

MPA Finance Status and Future Directions

DISCUSSION PAPER



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Executive Summary

Valued at USD 24 trillion, the ocean economy is the world's 7th largest economy in terms of GDP and supports numerous globally significant industries, including small-scale artisanal fisheries which play an important role in local welfare and food security. Protecting 30% of the ocean in Marine Protected Areas (MPAs) is a vital component in the design and management of a healthy interconnected seascape and is critical to mitigating the impacts of ocean users. The net benefits of 30% MPA coverage, after taking costs into account, ranges from USD 490 billion to USD 920 billion over a 35-year period (Brander et al., 2020), or USD 22 – 42 billion annually. In 2016, 170 countries acknowledged this value by committing to protect 30% of the ocean by 2030 (30 by 30) (Pew, 2021).

As global leaders now turn to the implementation of these commitments, a dialogue has developed specific to the issue of financing. While necessary, such isolated discussions have the effect of framing MPAs as stand-alone measures that require independent financing strategies. MPAs are integral to broader ocean management, and discussions of funding for MPAs should not differ from those of other ocean management measures: all such measures should be part of an integrated management regime that falls to seascape managers to include in comprehensive public budgeting processes. Similarly, in their implementation, MPAs do not exist in a vacuum, but rather take place within a broader network of ocean governance. Important and costly roles such as large-scale surveillance and scientific monitoring may best be handled by other, independently funded institutions and agencies.

Though research is limited, early studies suggest that the costs of achieving 30% MPA global coverage ranges from USD 5 – 19 billion annually. While this may overestimate financing needs for the reasons stated above, it likely does not consider significant funding needs for capacity development and technical support which should run parallel to MPA funding streams. Though it may appear daunting, the estimated cost to achieve 30% global MPA coverage would be the equivalent of less than one quarter of the value of global marine ecotourism, 3% of the value of global fisheries, or 0.5% of total global ocean value.

The current MPA funding landscape primarily consists of government budget allocations and other public funding, along with meaningful contributions from tourism fees and philanthropy, as well as scattered innovative financing mechanisms. MPAs provide significant benefits both globally and locally, but the vast majority of these benefits are challenging to monetize. Revenues associated with increasing tourism arrivals and blue economic development benefits can play an important role in MPA financing. However, these opportunities are limited and do not reflect the vast and varied benefits provided by MPAs. Overall, current MPA financing is fragmented and ill-equipped to meet the target of funding 30% MPA coverage. It does not meet the funding needs of the current MPA landscape, nor does it adequately reflect the value provided by MPAs.

As a public good that supports the global ocean economy, the cost burden of MPAs should be shared among ocean users, national governments, and the international community. Modest contributions from ocean-based economic actors – in keeping with their role as ocean users and beneficiaries – along with small increases in public allocations, including assistance to low-income MPA host countries, could meet the necessary funding requirements for 30% global MPA coverage with little economic impact.

Despite the apparent availability of funds, critical issues remain with regard to the political will, capacities, and other key enabling conditions. Perhaps the most significant question will be how to equitably capture and distribute MPA financing given the asymmetrical accumulation of MPA costs and benefits.

Protecting the ocean and the benefits it provides will require a cooperative approach from the global community, both public and private, and a commitment to share the burden. Policy makers and planners can make meaningful progress by setting aside some of the broader debates related to MPA value and costs and beginning to focus on the most appropriate means to channel funds from ocean users to those that bear the cost of MPA establishment and operations.

Key priorities for further discussion include:

- 1. How can ocean users be effectively included as a source of MPA finance?**
- 2. What mechanisms can best channel funding from global MPA users and beneficiaries to MPA managers?**
- 3. How can climate funds better respond to the role of MPAs in mitigation and adaptation?**
- 4. What needs to be done to understand and address the asymmetric accumulation of MPA costs and benefits?**
- 5. How can we better engage local communities and recognize their role in MPA implementation?**
- 6. How can MPA funding streams be structured to ensure a sufficient focus on capacity development and technical support?**
- 7. What is needed to better understand costs and cost drivers across various MPA archetypes?**

Supporting an Ocean Economy

The ocean economy is the 7th largest in the world, and it is essential to human wellbeing. At a local level, it is an important facet in the livelihoods of millions, including women and some of the world's most vulnerable communities. Marine Protected Areas (MPAs) are a vital component in the design and management of a healthy seascape and play a key role in mitigating human impacts. As such, there has been a global commitment to protect 30% of the world's oceans by 2030.

With an asset value of USD 24 trillion, the ocean economy is the 7th largest globally, with an annual contribution of USD 2.5 trillion in 2016 (EU, 2019; OECD, 2016). The ocean economy and all ocean users are threatened under a business-as-usual (BAU) management regime. Without proactive mitigation measures, the cost of damage from climate change, among other threats, could reach USD 322 billion per year by 2050 (Hoegh-Guldberg et al., 2015; EU Commission, 2019), and includes damage to:

- fisheries (USD 21 billion);
- tourism (USD 31 billion);
- climate mitigation services such as ocean carbon absorption (USD 163 billion), damages arising from sea-level rise (USD 101 billion) and storms (USD 6 billion).

Telecommunications, shipping and offshore renewables are all negatively impacted by increasing storm intensity and other climate change-related weather effects. For the shipping industry alone, storm surges which necessitate rerouting can cost USD 75,000 per extra day at sea. Similarly, port adaptation costs are USD 30 – 200 million per km² of port area (EDF, 2022; Sonic Shares, 2021). Annex 1 provides the value of a number of ocean sectors alongside possible losses under a BAU approach to marine management. There are numerous other ocean industries that will also be impacted including small-scale artisanal fisheries that continue to contribute to local welfare and food security (FAO 2010).

Beyond issues related to climate stability, nearly all ocean sectors rely on ocean management measures to minimize and offset their negative impacts on ocean resources and ensure the sustainability of key inputs. The economic benefits of effective marine management are significant. Investing USD 1 in ocean management can yield at least USD 5 in global benefits (Konar and Ding, 2020).

Protecting 30% of the ocean in MPAs is a vital component in the design and management of a healthy seascape and plays a key role in mitigating human impacts, particularly including those of ocean users and beneficiaries (Pew, 2018; 2021; IUCN, 2016). MPAs help combat the damage wrought by overfishing, resource extraction, coastal development, pollution, tourism, recreation, and human-caused environmental change.

Although quantification can prove difficult, the benefits of MPAs are not in dispute. A 2020 analysis of MPA expansion demonstrates that “the global benefits of expanding MPAs exceed their costs by a factor 1.4 – 2.7 depending on the location and extent of MPA expansion” (Brander et al., 2020). The estimated benefits from increased ecosystem goods and services ranges from USD 800 – 1,274 billion over a 35-year period¹ or between USD 36 – 58 billion in average annual value; the net benefit after costs are taken into account is USD 490 billion to USD 920 billion. This includes coral benefits, mangrove carbon, mangrove

¹ Brander applies a 3% discount rate to 35-year values.

benefits (other than carbon), and wetland ecosystem services; services assessed are tourism and recreation, coastal protection, provision of food and materials, biodiversity and carbon sequestration.²

Table 1. MPA benefits on ecosystem services and sectoral beneficiaries (adapted from Leenhardt et al., 2015 and Walsh et al., 2020).

Ecosystem Service Category	Ecosystem Service	Mechanism by which MPAs provide service	Sectoral Beneficiaries
Provisioning	<i>Food</i>	Increased production/stabilization of target species biomass	Wild Capture Fisheries; Aquaculture/ Mariculture
	<i>Ornamental resources</i>	Increased production/stabilization of ornamental fish biomass	Aquarium Trade
	<i>Raw materials</i>	Algal and sand production	Oil & Gas; Deep Sea Minerals; Offshore Marine Renewables
	<i>Genetic resources</i>	Protection of genetic diversity, adaptation to climate change	Global
	<i>Medicinal resources</i>	Protection of molecular diversity	Marine Bioceuticals/Pharmaceutical
Regulating	<i>Carbon sequestration and climate regulation</i>	Protection of plants and calcifying organisms (e.g., mangroves, sea grass, corals)	Shipping; Telecommunications; Insurance; Offshore Marine Renewables
Cultural	<i>Cultural heritage</i>	Maintenance of traditional community-based natural resource management	Local Communities /Global Stewards
	<i>Spiritual and historical heritage</i>	Maintenance of traditional community-based natural resource management	Local Communities /Global Stewards
	<i>Recreational activities</i>	Creation of nature-based ecotourism opportunities (scenic beauty and emblematic species)	Tourism
	<i>Science and education</i>	Creation of opportunities for research and education in places of reduced human impacts	Scientific Community
Supporting	<i>Primary production</i>	Protection of primary producers	All industries benefitting from provisioning services
	<i>Coastal protection</i>	Protection of habitat formers (e.g., corals, sea grasses, mangroves) and attenuation of wave intensity	Tourism; Shipping (ports); Infrastructure; Insurance

In recognition of the importance of MPAs, there has been a global commitment to marine protection. At the International Union for Conservation of Nature (IUCN) World Conservation Congress in 2016, 170 countries adopted Resolution 50, supporting the protection of 30% of the ocean by 2030, and an additional 21 countries have since publicly committed to this goal (Pew, 2021). Now the global community must focus on implementation of these commitments.

