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National-level Costs of Implementing 30x30 in Latin America and the Caribbean

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Policy Brief

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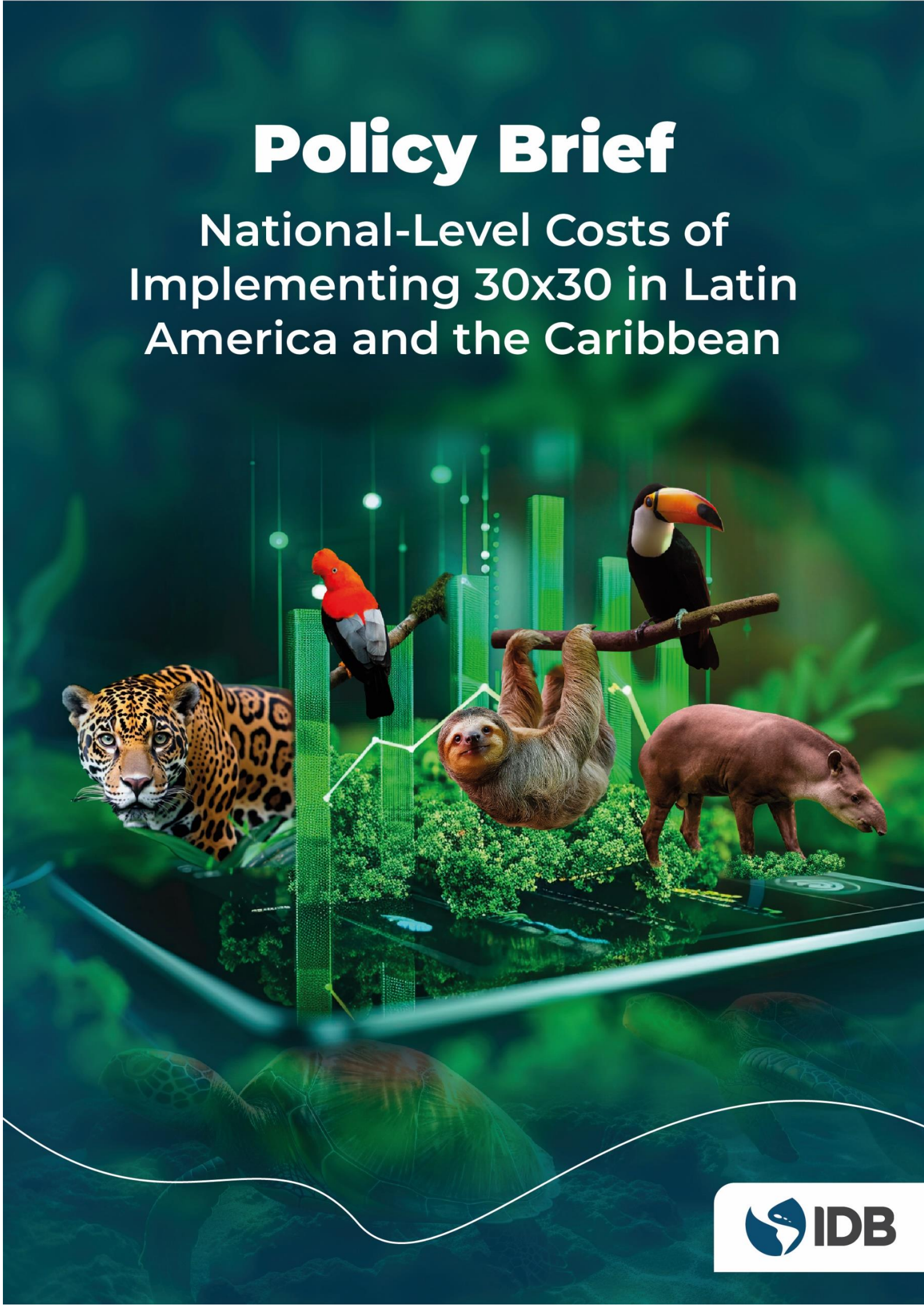

IDB

Policy Brief: National-Level Costs of Implementing 30x30 in Latin America and the Caribbean

The Commitment to Target 3 of the Global Biodiversity Framework in Latin America and the Caribbean

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Abbreviations

COP15	Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity
GBF	Global Biodiversity Framework
IDB	Inter-American Development Bank
IPLC	Indigenous peoples and local communities
LAC	Latin America and the Caribbean
MPAs	marine protected areas
NBSAPs	National Biodiversity Strategies and Action Plans
Open IEEM	Open Integrated Economic-Environmental Modeling
PCAs	protected and conserved areas
SEEA	System of Environmental Economic Accounting

Executive Summary

This policy brief explores the financial dimensions of implementing **Global Biodiversity Framework (GBF) Target 3**, which commits countries to conserving **30 percent of terrestrial and marine areas by 2030**—a goal commonly referred to as "30x30"—in Latin America and the Caribbean (LAC). While LAC countries already have relatively high levels of protection (24.5 percent terrestrial and 25.3 percent marine) compared with the global average, many still face significant expansion needs. These needs carry substantial costs, which this brief quantifies and contextualizes for 26 **Inter-American Development Bank (IDB)** member countries using data from a forthcoming IDB publication. The total cost for establishing and managing protected areas to meet 30x30 goals in LAC is **between US$9.6 billion and US$11.4 billion** (less than 0.2 percent of regional GDP).

Establishment costs (one-time expenses to create new protected areas) **for marine protected areas (MPAs) are generally modest**, often under US$1 million per country, because of the absence of land acquisition costs. In contrast, **terrestrial establishment costs** can be substantial, but costs can be lowered whenever new conservation areas can be established on donated or government-owned land.

Management costs (which are recurring annual expenses for operating these areas) in the marine realm are projected to be between US$1.4 billion and US$1.7 billion annually, a figure that represents a tiny fraction of LAC's GDP and is expected to decline over time relative to economic growth. **Terrestrial management costs are more variable**, ranging from just over US$1 million to US$2 billion per year[a], depending on the country, as these costs are influenced by system size, human pressures, and proximity to economically active areas.

Opportunity costs (which represent the economic trade-offs of restricting land or sea use for conservation purposes), **particularly terrestrial, are often misunderstood or overestimated.** For example, in many cases, protecting high-biodiversity areas does not significantly interfere with agricultural expansion. In countries such as Guatemala, Honduras, and Nicaragua, opportunity costs under a biodiversity priority scenario are minimal. **Marine opportunity costs are more complex,** though, because of the immediate economic shock that can result from restricting fishing activities. However, this brief highlights how well-

[a] All finance values are given in constant 2024 US dollars.

managed MPAs can lead to long-term gains through fish stock recovery and spillover effects, which benefit both fisheries and food security.

To support countries in achieving 30x30, **the IDB** is positioned to offer a wide range of technical and financial assistance, including **baseline research and knowledge products** to assess the economic and ecosystem service impacts of conservation decisions; **policy dialogue and strategic planning** to assist governments in preparing their biodiversity finance plans; **concessional, innovative, and blended finance** to help governments manage costs; and **technical cooperation** on **mainstream biodiversity in productive sectors**, among others.

