indirect impact taxes more difficult to implement ▪ Difficult to fully assess initial state of the environment and scope of the polluter's impact	▪ Huge potential where extractive nearshore industries are implemented ▪ May work mainly on a voluntary basis, given political and economic challenges ▪ Analysis of existing tax system (already implemented fiscal instruments may be harmful for biodiversity, in contradiction with the new taxes)

Figure 4: Examples of possible blue taxes for coral conservation purposes

IN BRIEF

1

BLUE TAX

CATEGORY PUBLIC INTEREST

TIMEFRAME DEPENDS ON SOCIAL ACCEPTABILITY AND POLITICAL AGENDA

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- A great mechanism to provide a **regular and reliable source of revenue** for coral ecosystem conservation if well earmarked, especially in tropical touristic destinations
- **Royalties on extractive activities,** collected on a voluntary basis, can raise a large amount of money from big companies

- **Tourism-related blue tax** is particularly suited to coral ecosystem contexts
- Blue tax can provide substantial returns if the taxed **environmentally damaging activity is chosen wisely.**
- Specific local blue tax in MPAs can represent a **large amount of an MPA's budget** (e.g. Bonaire Marine National Park)

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS

- **Implement** through fiscal reform and **blue-tax earmarking**
- Importance of **pre-existing tax collection** system and tax legislation
- **Conduct preliminary studies** to identify stakeholders, costs and possible consequences (decrease in annual visitors, etc.) to increase acceptability of the mechanism

- **Develop alternative form of tax** (royalty, license fee, etc.) to make sure "green" funds are not reallocated for other purposes
- **Assess** the sectors and **activities best suited to taxation**
- **Lower out-of-date taxes** to avoid too great an increase on individual tax bills

Further reading:

OECD, (2011). Environmental taxation, a guide for policy makers. © OECD 2011.
OECD, (2010). Taxation, Innovation and the Environment. © OECD 2010.

1 b. Biodiversity offsets

Biodiversity offsets are also based on the "polluter pays" principle: they are **"conservation outcomes resulting from actions designed to compensate for environmental impacts from development projects"** (BBOP, 2012). Biodiversity offsets are intended to be implemented as a last resort of the **mitigation hierarchy**[15] . They assume that impacts from development projects can be compensated for if sufficient habitat can be protected, enhanced or established elsewhere. The most common objective adopted in offset programs is to deliver No Net Loss (e.g. of a habitat, species, ecological status, ecosystem services) (OECD, 2014).

They usually come in three different forms, depending on national legislation about whether they are set up on a voluntary or obligatory basis (OECD, 2013; IUCN France, 2011):

- **"On-demand offset"**, in which the project owner takes entire financial and legal responsibility for compensation (CDC biodiversité, 2016). Offsetting measures are usually restoration, rehabilitation, or habitat creation or preservation mechanisms.
- **Biodiversity banking**, in which a public or private third party, specialized in compensation, sets up, without any obligations, the offsetting measures (Ruhl et al., 2006). Those actions generate offset "credits » that the third party can sell to a project owner who has to compensate for the impacts of his project. Offsetting measures are realized before the implementation of the project.
- **Financial compensation**, in which the project owner has to compensate for his damaging project by making a financial transfer to a third-party organization (UN Environment, 2012). This can be transferred to a compensation fund managed by the government or an environmental organization, to an environmental NGO or foundation, or to a territorial collectivity. Usually, financial transfers are used when on-demand offset is impossible.

Table 3: Advantages and inconveniences of biodiversity offsets

⊕	⊖
■ Offer a **conceptual framework to cooperate** with the most pollutant industries ■ Can provide substantial **additional resources from the private sector** to finance conservation	■ **No fungible unit** to capture biodiversity loss ■ So far, compensation means **conservation actions more than restoration ones,** and the added value of biodiversity offset programs on conservation can be difficult to prove (as conservation actions could have happened anyway)

[15] Mitigation hierarchy is a concept that guides project owners towards limiting as far as possible the negative impacts of their projects on biodiversity. It prioritizes actions to be taken to limit those impacts, which are first avoiding and minimizing any negative impacts, then restoring sites no longer used by a project, before finally considering, as a last resort, offsetting residual impacts. This hierarchy is known as the "avoid, minimize, restore and offset" scheme (Madsen et al., 2011).

The first appearance of such a measure in a legislative framework seems to be in the United States in 1958, in the Fish and Wildlife Coordination Act, to mitigate damages to wetlands (Ambrose, 2000). As of 2014, at least 56 countries have laws or policies that specifically require biodiversity offsets or some form of compensatory conservation for particular sets of impacts (OECD, 2014). Only **six of them have national marine biodiversity offsetting policies in place** (Australian Government, 2012; Niner et al., 2017b) while **77 nations have different levels of compensatory policies enabling the use of offsets in the marine environment** (Shumway et al., 2018) .

Regarding coral ecosystems, two types of damaging projects can be identified:

- **Direct damaging projects, taking place directly in the ecosystem** (e.g. construction of dikes, seawalls, harbors). Destruction of nearshore coral ecosystems during coastal development projects or marine extractive projects can occur. In that case, if impacts on the ecosystem cannot be avoided or minimized, restoration or conservation projects in areas of interest (i.e. areas with the same geographical and environmental characteristics as the impacted area) should be undertaken as a biodiversity offset.

- **Indirect damaging projects, implemented further inland or offshore** (e.g. agricultural or infrastructure projects, which can cause sedimentary pollution that impact ecosystems). Indirect impacts of inland activities could be mitigated either by direct offsets (creation of an MPA) or indirect ones (creation of a terrestrial protected area that could participate in climate change mitigation and reduction of erosion, thus impacting coral ecosystems on different levels). The impact of distant, indirectly damaging projects can be widespread and, for the moment, this makes it hard when designing MPAs to design specific biodiversity schemes that will take into account parameters from both the impacted ecosystem and that of the indirect damaging project.

Owing to a lack of legislation in many countries (Niner et al., 2017b), **most coral ecosystem biodiversity offsets have so far been based on voluntary schemes,** such as in the Fiji case study p. 25.

Effective offsets require a good understanding of the wider oceanographic and ecological baseline, as well as other human influences, typically across much broader spatial and temporal scales than on land (The Biodiversity Consultancy, 2017). As defined in Niner et al., 2017: "The scale and degree of connectivity between and within marine ecological units in three dimensions (Crowder et al., 2008), high biological and physical heterogeneity of both habitats and species on widely varying spatial and temporal scales (Crowder et al., 2008), poorly defined property rights and the remote nature of governance relative to population centers (Vaissière et al., 2014)" are the many challenges marine biodiversity offsets are facing.

Example of a marine biodiversity offsetting program – Fiji

There is no biodiversity offset legislation in Fiji, nor any administrative recognition of biodiversity offsets in the Environmental Impact Assessment (EIA) process or alternative mitigation measures. However, an integrated resort development project (97 residential lots, 5 tourism lots and a marina) near Nadi international airport in the south of Viti Levu in 2006 led to the conservation of 110 ha of mangroves in the southwest of the main island to compensate the destruction of 8.8 ha due to the dredging of a canal.

The initial development plan was to locate the marina at the extreme end of the island accessed by the Sabeto river mouth (north end of the island). However, the EIA mangrove assessment found this area to have the best-developed mangrove stand of the entire basin, and the coastal processes report recommended an alternative location for the marina. An alternative location at the other side of the island was accepted, avoiding the loss of an area of significant mangrove habitat.

The dredging of the canal was necessary to provide boat access to internal lots bordering the mangrove basin and resulted in the loss of 8.8 ha of mangroves. The developer, Relcorp Ltd, agreed to apply to the Department of Lands for a lease to preserve all remaining mangroves (105 ha) as a mangrove reserve. In 2011 a 99-year lease for Foreshore State Land was issued as a Mangrove/MPA to Relcorp. The reserve is managed according to a management plan allowing for traditional fishing activities by the Fishing Rights Owners and active conservation measures in the reserve.

source : The Biodiversity Consultancy, 2016

IN BRIEF

2

MARINE BIODIVERSITY OFFSET

CATEGORY : PUBLIC INTEREST

TIMEFRAME : DEPENDS ON THE SIZE OF THE PROJECT, THE SCOPE OF ITS IMPACTS AND THE CHOSEN COMPENSATION

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- Mainly **financial compensations** so far
- Development of a **few restorative coral ecosystems offsets**
- Can be a suitable tool to achieve both involvement in conservation finance and a **shift in practices by project owners**

- **Can raise a large amount of funds** from big public and private structures
- Coastal development is growing fast, which will result in an **increase in coastal-damaging activities** in the future

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS:

- First and foremost, **improve and respect mitigation hierarchy**, so that biodiversity offsets remain a last-resort action
- Carefully assess and **monitor environmental impacts** over the long term

- Carefully **address social challenges** of restoration projects
- **Improve** national / supranational **legislation** on damaging activities
- **Reinforce involvement of project owners** in compensation process to avoid them being detached from their environmental impacts

Further reading:

Barnard F., Davies G., McLuckie M. and Victurine R. (2017). Options and financial mechanisms for the financing of biodiversity offsets. White Paper.

Bull, J. W., Suttle K. B., Gordon A., Singh N. J. and Milner-Gulland E. J. (2013). Biodiversity offsets in theory and in practice. Oryx, Volume 47, Issue 3, July 2013, pp 369-380.

CSBI (2015). A cross-sector guide for implementing the Mitigation Hierarchy. Prepared by the Biodiversity Consultancy on behalf of IPIECA, ICMM and the Equator Principles Association. Cambridge, UK.

OECD, (2014). Biodiversity Offsets: effective design and implementation, policy highlights, preliminary versio.

Tucker, G. M., Dickie, I., McNeil, D., Rayment, M., ten Brink, P. and Underwood, E. (2016). Supporting the Elaboration of the Impact Assessment for a Future EU Initiative on No Net Loss of Biodiversity and Ecosystem Services. Report to the European Commission. Institute for European Environmental Policy, London.

1 c. Debt-for-Nature Swaps

Debt-for-Nature Swaps (DFNS) have been used to finance terrestrial conservation since the late 1980s (Kessel, 2006). First introduced in Latin American countries (Walsh, 1987; Moye, 2003), their functional principle is simple: it **"sets out the cancellation of all or part of the commercial or external debt of a country in exchange for promises of conservation projects development"** (UNDP, 2017a).

Among the three main types of DFNS (Kloss, 2001), bilateral ones are the most common transactions. They involve a government creditor and government debtor, and are in most cases assisted by a third-party conservation Non-Governmental Organization (NGO), which redeems part of a developing country's debt on the debt markets for a US$ discounted value. Thus, the debtor country has to reimburse the NGO directly for its new negotiated debt, with more advantageous criteria (e.g. debt rate, possibility to repay in local currency). Usually, the NGO sets up a Conservation Trust Fund (CTF) (see section *A precious tool: The Conservation Trust Fund*, p. 65) in charge of redistributing the funds. As the debtor country reimburses the NGO for its debt on new terms, the CTF uses the money to repay the initial investors and uses the remaining capital to fund a range of critical conservation activities.

Table 4: Advantages and inconveniences of Debt-for-Nature Swap

⊕	⊖
■ If the amount swapped is large enough, it may **reduce the risks of debt distress** and improve the debtor's credit standing.	■ **Limited impacts** in reducing debt burden so far, and the possibility that the burden might increase due to the debt swap process
■ Converting foreign currency debts to local-currency payment obligations can **lower the vulnerability of the debtor** to exchange rate fluctuations.	■ DFNS funds may be disbursed according to creditors' preferences, which might **not best mirror local conservation needs.**
■ DFNS prompt the creation of a CTF that dispenses proceeds over a **long period of time** & can fund projects **independently** of governments control	■ So far not all creditors have been willing to get involved (**mainly Paris Club[16] countries**).
	■ High initial transaction costs to structure such deal

[16] Paris Club: "informal group of official creditors whose role is to find coordinated and sustainable solutions to the payment difficulties experienced by debtor countries" (clubdeparis.org). It is composed of 22 permanent developed creditor countries; ad hoc participants may also been involved in negotiations (11 creditor countries so far). Observers from several institutions (e.g. World Bank, OECD, UNCTAD) are also present during Paris Club meetings, but do not get involved in negotiations. One of the main solutions provided by Paris Club countries for their debtors is a debt swap (debt-for-nature, debt-for-aid, debt-for-equity, or other local-currency debt swaps).

According to the Convention on Biological Diversity (CBD), 13 creditor countries and 31 debtor countries have been involved in DFNS (Gobin and Landreau, 2017), while **only one case of marine DFNS has been implemented so far**, in the Seychelles (see Seychelles Case Study pp. 29-32). Involvement of key actors and the financial and environmental guarantees they bring to the negotiations, as well as the evolution of both the international financial context and the national debt structure, are among the criteria to be considered when it comes to DFNS implementation (see figure 5 p. 30).

This DFNS scheme represents a first success (see figure 6 p. 31). Replication, where possible, of DFNS for SIDS[17] might be **a good instrument for facing both environmental and socioeconomic challenges** in a small coral islands context. Indeed, SIDS are the most-at-risk countries in regard to climate change, in terms of environmental, social and economic consequences, with large segments of their national economies being marine- and coral-dependent (tourism, fisheries, etc.) (Gillett, 2009).

In 2015, UNDP found that 15 of the 39 SIDS that are UN members had public debt-to-GDP ratios higher than 60%. Four SIDS – most of them in the Caribbean – reported debt-to-GDP ratios above 100%. Identifying those countries that have pre-existing commitments in terms of nature conservation, as well as international NGOs willing to get involved as a third party, and foundations ready to commit to granting a DFNS, could be the first steps towards generalizing such process. However, the global financial context, as well as the evolution of the national public budget in the short term, are to be closely watched, as they may impact both the process launch and the conduct and outcome of negotiations (see figure 5 p. 30).

[17] SIDS: 52 island countries and territories in the Pacific, the Indian Ocean and the Caribbean, sharing similar sustainable development challenges (e.g. small but growing populations, limited resources, remoteness, susceptibility to natural disasters, dependence on international trade, and fragile environments). The SIDS were first recognized as a distinct group of developing countries at the UN Conference on Environment and Development in 1992. Most of the SIDS are also gathered in the Alliance of Small Island States (AOSIS).