² The authors of the study acknowledge that their analysis is incomplete on both the cost and benefit side and predict that additional information on both sides would likely increase benefits.

Understanding MPA Costs

MPAs should be complementary to existing marine management efforts and other institutions may be the proper custodian of key roles, such as large-scale surveillance and patrol activities. Despite this, early work by Balmford et. al. sets a benchmark of between USD 5 – 19 billion in annual costs to support 30% global MPA coverage. While this may overestimate MPA management costs, it likely does not consider significant capacity development and technical support needs which should run parallel to MPA funding streams. While these estimates may appear daunting, the median estimated annual cost (USD 10.7 billion) would be the equivalent to 0.4% of total global ocean annual value (USD 2.5 trillion).

Critical to understanding effective MPA finance is an understanding of the types of priorities, activities and expenditures considered in estimating MPA costs.³

What is an “MPA cost?”

The primary cost drivers for MPAs can vary widely depending on location, key threats, size, and other factors (Walsh et al., 2021). Published data breaking down MPA costs is scarce. Despite this, some trends do emerge. Experience and anecdotal evidence suggest that surveillance and patrol is often the costliest MPA activity, sometimes accounting for as much as 50% or more of total MPA costs. In terms of budget categories, personnel costs are frequently the most significant cost driver, reflecting the important role that MPAs play in job creation.

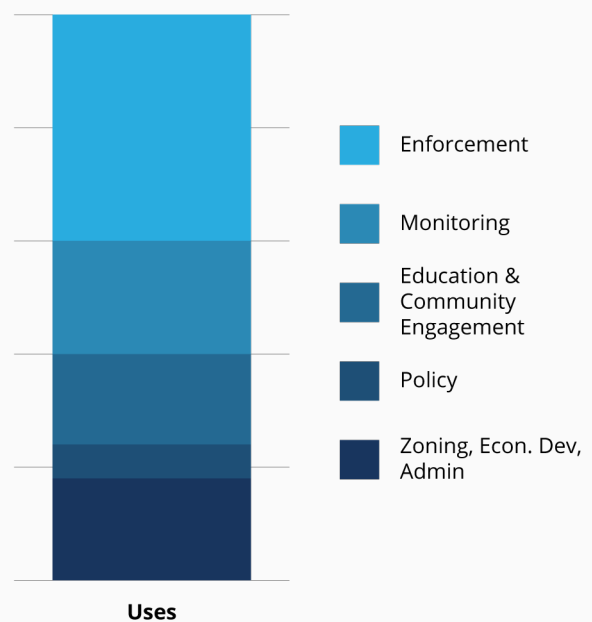
Traditional MPA planners and managers typically look to understand these key functions and then build budgets to support them. This approach treats MPAs as an abstract or stand-alone management tool. In doing so, it may overestimate the true costs of MPA implementation.

MPAs in context – BAU ocean management

As discussed, MPAs vary significantly in many respects, which complicates cost analyses. It may be useful to identify three simplified MPA archetypes, defined predominantly by scale:

- **Small scale MPAs**, typically near shore and closely interrelated with local communities;
- **Medium scale MPAs** that may be implemented at the state or provincial level and cross over sub-jurisdictional boundaries;
- **Large scale MPAs**, roughly 100,000 km² or more, that may occupy a meaningful percentage of a country's EEZ.

Figure 1. Illustration of MPA costs by function



³ Many cost estimates are based on observation and/or regression modeling and do not clearly categorize costs into budget or programmatic categories.

All three of these archetypes may employ similar measures. However, the roles and responsibilities for key activities are likely to vary significantly between these different archetypes. In a small-scale, coastal or community context, surveillance and patrol may consist of active vigilance by local members of seaside and seafaring communities. In some scenarios, community outreach and socialization play a larger role than any other active surveillance or patrol measures.

In the medium-scale MPA context, particularly in areas where government presence may otherwise be inconsistent and pressures on the marine resources are greater, MPA managers may need to lead some surveillance and patrol measures. In a large-scale or offshore MPA scenario, where travel to sites can take multiple days, surveillance and patrol pose unique challenges. In these cases, surveillance and patrol may more naturally be led by other marine patrol agencies such as marine police, military, fisheries enforcement or other civilian or military agencies. Some of these related agencies may already have the mandate, budget, equipment and personnel to implement such activities. While there may be additional costs associated with adjusting practices to better account for MPA dynamics, this may be an order of magnitude less costly than the wholesale allocation of such responsibilities to MPA managers who lack the financing, capacity, legal mandate, and other requisite capacities and resources.

Similarly, research and scientific tasks, such as impact monitoring, may be best led by independently financed and specialized entities such as state research bodies, universities, NGOs, or others.

Another important consideration when examining high-level MPA costs is the BAU marine management regime. Ideally, MPAs work as part of a multi-faceted ocean management system. In practice, however, MPAs frequently operate in areas with little or no government presence. In such cases, stakeholders and planners may have unrealistic expectations about the capacity of MPAs to carry out a broader range of governance activities or may attempt to push the costs of broader EEZ-level marine surveillance, infrastructure development and other national interest-related costs onto MPAs. MPAs are implemented to complement broader development initiatives and activities, and in most cases, it is those broader initiatives and economic activities that should extend support for MPAs rather than the reverse.

Figure 2. Illustration of cost sharing

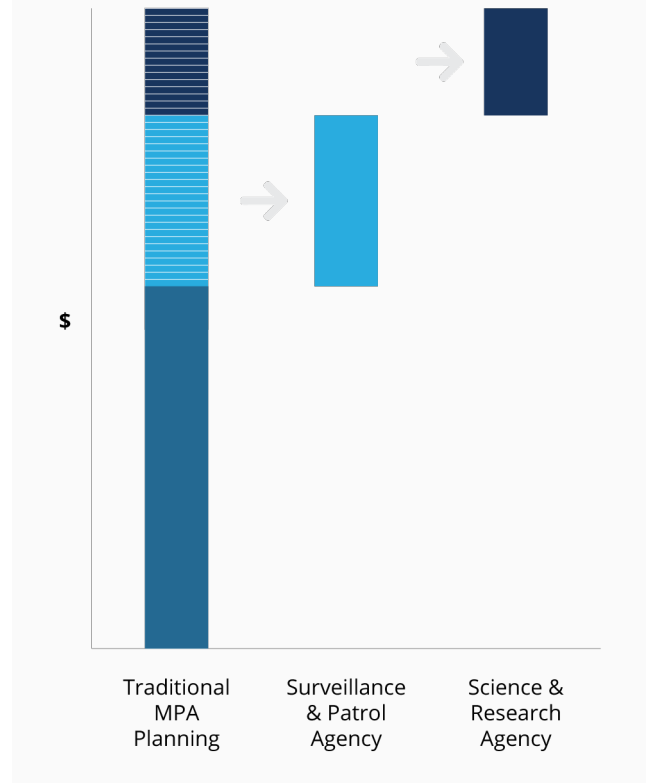
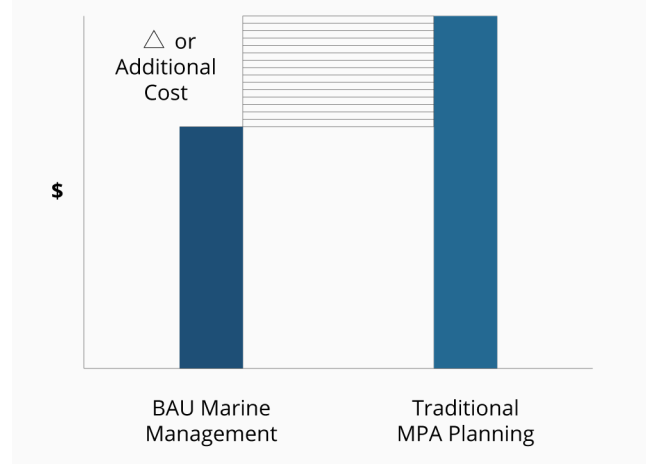


Figure 3. Illustration of MPA costs relative to BAU seascape management



Estimates of needed funding

Authoritative data on MPA costs is scarce. Walsh et al (2021) highlight that MPA costs are highly variable and ultimately determined by site-specific characteristics and management objectives. The high degree of variation in costs is highlighted by McCrea et al (2011), who reported costs ranging from USD 3 – 293,639/km², with lower costs per km associated with larger scale MPAs. Despite this, we turn to the limited published research on MPA costs as a high-level estimate of financing need.