In conclusion, while some financial requirements for 30x30 are less than commonly expected but others are just as significant, these investments all provide long-term economic and ecological benefits. There is a need for strategic planning to minimize costs and maximize biodiversity outcomes, and the data in this brief can serve as a tool for policy dialogue, budget planning, and international cooperation in LAC's journey toward meeting its biodiversity commitments.

Introduction

The GBF, which focuses on halting and reversing biodiversity loss by 2030, was adopted in 2022 at COP15 (the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity) by 196 signatory countries, including all the countries in LAC. The framework commits the signatories to a set of international biodiversity targets,[1] among which is **Target 3**, to conserve 30 percent of land, waters, and seas by 2030.[b] The target, widely known as **30x30,** signifies a major increase in conservation ambition—doubling the world's current terrestrial protected and conserved areas (PCAs) and nearly quadrupling its MPAs.[2]

The target addresses how global biodiversity losses and depletion of natural capital represent economic and financial costs and threaten global economic stability[3–5]—natural capital brings multiple economic benefits to countries, including people and governments. Having a robust natural capital is important for several reasons, including protecting nature's role in stabilizing the global climate,[6] protecting increasingly fragile water supplies, protecting vulnerable coastal areas from the increasing levels of storm damage, generating higher GDP growth,[7] and generating income from nature tourism, which is a major, rapidly growing global industry.[2,4] In addition to the highly damaging potential of these economic effects, the nonmonetary benefits that nature provides human beings are also at stake.

As countries move to protect their natural capital with national action plans for their 30x30 commitments, LAC is in a somewhat advantageous position. The region's PCA coverage rates of **24.5 percent terrestrial and 25.3 percent marine coverage** are higher than the global average. However, meeting the 30x30 target still requires substantial expansion for many countries, which will require planning for the costs.

Figure 1. LAC's Protected Areas

Source: UNEP-WCMC and IUCN.[104]

[b] "Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities, including over their traditional territories."[1]

Although robust ecosystem service valuation models exist,[c] the true value of nature may not be reflected in national accounts or in decision-making. For governments, there may be insufficient fiscal headroom to cover the additional expenditure needed for 30x30, especially if constrained budgets are already earmarked for other pressing needs such as health, education, and support for low-income families. Also, most governments are not likely to ignore the potential economic downside (opportunity costs) to their key national industries when assessing if and where to designate protected areas.

In addition, uncertain or overestimated short-term costs are an even bigger barrier to planning efforts. To comply with the 30x30 commitment, decision-makers need to have information on potential implementation costs in order to conduct policy planning around the GBF commitments and appropriately debate national legislation. And regardless of the long-term benefits of nature conservation, **the short-term costs of conservation are typically more visible** and sometimes more difficult to justify on political timescales.[8–11]

This policy brief is based on the forthcoming IDB publication "National-Level Costs of Implementing 30x30 in Latin America and the Caribbean," which **quantifies the projected costs of 30x30 for 26**[d] **LAC countries** through a range of economic models that project the costs and economic implications of expanding PCAs. The report's robust cost projections accommodate future policy changes, and its conceptual design of scenarios and cost approaches accommodates the uncertainty across multiple elements of future decision-making. Accordingly, the cost projections[e] will remain reasonably valid and informative if policy decisions diverge from the 30x30 scenarios used to generate the projections.[f]

[c] For example, System of Environmental Economic Accounting (SEEA), InVest, or the IDB's Open IEEM (Open Integrated Economic-Environmental Modeling) Platform

[d] Argentina, The Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela

[e] The report assumes that each country protects the same percentage (30 percent) of its own territory on both land and sea. For the countries that already have achieved 30 percent, the assumption made was that the current (>30 percent) coverage would be maintained.

[f] For the complete methodology on the different types of costs, refer to the publication.

Costs and Scenarios Approach

To provide a robust assessment approach to implementing 30x30, costs are planned for various likely scenarios associated with **marine and terrestrial conservation** expansion needs. Given that the current budgets of protected areas and PCAs are almost always below the levels required for adequate management of basic needs,[12] financial needs are assessed at two levels:[13] **basic needs** (the budgets necessary to carry out the core activities adequately) and **optimal needs** (the budget to carry out every activity PCA managers aspire to).[13] This brief models only the basic finance levels needed to establish 30x30 by addressing the three main direct cost types related to expanding protected areas and PCAs:

1. **Establishment costs** are one-time expenses involved in creating new PCAs.[2,14] This includes legal costs, setting up signage, or informing and consulting with the local community. **Marine costs, requiring no purchase, are typically lower than land costs.**
2. **Management costs** are the repeated and ongoing annual operational costs of running and maintaining PCAs, which mostly fall to public budgets,[15] since protected areas and PCAs are usually run by state or parastatal authorities.
3. **Opportunity costs** are the potential benefits that might have been enjoyed by an industry (or sector), but which cannot happen because of an area being declared as protected. For example, economic losses in sectors like agriculture and fisheries due to land or sea use restrictions. Given the important role that fisheries and agriculture play in LAC, any economic downside to those individual sectors caused by 30x30 needs to be anticipated and mitigated.

Costs are further subdivided into those associated with marine conservation and terrestrial conservation, reflecting the very different economic conditions, mechanisms, and outcomes for all costs in those two realms.

All costs depend on where protected areas and PCAs are located and how they are managed, but there is generally limited or no information on future locations or management approaches. Yet, cost projections are often needed in advance of such decisions being made and are sometimes required to guide decision-making. It is therefore necessary to have **scenarios** regarding possible future protected area and PCA locations to appropriately estimate costs. For this study, different configurations of future protected area and PCA locations and management approaches that capture the broad political and economic trade-off between economic and biodiversity priorities were modeled, resulting in three scenarios:

- **Scenario 1. Biodiversity priority** assumes that governments aim to protect the areas in each LAC country that have the highest biodiversity, but which remain unprotected.
- **Scenario 2. Economic priority** assumes that governments will aim to avoid opportunity costs as much as possible, so economic needs are given priority.
- **Scenario 3. Biodiversity/economic compromise** blends scenarios 1 and 2 by placing some but not all future agricultural land out of reach of PCAs and protecting biodiversity as before. For MPAs, this implies allowing sustainable fishing in 50 percent of the inshore MPA area.

Key Findings on 30x30 Costs and Scenarios

In general, larger protected area systems need larger budgets, and protected area systems under higher human pressure cost more to maintain. Also, systems that incorporate business aspects (such as ticket and gift sales, visitor centers, etc.) need larger budgets.[2]

But technological changes may also affect costs (and make operations more cost-effective) in ways that modeling cannot anticipate today.[g] Similarly, protected areas are a major driver of economic benefits, such as being a substantial revenue source in the nature tourism sector, so their growth will affect revenues. The nature tourism sector in most countries globally is several times larger than their protected area system costs, and LAC's sector is already a significant economic driver that is likely to grow particularly rapidly in the next few years.[2,16]

The following discussion of the key findings addresses the three main types of costs by marine and terrestrial area.