Example of a Marine Debt-For-Nature Swap - Seychelles

The Seychelles is an archipelago consisting of 115 granite and coral islands with a 1.4 million km² EEZ. From 2009, the presence of several national and external factors enabled the Seychelles to start its DFNS process (see figure 5, p. 30).

The favorable financial and national context in 2009 led to negotiations between the Seychelles and its creditors, resulting in the implementation of a CTF (see section *A precious tool: The Conservation Trust Fund*, p. 65), called SeyCCAT, to manage DFNS funds for marine conservation purpose

The process is still ongoing. A call for proposals was launched in 2017 by the SeyCCAT. All conservation-oriented projects wishing to be financed are currently reviewed by the board. In parallel, SeyCCAT and Seychelles financial institutions are trying to develop other financial tools (such as Blue Bond, see p. 47) to finance conservation, diversify funding sources and create more development possibilities.

Grenada and Jamaica have expressed interest in similar deals. In the South Pacific, Palau and the Marshall Islands also wish to follow suit. The World Bank is helping to bring the debt swap product to Jamaica. The country carries almost US$ 700 million in structural bilateral debt, but at this stage there is no available information on what proportion of that will be subject to a conversion, or whether it will concern the face value or only the interest rate.

source : Martin Callow, CEO of SeyCCAT
www.seyccat.org

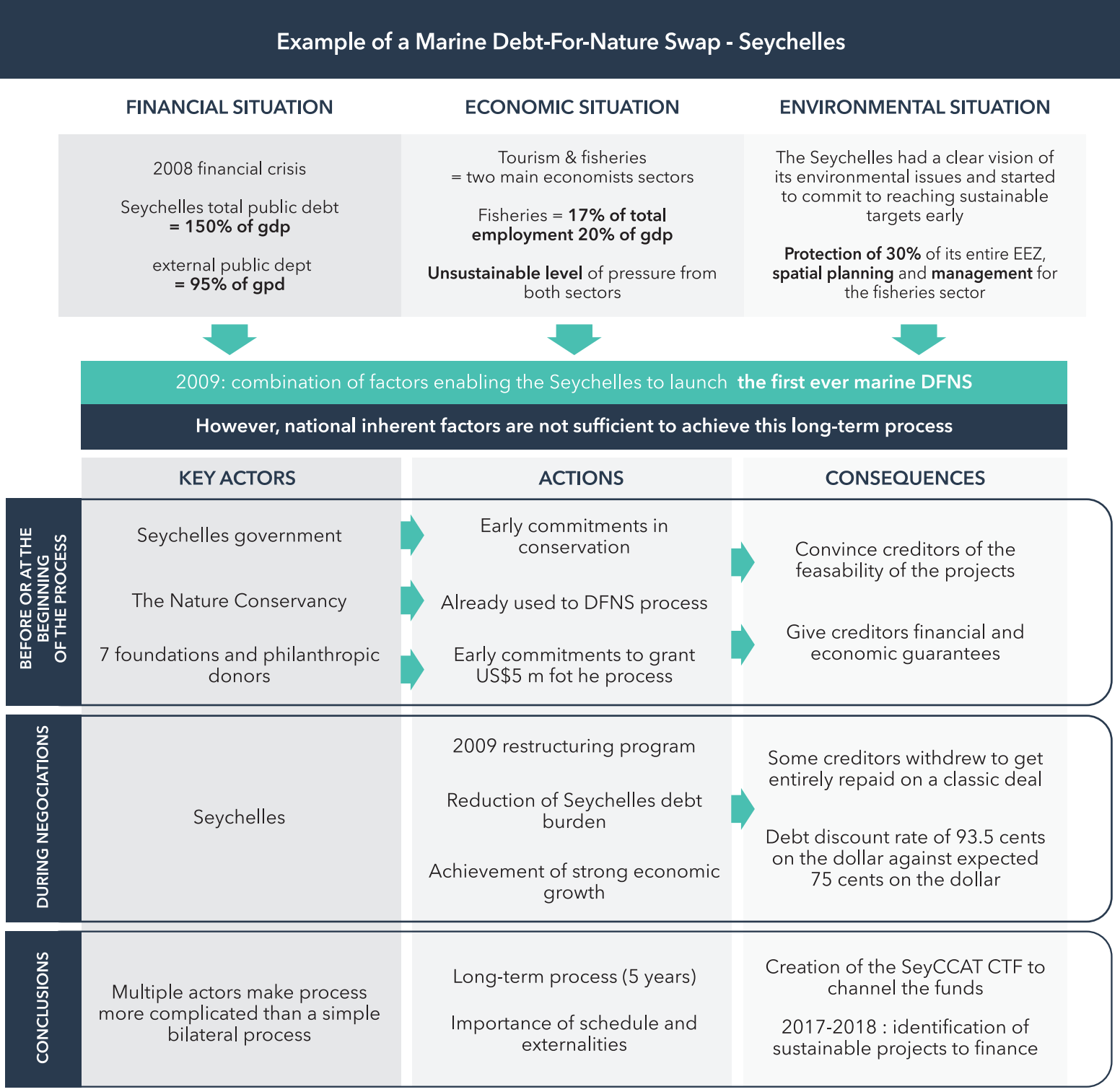
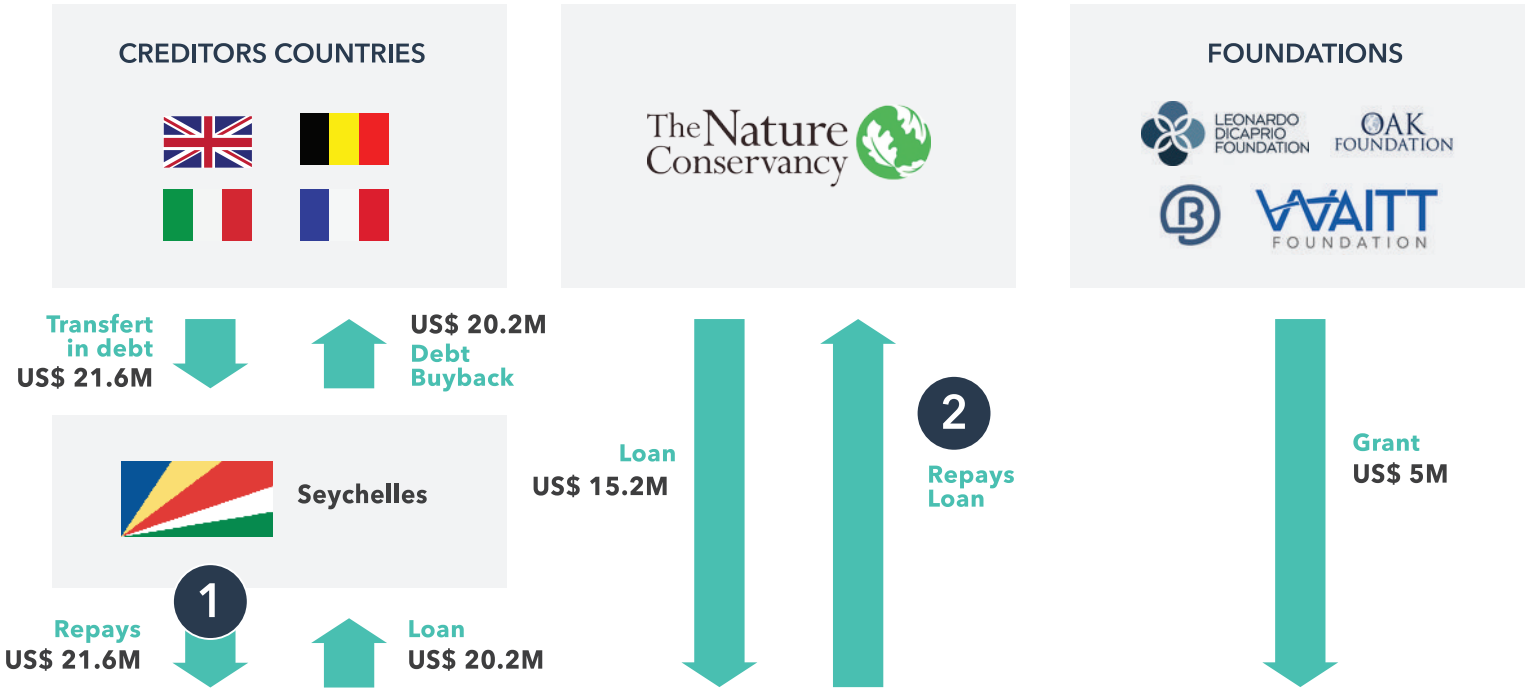


Figure 5: Seychelles Debt-For-Nature Swap process and success factors

Example of a Marine Debt-For-Nature Swap - Seychelles



SEYCCAT ROLE & CONSTITUTION

Seychelles Conservation & Climate Adaptation Trust

Manage multisource funds for mid and long-term conservation activities

CONSERVATION FINANCING OBJECTIVES

BLUE GRANT FUND

Short/Mid term

First 20 Years

3

Conservation activities

ENDOWMENT FUND

Long term

After 20 Years

4

Sustainable fishery program

30% protected EEZ

HOW DOES SEYCHELLES GOVERNEMENT USE THE US$ 21.6 MILLION DEBT TRANSFER ?

1

Two promissory note issued by Seychelles governement & owned by SeyCCAT with more favorable terms relative to original debt

NOTE 1 : US$ 15.2M at 3% over 10 years
NOTE 2 : US$ 6.4M at 3% over 20 years, with annual payments of US$ 430K / year = US$ 8.6M

HOW DOES SEYCCAT USE THE TWO NOTES ?

2

FROM NOTE 1

Repays The Nature Conservancy US$ 15.2M loan with 3% interest over 10 years = US$ 17.7M

3

FROM NOTE 2

Fund marine conservation & climate adaptation programming, disbursing US$ 280k per year in local currency equivalent over 20 years for a total of US$ 5.6M

4

FROM NOTE 2

Capitalize an endowment for future programming, investing US$ 15k per year at 7% compounding interest over 20 years for a total of US$ 3M Expected value of US$ 6.6M

Figure 6: Seychelles Debt-for-Nature Swap scheme and conservation outcomes, 2017

IN BRIEF

3

MARINE DEBT-FOR-NATURE SWAP

CATEGORY : PUBLIC INTEREST

TIMEFRAME : LONG TERM (FOR BOTH IMPLEMENTATION AND PROJECT-FINANCING)

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- **Only one** coral ecosystem conservation-oriented DFNS so far, in the Seychelles
- **Several island countries have shown their interest** in implementing such a mechanism (Granada, Jamaica, Palau, etc.)
- Can be a great mechanism to finance conservation projects at a **national scale** while **reducing financial pressure** on developing countries

- DFNS can **lead to the implementation of a CTF**, which is an important structure in managing conservation funds
- **Sovereign debt** is an **obstacle** for several developing countries in their **desire to implement new conservation policies**, even if paradoxically those debtor countries may be those most affected by climate change
- DFNS can **alleviate national budget pressure**, while allowing creditor countries to enlarge their investments in international conservation programs by reallocating funds

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS:

- **Partner up** with an international **conservation NGO**, and foundations willing to grant funds
- Negotiate with creditor countries to **reach an agreement on debt conversion rate**
- Assess the potential of **South-South DFNS**

- **Prioritize development of a independent public-private CTF** or use of an existing one, especially to settle an endowment fund to ensure long-term outcomes of the DFNS
- Accurately **analyze debt structures of developing countries** and SIDS to help identify most promising DFNS contexts
- Assess the feasibility of a regional DFNS scheme (through Alliance Of Small Island States (AOSIS) for SIDS for example)

Further reading:

Spergel, B. and Moye, M. (2004). Washington, D.C. WWF Center for Conservation Finance.

Kessel, A. (2006). Debt-for-Nature Swaps, a critical approach. Comparative Environment and Development Studies: A Seminar in Cultural and Political Ecology (Geog 488/ES 477).

Moye, M. (2001). Overview of Debt conversion. Debt Relief International Ltd.

2 ENCOURAGE THE DEVELOPMENT OF INNOVATIVE PRIVATE-LED MECHANISMS

Aside from public mechanisms, seeking alternatives to ensure funds for conservation through private investments is an increasingly popular idea among conservationists, given the availability of high volumes of funds in the private financial sector and the increased limitations on government budgets for conservation. Different mechanisms have been presented based on the principle that conservation needs financing through private actors (individual citizens and financial actors).

Private-led mechanisms assume that **individuals must choose to finance environmental protection.** These mechanisms are more incentivizing than binding. Four promising mechanisms are considered here:

- **Payments for Ecosystem Services (PES).** These are based on the relationship between users of ecosystem services and people impacting such ecosystems to incentivize the latter to modify their behavior.
- **Impact investing.** This incentivizes private and public actors to invest in projects in which they can achieve both return on investment, and positive environmental and social impacts.
- **Blue Bond.** This bond's issuance on strategic financial markets can help attract impact investors.
- **Parametric insurance.** In case of extreme climatic events, insurance funds are not used to reimburse insured persons' losses as in a classic insurance scheme. Rather, those funds are used to restore and enhance ecosystems, the health of which impacts the protection of insured assets.

PES and parametric insurance rely on the commitment of individuals at a local level, while impact investing and blue bonds are related to financial markets, and institutional and private investors.

2 a. Payment for Ecosystem Services & biodiversity fees

Payment for Ecosystem Services (PES) are a tool to pay or compensate "providers" of environmental goods and services, to encourage them to adopt new or modify existing behaviors in ways that maintain or increase the health or performance of ecosystem services (Van Hecken et al., 2015, Wunder, 2005). Table 5 introduces several advantages and inconveniences of their implementation.

Table 5: Advantages and inconveniences of Payment for Ecosystem Services and biodiversity fees

⊕	⊖
■ Incentive methods to promote **behavioral changes** are more likely to lead to long-term changes than methods based on the "polluter pays" principle	■ Necessary to design the PES scheme well, as **rebuilding can be at the expense of conservation of existing ecosystems**
■ Comes with provision of training and technical knowledge that can lead to **increased knowledge of ecosystem functioning** and sustainability for local communities	■ **Shift of pressure**: "protecting" one place reduces anthropogenic pressures, but those may be transferred to another place/ecosystem primarily designed to offer economic incentives to foster conservation, displacing social inequalities

So far, PES have broadly been used in forest- and fresh water-use cases, mainly to address deforestation, carbon sequestration, watershed and soil erosion issues (Grima et al., 2016; Young et al., 2014). **An interesting example of marine PES is taking place in Bonaire** (see Bonaire Case Study p. 36). This case is very relevant because it shows not only how PES can be implemented for coral tourism activities, but also how a PES scheme can help an MPA become self-funded.