A 2004 study estimated the cost of running a global MPA network with 20 – 30% coverage between USD 5 billion and 19 billion per year. More recently, updated values indicated effective management of only 10% coverage closer to USD 3 to 8 billion a year (Bos et al., 2015). A 2020 study that aimed to account for both MPA establishment and operational costs estimated the former at USD 12.6 billion with running costs of roughly USD 43 billion over a 35-year period, or a total cost of USD 2.52 billion annually (Brander et al., 2020)⁴. This research primarily used models to predict MPA costs based on a sample of reported data. As such, the work does not fully explore the underlying drivers of MPA costs. While these estimates should be used with caution, they do coalesce at least around a general order of magnitude and provide some indication of likely potential costs for the purposes of comparison.

Geographical distribution of costs

While defining total funding needs and identifying funding sources are critical tasks, it is even more important to understand the uneven geographic distribution of costs. Recent estimates suggest that achieving 30% MPA coverage implies that 70 – 90% of all protected area implementation costs will fall on low- and middle-income countries (Waldron, 2020). In addition to localized establishment and operational costs, local communities also face potential opportunity costs stemming from MPA-related restrictions on activities. Accurate quantification of opportunity costs remains limited, though recent analyses suggest that these costs may not be as high as originally thought (Lynham, 2022; Lynham et al., 2020).

Moreover, more needs to be done to recognize, communicate and maximize localized MPA benefits such as poverty reduction, benefits to health and women, and improved human well-being and prosperity (Ban et al., 2019; Leisher, Van Beukering, and Scherl, 2007; Naidoo et al., 2019; World Bank, 2021) and the estimated one million jobs that would be created by 30% MPA coverage (Balmford et al., 2004).

MPA Costs in Context

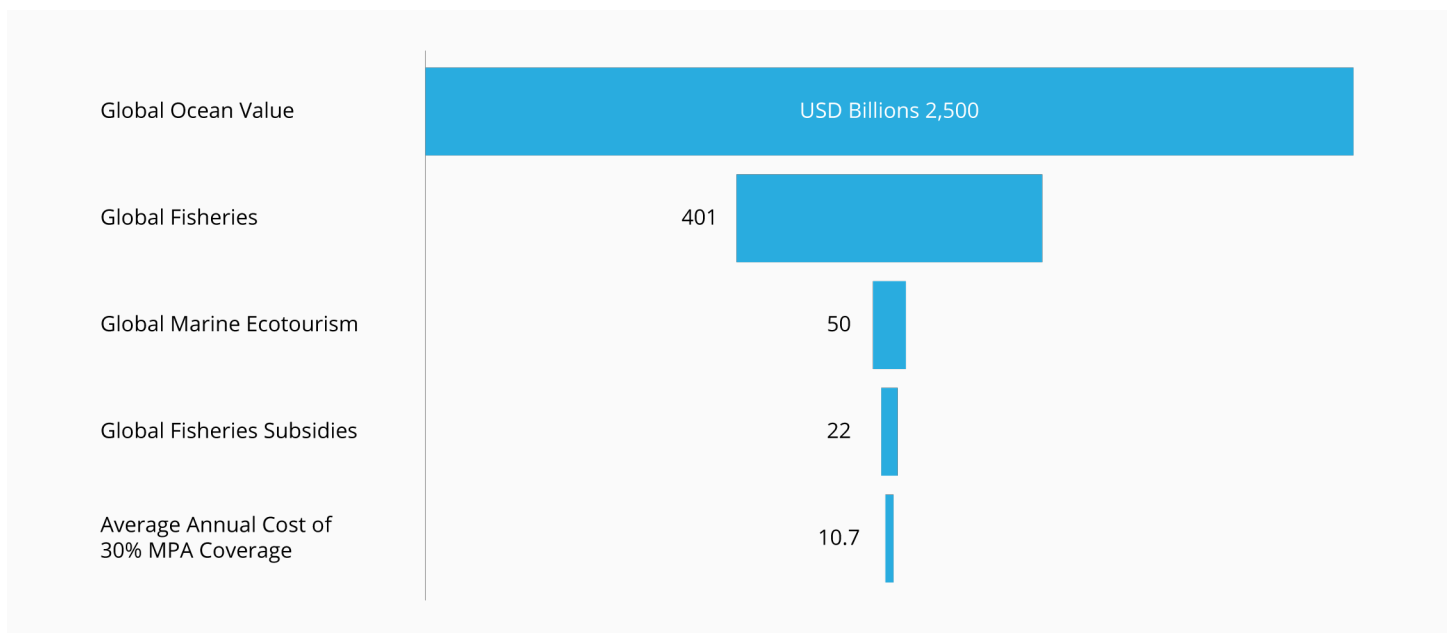
An understanding of MPA costs and financing is needed to ensure MPA implementation at sufficient scales, but some of the dynamics of this discussion appear to be specific to conservation. As previously mentioned, MPAs are a critical part of seascape management, working in tandem with seascape-level spatial planning, user licensing, pollution controls and numerous other efforts to ensure the sustainability of the resource. However, the discussion of self-financing seems specific to MPAs; similar discussions do not take place for fisheries management, marine pollution controls or other efforts. As a critical part of seascape management, budgeting for MPAs should be integrated with other seascape management activities under the authority of seascape managers—marine and fisheries ministries and agencies—and be included in overall seascape management budgets. Even in budget-constrained environments, such as low-income states, funding made available for marine management—potentially from distant water fishing fleets or from overseas development assistance (ODA)—should be utilized to implement an inclusive set of management measures, including MPAs.

⁴ Author's calculation based Brander's undiscounted expenditures across the three scenarios presented

More recent site-based efforts have focused on “business planning” for MPAs, terminology that further embeds the notion that MPAs should be able to generate their own funds, and in some cases even generate profits. However, there are many examples of critically important ecosystems in urgent need of protection that have no easily monetizable resource. MPAs should not be designed to serve specifically as tourism destinations or to generate carbon offsets, but rather to address a wide variety of environmental needs, many of which may prove challenging to monetize or value.

While not insignificant, it is important to view the cost of achieving 30% global MPA coverage in the broader context. As highlighted above, researchers estimate that the benefits of expanding MPAs to 30% coverage will exceed costs by a factor of 1.4 – 2.7 (Brander et al., 2020), with net benefits ranging from USD 490 billion to USD 920 billion over a 35-year period across all analyzed scenarios (Brander et al., 2015). Perhaps more significantly, as discussed above, MPAs play a critical role in supporting the broader ocean economy, the 7th largest globally, with assets valued at over USD 24 trillion (European Commission, 2019). The estimated annual cost of extending MPA coverage to 30% of ocean areas, USD 10.7 billion, would be the equivalent of less than one quarter (25%) of the annual value of global marine ecotourism (USD 50 billion), 2.7% of the annual value of global fisheries (USD 401 billion), or 0.4% of total annual global ocean value (USD 2.5 trillion). Moreover, 30% MPA coverage could directly provide one million full time jobs (Balmford et al., 2004).

Figure 4. Visual comparison of MPA annual management costs to achieve 30 by 30 and annual ocean sector values



Source data: FAO, 2020; Sumaila, 2020; OECD, 2016; Cisneros-Montemayor and Sumaila, 2010; Balmford et al.; 2004, Brander 2020, with Author's own calculations

While research on the net economic benefits of MPAs is compelling, it does not address how those costs and benefits accrue, and to whom. Greater precision and detail is needed related to both MPA costs and benefits in order to inform the design of solutions and the political discourse.

Current MPA financing falls short of covering the costs of MPA management at current geographic scales, let alone achieving 30% coverage. A number of financing options exist and relatively small incremental increases to these financing sources could capture enough additional revenue to cover MPA costs under a 30 by 30 approach. While identifying funding sources is critical, this may not be the most significant hurdle to effective funding for MPAs. The main challenges will be to generate political will and develop mechanisms by which to capture and distribute finance appropriately.

Current MPA coverage and financing

There are currently around 18,000 designated MPAs covering around 7.65% of the ocean surface, of which approximately one third offer a high degree of protection (2.7% of the ocean surface area) (Bohorquez, 2022). Only 1.3% of the high seas are designated as MPAs (Marine Conservation Institute, 2021). Voluntary ocean commitments made by parties in support of SDG 14⁵ would, if achieved, increase global MPA coverage to roughly 9.2% of the total ocean surface area, less than a third of the 30 by 30 goal (UN, 2017).

Data specific to MPA spending is sparse but likely follows other conservation spending patterns more broadly, albeit at a fraction of the size. In 2019, the total global annual flow of funds toward biodiversity protection equaled only 0.4 – 1.0% of global GDP, representing an annual value of approximately USD 52 – 143 billion (Bohorquez, 2022).

Individual MPA sites often rely on only one or two financing sources (Andrews et al., 2020) and overall, MPA funding is dominated by a few key sources: domestic budget allocations, ODA, philanthropy, and visitor fees. Domestic government spending remains the primary source of MPA finance, providing on average 60% of available funds to protected areas (Emerton et al., 2006). In lower income countries, where government spending may play a lesser role due to other more pressing priorities, ODA and philanthropy tend to play a larger role (Wabnitz and Blasiak, 2019; OECD, 2017; Emerton et al., 2006). More recently, debt-for-nature swaps (DNS), which have historically played a significant role in funding terrestrial protected areas, have been successfully implemented in the marine context (Convergence, 2017).