Establishment Costs

Establishment costs are often one-off costs involved in creating new protected areas.[30–32] Examples include setting up initial public and government consultations and project proposals, developing a legal framework for designation, developing a management plan, establishing signage and outreach to local community and stakeholder groups, establishing community and stakeholder compensation schemes (including alternative-income generating activities and fisher buy-out), conducting ecological and socioeconomic research, conducting management and enforcement training, and establishing infrastructure (including buildings, equipment, and site delineation). However, one cost dominates all others: the cost of

[g] This may particularly apply to the increased use of drones (unpiloted aerial and underwater vehicles) for both biological and compliance monitoring.[97–99]

purchasing land (acquisition cost). It is not uncommon for rural land prices to reach thousands of dollars per hectare in LAC,[33–36] and some estimates suggest that the acquisition cost could be approximately 50 times the annual management cost of a protected area.[32] On the other hand, marine establishment costs are much lower than terrestrial costs in LAC.

Marine Establishment Costs

- Statistical models find that **the longer MPA creation takes, the higher the cost. And MPA size is a strong positive predictor of establishment costs.**
- Establishment costs do not need to be paid up front in a single payment. Instead, they can be financed, including borrowing funds with an extended repayment term. The upcoming study compares **an up-front payment cost with an amortized cost**.[h]
- Throughout LAC, **marine establishment costs would be modest and, in some cases, either zero or very small in terms of government budgets.** If the costs are met up front, the **total regional cost is estimated at US$21.23 million**.[i]
- Regional costs are low because by 2025, most LAC countries had already protected 30 percent of marine areas (Chile, Colombia) or close to that (Costa Rica, 28.4 percent; Brazil, 26.7 percent; Panama, 26.3 percent; Mexico, 22.6 percent), and so **relatively few new MPAs needed to be created to achieve 30 percent coverage.**
- Costs for individual countries were often **less than US$1 million**, reflecting how a limited need for new MPAs can generate low national-system costs overall. **Establishment costs are 3.71 times smaller than a single year's annual management cost.**[37] However, if the total cost were amortized over 30 years at 5 percent interest, it would be almost twice as high (1.95 times the raw cost).

Terrestrial Establishment Costs

- **Establishment costs for 30x30 can be much lower if a large portion of all the new land needed can be acquired without purchase.** For example, much of the existing protected area system is on government-owned or donated land in Latin America.[38–40] Additionally, there may be cases where a land purchase is judged to be politically inappropriate or an unnecessary expenditure, such as where indigenous community conserved areas[41] become included in the lands counting toward the 30 percent target.[1]

[h] The study calculates a 30-year repayment plan with a 5 percent interest rate, representing a long loan or bond (since there may be budgetary pressure to keep annual repayments low) in broad alignment with recent bond rates.
[i] Confidence interval US$15.6 million to US$29.3 million, with all dollar values deflated to 2024 constant dollars.

- However, it is also important to note that nonstate structures of protected area ownership and management may require their own form of establishment to set them up as effective conservation areas.[41,42] For example, indigenous-managed areas that freely consent after open consultation to be included in 30x30 lands may need infrastructure, training, or formalization. This could often start with securing formal tenure to the land, which has very low costs compared to land purchase.[43–46]
- **Some LAC countries have already exceeded 30 percent protected area coverage,**[47] so no further establishment costs are implied. These are The Bahamas, Belize, Bolivia, Brazil, Panama, Trinidad and Tobago, and Venezuela.
- For countries that require relatively small acquisitions to achieve 30 percent, like Barbados and Costa Rica, the establishment costs are relatively low.
- Some countries with small land areas have a smaller area to protect to reach the target coverage, so their costs are lower. For example, El Salvador has a very small national land area and, therefore, a budget need of just over US$1 billion. This amount is even lower than that of Costa Rica, despite El Salvador's lower level of currently protected areas.
- At the other end of the spectrum, **establishment costs are particularly high in countries that need a large amount of new land to achieve 30 percent coverage**. For example, Colombia has 17.1 percent coverage and would require an additional 14.91 million hectares to reach 30 percent, resulting in a very high potential establishment cost (i.e., US$26.1 billion for 100 percent purchase in scenario 1).
- Guyana has 8.4 percent coverage, meaning that despite its relatively low cost base, so much new land would be needed that establishment costs could still be high (US$28 billion to US$63 billion for 100 percent purchase, depending on the scenario).

Management Costs[j]

Management costs are the recurrent annual costs of regular activities related to managing protected areas.[17,18] Because they are created and maintained with multiple objectives in mind, they can be highly variable.[19] Some examples of this type of cost include day-to-day patrolling (both staff and vehicle costs), habitat maintenance and improvement, wildlife monitoring (and possible interventions), and infrastructure, such as signage, fencing, trails, access roads, payroll management, and buildings for visitor centers, community relationship management offices, ticket sales, and concession sales.[20] However, effective protected area management also includes additional expenses such as education and communication outreach to increase the understanding of (and compliance with) park goals, livelihood programs for local communities and stakeholders, veterinary activities, financial planning, and

[j] The costs projected are of *effective operation* rather than *current operation*, since current MPA budgets are generally too low to achieve adequate management.[4,5]

funding applications.[19,20] Also, some protected areas carry out a broader range of activities than others.

Marine Management Costs

- Most LAC governments will need to **increase conserved marine areas** in the near future to achieve 30 percent coverage of national waters. Chile and Colombia have already achieved 30 percent protection of their ocean areas.
- **MPA management could represent a large increase in the financial resources** that governments need to provide, so projections of those costs are likely to be critical to policy and budgetary preparedness.
- The three scenarios reflect how decision-making around new MPA configurations can **often center on a trade-off between economic and biodiversity priorities**.
- Across all the LAC countries assessed, the **total annual regional management cost of implementing 30 percent MPAs was US$1.4 billion–US$1.7 billion for 2030**. As a regional budget, this is notably modest, being equivalent to just **0.02 percent of LAC's GDP** in 2023. Costs are projected to increase over time, but at a slower rate than GDP, making MPAs progressively cheaper (**MPA budgets are projected to fall by over 50 percent between 2030 and 2060**) as a percentage of GDP.
- It is easier to manage an area that simply allows no fishing. However, if scenario 1's ban on fishing in MPAs causes extensive compliance issues in its own right (as could occur if the ban were imposed with inadequate community consultation), then the managers of the marine park itself may need even more financial resources than before to manage ocean users who may be creatively evading the new restrictions.
- **Offshore areas were generally considerably cheaper to manage, because remote monitoring technology**[21] can be used to guide a small number of long-distance patrol craft in their dealings with large industrial vessels, providing cost savings, by specifically directing patrols towards a target, instead of having several crafts patrolling trying to cover more space.
- MPA systems that protect economically vulnerable coastal communities, and fishers in general, may be about 60 percent more expensive, but they are also likely to be more effective (and more cost-effective).[22–24] **Any policy that enhances compliance by working with the needs of fishers and local communities is likely to bring costs down over time.** MPAs also bring long-term benefits, including to local fishers, because they often allow fish stocks to regenerate, increasing future catches, profits, and food security. However, for those benefits to arise, the MPA system needs to be adequately funded[25] and contain a substantial proportion of highly protected areas (that do not allow exploitation). Also, pursuing other economic or social goals sometimes negatively affects MPA management costs. For example, **lighter MPA**

regulations introduced to avoid opportunity costs can instead cause increased management costs.