Fishermen/women, tourists, owners of built assets protected by coral ecosystems, and bioprospective pharmaceutical industries (Rocha et al., 2011) are among the **many segments that can be assessed for implementation of PES in a coral context**, as their activities and/or livelihoods rely to different degrees on coral ecosystem services. PES paid by coral ecosystem beneficiaries to other actors whose activities inland impact coral ecosystems (e.g. pesticides impacting a wide range of organisms, higher sedimentation rates impacting turbidity) may also be a good alternative for financing coral conservation; such payments can **raise awareness among inland actors of the impact of their activities, and encourage them to change their behavior**.

Implementation of coral ecosystem protection through PES incentives needs to **address several challenges to become more efficient**. The connectivity between and within coral ecosystems (Crowder et al., 2008), poorly defined property rights (Vaissière et al., 2014), and the scope of potential beneficiaries make the cause-and-effect relationship between ecosystem conditions and the services provided harder to establish. In addition, in some non-marine case studies, one barrier to the success of PES was the **pre-existence of environmentally harmful governmental subsidies in competition with PES** (Gobin and Landreau, 2017). Fishing subsidies are estimated to be as high as US$ 35 billion worldwide, of which US$ 20 billion directly contributes to overfishing (Sumaila et al., 2013). In those cases, PES effects were expected to be low, or even nil.

Example of a Payment for Ecosystem Services - Bonaire

In Bonaire, in the Netherlands Antilles, well known for its scuba diving, Bonaire National Marine Park (BNMP) has, since 1992, covered the cost of basic park operations through a fee charged to divers and other users of the park. BNMP receives no government funding. After park managers judged funding to be insufficient for sound management of the MPA, because of several issues (inflation, expansion of managing team and materials needed, reorientation of park policies, etc.), several ideas were tested to keep the BNMP self-sufficient financially. Among them, STINAPA (the BNMP's multistakeholder management body) started to charge mooring fees for boats, increasing self-generated incomes. However, BNMP remains at an 80–90% level of self-financing. BNMP has teamed up with the Coral Reef Alliance (CORAL), a US-based NGO, to accept donations through CORAL's tax-exempt status, to supplement its budget).

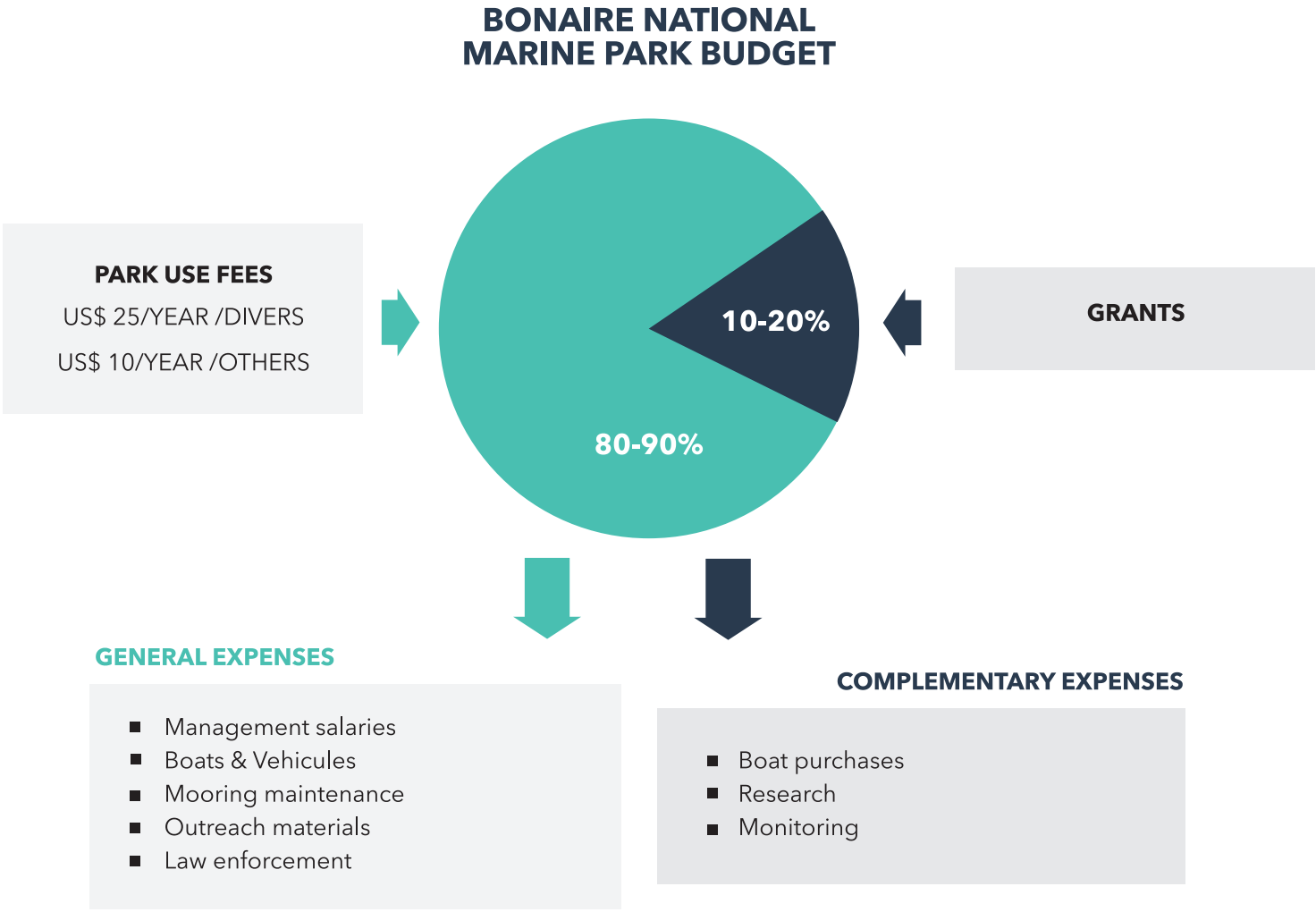


Figure 7: Self-financing mechanism through user fees, Bonaire National Marine Park

IN BRIEF

4

PAYMENT FOR ECOSYSTEM SERVICES

CATEGORY : PRIVATE-LED

TIMEFRAME : MINIMUM OF TWO YEARS OF PREPARATION FOR VERY LONG-TERM FUNDING

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- The **possibilities** of PES implementation to finance coral conservation are **numerous**
- Among them, **biodiversity fees** have the potential to raise a lot of conservation funds, permanently, espacially in countries where the economy relise on the touristic sector

- The **range** of direct and indirect **ecosystem services** provided by coral ecosystems to coastal populations is **wide**
- **Outcomes** are not only financial but also **visible in terms of improvement in individual and global practices**
- If well-managed, PES can reinforce community ties and represent an **incentive to modify people's behavior**

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS

- **Identify all stakeholders** (payers/beneficiaries)
- Reinforce **assessment of cause-and-effect relationship** between ecosystem conditions and the services provided
- **Settle an agreement** between the parties **on the value and price of goods and services** provided by the ecosystem

- **Establish norms** for governance and transactions
- **Address certain tourism-related issues** if implementation of biodiversity fees is required (definition of stakeholders, study of the link between tourism service and ecosystem conditions, multiplicity of external factors in tourists' choices, etc.)

Further reading:

Huberman, D. (2008). A Gateway to PES: Using Payments for Ecosystem Services for Livelihoods and Landscapes. Markets and Incentives for Livelihoods and Landscapes Series No. 1, Forest Conservation Programme, International Union for the Conservation of Nature (IUCN), Gland.

Mohamed, E. Y. (2012). Payment for coastal and marine ecosystem services: prospects and principles. International Institute for Environment and Development (IIED) briefing note.

2 b. Blue impact investing

Attracting private investors into environmental projects through "impact investment" is one way that is being explored of reducing the gap between financial needs and effective investment that achieves sustainable goals. It addresses both the lack of funding highlighted by conservationists and the increased interest among investors in the social and environmental impacts of their investments (Garcia Alba et al., 2015).

Although such investments have existed in different forms for decades, the term "impact investment" was created in 2007 by the Rockfeller Foundation to refer to all social investment initiatives (Greene, 2014). According to the Global Impact Investing Network (GIIN) website, impact investments are **"investments made into companies, organizations, and funds with the intention to generate social and/or environmental impact alongside a financial return.** In that way, it is different from both philanthropy (which does not seek financial return) and socially responsible investments (which seek to avoid negative impacts without necessarily requiring positive ones)."

According to the 2017 GINN annual impact investor survey, based on a global survey of 208 impact investors, the **impact investment market was then estimated to be worth US$ 114 billion.** Of all the respondents, 9% primarily target environmental impact objectives (+ 4% in 1 year) (Mudaliar et al., 2018). Among those environmental impact investments, the most targeted environmental impact is renewable energy (47% of the sample), followed by energy efficiency (42%). Figure 8, below, shows the full range of environmental impacts targeted: **ocean conservation is of least concern to impact investors , by far.**

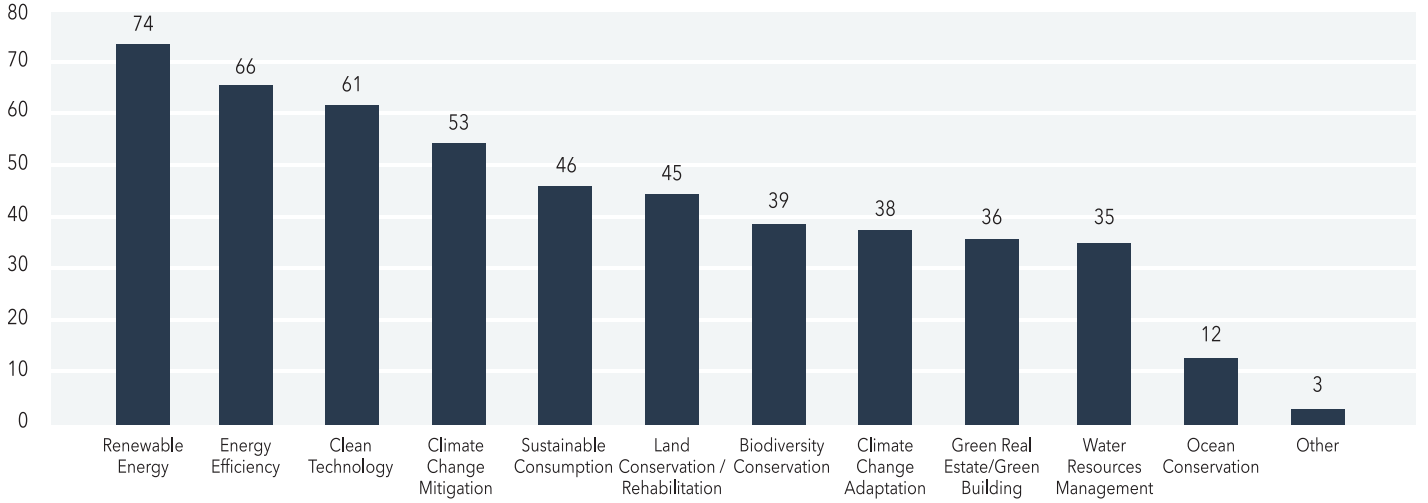


Figure 8: Environmental impacts targeted by number of GIIN survey respondents . Source: GIIN, 2016

Table 6: Advantages and inconveniences of impact investing for conservation purposes

⊕	⊖
■ Can stimulate the **creation and growth of innovative, emerging enterprises**, and hence also expand the whole economy	■ **No accepted standard** or definition of impact investing
■ Can catalyze **additional capital flows into developing economies**, and stimulate private sector development where this is otherwise absent	■ Potential creation of a **"to do good" market bubble** diverting capital from philanthropy and decreasing the grants allocated to social and environmental challenges
■ Can facilitate cooperation between public- and private-sector actors **(Public-Private Partnership)**	■ **Lack of reliable research** into and evidence on financial performance
	■ Difficulty of identifying low-risk and profitable business models

In terms of marine conservation, **impact investing is still at an early stage.** So far, it concerns mainly investments in **sustainable fisheries and ecotourism.** An example of impact investing in marine conservation projects would be to redirect fishery subsidies (Bos M. , in Wilson S., 2012).

Right now, fishing subsidies are estimated to be as high as US$ 35 billion worldwide, of which **US$ 20 billion directly contributes to overfishing** (Sumaila et al., 2013), and only **5% of total fishing subsidies have any sort of environmental aim.** Impact investing could redirect some of those funds towards sustainable fishing companies that abide by best management practices, and these could still produce a profit while providing a net environmental benefit. This could encourage private investors to do the same. A good example of impact investing for sustainable fishery takes place in the Philippines (see Figure 9, p. 43).

Ecotourism, which provides jobs to local communities and participates in the conservation of biodiversity and nature, is also **a promising sector for impact investments.** At the present time, a few cases exist (e.g. Rainforest Expeditions in Peru, financed through the EcoEnterprises Fund; the Playa Viva project, financed through Verde Ventures, in charge of impact investing for Conservation International). Both Verde Ventures and NatureVest are looking to develop new programs related to ecotourism.