Site-based revenues such as tourism entry fees can often be a critical component of MPA financing. It is important to note, however, that site-specific user fees are not viable for many sites and would be insufficient to cover more than a fraction of MPA management costs in many others. More remote and less ‘charismatic’ MPAs may lack any meaningful on-site funding options, though this is not necessarily correlated with the economic value of services provided. Even those MPAs capable of driving user fee revenues may see those funds channeled to central budgets in order to address other critical needs.

Looking across the landscape, the current structure of MPA funding is badly fragmented and does not meet the funding needs of the current MPA landscape nor reflect the value provided by MPAs.

⁵ Sustainable Development Goal 14, one of 17 SDGs established by the UN in 2015, states: “Conserve and sustainably use the oceans, seas and marine resources for sustainable development”.

Possible pathways to 30%

As mentioned above, local revenue streams such as those related to ecotourism or broader blue economy development can play a critical role. However, the potential for local revenue may be limited and in general, such revenue streams only represent a small fraction of the value generated by MPAs. The vast bulk of the ocean economy takes place around MPAs both in coastal or territorial waters and on the high seas and is dependent on MPAs to minimize their impacts and provide climate stabilization and other services. Yet this ocean economy that gives rise to the need for MPAs has not been accessed as a resource to support MPAs.

The table below presents a mock-up of a rough portfolio of funding that could make it possible to reach a target of 30% MPA coverage. The table is not intended to serve as a specific recommendation or authoritative analysis, but rather to illustrate the feasibility of meeting MPA funding needs by tapping in to the resources of the ocean economy. Our aim is not to determine what options are best for any given site or country but rather to start a larger discussion about the availability and appropriate sources of MPA finance.

There are essentially three main types of sources for MPA funding – the public sector, the private sector and philanthropy, though these can take many forms and be channeled in many ways. As a public good, governments remain the most critical MPA funder. We do not project dramatic changes in public expenditures but rather incremental increases and clearer allocations in public funding for MPAs. In recognition of the critical role played by MPAs in offsetting the impacts of – and providing benefits to – ocean users, we incorporate modest user fees in several ocean industry sectors. This list is not exhaustive but represents a subset of those high-value ocean users. User fees remain extremely modest against the backdrop of the sectoral values.

Table 2: Potential MPA financing sources, scale of global market, current contribution to MPA finance and potential for growth⁶

Source/ Mechanism	Summary	Potential	Annual Value (USD millions)
Domestic Government Budget Allocations	Public domestic expenditures as a part of global biodiversity finance totaled on average USD 67.8 billion annually between 2015-2017 ⁷	Earmarking 5% of domestic biodiversity finance for MPAs could generate USD 3.4 billion	3,390
Climate Finance Agreements	UNFCCC commitments to climate are 100 billion in climate finance annually, 6% of which is allocated to marine & coastal initiatives ⁸	Earmarking 3% of climate funding for marine conservation would yield USD 4 billion	3,000
ODA	Global ODA totaled USD 169 billion in 2021 ⁹	Allocating 0.6% directly to MPAs would yield USD 1.01 billion	1,014

⁶ References for data used on ocean-based sectors can be found in Annex 1.

⁷ OECD <https://www.oecd.org/environment/resources/biodiversity/report-a-comprehensive-overview-of-global-biodiversity-finance.pdf> accessed June 27, 2022

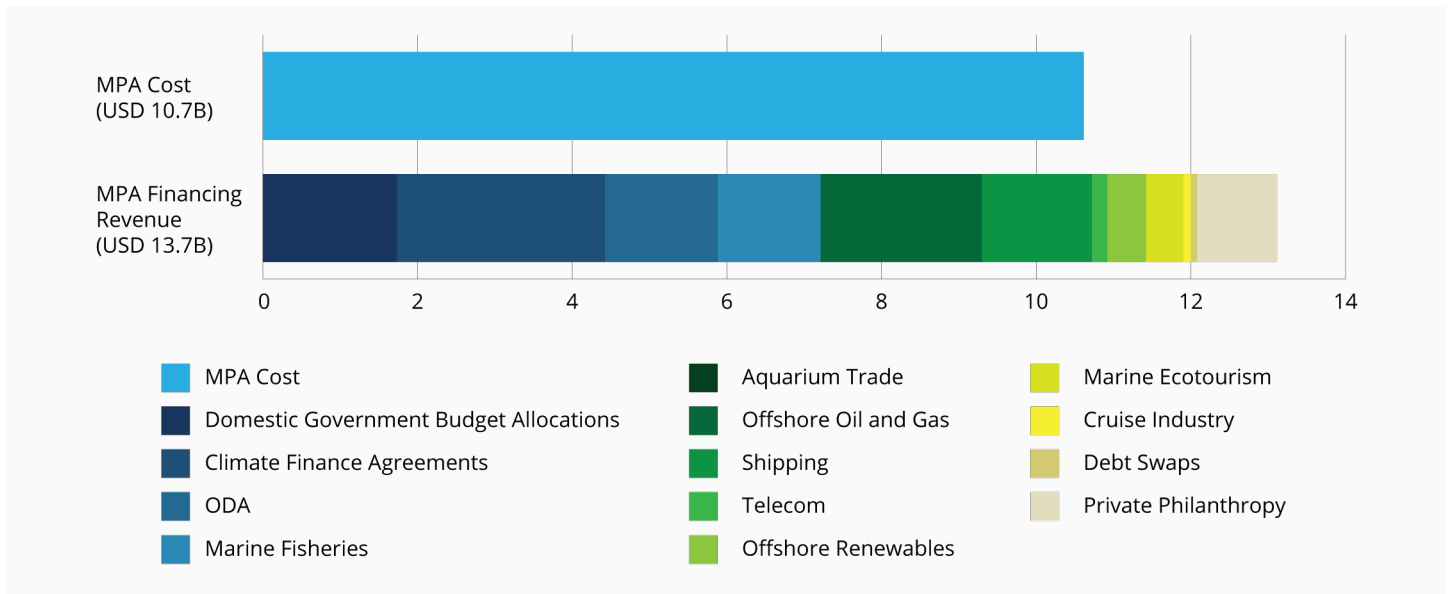
⁸ Wabnitz & Blasiak, 2019

⁹ Official development assistance (ODA) flows to countries and territories on the DAC List of ODA Recipients <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/official-development-assistance.htm> accessed June 27, 2022

Source/ Mechanism	Summary	Potential	Annual Value (USD millions)
Marine Fisheries	Global fish production totaled 179 million tons in 2018, with first sale value of ~USD 401 billion. Marine-based catch (capture and aquaculture) accounted for 115 million tons	A fee of approximately USD 0.01 per kg (~\$10/ton) on marine production would yield USD 1.15 billion, roughly 0.25% of total sectoral value	1,150
Aquarium Trade	Global import value of ornamental fishes total USD 290 million, 99% of which are wild-caught of coral reefs	A 1% import fee would yield approximately USD 2.9 million	3
Offshore Oil and Gas	Offshore oil and gas production averages 28 million barrels per day, with an approximate value of 2.15 billion/day or 785 billion/year	A USD 0.02 per barrel fee would yield approximately USD 1 billion	2,000
Shipping	~11 billion tons in annual maritime trade, totaling USD 500 billion in freight costs	A USD 0.1 per ton fee would yield approximately USD 1.1 billion	1,100
Telecom	Approx. 448 submarine telecommunication cables totaling over 1.2 million km in length	A USD 100 per km fee would total USD 120 million, or 0.005% of sectoral value	120
Offshore renewables	USD 141 billion industry increasing 28% annually and accounting for 1.6 Twh in 2020	A 0.5% surcharge on ocean-based energy generation could yield USD 700 million	700
Marine Ecotourism	Marine ecotourism accounts for USD 50 billion annually	A 1% surcharge on marine-ecotourism sector could yield 500 million	500
Cruise Industry	Revenues surpassing USD 46.6 billion (2018); 30 million passengers (2019)	A USD 2 surcharge per person would yield USD 60 million	60
Debt Swaps	Debt swaps generated roughly USD 1 billion for environmental concerns between 1987 and 2010. From 2007 to 2020, public debt as a share of GDP nearly doubled, from 70% to 124%	Renewed interest in debt swaps could yield approximately USD 50 million annually	50
Private Philanthropy	Philanthropic funding for ocean-based initiatives totaled USD 1.2 billion in 2020	Allocating 50% of 2020 philanthropic spending on ocean-related issues would yield USD 600 million	600
Total			13,687

Figure 5 below illustrates that the additional financing needed to reach 30% coverage could be achieved with some incremental increases to traditional sources and small user fees on major industries, which would have only limited financial impacts on each sector. Taken together, the portfolio of funding presented above surpasses the mean annual cost estimate for global MPA funding put forward by previous analyses (Brander, 2020; Balmford, 2004).¹⁰

Figure 5. Pathway to annual financing for 30% MPA coverage



While there remain numerous hurdles to securing adequate levels of MPA financing, the availability of funding may not be the most significant. More challenging may be how to channel funds from ocean users to MPAs equitably and appropriately.