Terrestrial Management Costs[k]

- Across LAC, **the 2030 annual management cost for the three terrestrial scenarios ranged from US$1.2 million per year for Guyana to over US$2 billion for Brazil**. his large difference between countries was primarily driven by two factors: the **size of each country** and the **human pressures on the protected area systems** implied by the scenarios. Countries where these pressures were higher tended to have higher costs.
- Historically, **terrestrial protected areas have been situated in areas of relatively low economic importance, such as remote lands**, deserts, or mountaintops, which also have low human pressures and low land values (agricultural rents).[26,27] This wilderness-style approach may have been motivated by trying to avoid opportunity costs; however, **it has also prevented protected area systems from capturing much of the important biodiversity and ecosystem services** (such as clean water, pollination, and pest control) **that benefit each country.**[28,29] The closer protected areas are to people and agricultural production areas, the higher the economic value of protected area–related contributions. **The value of the benefits indeed outweighs the cost of providing them.**[2]
- For all LAC countries, **scenario 1 (biodiversity priority) is generally cheaper than both scenarios 2 (economic priority) and 3 (compromise).** In some cases, the low cost of scenario 1 is particularly striking: In Argentina, it would be less than half the cost of scenario 3.

Opportunity Costs

For terrestrial areas, the main opportunity cost is nearly always measured as a potential income loss in agricultural production.[2,48,49] For marine areas, the main opportunity costs are fishing, which is the most common profession in Latin America, making it an important source of income and a key aspect supporting food security.[50] The region has traditionally been a major exporter of fish, with volumes exceeding domestic consumption.[51] However, fisheries production in the region has also seen notable declines in the past 20 years,[50] due to two main problems: overfishing and warming of the oceans[52,53] If all current conditions remain, **the LAC**

[k] The costs given for the scenarios should not be regarded as exact; they are projections. When interpreting the results, it is important to consider this relative level of uncertainty. Some countries have higher levels of uncertainty than others.[k] However, this does not mean that all country estimates are highly uncertain. Overall, projected management costs for most of the countries are stable across scenarios.

region is likely to see generalized near- and medium-term declines in fisheries catch and output.[52] In 2024, **the condition of LAC's fishing area was judged to be unsustainable**, and its **regional figures are considerably worse than the global average**.[55]

Marine Opportunity Costs

- The highest opportunity costs are located in exclusive economic zones, which combine accessibility from shore with high fish biomass and national fishing rights[56] Limiting or banning fishing in 30 percent of the exclusive economic zone area could therefore cause fishers to lose a large part of their original fishing grounds and have to travel further, or fish more intensively and for longer, to achieve previous catch levels.[57,58] These restrictions could therefore lead to lower catches and higher costs.
- **MPAs can return fisheries to sustainability by allowing a portion of the fish stocks to recover** (as long as access for fishing is limited or removed in MPAs).[59] This is because recovering stocks can cause overspill, which is when some of the increasing stocks migrate out of MPA system areas where fishing is not permitted into areas where it is, **generating a higher catch with less effort.**[60,61]
- The initial closure of any large portion of fishing grounds can be a shock and is **likely to cause immediate losses in the short term**. But, as the fish stocks recover and the fishing fleets adjust their fishing patterns, **the benefits may start outweighing the losses**. **The more an area was overfished in the past, the larger the benefits of allowing stock recovery in MPAs are likely to be.**
- **Scenario 1 (biodiversity priority)** models a strict conservation benchmark in which fishing is heavily curtailed to approximate the effects of an extensive no-take policy. Notably, this scenario **yields the most pronounced mid-century catch improvements**, indicating robust stock rebuilding and **long-term gains in sustainable catch** under maximal protection.[62] Though not a practical policy, it serves as a methodological extreme, maximizing ecological recovery while estimating lower-bound, minimal management intervention costs and an upper bound of potential stock rebound. By comparison, scenario 2 (economic priority) and scenario 3 (compromise) produce modest short-run boosts in catch, reflecting more lenient management, but those gains tend to be transient (initial boosts decay to near zero in later years as stocks remain under pressure), whereas the stringent protections of scenario 1 lead to continual increments in catch over time as healthier fish populations sustain higher

yields. However, it must be emphasized that scenario 1's full-closure assumption is a simplified analytic tool to explore ecological potential.[I]

- Fisheries are not the only economic sector that will interact with MPAs. The visitor economy for coastal and maritime areas and all related support services is **likely to experience economic benefits from better protection of ocean and coastal areas.** In the broader economic picture, the short-term shock to fisheries may be counterbalanced by rapid economic gains in these other sectors.

[I] Scenario 1 was selected as a modeling convenience. By assuming a total fishing closure, the analysis could simplify ecological and economic calculations. The IDB does not advocate blanket no-take zones as a preferred policy; this assumption serves only as a methodological baseline to gauge the lower bound of management costs and the upper bound of potential recovery benefits. Furthermore, extensive empirical research shows that comanagement and hybrid governance models (which involve shared responsibility between governments and fishing communities, and use a mix of conservation tools) generally outperform strict closures in delivering long-term sustainability and compliance.[102] These collaborative approaches are more complex and resource-intensive to design and implement, but they produce outcomes that pure no-take strategies often struggle to achieve in practice.

Terrestrial Opportunity Costs

- **Creating a new terrestrial protected area does not immediately decrease agricultural profits or income**. Rather, it changes the potential to earn income from the land in the future.
- The overall pattern of projected national opportunity costs shows **three broad categories of outcomes**. The first is countries with **no projected opportunity costs**[m] (e.g., Argentina, The Bahamas, Costa Rica). The second is countries with **projected opportunity costs that are a few tens of millions of dollars per year**, representing a very small proportion of their total projected agricultural output (e.g., Guatemala, Honduras, and Nicaragua). The third is countries with **more substantial opportunity costs** (e.g., Chile between 7.6 percent and 10.6 percent of its total projected output for that year; Guyana up to 4 percent; Ecuador between 2.7 percent and 3.1 percent; and 1.8 percent for Costa Rica. Scenario 3 (compromise) generally had lower costs (and more countries with zero cost). In scenario 3, the cost for Chile was reduced to US$196.9 million or 0.5 percent –0.7 percent of total output, and the cost for Guatemala, Guyana, Honduras, and Nicaragua was reduced to zero.
- The magnitude of the costs responds to certain **key drivers**. First, costs depend on **how much high-biodiversity areas overlap with optimal areas for agricultural development. The greater the displacement, the higher the potential opportunity cost.** The second is the **size of the pool of potential agricultural land remaining after expanding protected areas** to 30 percent coverage. The higher the number of potential agricultural sites that remain unprotected, the lower the likelihood that opportunity costs occur. These two effects also interact: the more additional land is needed to achieve 30x30, the worse the constraints on high-potential agricultural areas.
- Across all 26 countries, **the total opportunity costs for 2050 are projected to be approximately US$3.75 billion per year in scenario 1 and US$0.35 billion per year in scenario 3.** However, when compared against LAC's total production value of US$738 billion to US$792 billion,[63] **the percentage reduction in overall agricultural profit (net output value) is <0.5 percent in the worst-case scenario (scenario 1)**, and potentially as little as 0.04 percent (in scenario 3) or even 0 percent (in scenario 2). **LAC opportunity costs are therefore confidently projected to be very modest when placed in the context of the agricultural sector's size.**
- These very small opportunity costs contradict a natural intuition that the opportunity costs of conservation must be high because potentially productive land is being set aside. Such an instinct has already caused existing PCAs to be placed in remote areas

[m] In scenario 1 (biodiversity priority)

with little productive potential, usually at the expense of effectiveness in actual species and ecosystem protection.[64,65] Our findings suggest that **for many countries in LAC, the 30 percent requirement does not imply a conflict with economic well-being in their rural economies**.