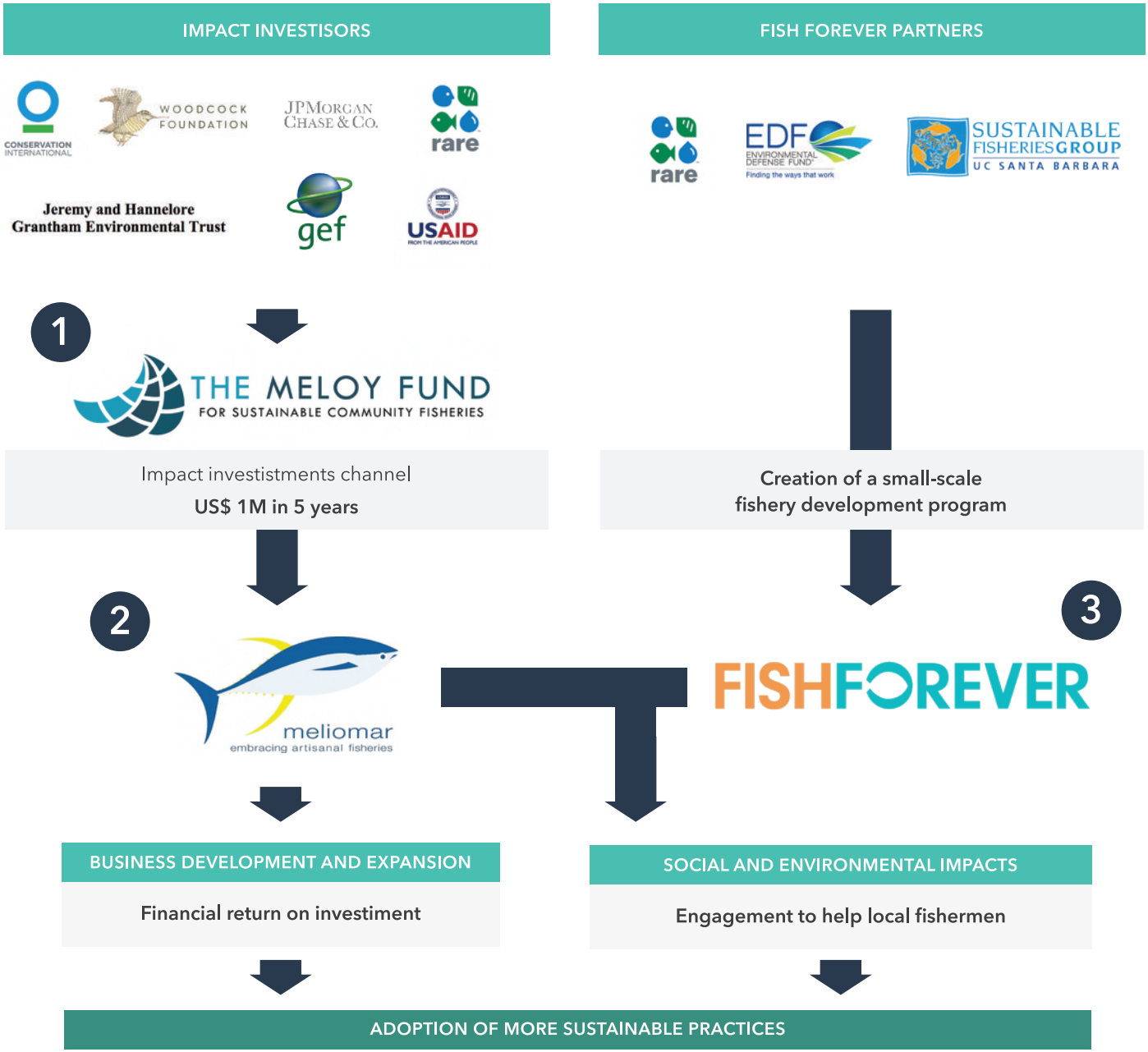
Being able to **provide robust business models in conservation, but also in sustainable fisheries and ecotourism, is a prerequisite for attracting impact investors** into those fields. So far, few sustainable fisheries projects have reached a stage where sufficient profitability can be assured. Several factors can explain it: « the complexity of fisheries management, which often involves many stakeholders and regulatory bodies; the difficulty in making firm projections of fisheries' recovery and resulting improved profitability; and the difficulty in making long-term, illiquid investments in developing countries» (Loew, 2017).

Regarding ecotourism, it relies strongly on several externalities (weather, political stability, etc.). Forward thinking about those externalities during the initial phase is necessary to better anticipate their potential impacts on funded projects and return on investments.

Example of impact investing in sustainable fisheries - Philippines

RARE is an NGO aiming to use behavior change to achieve long-lasting conservation results. It has developed several tools to improve fisheries' sustainability, especially in Indonesia and the Philippines. In this case, it helps a Filipino fishery company, Meliomar, to receive impact investments to grow in exchange for social and environmental commitments (see figure 9, p. 43).

Example of impact investing in sustainable fisheries - Philippines



Example of impact investing in sustainable fisheries - Philippines

1

THE MELOY FUND FOR SUSTAINABLE COMMUNITY FISHERIES

Created by Rare to invest in fishing- and seafood-related enterprises that will lead to better management and protection of these natural assets, while offering local fishermen/women the opportunity to secure more sustainable livelihoods.

Among other initiatives, the fund invested US$ 1 million from several investors in Meliomar Inc. in 2016.

IMPACT INVESTMENT CHANNEL

2

MELIOMAR INC

A Filipino fish aggregator, processor, importer, and exporter, founded in 2013. Investments from the Meloy Fund will help it:

- Expand its supply lines to source new species from fishermen/women in order to reduce overfishing risks;
- Create new markets and work with regionally based international hotels;
- Invest in traceability software;
- Boost its working capital so it can pay fishermen/women up front.

EXPECTED FINANCIAL AND ENVIRONMENTAL RETURNS

3

FISH FOREVER

Created by Rare, the Sustainable Fisheries Group of the University of Santa Barbara, and the Environmental Defense Fund to find ways of developing sustainable fisheries for local communities in a wide range of tropical contexts.

As part of the impact investment deal, Meliomar committed to sourcing at least 10 tons of seafood annually from fishery improvement projects (FIPs). That has been jointly developed between local Filipino communities and Fish Forever.

Apart from return on investments for impact investors, this relationship is expected to bring US$ 2.5 million in additional annual income to 16,000 local fishermen/women, and at least 12,000 ha of critically important marine ecosystems under improved management by 2021.

EXPECTED SOCIAL AND ENVIRONMENTAL RETURNS

Figure 9: Impact investment scheme in sustainable fisheries, Philippines, 2017

IN BRIEF

5

BLUE IMPACT INVESTING

CATEGORY : PRIVATE-LED

TIMEFRAME : 2–5 YEARS OF PREPARATION FOR 5 YEARS OF FUNDING

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- Still at an **early stage**
- Focuses for the time being on **sustainable fisheries and ecotourism**, the two main economic sectors in a coral ecosystem contest
- A good instrument for **bringing in new funds** for conservation purposes at both national and local levels

- The **range of impact investors is wide**, from small groups to large institutions
- Portfolios can vary widely in size and budget, and have the **potential to address all kinds of conservation issues** and sustainability projects at every scale

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS

- **Improve** local stakeholders' administrative and **business-design capacity**
- Train local sustainable businesses to **provide robust business models**
- **Convince public entities to collaborate** with private partners to implement conservation

- Clearly **assess expected return and risk associated** with the investment, conservation impact, and duration of the commitment
- **Develop visibility** of environmental and social impacts of investment

Further reading:

Credit Suisse, WWF, and McKinsey & Company, (2014). Conservation Finance – Moving beyond donor funding toward an investor-driven approach.

Credit Suisse and McKinsey & Company, (2016). Conservation Finance – From niche to mainstream, the building of an institutional asset class

NatureVest and EKO Asset Management Partners, (2014). Investing in Conservation – A landscape assessment of an emerging market.

Richter, B. (2016). Water Share: Using water markets and impact investment to drive sustainability. The Nature Conservancy: Washington, D.C.

2 c. "Coral" bonds: blue bonds for coral ecosystems

A bond is **"a form of debt security or legal contract for money owed that can be bought and sold between parties"** (Gobin and Landreau, 2017). A bond differs from impact investing in the nature of the agreement between the parts involved. In a bond agreement, the buyer of the bond is loaning money to the issuer, who thus owes a debt. Under such an agreement, the issuer has to pay at periodic agreed dates the interest on the bond (called the coupon); the initial loaned capital (called the face value of the bond) is then repaid in full at the end of the bond period.

"Green" bonds are a new form of bond, as the first one was **issued by the World Bank only in 2008**. Green bonds present several advantages and inconveniences (see table 7 below) and are used mainly as a tool for financing ecological transition and allowing investments in the energy sector (development of renewable energies, improvement of power efficiency, development of transport infrastructure with reduced greenhouse gas emissions, etc.) (UNCTAD, 2014). As a consequence, there are several green bonds related to the marine environment (called blue bonds in the rest of this section), but these focus mainly on renewable energy (e.g. hydro power stations, offshore wind farms) or port infrastructure.

Table 7: Advantages and inconveniences of green bonds for marine conservation

⊕	⊖
■ Financial actors issuing such bonds can then **communicate their environmental strategy** to raise money from Socially Responsible Investments funds	■ Mechanism is **not well adapted to financing conservation projects** (safe business models in conservation remain difficult to identify and develop)
■ Benefit from a **high credit rating** (though coupons are low), which makes repayments easier [18]	■ **No standardized criteria** to assess the environmental dimension of financed projects
■ Green bonds **market is rising sharply** in value and projected to continue to do so in the future [19]	■ **Still to be issued** (first green bond for conservation accepted only in September 2017)
	■ High transaction costs

So far, only one green bond focused on conservation has been accepted. It is dedicated to financing marine conservation activities. It was accepted by the World Bank in September 2017 (see Seychelles Blue Bond Case Study, p. 47). It still has to be issued and its real impacts in the field have yet to be demonstrated.

[18] Gobin and Landreau, 2017
[19] Worth more than US$ 130 billion in 2017, against US$ 81.6 billion in 2016 (CBI, 2018)

Example of a Blue Bond - Seychelles

In September 2017, the World Bank approved a bond of over US$ 25 million for the Republic of Seychelles, "to improve the conservation of its marine resources and expand seafood value chains" (World Bank press release, September 2017). This bond is yet to be issued. In financial terms, this blue bond will work as follow:

- A US$ 15 million bond issuance, supported by a US$ 5 million loan and a 5 million guarantee;
- This will later be supplemented with a US$ 5 million grant from GEF and a US$ 5 million non-grant instrument;
- The total funds entering Seychelles to allocate to the project will thus be US$ 25 million (plus US$ 10 million in the form of a guarantee and a loan to repay the coupon in the early years).

Two entities in the Seychelles will work jointly : SeyCCAT (see Seychelles case study pp. 29-32) will be issuing grants, while the Development Bank of Seychelles will be issuing concessionary loans to eligible organisations and businesses.

The principal goal of this strategy, in complementarity with the DFNS funds (see Seychelles case study pp. 29-32), is "to achieve the Blue economy strategy of the country, by diversifying the local economy, creating high value jobs, ensuring food security, while sustainably managing and protecting marine resources" (Mark Lundell, World Bank country director for Seychelles). This World Bank project is part of the third phase of the South West Indian Ocean Fisheries Governance and Shared Growth Program (SWIOFish) that aims to increase the economic, social and environmental benefits from sustainable fisheries.

SeyCCAT and Seychelles representatives are also thinking to extent the scope of financeable projects, as some non-marine projects may have indirect benefits for coral ecosystems (e.g. waste and wastewater treatment in coastal areas, climate change mitigation projects, etc.).

One promising aspect regarding blue bonds is that **they can be used in cooperation with other financial mechanisms to raise more diverse funds for conservation,** from a wider range of actors. Green or blue bonds issued on financial markets can theoretically **attract private and public financial actors** willing to make "impact investments" (see section Impact investing, above). In 2017, private businesses represented 37.6% of total issued volumes, while financial institutions represented 29.5% (CBI, 2018). These bonds can also be used to fund DFNS processes in developing countries (see section *A precious Tool: The Conservation Trust Fund,* p. 65).

Although green and blue bonds are part of a specific market niche on the financial market, they are nevertheless subject to financial laws. Private actors issuing them have often short- or mid-term performance targets that are not always compatible with environmental objectives.

Given the current trend of green bonds (not yet designed for conservation purposes) and blue bonds (still to be issued and not designed specifically for coral ecosystems but for broader marine issues), **a new kind of *ad hoc* bond should be developed to better address the specific financing challenges facing coral conservation: coral bonds.** This needs to be designed and developed in a different way, enabling it to address inherent coral conservation targets while giving a return on investment different from classic financial market bonds. The framework of its application needs to be regulated to make sure that only sustainable projects are funded and to avoid possible misuse of the bond. It is also important to determine the kind of funds and partners (taxes, private funds, international institution back-up, etc.) that are most likely to be mobilized through the coral bond.

IN BRIEF

6

BLUE BOND

CATEGORY : PRIVATE-LED

TIMEFRAME : AROUND 5 YEARS OF PREPARATION FOR 5–10 YEARS OF FUNDING

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- In 2017, the **first blue bond ever has been accepted** in the Seychelles by the World Bank & could open the way for other programs, depending on future success
- To be issued & tested
- Has the potential to **attract multisource funding**

- A good instrument for **bringing in new funds** for conservation purposes at both national and local levels
- Could be used to **finance DFNS** for developing countries [20]
- Depending on the bond value, can be used to finance conservation at a **regional scale**

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS

- **Involve credit-rating agencies** to enable attractive investments
- Be careful about **inherent issues of financial markets**
- Assess the possibilities of developing blue bonds at a **regional level**

- **Implement strong investment frameworks** with measurable financial return
- **Use existing CTF** to manage and negotiate blue bonds with institutional issuers
- Assess all **ethical questions about environmental and social impacts** of bonds and debt-creation mechanisms

Further reading:

World Bank (2015). Bonds for sustainable development.

KPMG International, (2015). Sustainable Insight – Gearing up for green bonds, key considerations for bond issuers.

NatureVest website: http://www.naturevesttnc.org/

[20] In 2016, the impact investing unit of The Nature Conservancy (TNC), NatureVest, was awarded a proof-of-concept grant (a grant conceded to an organization or an enterprise to establish the preliminary rollout of a specific program, process, method, principle, model, or idea to demonstrate its feasibility. It is a trial run to see if that program or idea is achievable (K-12 Blueprint, 2014). TNC will use the Convergence Design Funding award to design a blue bond that will finance debt conversions for SIDS that face climate change challenges.

2 d. Parametric insurance

One of the key ecosystem services provided by coral ecosystems is their protection of coastal people and assets (see figure 1, p. 12). Coral reefs can protect coastal populations against extreme climatic events such as hurricanes and coastal flooding. However, climate change tends to multiply natural negative factors, making coral reefs less resilient as well as increasing the frequency of extreme climatic events. If the present trend continues, **coral reefs may not be able to recover fast enough between each extreme weather event**. In that case, there is an urgent need to find ways of restoring and protecting coral ecosystems in cooperation with coastal populations and touristic operators, such as hotel owners.