Financing mechanisms

The table above demonstrates the feasibility of generating funding sufficient to meet a target of 30% MPA coverage from a portfolio of financing options. The question then remains how to allocate MPA funding from ocean actors equitably and appropriately. A number of mechanisms not included in the table could be used to access or augment the pools of funding described in Table 2. Impact investment can also play a role, for example by shouldering discounted rates of return associated with blue bonds or debt swaps. Blue bonds and impact investments, as well as blended capital, can also finance specific projects or initiatives. However, their use in this manner to directly support MPA operations might be limited to cases where operations have been privatized and/or bundled with integrated sources of revenue that would be needed to meet debt or equity payment obligations.

A variety of mechanisms have also been developed to enable economic actors to offset their ocean impacts. Biodiversity and carbon offsets, wetlands banking, and other mechanisms can serve to channel funds from users and beneficiaries to conservation. Offset mechanisms are designed to monetize negative economic externalities and facilitate more direct transactions between users/beneficiaries and those implementing conservation measures. Offsets require significant investments in assessing and valuing environmental impacts of both the user and of the offsetting conservation activity. While

¹⁰ Costs will accrue unevenly over time. For the purposes of generating a benchmark calculation, the authors develop an average across both Balmford's 2004 work and Brander's more recent 2020 analysis, presented in 2022 US dollars, equaling USD 10.7 billion.

offsets may be used to channel funding in specific cases, it is unclear that a system based on bilateral offset mechanisms could adequately or systematically address the significant benefits of MPA or the diverse impacts of all ocean users. An expanded list of financing options is discussed in Annex 2.

Another possibility would be to develop sector-based user fees, as presented in Table 2. This approach would eliminate the need for individual calculations of corporate impacts, discussions of additionality, or selection of specific MPA sites, among other facets of private ecosystem services markets. Fee collection might take place at the state level or be led by the private sector – for example, by the insurance industry, in a role somewhat aligned with the existing role of insurers in that MPA funding would be channeled to uses that decrease insurer risk. In any case, a global financing architecture would need to be developed, perhaps similar to a global conservation trust fund (CTF), to collect, house, and distribute funding. Given the existing track record of global financing mechanisms, this would appear to be a significant but not insurmountable challenge.

Other challenges and key conditions

If financial capacity is not the primary constraint on the efficient funding of 30% MPA coverage, numerous other challenges remain. Funding for marine protection remains fragmented; limited by regulatory and capacity gaps; constrained by complicated tenure and ownership (Sumaila et al., 2020); and will depend on political will, effective stakeholder engagement, and logistical and administrative design, among other factors.



Understanding localized cost and benefits

Perhaps the most challenging aspect of MPA finance will be developing the ability to deliver MPA finance to those bearing the costs. As previously noted, in reaching 30 by 30, as much as 90% of all protected area implementation costs will fall on low- and middle-income countries while the benefits will accrue across a global set of stakeholders (Waldron et al., 2020). Countries hosting expanded MPA systems will face new operational and opportunity costs. One major obstacle to equitable MPA finance is understanding how actual costs are accruing and designing mechanisms to channel funding appropriately, particularly across jurisdictions. This central challenge of MPA finance underlies many related issues.



Collection mechanisms

Funding mechanisms must surmount a number of significant challenges, including collecting funds from the appropriate parties in the appropriate amounts and channeling those funds efficiently to effective conservation projects.

Despite occasional resistance, collection of local and site-based revenues, such as tourism entry fees, can be relatively straightforward, though political will and policy is needed to ensure funds are established and channeled to MPA management. Channeling funding from a broader set of ocean users is perhaps a more critical component of financing for 30% MPA coverage and will likely prove more challenging, potentially requiring international cooperation and coordination to resolve.

A number of potential mechanisms could be deployed to address this need. Privatized transactions such as offset purchases could be used to capture this revenue and channel that funding to the appropriate users, though it remains unclear how these mechanisms could generate funding at the needed scale at reasonably low cost. Other solutions may include utilization of the insurance industry (which as previously noted, would also benefit from fewer claims under a lower impact climate scenario) for revenue collection. Similarly, at the public level, in addition to committing to 30 by 30, all country governments will need to make a commitment to financing MPA efforts, some locally, some internationally, and some both.



Distribution and cross-jurisdictional transfers

Developing the appropriate mechanisms for channeling funds from developed to developing countries will be a matter of particular importance. This will include bi- and multilateral funding, as well as securing funding support from industries that operate across national jurisdictions, e.g., distant water fishing fleets, offshore oil and gas, and the shipping industry. More recently, some EU Sustainable Fishery Partnership Agreements have included contributions earmarked for MPA implementation (OECD, 2018). Financing cross-jurisdictional transfers (including those beyond existing bilateral agreements) or transfers within the high seas will require more complex institutional arrangements, and will also require agreed-upon frameworks for finance distribution.

Lessons can be learned from pre-existing regional and global institutions and multiple revenue collection mechanisms could feed into one or several disbursement infrastructures. For example, a global CTF could be considered for finance administration and disbursement and has already been suggested as a potential approach for financing high seas MPAs (Walsh et al., 2020). Another potential example could be a multilateral Ocean Sustainability Bank to draw in private capital and distribute funds to MPAs both within and outside of EEZs (Walsh et al., 2020).

More generally, CTFs can support MPA implementation and financing across multiple geographic scales. CTFs are a valuable administrative tool and have the ability to channel financing from any source. Independent CTFs often combine public and private funding, allowing allocation of resources which could not otherwise be directly channeled through government entities. In this way, a CTF can operate independent of government cycles but can still align with national goals and commitments. CTFs can provide for contingent circumstances and mitigate risk associated with other linear financing sources and mechanisms. CTFs for MPA administration have already been developed at site-specific, regional, national and global levels.



Institutional development

Accessing MPA financing will require investment into the development of appropriate institutions and legislation, including at the national level. The administrative costs of such financing mechanisms can be significant and should not be overlooked during the planning stages. At the same time, it will be important to support countries with less institutional capacity and human capital to make it possible for them to also access bi- and multilateral funding. This could be achieved by streamlining and/or minimizing funding application requirements as well as through programs to improve institutional capacity and human resources.



Equity and benefit-sharing with women and local communities

Similarly, appropriate disbursement mechanisms will need to be developed in order to transfer finance to those providing the environmental benefits associated with MPA establishment and management. MPAs play an important role in promoting the welfare of local communities as well as women and other groups, though MPA implementation may negatively affect local resource users, at least in the short-term. Developing and implementing appropriate mechanisms for sharing benefits among stakeholders and affected communities at all scales of implementation will be paramount in MPA design and financing. Just as importantly, effectively engaging these stakeholders is critical to ensure self-determination and buy-in.



Capacity development

A system intended to channel billions of dollars to MPAs, many in remote locations, will require considerable investments in capacity development. Policy makers and planners should consider standardized benchmarks to ensure that core MPA funding is coupled with sufficient parallel investment in capacity development and technical support. The total costs and time requirements of this process should not be underestimated.



Effective financial planning

Financial planning for MPAs is often overlooked. Even in those instances where a financial plan is developed, it may be overly optimistic about prospective revenue and benefits or under-estimate dangers and risks. For new MPAs, financial plans should be developed during the design phase to assess costs associated with MPA establishment and management, identify operating models under a variety of funding scenarios, harness opportunities for cost reductions, and assess existing and new opportunities for funding. Financial planning should be aligned with government budget processes and utilize standard government formats and indicators in order to effectively channel government budget allocations and to facilitate monitoring and oversight.



Portfolio of funding sources

Current MPAs often rely on only one or two funding sources, which can increase financial risk. Those MPAs that do not rely on government budget allocations at least in part are more at risk, as has been seen in the revenue losses experienced by a number of MPAs that mainly relied on tourism entrance fees during the COVID-19 pandemic. MPAs that include one or two additional funding sources on top of government allocations will strengthen their long-term viability. A balance will be needed between de-risking finance and minimizing administration costs, particularly in those MPAs with minimal capacity. In addition, different financing mechanisms can have complementary roles within an MPA financing strategy, with some mechanisms better suited to differing MPA needs and timelines. For example, philanthropic funding tends to be important during the MPA design and establishment stages, while other more innovative financing mechanisms may require longer lead times for design and establishment. Similarly, government budget allocations can be used to fund core staff and administration costs while climate finance can be used to fund management actions that have a programmatic focus. Again, appropriate financial planning will be needed to support such multifaceted designs.