- Protected areas provide both direct cash revenue from the nature visitor economy,[2,16] and multiple more indirect economic benefits through ecosystem services, such as ensuring a consistent flow of clean water (including to agriculture itself) or multimillion-dollar values of protection for coastal infrastructure and communities.[4] Protected areas placed in remote areas are therefore less likely to be visited (reducing potential revenue), implying higher costs and lower incomes. **If remote placement actually achieves no gain for the national agricultural sector, but causes losses in other sectors, the net result will be negative outcomes for GDP and human welfare.**

Policy Recommendations

The information in this report can be used by policy- and decision-makers to inform their debt-management strategies, policy dialogues, budget planning, and international cooperation finance needs toward meeting their biodiversity commitments and national priorities. As such, the following are the key policy recommendations based on the different types of costs to comply with Target 3.

Establishment Costs

Since the **costs of creating new MPAs are usually low** and nonrecurring, it would be **advisable for governments to fund them up front**, especially if only a few additional MPAs remain to be designated to meet the target. Covering these initial costs will accelerate benefits without generating a significant burden on the treasury. If immediate funding exceeds national capacity, international assistance can be sought (for example, specialized bilateral or multilateral funds) to cover the costs and take advantage of global initiatives supporting marine conservation.[n]

For the terrestrial realm, acquisition is by far the largest cost.[15] Even if treated as a one-off expenditure item, acquisition costs still may represent a major budgetary challenge, so many countries may seek to **amortize those costs**. In addition, to mitigate the very high costs that would arise if land had to be purchased for multiple new parks, and to protect their national natural capital in the most appropriate places, **governments can identify where high-**

[n] In Colombia, 45 percent of the Seaflower MPA establishment costs were funded by international assistance.

biodiversity unprotected land might become part of 30x30 without the need for land purchase. However, it is important not to place new PCAs on land merely because it is cheap. The cheapest land can often have low biodiversity value, which would go against the Target 3 commitment to protect lands of biodiversity importance.

The first step needed would be to **map biodiversity priorities and ownership status in high-priority areas.** Where biodiversity priorities align with low-cost (or free) land availability, **protecting those sites would be a natural policy strategy**. Where sites in need of protection are under private ownership, either purchase the land from or negotiate for collaborative nature conservation with the current owners. By **combining biological and land-ownership information** on all sites that are candidates for protection, **governments can then define the financial needs (establishment costs) for each spatial implementation option for 30x30.** If the most important biodiverse areas prove to be expensive for national budgets, governments can approach international institutions and donors for financial assistance using the defined monetary need and rationale.

In addition, identifying high-biodiversity unprotected areas also provides a unique opportunity to **involve Indigenous peoples and local communities (IPLC) in 30x30.** Nonstate ownership and management structures such as community reserves, Indigenous Community Conservation Areas,[41] and other effective area-based conservation measures[41,70,71] can have an explicit and important contribution to 30x30, as they may prevent land acquisition costs.[o] However, any discussion of IPLC involvement in 30x30 needs to acknowledge that protected area expansion can adversely impact IPLC if it is not implemented in a way that respects their rights and livelihoods.[43,72–74] Even after a broad, rights-based and free, prior, and informed consent–based approach has been implemented, it can still be necessary to agree to detailed arrangements for shared-objective land uses.

Management Costs

In the marine environment, MPA management costs are usually low enough that governments can fully fund conservation of high-biodiversity areas without great fiscal effort. The study found that **scenario 1 (biodiversity priority) had the lowest total cost,** showing that strictly protecting key areas can be more cost-effective, as monitoring a no-fishing zone is simpler and cheaper than managing an area where limited exploitation with complex regulations is permitted. By attempting to avoid immediate opportunity costs through permissive MPAs, the permanent management cost of the system increases, and the medium-

[o] It is important to note that embracing this opportunity could imply various new or different costs for governments, ranging from simple financial recognition of PCA management activities such as clarifying and legally codifying tenure,[45] to financial support to maintain the ways of life and cultural traditions that often underpin a long-standing history of ecological stewardship by IPLC.

term economic benefits that stricter protection would provide are foregone (for example, greater sustainable catches and future tax revenue). **Improving the rule of law and marine governance** significantly reduces MPA costs: when there is more voluntary compliance and less illegal fishing, less expensive surveillance is required. Any policy that encourages compliance with regulations, working hand-in-hand with fishers and local communities to accommodate their needs, tends to reduce operational costs over time by increasing collaboration and decreasing resistance.[25]

For the terrestrial realm, cost decreases can be driven primarily by low rates of development in buffer zones[66,67] around protected areas, which often have been shown to be an effective way of preserving the ecological intactness of the core protected area.[66,67] **Governments and managers should be aware that nature tourism raises management costs, but it can be a major source of income in a rural area that otherwise lacks high-revenue economic opportunities**.[68] This additional budget pressure operates both directly, by increasing the need for visitor-management investment, and indirectly, by bringing more people and infrastructure to the edges of protected areas. **Possible policy solutions include levying tourism fees that contribute to conservation running costs** (as already occurs in several countries[13,58]) or even direct involvement of commercial tourism enterprises in preserving the ecological integrity of the area.

Opportunity Costs

For the marine realm, closing any ocean area to fishing typically generates opposition from fishers, as they perceive a direct harm to their livelihoods in the short term.[75] Scenario 1 (biodiversity priority) could reduce catches in the short term (next decade), but by 2050 would produce the greatest cumulative increase in catches compared with less strict scenarios, provided that populations were previously overexploited and patrolling efforts outside the MPA are controlled. Thus, if fishing supply decreases after 2030, fish prices may increase and partially compensate for the reduced income from lower volume, assuming relatively inelastic demand and markets that transmit these higher prices to producers. However, this compensation would be limited and variable depending on species and market. Nevertheless, in certain cases, the drop in catches could be greater than what price increases can compensate for, leaving net losses for some fishers. In such cases, temporary financial support would be necessary for the initial impact (especially for small-scale fishers, who often lack access to formal credit or have insufficient savings) to sustain their livelihoods during the transition. Furthermore, these vulnerable groups should be closely monitored to detect signs of economic distress and, if necessary, consider limited exceptions that allow them to continue fishing in an artisanal and sustainable manner. Such exceptions must be carefully designed so as not to compromise the recovery of the protected area. Such assistance would represent

investment in growth by helping fishers cope with the transition while reserves recover, enabling greater medium-term economic growth in the sector thanks to more sustainable fisheries and the development of alternative activities. Beyond the fishing sector itself, governments may also need to track any economic distress on domestic consumers (especially low-income populations dependent on the product) from increases in fish prices and react accordingly (for example, food security programs or facilitating imports) to safeguard nutrition and access to protein. For long-term economic growth, **establishing strict MPAs (no-take zones) is usually more effective for most countries**, as it maximizes biomass recovery and ecosystem services.[62]

Effective fisheries management is likely to rely on hybrid approaches. While complete no-take measures are easier to model and use to clearly illustrate the benefits of stock recovery, a combination of partial protections, adaptive quotas, and comanaged regulations will generally be more feasible and socially acceptable, with greater buy-in from stakeholders.[p]

If MPAs are located only in areas of low fish abundance (avoiding interference with fishing areas of interest), or if they are left without sufficient funding for effective management,[25] very limited recovery of target populations can be expected. In other words, protecting empty areas or operating paper parks[q], without real control, generates minimal benefits. Research shows that spillover from a large MPA can extend over 100 nautical miles from its boundaries.[76,100,101] Therefore, if recovery within the MPA is weak, this lack of surplus will be noticed throughout most of a country's exclusive economic zones, depriving national fisheries of a potentially broader benefit. **Although it may be politically tempting to meet targets by protecting areas of little fishing interest, in the long run, this strategy can be counterproductive**: fisheries would continue to decline (affecting food security and sector income), GDP would lose potential contributions from more robust fishing and tourism, and biodiversity would continue to diminish.