A recent initiative to finance coastal protection through coral restoration, which is currently being tested in Mexico, is a Public-Private Partnership (PPP) in the form of an **alternative type of insurance, called parametric insurance**. With such insurance, compensation is based on the analysis of the behavior of an objective climatic variable (or variables for multi-risk parametric insurance), highly correlated to the risk to be covered. Unlike standard insurance policies, parametric insurance is not based on post-event losses valuation in the field.

Parametric insurance is based on the **use of one or several objective variables that measure the intensity of a particular extreme weather event** (rainfall and/or streamflow measurements inform the intensity of flooding; wind speed the intensity of a hurricane; heat the intensity of drought, etc.) (Hellmuth et al., 2009). Chosen variables are used as an index of event intensity. The amount of compensation depends on the specific value of the chosen variable during a given climatic event: more precisely, when the said variable reaches or exceeds a certain threshold value (predefined in the contract and agreed upon by both sides). One advantage among many (see table 8 below) of such insurance is that the calculated compensation is predetermined by objective variables independent of both parties to the contract.

Table 8: Advantages and inconveniences of general parametric insurance (not specific to coral ecosystems)

⊕	⊖
■ **Decrease in administrative costs** (insurance purchasing and closure)	■ Only works for risks that can be modeled with a **high level of certainty**
■ **Limitation of moral risk** (possibility that the insured party overestimates their compensation)	■ From one individual to another, calculated **compensation can be lower than real losses**
■ **Transparency**	■ Potential **market limitations**
■ **Compensation available more quickly,** right after the climatic events[21]	■ Risk that there is actually **no correlation** between the compensation established in the policy and the real losses

[21] The process is quicker because compensations is not based on individual observation of losses but on predetermined values.

Example of parametric insurance applied to coral ecosystem protection - Mexico

So far, parametric insurance has mainly been used to compensate farmers for agricultural losses in developing areas, even though other economic sectors at risk (transportation, etc.) are also beginning to use it. There is only one case of parametric insurance applying to a "natural structure": the Costal Zone Management Trust in the resort towns of Cancun and Puerto Morelos in Mexico (Tercek, 2017; Flavelle, 2017). This parametric insurance program is a Public-Private Partnership between hotel owners (insured party), the state of Quintana Roo, Mexico, an insurance company (Swiss Re), and an environmental NGO (The Nature Conservancy), and presents several advantages for coral ecosystem conservation (see table 9, p. 53).

Example of parametric insurance applied to coral ecosystem protection - Mexico

MEXICO REEF INSURANCE

Stretch of **60 km of beach and reefs** protecting resort towns of Cancun & Puerto Morelos, Quintana Roo State, Mexico

HOTEL OWNERS

Pay Swiss Re an amount between US$ 1M & US$ 7.5M for parametric insurance premiums on the policy

INTERNATIONAL INSURANCE COMPANY

If any destructive storms damage the reefs, pays out between US$ 25M and US$ 70M in any given year, mainly for restoration of the reef

STATE OF QUINTANA ROO

Acts as a self-insurance when beaches and reefs are damaged by a storm but the policy threshold value is not met

INTERNATIONAL NGO

Pays for the science-based restoration and maintenance of the reefs

Figure 10: Parametric insurance applied to coral ecosystem protection – State of Quintana Roo, Mexico

Table 9: Advantages and inconveniences of parametric insurance for coral ecosystem conservation

⊕	⊖
■ **Near-immediate payouts** leading to prompt start of any reef repairs (fast action is crucial for repairing coral that has broken off)	■ **Limited technical knowledge** to implement cost-effective restoration techniques at a large scale
■ **Local stakeholders incentivized** : if they do not participate in keeping the reefs healthy, they are more likely to pay higher insurance costs	■ Seems more appropriate for some coastal ecosystems, such as **mangroves**
	■ Can be **expensive** (actors may not be prepared to pay the insurance premium)

Many tropical costal areas are characterized by high urban and touristic development (linked to the presence of the ecosystem), paired with an increase in extreme climatic events such as hurricanes. Given that both phenomena (coastal population density and the occurrence of extreme climatic events) are likely to increase in the future, coral ecosystems in the areas under the highest pressure may enter a **downward cycle:** coral ecosystems protect growing coastal populations from extreme climatic events, but **the higher the frequency of such events, the less time those ecosystems have to totally recover.** The implementation of parametric insurance mechanisms may be a **good incentive for coral ecosystem conservation, involving those local populations** directly protected by the ecosystems. However, such insurance does not seem replicable in all coastal contexts, in terms of both ecological and financial factors.

First, the "test" of this first example of parametric insurance is taking place in one of the world's most famous touristic places. It may be harder in other contexts to find hotel owners willing to get involved in such process. The question of **how to finance the process is of primary importance** in ensuring the success of parametric insurance for coral ecosystem conservation. The first step is to assess the wide range of stakeholders who would be prepared to pay for such insurance: those who would take out the policy and pay the premium (e.g. local inhabitants, touristic sector stakeholders, tourists); and those who would pay the compensation (e.g. the state, the government) alongside the insurance company if the compensation is not covered in full by the latter.

Second, **some ecosystems seem to be more suited to restoration than others.** Although there are a lot of academic papers and experimental projects on coral reef restoration, parametric insurance may not be efficient when it comes to protecting touristic assets through coral restoration, for two main reasons. On the one hand, there is no evidence of a successful coral restoration project on a broad scale so far[22]. On the other hand, even though the literature about this is still in development, it seems that it is the geographical and physical shape of the barrier reefs that play a major role in mitigating the energy and height of waves reaching the shore, more than the health of coral reefs themselves. In contrast, **mangrove reforestation projects could feasibly be financed through such a mechanism,** as the correlation between their presence and coastal protection has been thoroughly assessed (Spalding et al., 2014; Tusinski et al., 2014), and the reforestation techniques are easier to develop[23].

To make the implementation of parametric insurance a solid tool for coral conservation, it could be coupled with biodiversity offsets (to involve owners of touristic assets in conservation during both their development and their operational phases) or with tourism-related blue taxes (to involve all tourism stakeholders, i.e. the providers and the users).

[22] An ongoing project in Grenada, "at the Water's edge", led by The Nature Conservancy, is trying to develop a hybrid solution based on classic engineering and coral restoration to help prevent coastal erosion in Greenville Bay.
[23] The ongoing project in Granada also involves a mangrove reforestation program.

IN BRIEF

7

PARAMETRIC INSURANCE

CATEGORY : PRIVATE-LED

TIMEFRAME : RAPID IMPLEMENTATION/FUNDS AVAILABLE QUICKLY AFTER A DISASTER

OPPORTUNITIES FOR CORAL ECOSYSTEM CONSERVATION

- **First case study** applied to coral ecosystems is on trial in Quintana Roo State, **Mexico**
- It is a **new way of designing insurance** that could help develop restoration processes
- **Local stakeholders incentivized:** if they do not participate in keeping the reefs healthy, they are more likely to pay higher insurance premiums
- **Funds** for restoration are **available quickly** after the extreme climatic event
- It could help to **raise awareness among coastal stakeholders** of the importance of the ecosystem service provided by coastal protection

IMPLEMENTATION REQUIREMENTS AND RECOMMENDATIONS

- **Identify insurance companies** willing to get involved
- **Improve knowledge** of protection mechanisms and restoration practices
- **Assess all stakeholders** and **incentivize them** to apply for an innovative insurance policy
- **Diversify activities** supported by insurance payment (i.e. not only restoration-focused)

Further reading:

Ibarra H. (2009). Parametric Insurance: general market trends and perspective for the African insurance sector.

Ogden, P., Bovarnick B. and Hoshijima, Y. (2015). Key principles for Climate-related risk insurance. Center for American Progress.

Tercek, M. (2017). Insuring Nature, insuring resilience. [Blog] Blog Nature.

3 INNOVATE WITH FINANCING STRATEGIES AND BUSINESS MODELS

Up to this point the report has detailed practical uses of innovative financing mechanisms for coral conservation. More general information about those mechanisms can be found in the expert literature (see "Further reading" boxes). However, **changing conservation financing mechanisms without rethinking the way they are practically implemented in the field is pointless.** We propose taking inspiration from the business world, using a standard business model to better articulate financing and the attainment of specific goals. This is, in our opinion, the missing element required to enhance the use of innovative mechanisms and the understanding of conservation needs.

Adapting a classic business model to conservation strategies could allow MPA managers and conservation stakeholders to escape the classic pattern of conservation finance and to identify, more precisely, adapted mechanisms better suited to addressing their specific needs in terms of MPA management or other coral protection mechanisms.

A business model is a plan that identifies the many parameters to be considered when starting a project (e.g. customer base, source of financing, identified partners, source of revenues). The most common tool used to get a clear view of all these factors (and used as a standard in many economic sectors) is the business model canvas (Osterwalder et al., 2011). This is a matrix of nine boxes (see figure 11, p. 56) representing the main factors a project owner must think about:

- The right side of the canvas is dedicated to **bilateral interactions with customers;**
- The left side pertains to **assets and resources, and the costs** incurred by your model;
- At the heart of the canvas is the **value proposition**[24] , detailing the purpose of the business.

Regarding the integration of business methods into conservation finance, the underlying philosophy of a business model is the same whether it is applied to a classic financial system or to an MPA. This is first and foremost to identify a "client", or a group of clients, and their specific needs. MPAs and conservation projects, as companies, must define a value proposition, which defines their intentions towards those identified clients. Thus, the same canvas can be used to build a conservation business model as a business one.

This section introduces **four basic business models for coral conservation**. These are generic models and may be further revised, mixed or modified to fit the context in which they will be implemented.

[24] Value proposition: a business or marketing statement that a company uses to summarize why a consumer should buy a product or use a service. This statement convinces a potential consumer that one particular product or service will add more value or better solve a problem than other similar offerings. Companies use this statement to target customers who will benefit most from using the company's products.

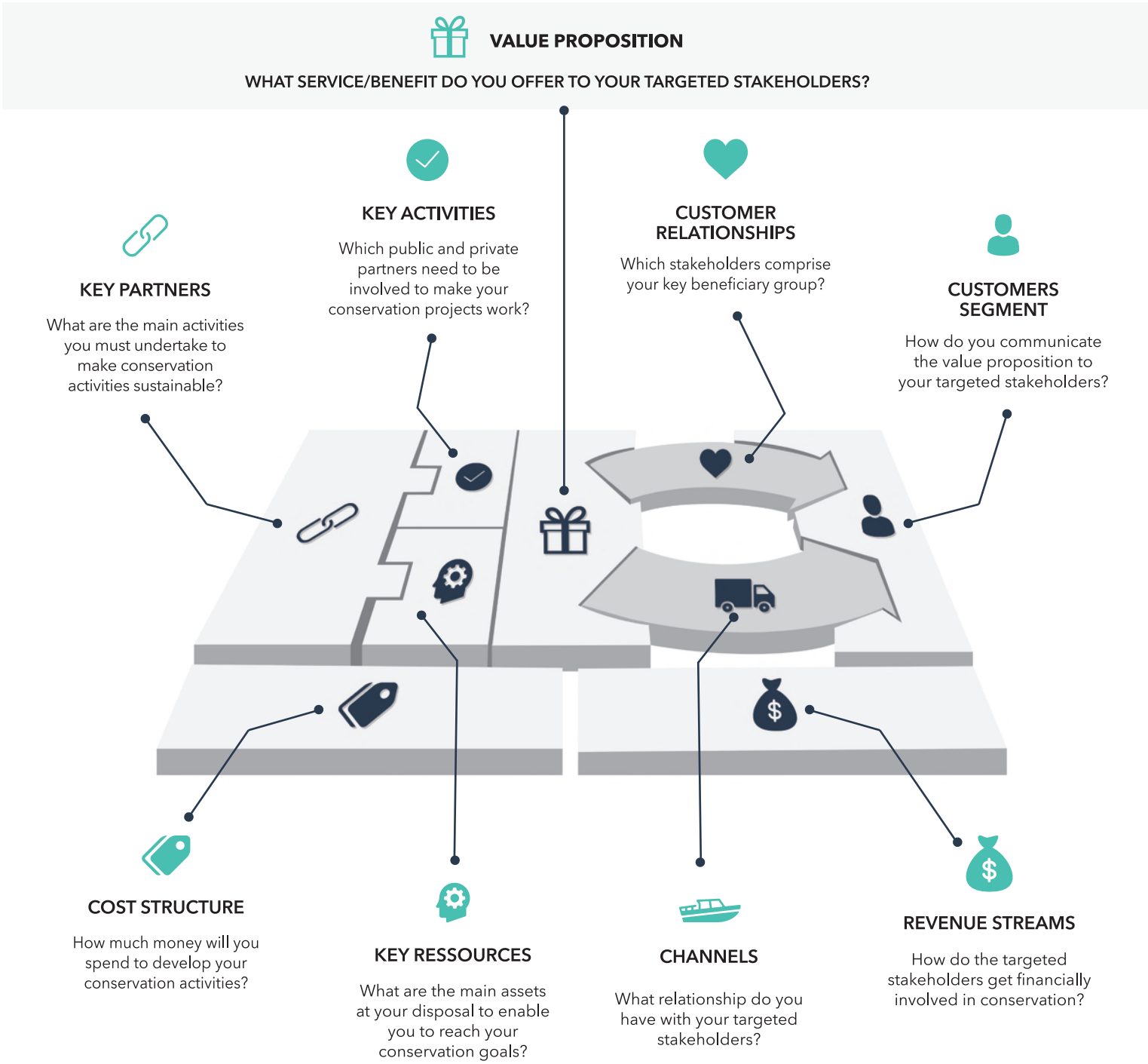


Figure 11: The business model canvas (source: www.strategyzer.com)

3 a. The "coral economy" model

This model is based on the value proposition that **coral conservation supports a whole local economy** (see figure 12, below). This model revolves around the recognition that coral is, locally, a key asset to coastal tourism and fisheries. The main revenue streams in this model are Payment for Ecosystem Services and biodiversity fees. The "customers" are tourists, fishermen/women, and any other beneficiaries of coral ecosystem protection[25].