In-kind partnerships

MPAs should benefit from cooperative relationships with other government agencies and not act as stand-alone entities. At present, many of the costs borne by MPA budgets include activities that can be housed under different government entities. For example, the monitoring and enforcement of a country's EEZ should fall under the remit of the navy or a similar agency; monitoring and enforcement of national marine territory is something that should occur with or without the presence of an MPA. However, MPAs are frequently established in remote areas with little governance. Policy makers and planners may therefore have an interest in placing broader governance responsibilities on MPAs. While this may be inevitable in some cases, this broader role should be recognized and considered in funding determinations. More generally, there remains a lack of data and transparency around many of these underlying seascape management costs and how MPA costs fit within them.



Realignment of harmful subsidies

Current conservation efforts and investments are undercut by harmful subsidies which increase unsustainable resource use. It is estimated that the global fishing sector receives around USD 22 billion in subsidies to support unprofitable, large-scale industrial fishing operations which leads to inflated fishing capacities and overfishing (Sumaila et al., 2019). This is more than the total estimated funding required to establish and manage MPAs under a 30% coverage scenario. Realigning expenditures towards positive subsidies and other efforts to increase fish stocks would improve the efficacy of MPA finance as well as bolster fisheries.

Key Conclusions and Needs

The perception of MPAs as standalone entities that must account for their own financing does not align with the reality of MPAs as a critical component in a wider, ocean-based management regime and economy. MPAs are a critical public good designed in large part to help mitigate and offset the detrimental impacts of the vastly valuable marine-based economy and complement existing management regimes.

While many MPA sites can develop important site-based revenue streams, these are not sufficient to meet the scale of financing needed nor do they adequately reflect the value generated by MPAs. A coordinated approach is needed that accounts for the unique roles and responsibilities of governments and ocean users and that is able to recognize and reconcile the uneven distribution of MPA costs and benefits, channeling funds to those countries and communities that bear the burden of MPA management.

Achieving 30 by 30 will require a global effort, not to be inequitably borne by low- and middle-income nations. Protecting our ocean and the benefits it provides will benefit all of us and we must commit to its protection.

A number of important questions and needs now face the global community:



MPAs as a public good

MPAs provide vast benefits but are only sometimes the source of a monetizable service transaction. In this sense, MPAs are public goods that support national and global objectives. However, discussions often center on MPA self-financing, something not seen in many other government agencies or services. The unique standing of governments as the natural stewards of public goods makes them the appropriate institution to finance conservation efforts. Nonetheless, there remains a need to complement government funds by looking to other sectors.



Recognizing appropriate MPA “users”

The cost of achieving 30% global MPA coverage is reasonable in comparison to the benefits provided by MPAs, the vast ocean economy that gives rise to the need for MPAs and the potential costs of a failing ocean ecosystem. We must do more to recognize the responsibilities of these sectors as the proper beneficiaries and users of MPAs and push the discussion beyond the availability of funds to focus more on effective approaches to channel funds.



Recognizing MPA value

MPA benefits are diffuse and often hard to measure, and much time and energy has been invested into ascertaining such values. While authoritative figures may remain elusive, the general net positive value of MPAs appears to be beyond debate. Moreover, the financial risk in not investing in such management measures is significant. A mere 5% loss in ocean sector industries represents some USD 125 billion annually. Reframing the narrative around MPA benefits may enable focus and investment to shift away from the general justification of MPAs toward critical questions related to the design and implementation of funding mechanisms.



Recognizing the ocean and MPAs as a carbon sink

The climate change sector continues to underinvest in marine mitigation and adaptation. More work is needed to promote the marine environment as a tool in climate change mitigation, both at the global and national levels. It will also be important to support mechanisms that improve access to climate change mitigation and adaptation finance in Big Ocean States, which may face challenges in applying for large-scale multilateral funding.



Mechanisms to channel funding

The geographic distribution of MPA costs and benefits requires the development of mechanisms that can efficiently collect and channel funds from users and beneficiaries to MPAs, often across jurisdictional boundaries. There are a number of available mechanisms to do this, ranging from CTFs to offset mechanisms. Each may have its own strengths and weaknesses, and many can be used in tandem. Practitioners must begin to coalesce around the identification, design, and selection of priority mechanisms.



Asymmetrical geographic distribution of costs and benefits

The asymmetric distribution of MPA costs and benefits may be the most critical factor in limiting public decision-making on MPA finance. Better understanding of the distribution of MPA costs and benefits, particularly localized MPA costs and benefits, is needed to inform the design and structure of MPA financing mechanisms and ensure no party is required to bear outsized costs. This is of particular relevance as developing countries, with limited resources, will host a larger share of MPAs under a 30% coverage scenario.



Local community benefit-sharing and inclusion

Another critical challenge is the recognition and sharing of benefits with local communities. Local communities appear to gain economic and health benefits when in proximity to MPAs but may also make important sacrifices and provide needed support for MPAs. It is critical to more clearly recognize the benefits and costs borne by local communities and incorporate such considerations into standards for MPA funding mechanisms. While the establishment of standards will be helpful to ensure systematic consideration of benefit sharing, the specific structures used on site will likely vary significantly with local needs and practices. The inclusion of local community representatives in these discussions is needed to ensure such mechanisms meet the needs of those they are designed to serve.



Coordinated MPA finance

MPA finance is often thought of in isolation. However, ocean protection and seascape management require a holistic approach, as does MPA finance. While some MPAs show viable on-site financing options, others do not. Shifting the narrative around MPAs as one which must be self-financing to that of a public good will help achieve this. However, efforts need to be made that look into equitable distribution of finance across all MPAs and MPA networks, including regional and/or global funds.



Identifying MPA costs and cost drivers

Accurate MPA costing data remains elusive and the most exhaustive analysis of MPA costs was conducted 2004. Current estimates may not account for a number of factors or considerations, including that the majority of current MPA budgets are insufficient to carry out management needs; MPA budgets may not include financing for additional needs such as capacity development; and the inclusion of activities which are part of larger government mandates and should not necessarily be borne by MPA management. Without a better understanding of MPA costs and cost drivers across a variety of MPA archetypes, it will be difficult to accurately determine MPA financing needs.



Capacity development

Technical capacity to efficiently distribute and manage MPA financing, as well as effectively implement MPA operations, is scarce in many contexts. Planners should consider the development of standards to ensure basic levels of co-funding for capacity development and technical support is allocated in parallel to base funding for MPA operations. Existing projections of MPA funding needs might overestimate the actual needs of MPAs in a context of complementary ocean management. However, an additional allocation to ensure sufficient capacity might again increase the overall funding needed.

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Sector Values and Costs under BAU

Sector	ANNUAL Global Value	Losses under BAU	Reference
Wild Capture Fisheries	<p>179 million tons valued at USD 401 billion (2018). Marine capture fisheries and aquaculture comprised 84.4 and 30.8 million tons respectively.</p> <p>Direct & indirect employment to 10-12% of world population, 90% in developing countries.</p> <p>Women make up 50% of the global workforce including post-harvest work.</p>	<p>Global fish stocks (90%) are either fully exploited, overexploited or depleted. One third of fish stock considered harvested at biologically unsustainable levels.</p> <p>Mismanagement of global marine fisheries associated with lost revenues of USD 83bn (2012); increase from USD 52bn in 2004.</p> <p>In 2016, algal blooms in Chile killed 12% of salmon production equaling losses of USD 800 million; in California, a 2015 algal bloom caused losses to crab fisheries of USD 30 million.</p>	<p>FAO, 2020; World Bank, 2017; Ocean Risk Initiative, 2018</p>
Aquarium Trade	<p>Between USD 800 million to 30 billion (including accessories).</p> <p>Global import value for ornamental fishes (without accessories): USD 290 million/year.</p> <p>150 million marine ornamental fishes traded annually.</p>	<p>99% of marine ornamental fishes are wild-caught from coral reefs; only 1% are captive-bred.</p>	<p>UNEP, 2003; Biondo et al., 2020</p>
Offshore Oil & Gas	<p>Daily global offshore oil production approx. 28 million barrels = USD 1.4 billion - 2.8 billion per day.</p> <p>Offshore oil and gas as % of national GDP: United States 1.5%; United Kingdom 3.5%; Malaysia 12%; Norway 24%; Nigeria 35%.</p>	<p>Climate change-related effects on coastal and offshore oil and gas development have already been observed.</p> <p>Changes in temperature, precipitation, sea level rise, storm intensity and wave regime affect coastal and offshore exploration and production, and also product transportation.</p>	<p>Burkett, 2011; Harris, et al., 2016. (UN); Bayraktarov et al., 2015; Andrews et al 2021; Prophecy Market Insights, 2021)</p>