MPAs not only impact fishing, but also other economic sectors linked to the ocean. In fact, **coastal and marine tourism and associated services will likely experience economic benefits thanks to better protection of oceanic and coastal ecosystems**. For example, by increasing underwater biodiversity and scenic beauty, demand for diving, sport fishing, and other recreational activities grows, boosting local economies. Considering the economy as a whole, the initial drop in fishing activity could be counteracted by accelerated growth in other sectors, particularly marine tourism. In several cases, tourism revenues derived from a healthy

[p] See note I.

[q] Paper Parks are legally designated areas, which were politically easy to set in order to achieve conservation targets in paper, but in practice are ineffective in achieving the conservation goals[105].

protected area have quickly exceeded local fishery losses, offsetting the temporary economic shock. The magnitude and speed of this effect will depend on each country's capacity to develop that additional tourism. Ultimately, **the government must weigh the benefits that MPAs bring to tourism against initial losses in the fishing sector** to ensure that policies include appropriate compensatory or transition measures and maximize national net economic benefit.

For the terrestrial realm, countries with zero or very low opportunity costs could expand their PCA systems in ways that capture high national biodiversity and ecosystem values with little or no economic downside. The large number of countries with low or zero opportunity costs may seem surprising. However, a protected area simply asks producers to **avoid converting the country's most critical high-biodiversity natural habitat areas** when they choose where to expand their operations in the future. In many cases, **avoiding critical sites may lead to no opportunity cost at all, so long as the same future production can be achieved by converting noncritical sites instead.** However, where such ideal conditions do not exist, difficult decisions about trade-offs and priorities need to be made, including **who pays the opportunity costs**. These costs generally fall upon producers, who may be able to pass the costs on to consumers through price increases, but in an international market, a country with unusually large opportunity costs will not be able to proportionally increase prices without becoming uncompetitive internationally. In response, the two main policy alternatives would be **government support to producers** or **deliberate avoidance of the worst opportunity costs**.

If governments ignore low opportunity costs and still move forward with a policy of placing new PCAs in remote, low biodiversity areas, **this could actually generate negative outcomes for the overall national economy, national GDP, and nature.** To maximize net economic gain from 30x30, countries should assess their opportunity costs, compare them with benefits such as tourism and ecosystem services, and, where appropriate, place PCAs as close as possible to where people live.

How the IDB Can Support Countries on Their Road to 30x30

Estimating the cost of protecting 30 percent of the oceans and lands in LAC is a key input in assessing sustainable financing needs and elaborating a strategic plan to provide LAC countries with financial support to implement GBF Target 3. The IDB can directly support countries with baseline research, data, and knowledge products. For instance, the Open IEEM (Integrated Economic-Environmental Modeling) can be applied to estimate scenarios on economy, society, natural capital, and ecosystem services for decision-making, policy, and investment, as well as assessment of potential economic impacts.

The IDB can also support countries' transition to becoming nature-positive by facilitating sector dialogue on mainstreaming biodiversity and natural capital in productive sectors and ministries, as well as helping to demonstrate economic co-benefits through instruments such as bioeconomy strategies, development and implementation of national biodiversity strategies and action plans (NBSAPs), and associated financing plans to achieve their GBF targets.

The largest costs associated with 30x30 may still represent a major budgetary challenge for some countries, pushing them to try to amortize costs. However, the resulting interest payments could be relatively costly in the long run and would potentially add to an increasing debt burden.[77,78] The IDB can help to alleviate this by using concessional and blended finance.[42] For example, many countries in LAC have already been issued debt-for-nature swaps, including Barbados and Ecuador.[79–86] For example, Ecuador funds Galapagos conservation with a Blue Bond that pays a coupon rate of 5.645 percent,[87] and Barbados swapped some of its debt with an average 7.2 percent cost for bonds having a 3.8 percent rate of interest.[88]

The IDB can also help with finance solutions, including leveraging concessional funds such as the Global Environment Facility and the Green Climate Fund. Several financial instruments are available, but they should be individually assessed in consideration of national contexts. Additionally, the bank can provide technical cooperation to support countries to include establishment and management activities of protected areas in policy matrixes as part of financial operations, and to include them in their NBSAPs and national strategies, and as part of Conservation Trust Funds' activities.

Conclusions

This brief examines the costs associated with implementing LAC's 30x30 commitment to mainstream protected area considerations into financial decision-making. Specifically, the country-specific knowledge generated for the 26 IDB member countries allows for effective biodiversity mainstreaming into estimates of annual management costs for expanding the protected areas systems, one-time establishment costs for new protected areas, and opportunity costs associated with expansion tailored to each country.

Terrestrial establishment costs are the highest direct costs for 30x30 when aggregating at the regional level. This is because a large expansion of protected areas could imply purchasing millions of hectares of land to create new parks. **Marine establishment costs** for 30x30 are very small in comparison (often less than US$1 million per country).

Terrestrial management costs of 30x30 vary widely across LAC countries, from US$1.2 million per year in Guyana to over US$2 billion per year in Brazil. Costs are strongly driven by local pressures, such as the potential agricultural value of the protected land. Protected area system costs are higher if system expansion implies setting aside some of the country's last remaining suitable land for agriculture or development, which puts particularly high pressure on the system (e.g., Chile, Ecuador). **Marine management costs** are much more modest in

national budget terms and will typically drop over time as a percentage of GDP, even if they increase in simple terms. The costs are mainly driven by the relative fisheries catch available in the MPA vicinity and the protected area system size and GDP per capita in nearby coastal regions, which increases both human pressures and input costs for local MPA managers.

Terrestrial opportunity costs are minimal in many LAC countries, contradicting the common intuition that protected areas harm economic output. Historically, this intuition has caused governments to place much of their protected area system on remote, unproductive land, away from people and their economic actions. However, placing new protected areas closer to people would bring few of the expected costs but many benefits, as both ecosystem services and tourism values depend on proximity to people. In countries where alternative lands for agriculture exist, opportunity costs from protected area creation can indeed be zero. But in countries where there are few land alternatives for new agriculture, opportunity costs can be very high (e.g., Chile, Colombia, and Ecuador).

Marine opportunity costs, from implementing stricter levels of protection in MPAs for 30x30, are likely to cause an initial economic shock to fisheries, but also substantial medium-term benefits. The widespread practice of allowing substantial fishing in MPAs[33] can reduce the shock but also reduce the benefit and, indeed, the sustainability of the benefit over time. If stricter MPAs are not implemented, many fishers may struggle to remain profitable by mid-century because of continued high levels of exploitation and ocean warming.