This model can be called a **"closed-circuit model"**: the revenue streams invested by local operators for MPA management will help secure the operators' future revenues by protecting ecosystems on which their activities rely. The coral economy model could then enter a virtuous cycle.

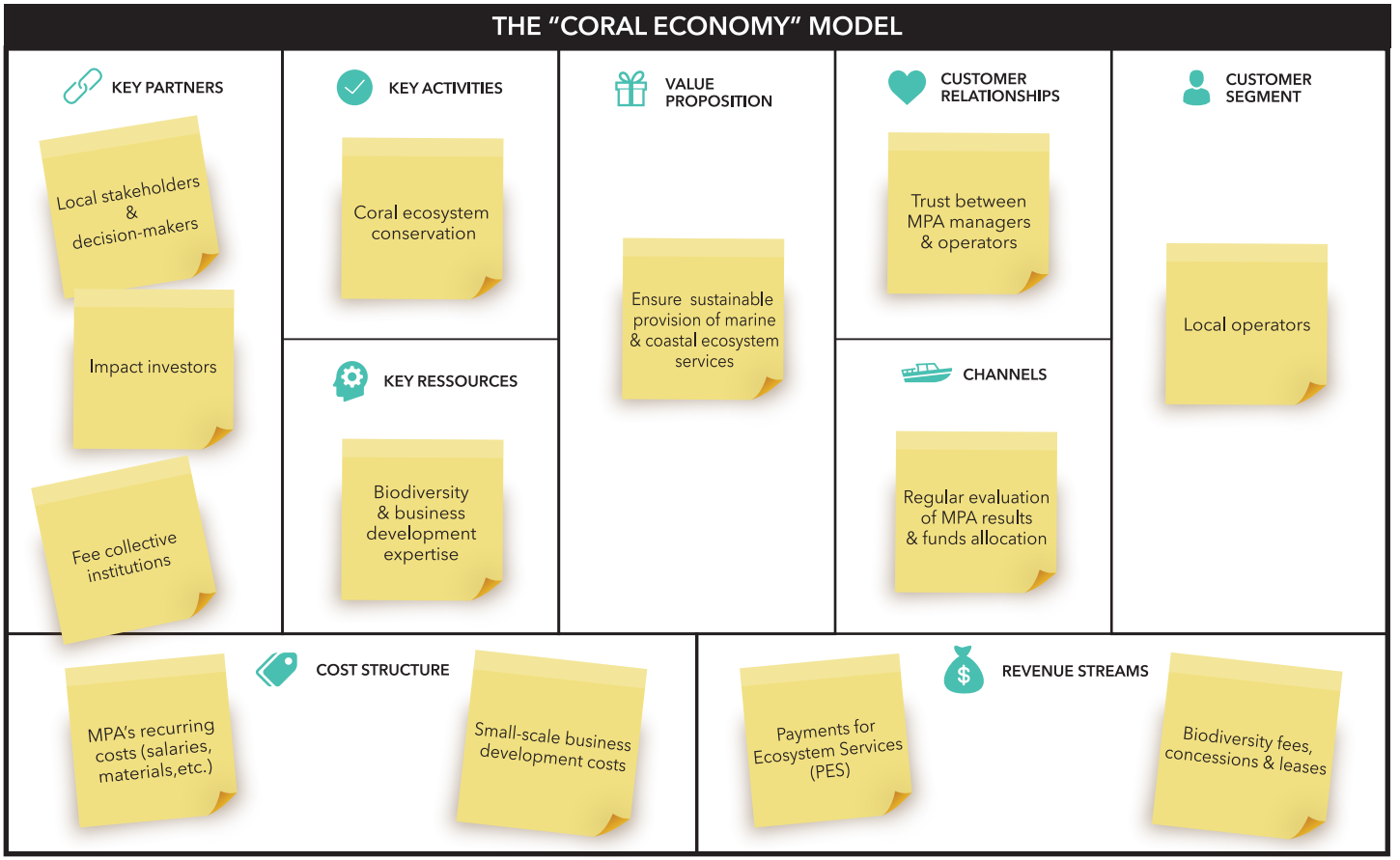


Figure 12: Example of "coral economy" business model canvas targeting local operators, 2017 (canvas frame from strategyzer.com)

[25] Such beneficiaries might be fish farmers benefiting from good quality of water, researchers enjoying rich biodiversity for their research, etc.

The financing mechanisms in this model can be coupled with innovative ones to invest in and develop MPAs and associated fees, concessions and leases. The initial proposition value in this canvas may indeed benefit from the **intervention of a specific key partner (namely impact investors) to increase financing.** This complementary type of financing relies on the provision of investment return rates to be successful. In this case, the visits of tourists or development of sustainable fisheries can generate the required returns. This model would then enter a virtuous cycle once again, as impact investors will to invest and local operators' successes would go hand-in-hand.

The two main segments identified here (local operators and impact investors) would evidently have different expectations from such a model, although both would expect their involvement to have an impact on the local marine environment. An existing institution, such as an environmental organization already operating at the local level, which has a good understanding of both local actors' needs and impact investing functioning, should be invited to participate in the scheme; this body would mediate between the key actors and manage the project administration. A portion of the project financing should go towards strengthening this institution to ensure it has the authority and resources required to ensure better communication between the relevant actors and manage the financing process.

One other important benefit of this model is that it is likely to have a **wide range of positive impacts on more than its identified client segments.** Conservation financed through this model will impact all the services provided by the protected ecosystems, not only the ones of interest to the identified customer segments. This may be worth emphasizing during the process of developing the model, especially to highlight to impact investors that their investments will go further than just helping the blue economic actors they are financing.

3 b. The "national legacy" model

This model is based on the **recognition at national scale that coral ecosystems are a public good that should be protected by public involvement.** In this case, the mechanisms for financing conservation are essentially based on national ones, and prompted by changes in regulations (see section *Reinforce use of public interest-centered mechanisms* p. 18). They include the development of green taxes and fiscal instruments (see figure 14, below). These can be powerful tools with which to generate revenue, especially if the funds are well earmarked, although **winning public support for such measures will require a combination of good communication and effective regulation.** Marine biodiversity offsets could also become an important source of revenue, though these would require a regulatory framework at national scale to be effective.

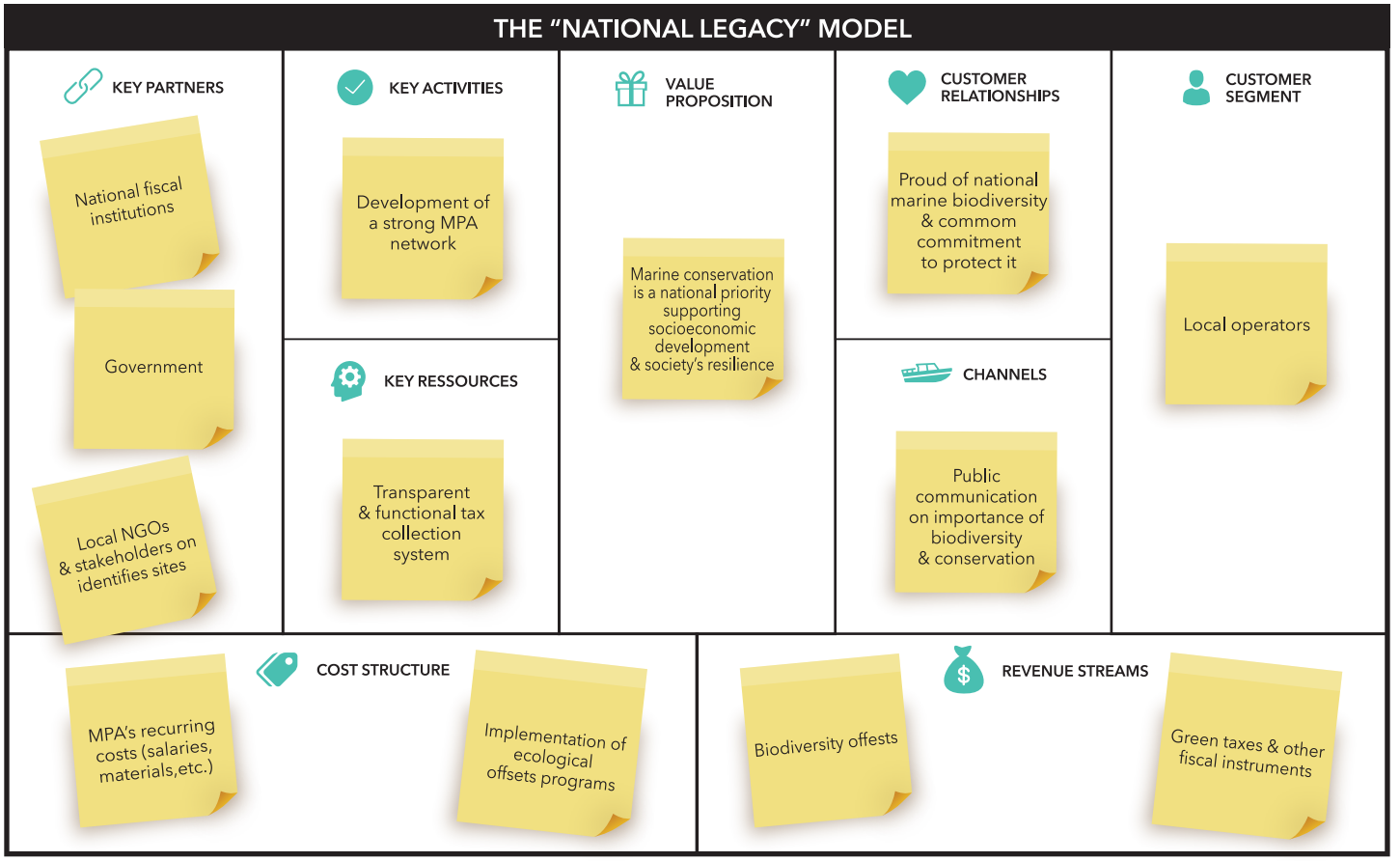


Figure 13: Example of "fiscal national legacy" business model canvas, 2017 (canvas frame from strategyzer.com)

For countries with less developed fiscal systems, fiscal instruments may be difficult to implement at first. A **Debt-for-Nature Swap may be a good option,** in case the structure of the country's debt enables such a mechanism (see section *Debt-for-Nature Swaps*, p. 27).

DFNS gives the developing debtor countries a chance to use extra funds for conservation and to fulfill their commitments. It gives developed countries the opportunity to communicate on their involvement in international conservation, as well as to recover some money that might never otherwise have been recovered. Money from debt conversion can also be used to reduce the size of the creditor country's conservation donations, or reallocated to other conservation targets.

To give a practical illustration of a DFNS-oriented national legacy model, **the model canvas is applied to the Seychelles case study** (pp. 29-32) **introduced earlier** (see figure 14, below).

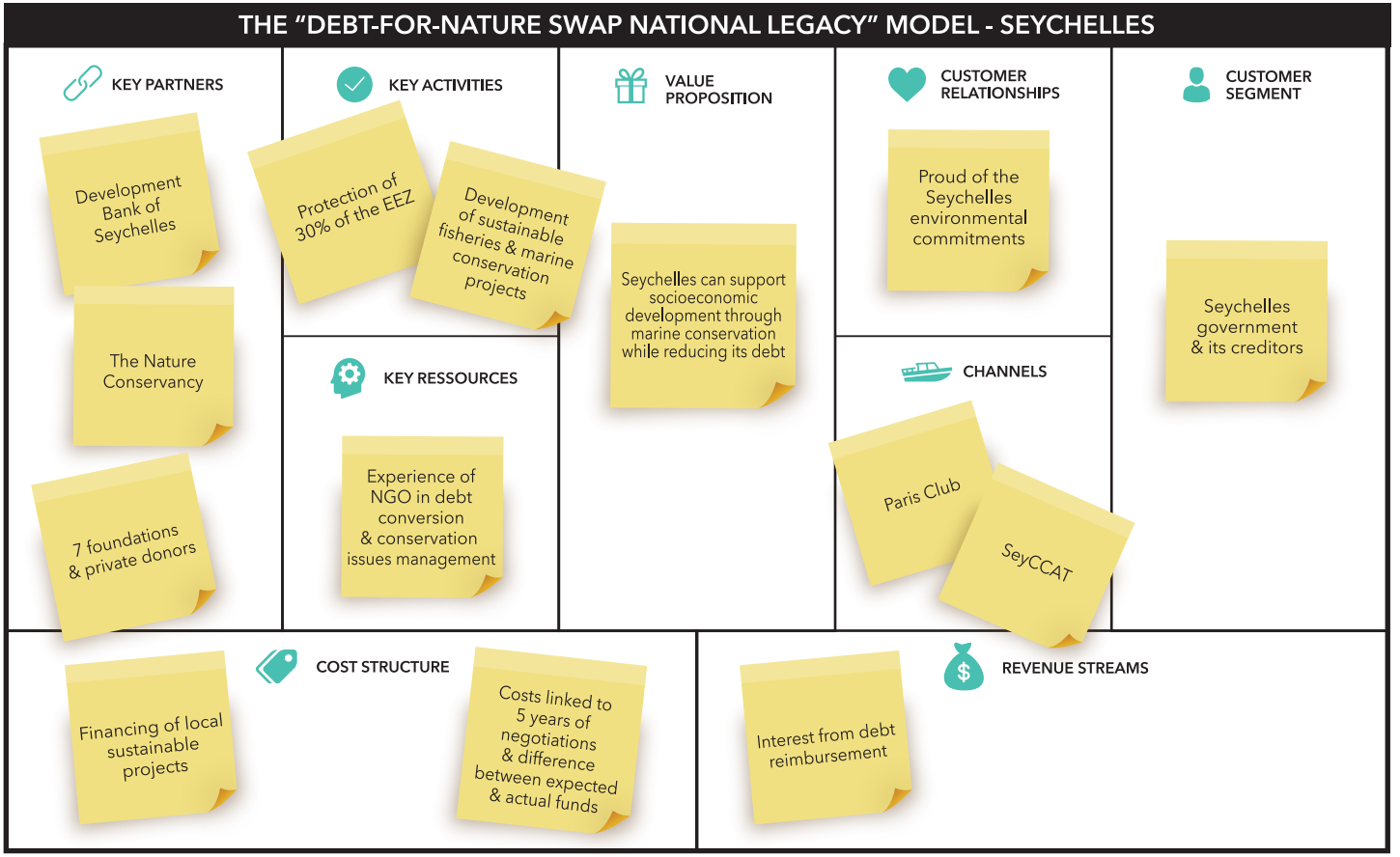


Figure 14: Example of "Debt-for-Nature Swap national legacy" model canvas applied to the Seychelles case study, 2017 (canvas frame from strategyzer.com)

The choice of one or the other model, or whether to develop a mixed model, depends essentially on the given international and national macroeconomic context, such as national debt situation, relationship with creditor countries, national fiscal context, etc. Designing a **hybrid model** may allow a country to **raise capital from a wide range of sources to achieve its national legacy objectives** by diversifying its funding. The synergy of the two canvases is important, as communication about previous implementation of green taxes and biodiversity offsets may incentivize creditor countries to develop a DFNS scheme if it convinces them of the debtor country's commitment to addressing conservation issues. Implementing a CTF is also a significant part of the DFNS national legacy canvas, given the importance of having a CTF structure to manage DFNS funds (see section *A precious tool: The Conservation Trust Fund*, p.65).