Sector	ANNUAL Global Value	Losses under BAU	Reference
Shipping	Accounts for roughly 80-90% of total volume of global trade each year.	Weather-related conditions responsible for at least 20% of roughly 400 total vessel losses that occurred worldwide from 2015-2019.	
	Total volume of maritime trade: 11.08 billion tons (2019).	Stronger storms require rerouting. For container ships consuming 150 tons of fuel per day, each additional day at sea can cost approx. USD 75,000.	EDF, 2022; Sonic Shares, 2021
	50,000 merchant ships registered in over 150 nations, employing >million seafarers and generating >USD 0.5 trillion/year in freight costs.	Port adaptation costs focused on elevation approaches cost from USD 30 million to over USD 200 million per km ² of port area.	
Telecommunications	Global telecom services valued at 2.5 billion (2020), expected growth of 6.2% annually.	Major storms, wave and current action pose some of the largest natural threats to submarine cables and cable networks. Cables damaged by submarine landslides and turbidity currents (rapidly moving ocean currents with high amounts of sediment).	Wang et al., 2020; Research and Markets, 2020; UNEP, 2009; International Cable Protection Committee, 2011
	In 2018, there were approx. 448 submarine telecommunication cables, equaling total length of over 1.2 million kms.	Repair of damaged cable averages between USD 1 million to USD 3 million per individual repair.	
Offshore Marine Renewables	Marine renewable energy: USD 141 billion global industry and increasing at 28% annually.	Risks to this sector are primarily from storm damage. The total global risk to assets and revenues is USD 8.6 billion over the next 15 years.	WWF & Metabolic, 2021

Sector	ANNUAL Global Value	Losses under BAU	Reference
Tourism	USD 9 trillion (2019); 10% of all global GDP.		
	Coral reef tourism is worth USD 36 billion per annum, USD 19 billion is generated through “on-reef” tourism.	Damage to coral reef and mangrove habitats, recreational fishing, climate change, pollution, and beach quality under a BAU scenario risk global tourism-related economic losses of up to USD 655 billion over the next 15 years.	World Travel & Tourism Council, 2021. McKinsey, 2020; Sumaila, 2020; World Bank, 2021; WWF & Metabolic, 2021
	30% of the world’s reefs have tourism value; over 70 countries and territories have reefs that generate over USD 1 million in tourism spending annually.		
Ecotourism	Marine ecotourism accounts for USD 50 billion annually	Same as above	Sumaila, 2020;
Cruise Industry	Revenue surpassing USD 46.6 billion (2018); 30 million passengers (2019). Despite COVID, revenues set to return to 34.1 billion by 2025.	Exact figures not available but anticipated increased costs as per the shipping industry more generally.	Syriopoulous et al., 2020; Statista, 2022
ALL	Overall asset value of the ocean is currently about USD 24 trillion, providing annual goods and services worth at least USD 2.5 trillion. Blue economy associated with 5% annual growth rate.	An estimated USD 8.4 trillion worth of blue economy assets and revenues are at risk under a BAU scenario in the coming 15 years, with the amount increasing exponentially over time. Sectors most dependent on healthy ocean (fisheries, coastal tourism) show greatest losses as share of total sector value. Other growing sectors (ports and shipping, coastal real estate and infrastructure, marine renewable energy) will be increasingly exposed to climate change risks.	WWF & Metabolic, 2021; Ocean Risk Initiative, 2018

MPA Financing Mechanisms

Below we provide a discussion of MPA financing mechanisms that, while not comprehensive, tends to many of the mechanisms common in practice or in literature.

1. Domestic Public Budget Allocations

While some MPAs may find on-site revenue generation opportunities, the majority of MPAs will find local financing sources provide only a fraction of what may be needed, if that. Such MPAs will need to look to financing at other scales to meet their needs. The public sector is the natural steward of goods that have a value to society that cannot easily be monetized. For this reason, the public sector has been the primary funding source for MPAs. While other sources and mechanisms indeed need to be brought to bear, public budgets will and should remain the primary funder of conservation.

Current public sector funding for MPA management represents a small percentage of annual government spending (Flores & Bovarnick, 2016; Emerton et al., 2006). Averaging spending in approximately 40 countries between 2002 and 2010, total environmental expenditures accounted for only 0.2% of government expenditure (CBD, 2011; Emerton et al., 2006). More recently, the UNDP (2018) recorded total biodiversity expenditures accounting for between 0.03% and 0.94% of a country's GDP on average, or between 0.14% and 4.6% of public budgets. The US spends 0.34% (USD 12.2 billion) of its total federal budget on ocean and coastal support, allocated to 14 federal departments and 38 agencies. Given the importance of the ocean sectors to many countries, their significant contributions to national GDP and their reliance on healthy marine systems, current public investments are minimal.

Running counter to this is government spending on harmful subsidies. An estimated USD 22 billion annually is allocated in the form of harmful subsidies spent to increase fishing capacity and facilitate overfishing. This alone is greater than the estimated financing required to meet 30% MPA coverage (Sumaila et al., 2020).

2. Bi- and Multi-lateral funding; global fund

The costs of MPA management is not felt uniformly across regions or jurisdictions. The 'global south' bears an outsized share of the costs but many benefits accrue globally, including to many industries concentrated in more developed countries. As such, efforts are needed to strengthen and increase bi- and multilateral funding streams to support ocean protection and sustainable management in Large Ocean States and territories, developing countries and international waters.

ODA for the ocean economy remains at USD 2.9 billion, down from USD 3 billion in 2018. Of this USD 1.65 billion targeted the sustainable ocean economy, and represented 0.8% of gross global ODA; an additional 0.6% was committed to ocean-based industries without a dedicated sustainability focus (OECD, 2021). Of the USD 1.65 billion targeting the sustainable ocean environment, 35.6% targeted marine protection (USD 587 million) (OECD, 2021). Moreover, it may be difficult for those with the greatest need to access these funds, such as Large Ocean States and territories – more needs to be done to ensure that complex or labor-intensive administrative procedures do not inadvertently impact allocations.

3. Ocean User Funding

The ocean-based economy is the 7th largest in the world and it is from the impacts of this economy that the need for MPAs arises. MPAs are an integral part of a multi-faceted and dynamic ocean management regime, providing direct benefits to, and offsetting the negative impacts of, ocean-based economic sectors.

Given increasing pressure on public funding and the significant wealth generated by ocean resources, the ocean-based sectors have a critical role to play as funders of marine conservation. The lack of a monetizable service exchange prevents the direct flow of funds from most ocean users to MPAs. The benefits to direct users of MPAs – such as tourists or researchers – do not adequately reflect the value provided by MPAs which is better examined in the context of the broader host of ocean users. Below we look at several ocean-based sectors.

Tourism/visitor fees

The most well-established user fee is the tourism/visitor fee, which makes up a substantial component of many MPA budgets. Entry or visitor fees can be implemented at a variety of scales ranging from a single attraction within an MPA to a national-level levy on all arrivals which can then be distributed to a broad network of conservation efforts. Anecdotal evidence has shown that iconic and accessible MPA sites have significant potential for revenue generation with little negative impacts on visitor levels.

However, visitor fees do have limitations. There are many valuable MPA sites that for one reason or another are not able to attract visitors. Structuring a visitor fee at a national level may be able to address this, essentially redistributing funds from one popular site to other sites. However, this is of limited help in an environment where total network-level financing requirements outstrip total entry revenue or where visitorship at a national level remains low. More generally, MPA-related tourism represents only a small subset of the ocean-based economy which is also dependent on MPAs.

More recently, the global COVID-19 pandemic has significantly affected the tourism market and has reduced revenues associated with visitor fees. Analysts do not

expect a full recovery until 2024 or later, although increases in travel activity are expected to continue this year. Despite this recent picture, it is important to remember that the tourism market, including MPA tourism, is a rapidly growing sector which, prior to COVID-19, accounted for 1 in 10 jobs globally (WTTC, 2019). Similarly, MPA finance that strongly relies on tourism revenues should consider developing additional resilience via fund diversification or contingency planning.

Despite the value of tourism entry fees, tourism industry actors often resist implementation of visitor fees out of fears relating to visitor levels or spending patterns. While anecdotal evidence has shown high potential for revenue generation with little negative impacts on visitor levels and spending, there is little documented or quantitative evidence on the issue. More research can be done to demystify the impacts of these mechanisms.

Box 1: Palau's Pristine Paradise Environmental Fee

Set at USD 100 per visitor, all visitors to Palau must now pay Palau's Pristine Paradise Environmental Fee (PPEF). Revenues are generated from a departure fee, which is added to all airline tickets but that is refunded to locals, and is distributed to environmental and social needs.

Current allocations include USD 30 towards a 'green fee' which distributes funds between Palau's Protected Area Network Fund (15%), a Fund administrator (5%), and water and sanitation (10%). A further USD 10 is earmarked for The Palau National Marine Sanctuary (PNMS) Fisheries Protection Trust Fund. Additional allocations include the national pension plan and departure tax, with the remaining being divided among the states (Andrews et al., 2020).

Palau's reputation as a world-class diving spot has made implementation of a green fee a logical financing option. However, government allocations do not play a significant role in funding the country's protected areas, and financing is highly dependent on tourism arrivals.