Financial costs for 30x30 will vary according to the individual countries' national priorities, protected areas' system size, and other variables. However, regardless of the estimated costs, these investments provide long-term economic, social, and ecological benefits, as protected areas provide many ecosystem services[1,41,89,90] such as more secure water supplies,[91] local weather benefits, recreation,[93,94] pollination and pest control,[92] and health and productivity gains.[47,95,96] Therefore, there is a need for strategic planning to minimize costs and maximize biodiversity outcomes. The data presented in this policy brief can serve as a tool for policy dialogue, budget planning, and international cooperation in the region's journey toward meeting its biodiversity commitments.

Table 1. Cost Scenarios of 30x30 for LAC's Marine and Terrestrial Realms

	Establishment costs													Management costs						Opportunity costs					
		Scenario 1 Biodiversity priority				Scenario 2 Economic priority				Scenario 3 Compromise				Scenario 1 Biodiversity priority		Scenario 2 Economic priority		Scenario 3 Compromise		Scenario 1 Biodiversity priority		Scenario 2 Economic priority		Scenario 3 Compromise	
		Terrestrial (US$ millions)				Terrestrial (US$ millions)				Terrestrial (US$ millions)															
		Sub-scenario [a]																							
Country	Marine (US$ millions)	Must purchase 25% of new land	Must purchase 50% of new land	Must purchase 75% of new land	Must purchase 100% of new land	Must purchase 25% of new land	Must purchase 50% of new land	Must purchase 75% of new land	Must purchase 100% of new land	Must purchase 25% of new land	Must purchase 50% of new land	Must purchase 75% of new land	Must purchase 100% of new land	Marine (US$ millions) [b]	Terrestrial (US$ millions)	Marine (US$ millions) [b]	Terrestrial (US$ millions)	Marine (US$ millions) [b]	Terrestrial (US$ millions)	Marine [c]	Terrestrial 2035 (US$ millions)	Marine [c]	Terrestrial 2035 (US$ millions)	Marine [c]	Terrestrial 2035 (US$ millions)
Argentina	1.46 (1.00–2.06)	44.52 (30.53–67.84)	89.04 (61.05–135.68)	133.56 (91.58–203.51)	178.07 (122.11–271.35)	41.63 (28.55–63.28)	83.27 (57.1–126.56)	124.9 (85.64–189.84)	166.53 (114.19–253.13)	40.47 (30.53–61.67)	80.94 (61.05–123.34)	121.41 (91.58–185.01)	161.89 (122.11–246.68)	123.57	246.92	177.25	425.6	173.92	615.61	6.44	0	11.23	0	13.98	0
Bahamas, The	1.73 (1.28–2.33)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	71.62	18.89	112.5	18.89	100.52	18.89	-29.4	0	-27.27	0	-28.8	0
Barbados	1.17 (0.89–1.58)	0.09 (0.06–0.14)	0.18 (0.13–0.28)	0.28 (0.19–0.42)	0.37 (0.25–0.56)	0.09 (0.06–0.14)	0.18 (0.13–0.28)	0.28 (0.19–0.42)	0.37 (0.25–0.56)	0.08 (0.06–0.13)	0.17 (0.13–0.26)	0.25 (0.19–0.38)	0.34 (0.25–0.51)	30.56	10.66	43.78	10.66	42.6	10.66	-28.53	1.5	-27.11	0	-28.42	0
Belize	0.39 (0.30–0.47)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	14.77	37.72	20.42	37.72	20.35	37.72	108.22	0	97.91	0	104.33	0
Bolivia	0	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	NA	187.39	NA	135.32	NA	147.05	NA	0	NA	0	NA	0
Brazil	0.92 (0.67–1.21)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	153.16	2386.64	245.01	2481.73	212.94	2512.08	-14.3	0	-0.98	0	0.83	0
Chile	0	12.19 (8.36–18.58)	24.38 (16.72–37.16)	36.58 (25.08–55.74)	48.77 (33.44–74.31)	13.35 (9.15–20.28)	26.69 (18.340.57)	40.04 (27.45–60.85)	53.38 (36.6–81.14)	11.08 (8.36–16.89)	22.17 (16.72–33.78)	33.25 (25.08–50.67)	44.33 (33.44–67.56)	158.68	1684.98	222.84	1794.22	220.39	1684.98	2.14	2609	0.28	0	0.28	196.9
Colombia	0	6.52 (4.47–9.94)	13.05 (8.95–19.88)	19.57 (13.42–29.82)	26.1 (17.89–39.76)	2.82 (1.93–4.29)	5.64 (3.87–8.57)	8.46 (5.8–12.86)	11.28 (7.74–17.15)	5.93 (4.47–9.04)	11.86 (8.95–18.07)	17.79 (13.42–27.11)	23.72 (17.89–36.15)	32.68	127.59	44.96	149.07	44.2	137.76	-32.08	0	-0.57	0	-0.73	0