3 c. The "built-to-last" model

This model is based on managers and stakeholders engaging in the permanence of conservation. All mechanisms converge to build up a **self-financing model**, resilient and offering constant revenue streams. This model is based on the assumption that **coral conservation will be permanent only if the population living in or around the protected area can provide for their basic needs in a way that is sustainable.**

This model can be divided into two temporal phases: a capitalization phase and a self-financing phase. It favors a **microfinance approach** to help all financed projects to reach different levels of self-sufficiency. The establishment or use of a pre-existing microcredit institution should, during the capitalization phase, help local, small sustainable entrepreneurs to develop their business. The sustainability (both environmental and economic) of the financed projects will address specific needs and issues related to conservation in the area, while decreasing environmental pressures caused by local populations (see figure 15, below).

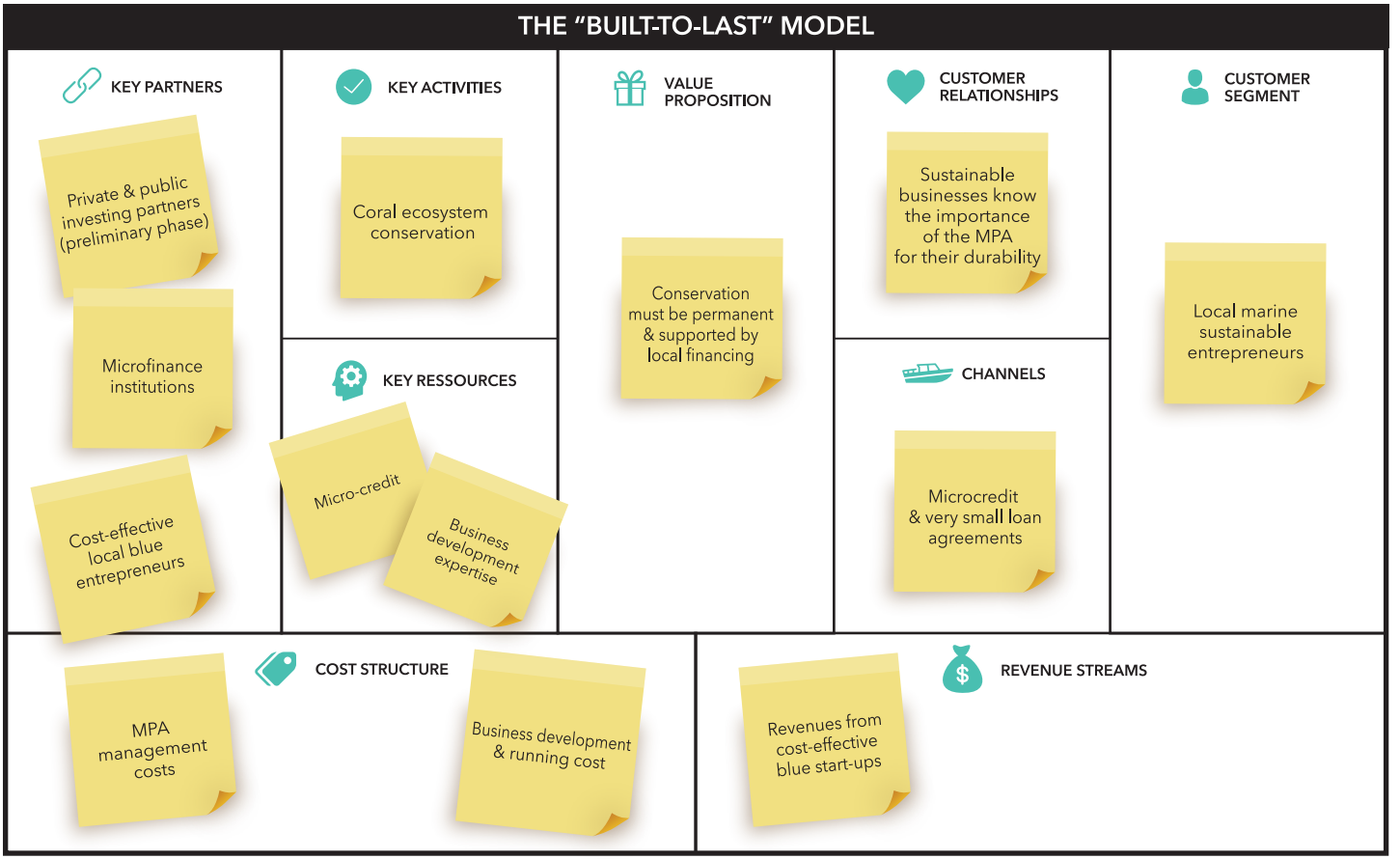


Figure 15: Example of "built-to-last" business model canvas, self-sufficiency phase, 2017 (canvas frame from strategyzer.com)

The capitalization phase could have a model of its own (not represented graphically in this report). Philanthropists and individual or institutional donors (the main contributors at the moment) are still implicated in the process. Instead of going directly to projects and environmental organizations, **start-up funds are allocated to microcredit and small loan institutions to help initiate projects.** For such a mechanism to be sustainable and cost-effective, and given the increasing interest shown by financial markets in impact investments, impact investors could at a later stage get involved in the capitalization phase by investing in the relevant microcredit institution. **The track records of financed projects and the microcredit institution could help attract those investors,** once financial and risk guarantees are better assured than at the beginning of the process.

The temporal boundaries between the capitalization and self-financing phases are not set in stone, as the involvement of external partners may continue even after sustainable businesses have achieved enough self-sufficiency to fund conservation activities by themselves. **A temporal evolution of key partners can also be envisaged in the self-financing model**: philanthropists and public funds provide support at the beginning to help blue small entrepreneurs through the microcredit institution; impact investors may then be attracted in once the blue businesses attain economic sustainability. Their investments in the microcredit institution could either **continue to finance those blue businesses** to help them become more sustainable, **or they could help to finance new blue entrepreneurs** in the area. In that case a business model combining the preparatory phase (importance of key partners) and the self-sufficiency one (sustainable businesses not only finance conservation, but also attract additional external capital by becoming financially attractive to impact investors) could be designed, to better address the entire scope of the financing process.

3 d. The "blue infrastructure" model

This model is based on the **protection offered by the coral reefs, mangroves and seagrass meadows to coastal populations against extreme events and climate change more generally.** Central to this model is recognizing the built capital on the shore that depends on marine ecosystems for their protection. The innovative financing mechanisms could include parametric insurance, financed by identified and willing-to-pay stakeholders (tourism operators, coastal populations, government, etc.). Also, PES could be developed to finance ecosystem protection (e.g. shrimp farms benefiting from the protection of mangroves could finance their conservation).

This model is focused on the provision of one specific service provided by coral ecosystems (see figure 16, below). The appeal of such a model is that protection of those ecosystems will not only maintain or enhance the targeted service, but also a wider range of economic and non-economic services. Therefore, the blue infrastructure model is likely to have a positive impact on other beneficiaries, which is something that should be highlighted when designing and marketing the business model to the relevant customer segments. Showing coastal populations the importance of healthy coral ecosystems for their own sake, and finding partners to design the parametric insurance, are key to the development of this model.

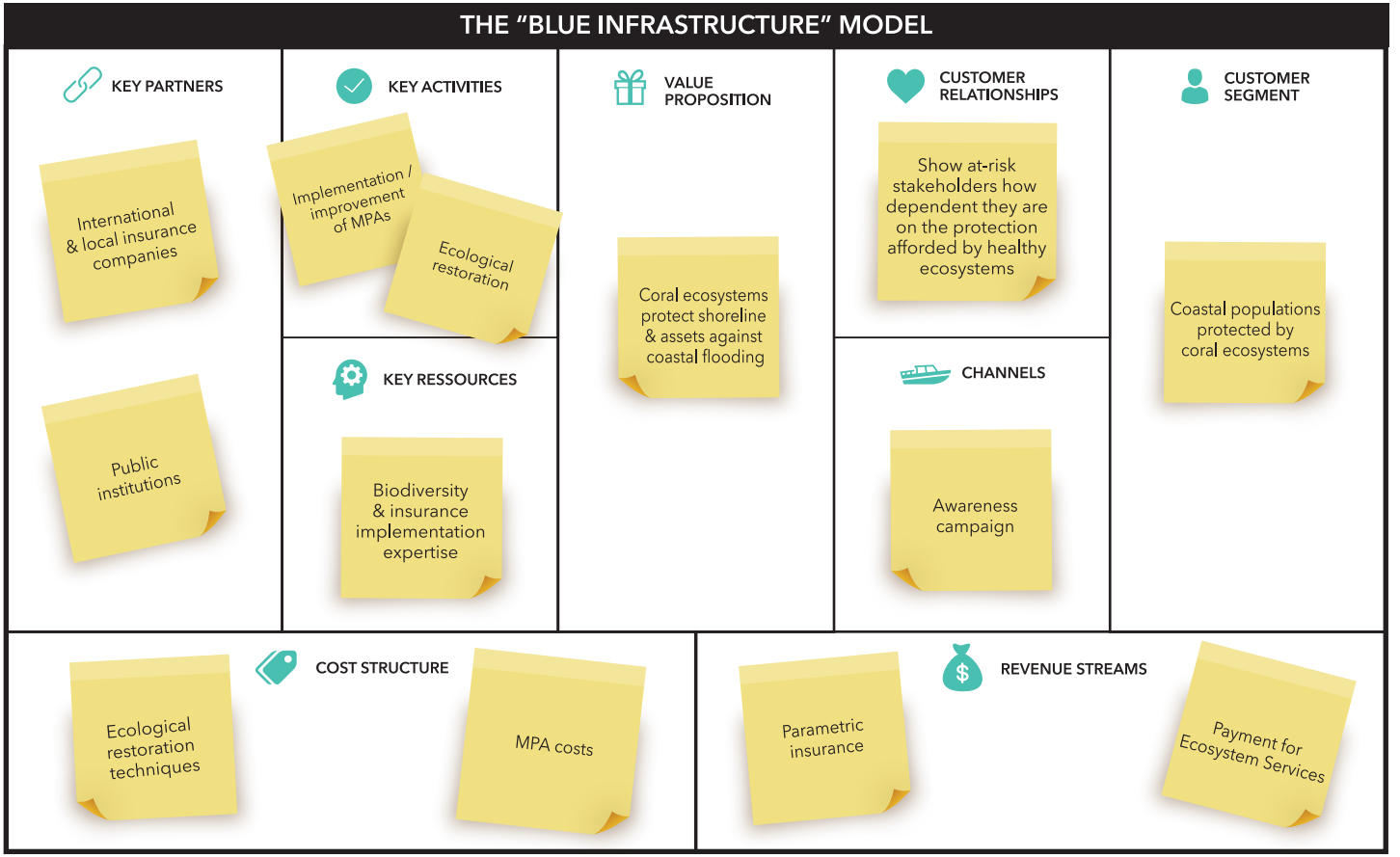


Figure 16: Example of "blue infrastructure" business model, 2017 (canvas frame from strategyzer.com)

The model as designed above presents **two main revenue streams** as mechanisms to finance the general protection and enhancement of coastal protection services provided by coral ecosystems. For greater efficiency and to address a broader range of issues, a stronger "blue infrastructure" model could be designed, with the two main revenue streams (parametric insurance revenues and PES) **targeting different impacts on connected coral ecosystems.** For example, parametric insurance could be used to target mangrove restoration, while PES could serve to develop MPAs and reduce potential anthropogenic impacts on coral ecosystems. **The connectivity between coral ecosystems is significant, though not yet fully understood.** So the two processes would work together, as mangrove restoration would be less efficient without strong MPA policies, and coral ecosystems would benefit from restoration and/or replanting. The main challenge presented by this model is how to assess precisely which stakeholders should pay for the coastal protection. Parametric insurance, as well as PES, can be envisaged at an individual level (tourism operators, citizens protected by the reefs, etc.) or at a national level (the State). The high number and wide dispersal of people who are protected by coral ecosystems might put specific individuals off paying for a broader range of stakeholders.

Over time, **as both coral restoration techniques and knowledge of the ecosystem parameters involved in coastal protection evolve, this model has the potential to become a strong financial tool for coral conservation.**

Conclusion on business models

Innovation in financing mechanisms cannot bridge the coral protection financing gap if their practical implementation in the field is not rethought at the same time. The adoption of a built-in financing strategy and a business model adjusted to the specific needs of MPAs or other coral protection mechanisms seems necessary to fill this gap, totally and sustainably. Several conservation business model canvases have been introduced above, addressing some of the challenges faced by marine conservation stakeholders. However, **the models introduced above are not fixed.** Depending on the local environmental and economic context, as well as international financial one, **they must be adapted and/or combined to better address inherent issues and challenges there.**

The traditional business model was designed for use in environments where the primary goal is to make money; but that is not the primary motive in conservation. So, **if decision-makers were to choose to use business models as part of their coral conservation strategy, designing their own business model canvases to reflect their unique constraints and challenges would be the first, essential step.** Some business models for NGOs and social enterprises have been designed to address specific challenges experienced by these organizations. Although they do not target the same issues as the ones faced in conservation, they could be an inspiration in developing specific business models for coral conservation.