Fisheries

The fishing industry also derives significant benefits from a healthy marine ecosystem and from MPAs in particular. Effectively designed conservation areas can support global fisheries through protection of habitats, spawning grounds, genetic diversity and other services. Despite an annual production value of USD 400 billion annually, fishing industry fees have, to date, not been effectively channeled to support MPAs at scale. However, fishery subsidies have consumed additional government resources, helping add effort and, in many cases, further degrade the productive capacity of the resource.

Distant water fishing nations – of which five countries make up 90%¹ – receive significant benefits from lower-income countries. One third of EU fisheries production is caught in developing countries and international waters (OECD, 2018). However, in many cases, the revenues sourced from distant water fishing allocations are prioritized for other uses, leaving MPAs underfunded, even when a significant proportion of national revenue is dependent on such management measures. More recently the EU has begun supporting MPA creation through Sustainable Fishery Partnerships (OECD, 2018).

Given the scale of the fishing industry, small fees on licenses or catch would represent meaningful progress toward the funding of 30% MPA coverage, funding that would likely pay itself back directly through increases in stock health and fish spillover.

Box 2. Sustainable Fishery Partnership Agreements between the European Union and Mauritania

In 2004, the European Council paved the way for Fisheries Partnership Agreements (FPAs), more recently renamed Sustainable FPAs. These agreements involve a financial contribution to fishing nation partner countries that include two components: (1) a financial contribution for access rights to the fisheries

resources within the EEZ; and (2) “sectoral” financial support, which promotes in-country sustainable fisheries development and is spent according to an agreed program.

In 2015, an agreement was made between Mauritania and the EU that was worth some 59 million EUR annually (OECD, 2018). The FPA provides sectoral support funds totaling 4 million EUR/year which is paid into the country's national budget. Of this, 0.5 million EUR is channeled to Banc d'Arguin National Park (PNBA) and 0.5 million to BACoMaB Trust Fund (Fonds Fiduciaire du Banc d'Arguin et de la Biodiversité Côtière et Marine). This ongoing commitment by the government to contribute to the BACoMaB Trust Fund has further increased funding by attracting additional financing from other international partners (OECD, 2018). MPA funding accounts for some 1.7% of FPA commitments.

Other

While fisheries and tourism are often considered the primary beneficiaries of MPAs, the ocean economy is significantly broader. A number of critical industries benefit from ocean management, but more importantly, also have impacts on the marine environment.

The shipping industry, for example, is responsible for 80% of all global trade by volume and accounts for 2% of global GHG emissions (IEA, 2021). The industry is heavily impacted by changes in storm intensity and sea level rise and therefore not only impacts the ocean through its emissions, but also relies on a stable climatic system (EDF, 2022).

Given the size of the industry, a small fee on a per-ton or per-container basis could yield hundreds of millions of dollars, with little repercussions. Although no current system is in place, the Ocean Recovery Alliance (2016) describes a potential revenue generation scheme for

¹ <https://www.seafoodsource.com/news/supply-trade/five-countries-account-for-90-percent-of-distant-water-fleet-effort> accessed June 10, 2022

ocean conservation efforts proposed by the Ocean Appreciation Program. This scheme proposes a voluntary fee per container shipped across the ocean, and calculates a potential revenue of USD 3 billion annually.

4. Carbon and Climate

There is a growing awareness of the role of MPAs as a nature-based solution in the fight against climate change. In 2021, the US, UK, Chile, Costa Rica and France announced a global partnership to advance this cause (NOAA, undated).

Under the UNFCCC, developed countries committed to USD 100 billion annually by 2020 and four multilateral funds have been established to support adaptation projects: the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF), the Adaptation Fund (AF), and the Green Climate Fund (GCF) (Wabnitz & Blasiak, 2019). However, despite the ocean being a major sink for atmospheric carbon, prior to 2018 only approximately 6% of projects were focused or partially focused on marine and coastal initiatives (Guggisberg, 2018).

As climate finance continues to grow, allocations for ocean conservation should be increased and earmarked for MPA implementation and management. Private carbon market finance will also be more readily available for the marine environment going forward; however, it is unclear if the scale and configuration of this funding will allow more than project-based funding.

5. Debt for nature/adaptation swaps

A 2010 congressional paper reports that USD 1 billion was generated by debt swaps between 1987 and 2010 with non-US bi- and multilateral swaps accounting for USD 499 million, US bilateral swaps accounting for USD 396 million, and three-party swaps accounting for USD 138 million. Although tailing off in the 90s, DNS have more recently seen a renewed interest, stemming in part from significant growth in public sector debt. From 2007 to 2020, public debt as a share of GDP nearly doubled, from 70% to 124%.

Global pledges on climate finance have also brought renewed attention to DNS, and in 2015, the Republic of Seychelles engaged in the first ever DNS focused primarily on marine protection.

DNS do have limitations - they are predicated on underlying financial positions and debt relationships and have high transaction costs. There is also a limited supply, based on outstanding debt stock. However, growing public debt might present an opportunity to ramp up such transactions. DNS may also be aided by the growing presence of impact investors who may be willing to sacrifice premiums in order to support funding for conservation.

6. Blue Bonds

Nature bonds are a rapidly developing debt market, now worth some USD 300 billion (UNDP, 2018). In 2016, green bonds raised over USD 100 billion (Brown et al., 2011), and in only six years the Global Green Bond issuance has risen from USD 11 billion to USD 200 billion (Waldron, 2020). This sector offers a significant opportunity for ocean finance based on its scale, its relevance to advanced financial markets and its ability to rapidly deliver new actors and partners (Thiele, 2015).

Nature bonds can take many forms. In general, revenue from bond sales is used to implement projects which can generate revenue. Revenues are then used to repay bondholders. In this case, the proceeds from bond sales may be able to support conservation goals though, for instance, developing fee-for-service tourism infrastructure, but direct opportunities to fund conservation management may be limited. Other bonds may be issued that can be paid from general accounts. Proceeds from these bond sales can be used for non-revenue generating activities, with bond repayments made using government revenue from other sources. Such a mechanism can be used to attract private investors, including impact investors who may be willing to sacrifice part of the traditional risk-based premium in order to support conservation objectives.

Box 3: Blue Bonds in the Republic of Seychelles

In 2018, the Republic of Seychelles launched the world's first sovereign blue bond, raising a total of USD 15 million to advance the country's blue economy. The bond has a loan guarantee from the World Bank, and is coupled with an additional USD 10 million in funding, consisting of a USD 5 million grant from the GEF and USD 5 million in low interest loans from the International Bank for Reconstruction and Development (IBRD). The USD 25 million is split between two implementing entities – the Development Bank of the Seychelles (USD 20 million) and SeyCCAT (USD 5 million). The economic development programs are designed to promote a healthy and sustainable fishing industry and generate increased tax revenue, thus enabling the Seychelles to repay the bond (Andrews et al., 2020).

7. Impact Investing

Impact investing almost doubled in value between 2017 and 2019, increasing from USD 35 billion to nearly USD 60 billion. However, to date, little of this finance has made its way into conservation projects (Walsh et al., 2020). The frequent lack of a monetizable service transaction in MPAs may prevent direct return-seeking investments. Currently, impact investing to support MPA management predominantly focuses on privatized MPAs in areas with reasonable site-based revenue streams that can be bundled together with conservation activities. However, it remains to be seen how impact investing can be used to support MPA establishment and operations at scale – in areas that have not been privatized or lack local revenue generation opportunities.

In addition, government and/or donor finance is often required in order to de-risk transactions and attract private sector investments, as is often the case with many

innovative financing mechanisms. Governments will also be required to develop a regulatory environment that is conducive to private sector investments (Sumaila et al., 2020; Walsh et al., 2020).

While impact investing can attract new players into the market and has the potential to support localized and potentially profitable MPAs, it is unlikely to present a global solution.

8. Private Philanthropy/Donor Funding

Private philanthropy will continue to play an important role in MPA financing and can often represent one of the few early sources of MPA financing (Emerton et al., 2006; Reid-Grant & Bhat, 2009; Wabnitz & Blasiak, 2019). Over the past decade, philanthropic funding for marine conservation has doubled; in 2020 private ocean philanthropy accounted for some USD 1.2 billion, up from USD 520 in 2010. In 2015, philanthropic support for oceans exceeded ODA funding, and as of 2019 they remain similar in size (CEA 2022).

Five foundations made up just over half of all commitments in 2014 (57%), with the bulk of funding between 2010 and 2020 going to science (21%) and protected areas and habitat protection (17%) (CEA 2022). Granting has predominantly remained focused in North America, Europe and the Coral Triangle, although more recently donors are shifting to new geographies (Gruby et al., 2021).

However, philanthropic support for the oceans still only accounts for less than 1% of philanthropic giving and as such, there exists the potential to increase this type of financing.

Nevertheless, private philanthropy and donor funding tends to represent short-cycle funding that is perhaps most beneficial in supporting MPA establishment, capacity development and, indeed, in developing longer-term financing frameworks and institutions. As such it is often best as part of a wider portfolio of financing options.