Costa Rica	0.6 (0.49–0.76)	0.33 (0.23–0.51)	0.66 (0.46–1.01)	1 (0.68–1.52)	1.33 (0.91–2.03)	0.41 (0.28–0.63)	0.83 (0.57–1.25)	1.24 (0.85–1.88)	1.65 (1.13–2.51)	0.3 (0.23–0.46)	0.6 (0.46–0.92)	0.91 (0.68–1.38)	1.21 (0.91–1.84)	18.38	229.53	26.32	247.31	25.65	240.85	-28.41	223.1	-0.12	0	-0.39	31.4
Dominican Republic	0.72 (0.51–0.96)	0.61 (0.42–0.93)	1.21 (0.83–1.85)	1.82 (1.25–2.78)	2.43 (1.67–3.7)	0.61 (0.42–0.92)	1.21 (0.83–0.1.85)	1.82 (1.25–2.77)	2.43 (1.67–3.69)	0.55 (0.42–0.84)	1.1 (0.83–1.68)	1.66 (1.25–2.52)	2.21 (1.67–3.37)	4.62	95.9	6.36	94.54	6.36	94.51	-19.18	72.4	-7.38	0	-7.99	0
Ecuador	0.72 (0.56–0.96)	3.78 (2.59–5.75)	7.55 (5.18–11.51)	11.33 (7.77–17.26)	15.11 (10.36–23.02)	4.19 (2.88–6.37)	8.39 (5.75–12.75)	12.58 (8.63–19.12)	16.77 (11.5–25.49)	3.43 (2.59–5.23)	6.87 (5.18–10.46)	10.3 (7.77–15.69)	13.73 (10.36-20.93)	88.91	228.69	132.35	231.1	128.29	231.53	-8.29	567.5	-1.5	0	-1.46	83.5
El Salvador	0.74 (0.56–1.00)	0.28 (0.19–0.43)	0.57 (0.39–0.87)	0.85 (0.58–1.3)	1.14 (0.78–1.73)	0.28 (0.20–0.43)	0.57 (0.39–0.87)	0.85 (0.59–1.30)	1.14 (0.78–1.73)	0.26 (0.19–0.39)	0.52 (0.39–0.79)	0.77 (0.58–1.18)	1.03 (0.78–1.57)	2.35	24.29	4.06	25.99	3.11	24.29	+	0	+	0	+	0
Guatemala	0.75 (0.57–0.98)	7.31 (5.01–11.14)	14.62 (10.03–22.28)	21.93 (15.04–33.42)	29.24 (20.05–44.56)	7.37 (5.05–11.19)	14.73 (10.1–22.39)	22.1 (15.15–33.58)	29.46 (20.2–44.78)	6.65 (5.01–10.13)	13.29 (10.03–20.25)	19.94 (15.04–30.38)	26.58 (20.05–40.51)	14.54	80.94	20.68	79.09	20.13	79.71	-	48.2	-	0	-	0
Guyana	0.95 (0.7–1.28)	15.79 (10.83–24.07)	31.59 (21.66–48.13)	47.38 (32.49–72.2)	63.17 (43.32–96.26)	7.09 (4.86–10.78)	14.18 (9.73–21.56)	21.28 (14.59–32.34)	28.37 (19.45–43.12)	14.36 (10.83–21.88)	28.71 (21.66–43.75)	43.07 (32.49–65.63)	57.43 (43.32–87.51)	30.74	1.22	44.31	1.22	42.95	1.22	-	62.8	-	0	-	0
Haiti	0.90 (0.66–1.24)	0.21 (0.15–0.32)	0.43 (0.29–0.65)	0.64 (0.44–0.97)	0.85 (0.58–1.3)	0.21 (0.15–0.33)	0.43 (0.29–0.65)	0.64 (0.44–0.98)	0.86 (0.59–1.31)	0.19 (0.15–0.3)	0.39 (0.29–0.59)	0.58 (0.44–0.89)	0.78 (0.58–1.18)	NA	12.77	NA	12.6	NA	12.43	-	8.8	-	0	-	0
Honduras	0.83 (0.6–1.13)	0.44 (0.3–0.67)	0.88 (0.6–1.34)	1.32 (0.91–2.01)	1.76 (1.21–2.68)	0.44 (0.3–0.42)	0.88 (0.61–0.84)	1.32 (0.91–1.27)	1.77 (1.21–1.69)	0.4 (0.3–0.61)	0.8 (0.6–1.22)	1.2 (0.91–1.83)	1.6 (1.21–2.44)	2.94	22.78	5.62	22.52	3.98	21.67	-20.04	51.4	-10.09	0	-12.72	0
Jamaica	1.06 (0.77–1.49)	0.15 (0.1–0.23)	0.3 (0.21–0.46)	0.45 (0.31–0.69)	0.6 (0.41–0.91)	0.15 (0.1–0.23)	0.3 (0.21–0.46)	0.45 (0.31–0.68)	0.6 (0.41–0.91)	0.14 (0.1–0.21)	0.27 (0.21–0.42)	0.41 (0.31–0.62)	0.55 (0.41–0.83)	12.06	26.96	16.97	26.27	16.8	26.66	-21.92	5.8	-22.56	0	-20.87	0
Mexico	0.98 (0.71–1.38)	22.84 (15.66–34.81)	45.68 (31.33–69.61)	68.53 (46.99–104.42)	91.37 (62.65–139.23)	20.97 (14.38–31.87)	41.94 (28.76–63.74)	62.9 (43.13–95.61)	83.87 (57.51–127.48)	20.77 (15.66–31.64)	41.53 (31.33–63.29)	62.3 (46.99–94.93)	83.06 (62.65–126.57)	42.64	562.65	72.83	534.58	57.5	663.31	10.14	0	29.27	0	36.8	0
Nicaragua	0.62 (0.47–0.86)	3.31 (2.27–5.05)	6.63 (4.54–10.1)	9.94 (6.81–15.14)	13.25 (9.09–20.19)	3.3 (2.26–5.02)	6.6 (4.52–10.03)	9.9 (6.79–15.05)	13.2 (9.05–20.06)	3.01 (2.27–4.59)	6.02 (4.54–9.18)	9.03 (6.81–13.77)	12.05 (9.09–18.36)	8.05	41.7	11.91	41.77	11.11	41.74	-17.98	14.1	-13.1	0	-10.26	0

Panama	0.92 (0.69–1.19)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	11.01	61.08	20.18	61.08	15.31	61.08	+	0	+	0	+	0
Paraguay	0	1.7 (1.17–2.6)	3.41 (2.34–5.19)	5.11 (3.5–7.79)	6.81 (4.67–10.38)	1.45 (1.00–2.21)	2.91 (2.00–4.42)	4.36 (2.99–6.63)	5.82 (3.99–8.85)	1.55 (1.17–2.36)	3.1 (2.34–4.72)	4.65 (3.5–7.08)	6.19 (4.67–9.44)	NA	803.48	NA	774.73	NA	836.58	NA	0	NA	0	NA	0
Peru	1.19 (0.83–1.76)	20.81 (14.27–31.71)	41.62 (28.54–63.43)	62.44 (42.81–95.14)	83.25 (57.08–126.85)	30.2 (20.71–45.90)	60.4 (41.42–91.80)	90.6 (62.12–137.70)	120.79 (82.83–183.60)	18.92 (14.27–28.83)	37.84 (28.54–57.66)	56.76 (42.81–86.49)	75.68 (57.08-115.32)	96.57	492.31	143.75	462.54	136.01	648.76	-8.23	1.3	-17.28	0	+	0
Suriname	0.91 (0.66–1.24)	2.91 (1.99–4.43)	5.82 (3.99–8.87)	8.73 (5.98–13.3)	11.64 (7.98–17.73)	2.93 (2.01–4.46)	5.87 (4.02–8.91)	8.8 (6.04–13.37)	11.73 (8.05–17.83)	2.64 (1.99–4.03)	5.29 (3.99–8.06)	7.93 (5.98–12.09)	10.58 (7.98–16.12)	107.71	51.72	152.59	57.84	152.11	59.31	-40.33	0	-8.33	0	-31.31	4.7
Trinidad and Tobago	0.86 (0.65–1.18)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	108.01	4.81	152.84	4.81	152.13	4.81	-	0	-	0	-	0
Uruguay	0.55 (0.44–0.66)	4.9 (3.36–7.47)	9.81 (6.73–14.95)	14.71 (10.09–22.42)	19.62 (13.45–29.89)	5.27 (3.62–8.02)	10.55 (7.23–16.04)	15.82 (10.85–24.05)	21.1 (14.47–32.07)	4.46 (3.36–6.79)	8.92 (6.73–13.59)	13.38 (10.09–20.38)	17.83 (13.45–27.18)	49.31	63.8	70.81	64.49	70.21	65.75	+	0	+	0	+	77.6
Venezuela	2.26 (1.53–3.38)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)	411.76	334.44	590.28	336.4	580.5	336.17	-27.54	0	103.92	0	78.27	0

Source: Based on the original report (Waldron, et.al).

Notes:

NA = not applicable.

a. National acquisition and establishment costs would vary, depending on country. Terrestrial establishment costs are presented in sub-scenarios to show the assumptions on the proportion of land a country needs to buy to achieve the 30%. The costs of establishment will decline if the country only needs to purchase 25% of the land required to achieve the 30%. But it will increase if the 100% of the land needs to be purchased.

[b] Mid sub-scenario.

[c] Mean % change in catch during main shock

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