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Osterwalder A., Pigneur Y., Business Model generation. A handbook for visionaries, game changers and challengers. John Wiley & Sons, INC., 2011

4 A PRECIOUS TOOL: THE CONSERVATION TRUST FUND

In the coral conservation business models described above, there is a strong reliance on preparatory funding coming from key partners. Once conservation business models have been designed and the best-suited financial mechanisms identified, MPA managers and conservation decision-makers must consider two questions:

- **How will the funds be transferred from investors to conservationists?**
- **Who will be in charge of controlling the flow and the use of allocated funds on a broader scale?**

Complex financial engineering mechanisms, involving different kind of structures, are necessary to collect and allocate conservation funds; Conservation Trust Funds (CTFs) are one of them. CTFs were first developed for biodiversity protection in South America (Clément et al., 2010) to achieve lifelong financing for Protected Areas. In terms of coral ecosystem conservation they are a promising structure, as demonstrated by some of the examples presented in earlier sections of this report. CTFs, which can be national or regional, possess several features giving them the potential to become leading instruments for conservation finance.

As defined by UN Environment, a CTF, or environmental fund is an "**independent investment entity implemented to mobilize, blend, and oversee the collection and allocation of financial resources for environmental purposes**". In terms of its financial structure, an environmental fund can take three main forms:

- **A sinking fund,** which spends a determined portion of its capital annually, over a defined period, until it sinks to zero;
- **A revolving fund,** which is restocked or augmented on a regular basis, usually through fees or taxes;
- **An endowment fund,** which operates by allocating a share of the income generated by the "endowment", usually composed of (or invested in) stocks or other revenue-generating assets.

Some environmental funds are made up of a combination of the above (Preston et al., 2012), such as the SeyCCAT in the Seychelles, or the regional Mesoamerican Reef (MAR) Fund (see MARFund case study, pp. 66-68).

Example of Conservation Trust Fund - Mesoamerican Reef Fund

The MAR region encompasses the largest coral reef in the Atlantic. Its coastline stretches for 1,000 km, from the tip of the Yucatan Peninsula in Mexico to the Bay Islands in Honduras, passing through Belize and Guatemala.

MAR coral ecosystems provide revenue and food services to at least half of the 1 to 2 million people living on the coastline (FFEM, 2017). MAR's contribution to the local economy has been estimated at US$ 2.7 billion in terms of tourism, US$ 395 million in terms of fisheries, and between US$ 944 million and US$ 2.8 billion in terms of coastal protection.
In 2004, four conservation national funds (one from each of the four Mesoamerican Region countries) were brought together to create a regional conservation fund, the MAR Fund.

Example of Conservation Trust Fund - Mesoamerican Reef Fund

25 INSTITUTIONS FORM VARIOUS HORIZONS

NOAA · cooperación alemana · KFW · WWF · Rosenstiel School of Marine & Atmospheric Science · the David & Lucile Packard Foundation · Niparajá · Conservation International

8 INDIVIDUAL DONORS

MESOAMERICAN REEF FUND


In 2004, conservation funds from the 4 MAR countries initiated the fund


MAR FUND

Regional coordinating & fundraising institution

Participatory, privately managed fund

BUDGET

US$ 19.6M in sinking funds in 11 years between 2004 & 2015

US$ 23.6M in a endowment fund since 2013

Example of Conservation Trust Fund - Mesoamerican Reef Fund

DECISION MAKING ORGANISATION

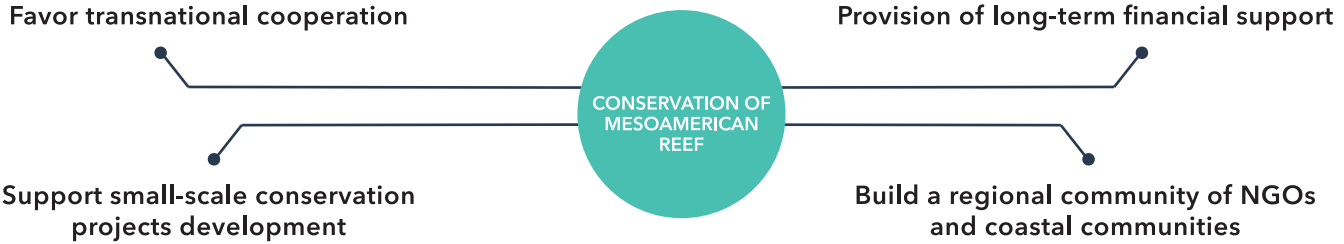
BOARD OF DIRECTORS REPRESENTING A DIVERSE GROUP OF STAKEHOLDERS

- 4 founding national funds
- 4 national representatives
- 1 central American Commission on Environment & Development (CCAD) representative
- 7 donors / collaborators from international community

5 ADVISORY COMMITTEES

Governance | Development | Investment | Grants & Evaluation | Audit

MAIN OBJECTIVES



HOW ?

- 14 priority areas : more than 10,000 km²
- **Etablishment of new regional strategic alliances** (Connectivity Network, Mesoamerican Reef Rescue Initiative, Lion Fish working group, Manatee working group)
- 52 small projects financed, 24 communities & 21 NGOs are benificiaries

Figure 17: Organization and functioning of the Mesoamerican Fund, 2017

The governing body of an environmental fund is usually made up of representatives from ministries, civil society organizations, international organizations, and the private sector. In some examples of Funds in charge of channeling money from DFNS processes, representatives from creditor countries may also be involved (see section *Debt-for-Nature Swaps*, p. 27).

As institutional structures, CTFs can accommodate several financing mechanisms:

- **Debt-for-nature swaps** are a major part of environmental funds, given that 56% of the capital received by the 40 largest CTFs has come from bilateral debt reduction programs[26] (CFA, 2008).
- **Environmental bonds.** In September 2017, the World Bank approved a bond of over $25 million for the Republic of Seychelles which will be managed by the SeyCCAT (World Banks press release, September 2017) (see Seychelles case study p. 47).
- **Impact investing.** The Seychelles blue bond will be issued on strategic financial markets by the government of Seychelles (sovereign issuance) and co-managed by the development bank of Seychelles and the SeyCCAT to attract impact investors, which funds will be managed by the latter.
- **Public taxes or fees.** Being controlled by such structure improves their earmarking.
- **Parametric insurance.** In March 2018, The Nature Conservancy, the State Government of Quintana Roo, Mexico, and partners from the science community developed the Coastal Zone Management Trust, which covers a portion of the Mesoamerican Reef along Mexico's Yucatan Peninsula. Among its responsibilities, the Trust will act as an intermediary between holders of insurance against reef damage (beachfront hotels, tourism industries, local government, etc.) and the insurance company, Swiss Re (see figure 10, p. 52).

As for its financial structure, a CTF can both collect funds from several sources and allocate funds to several beneficiaries. The SeyCCAT for instance will, in the future, channel money from the Seychelles DFNS and from the Sovereign Blue Bond towards conservation projects financing.

This characteristic of CTFs means they could also be implemented on a broader scale. The idea would be to **group together nations experiencing the same environmental issues and challenges** and to create a CTF to service all of them, run by one international environmental actor (a recognized NGO, for example). Setting aside technical challenges that might arise, it is possible to envisage the **implementation of a regional or even international environmental fund in charge of managing one or several of the financing mechanisms described in the first section of the report** (*Reinforce use of public interest-centered mechanisms,* p. 18) to address transnational conservation issues. For example, in 2016, the impact investing unit of The Nature Conservancy, NatureVest, was awarded a proof-of-concept grant. TNC will use the Convergence Design Funding award to design a blue bond that will finance debt conversions for Small Island Developing States (SIDS) facing climate change challenges.

[26] Conservation funds generated from DFNS peaked in 1992 and 1993, at a time when debt cancellation was high on the global agenda after the first 1992 United Nations Conference on Environment and Development (also known as the first Rio conference). During this conference, the Climate Change Convention was agreed upon, and the Convention on Biological Diversity was opened for signature.

Debt conversions financed throught such financials engineering mechanism could be used to address similar issues in neighboring contexts. In addition, national environmental funds could potentially channel funds from other sources with a more specific national focus to address endemic issues.

The idea is to keep all nations involved in the arrangements at a regional level. Doing so presents several benefits. A lot of countries in a specific region are **dealing with the same climate change issues and challenges** (increase in hurricane occurrence, sea-level rise, etc.). This is especially true when it comes to Small Island Developing States. In addition, sustainability of fisheries, while being a widespread issue globally, is a national concern for many SIDS given the importance of this sector in their economy. A lot of fish on which those populations rely are part of scattered moving fish stocks, even while an important part of their life occurs within coral ecosystems. **Matters of stock durability and stock resilience cannot only be addressed at a national level.** For example, changes in fishing practices in a South Pacific island country may not have the desired impact on fish stocks if neighboring countries are not addressing those issues in the same way. Implementing a regional MPA network to enhance fish stocks resilience and connectivity could be facilitated by the development of a regional CTF. **Working at the regional scale could also facilitate exchange of know-how through the conservation funds.** Depending on the progress of each country project, partners might be able to avoid mistakes or reorient their conservation practices and policies towards what has been found to work in other cases.

In the case of **tourism**, too, **gathering countries into such regional arrangements could improve conservation-oriented measures**. Several countries within a given region (Caribbean, South Pacific, etc.) often present a **similar touristic offer for major tourism markets** (North America and Europe), in terms of activities and prices. Therefore, one country may be reluctant to transform its touristic offer into a more sustainable one for fear of seeing visitors bypass it for another destination. Making mutual funds available to such countries through a regional CTF, to encourage all the identified countries to make similar modifications to their tourism offer, could hasten their progress towards sustainable tourism.

Finally, it may be easier, in terms of logistics, to gather together regional countries rather than more dispersed ones, given that most of the time these are **already engaged in regional economic or environmental partnerships.** The question of macroeconomic externalities remains important here, as a bad evolution of international financial markets, or even an economic downturn in only one national partner, could put at risk the entire financial arrangement.

However, **given the similar challenges faced by coral ecosystems worldwide,** and the **urgency of protecting coral reefs stated by many experts and governments** (Hugues et al., 2017, International Year of the Reef, 2018), it could be necessary to **go a step further by implementing a world conservation fund dedicated to coral conservation.** The main objectives of this International Coral Conservation Trust Fund would be to collect additional private and public resources to finance research, conservation and restoration of coral ecosystems. Such a fund could be created ex nihilo or hosted by an existing institution (ICRI, GEF, etc.). This structure could channel innovative financing mechanisms such as those introduced in this report, but also test conservation business models in pilot sites, to develop new practical approaches in the field and so accelerate the pace of coral conservation.

Conclusion: CTFs are a tool already widely used to channel conservation funds from different sources, which can still be improved to better respond to local and regional marine conservation challenges. Other forms of financial engineering may also emerge in the future (e.g. Park Bonds, Project Finance for Permanence). Though promising, they have not been explored in this first study.

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CONCLUSION

It appears **urgent to diversify the financing pattern for coral conservation,** which relies too heavily on philanthropy and government budgets, and remains insufficient. The 7 financing mechanisms described in this report may be able to fill part of the marine conservation financing gap, if well managed. One of the keys to success is that conservation should not rely on one mechanism. On the contrary, **conservation should be financed by a mix of traditional and innovative mechanisms,** both public and private, depending on local marine conservation priorities and objectives. Some mechanisms are better suited to financing specific conservation actions than others. **Identifying the most urgent objectives in each context will allow conservation stakeholders to determine the best financing sources.** This mix of financing mechanisms could also avoid the potential impacts of external financial factors.

Finding new mechanisms through which to finance coral conservation **will not be sufficient to address global challenges** if the methods of financing are not rethought at the same time. The **setting-up of a new approach, based on business models, is necessary to make sure practitioners engage in new financing mechanisms.** The basis of a business model can be applied to a classic financial system or to a conservation activity. This is, first and foremost, to identify a "client", or a group of clients, and their specific needs. The definition of a clear **value proposition**, defining business intentions towards identified clients, is key to understanding what is to be achieved in a specific context, and what kind of financing mechanism is best suited to the task. Four business models, addressing specific coastal challenges and needs, have therefore been proposed in this study. It is up to conservationists and local stakeholders to make their chosen model their own and adapt it to their specific needs. Although business models have not been applied to marine conservation projects before, they have already been adapted to address initiatives such as social business. **Thus, it will also be necessary to think about and design new business models specially adapted to the inherent parameters of conservation projects.**

Based on the new approach introduced above, and mindful of the increased threats to coral reefs at a global level and the urgency of protecting them as highlighted by many experts and international institutions, we propose below some recommendations to address coral conservation financing issues.

FAVOR NEW FINANCING APPROACHES FOR CORAL CONSERVATION IN THE FUTURE:

1. Identify current and future environmental issues and the financial mechanisms best suited to addressing them
2. Assess the regulatory or legal gap for the development of alternative financing mechanisms
3. Assess the social, economic and political acceptability of different mechanisms in various contexts
4. Promote private investments for coral conservation

ADAPT BUSINESS MODELS TO CONSERVATION TO MAKE PROJECTS MORE ATTRACTIVE TO INVESTORS:

1. Engage public policymakers in public-private partnership (PPP) development
2. Make sure communication is possible between conservationists and investors
3. Assist coral managers by providing capacity building in financial strategy and business model development
4. Create the conditions for blue enterprise development in the field of coral conservation

STRENGTHEN THE DEVELOPMENT OF CTFS TO BETTER ADDRESS GLOBAL ISSUES:

1. Address coral ecosystem issues on an international scale through an International Coral Conservation Trust Fund
2. Channel new public and private investments towards practical action on research into, and conservation and restoration of, worldwide coral ecosystems at local levels

Finally, coral conservation and its financing must also be considered in light of the **long-term evolution of ecosystems and threats**. As stated by Hughes et al. in 2017, coral ecosystems are likely to evolve, adapt and change over time, no matter how much effort countries put into the conservation process. As a consequence, **conservation needs and means could be different in the future as ecosystems evolve** in answer to external threats. Thus, instruments of conservation and financial mechanisms are likely to evolve as well, towards new forms we cannot yet foresee. Scientific knowledge and reliable predictions regarding both the evolution of externalities and their impact on ecosystems (vulnerability rate, resilience, etc.) could be important in anticipating the changes that will be required to conservation measures and their financing.

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