DOES EXTERNAL FINANCING INFLUENCE NATIONAL COMMITMENTS TO BIODIVERSITY CONSERVATION?

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Executive Summary

The conservation community has committed technical and financial assistance to low- and middle-income country (LMIC) governments to support the management costs associated with protected areas (PAs) as a means of conserving high biodiversity areas. At the same time, the conservation community has been working with donors to push for consistent, long-term funding for protected areas. Donors have listened, and increasingly provide reliable and consistent funds for PAs. However, there has been no assessment of whether and how this long-term PA funding influences internal, national commitments for PAs.

In this pilot study, we interviewed PA experts from three global regions: Asia, Africa, and Latin America to discover whether, in their experience, external financing of PAs influences a government's decision to fund its own PAs. We found that roughly half our 15 respondents believed external funding does influence internal government spending on PAs, but this influence occurs through multiple pathways and can be positive or negative.

When respondents indicated there was no influence of external funds, the reasons given included that, 1) the government had other priorities and was unlikely to spend money on PAs regardless of presence of external funds, or 2) the government does not tend to accept external funding, so it therefore has little influence.

Some respondents indicated that external funding results in increased internal government spending on PAs. The explanations for this trend included 1) that a stipulation built into the external funding mechanism prevents the government from diverting these funds to other uses; 2) that external funding positively influences political-will to support PAs; 3) that increased external funding increases a park's capacity, which in turn gives it more resources to lobby the government for additional funds; or that 4) international NGO investment in innovations may sway the government to invest more in effectively managed areas.

Other respondents indicated that external funding can have a negative influence on internal spending because the addition of external funds allows the government to divert scarce resources elsewhere.

Two factors we found that play into the relationship between internal and external funding were GDP and level of NGO involvement in PA management. Higher GDP is loosely tied to higher levels of PA funding, indicating (unsurprisingly) that more money available means more money goes to PAs. Similarly, NGO involvement in PA management is linked to more internal funding, in most cases. NGO involvement also appears to influence the funding mechanisms used and some level of mechanism success. NGO involvement may also be tied to the number of protected area downgrading, downsizing, and degazetting (PADDD) events, with less NGO involvement linked to increased PADDD (though data here is scarce). It is important to note that our interviewees were predominantly NGO representatives (>70%), so these results associated with the level of NGO involvement may be skewed because of participant biases.

Beyond these findings and their implications for PA funding decisions, we believe this pilot study developed a useful and replicable set of methods that could be used to expand this research, make conclusions more robust, and add nuance to the explanations provided here.

1. Introduction

The conservation community has committed technical and financial assistance to low- and middle-income country (LMIC) governments to support the management costs associated with protected areas (PAs) as a means of conserving high biodiversity areas over the last few decades. Given other priorities, LMIC generally tend to have little capacity and weak governance for PAs, making external support imperative for conservation. In the past, funds provided to PAs have failed to provide long-term sustainable conservation outcomes, due to a focus on short-term finance for capital investment, with limited support for sustaining PA structures and institutions.[1] Consequently, the conservation community has been working with donors to shift toward consistent, long-term funding for PAs. Donors have listened and increasingly provide reliable and consistent funding. However, there has been no assessment of whether long-term funding of PAs leads to increased support from national governments for their PAs, or a continuous dependence on external donors, and thus there is little understanding of the best models for long-term, self-sustained protection. The Conservation Measures Partnership (CMP) is interested in understanding how different models of PA financial support influence the sustainability of investment in conservation.

Duke University collaborated with CMP to research this issue through a client-based course that involved Duke University undergraduate and masters-level students from the Nicholas School of the Environment and the Sanford School of Public Policy. Over the Spring 2020 semester, a student team conducted a literature review and expert interviews to develop a set of case studies that explore the role that different types of financial support play in either encouraging or discouraging a country's investment in national PAs.

Past research has focused extensively on funding mechanisms for conservation, but no research has previously been done on the influence of these external funding mechanisms on the scale and continuity of government commitments of funds for conservation. Our research entails both quantitative data collection and interviews with a variety of experts to gain a more complete understanding of the situation from an insider's perspective.

To conduct this research the Bass Connections team chose to do a qualitative *exploratory case study approach*[2]. Experts were identified by project leaders David Wilke and Paulina Arroyo or suggested by other interview subjects either for their extensive knowledge of a PA Network or specific PA of interest. A database containing contextual information was created for each selected case study country. This database includes the country's legal context, economic information, interview responses and relevant documentation from our literature review for each country of interest.

Background Literature

During the fall of 2019, Mennonite Economic Development Associates (MEDA) was hired as a consultant to frame this research project. They conducted a literature review to address their overall research question: "does external funding (private or public sources) promote or militate

[1] Emerton, L. 2006. *Sustainable Financing of Protected Areas : A Global Review of Challenges and Options*. IUCN. https://doi.org/10.2305/IUCN.CH.2005.PAG.13.en.
[2] Yin, R. K. 2019. *Case Study Research and Applications*. SAGE Publications Inc. https://www.sagepub.com/hi/nam/case-study-research-and-applications/book250150

against funding/investing in PAs by national governments." Overall, they found that it is "not possible to establish a direct linkage between external funding and the dedicated budget from their countries' governments to protected areas".[3] They identified three specific challenges that inhibited their literature research:

1. Limited research has been conducted on factors influencing national government investment in PAs.
2. Literature describing long-term financial mechanisms was primarily focused on specific PAs rather than across a country's PA network, which made it difficult to assess how country governments are investing in these networks.
3. Literature and information about national government spending on PAs is not easily accessible or publicly available.

MEDA found that the key funding channels for PAs include multilateral and bilateral funding, domestic government budgets, foreign donors, and private and community foundations. Domestic government budgets were still the single largest source of PA financing in most countries, but as a share of total government spending the sums are relatively small.[4] While existing studies broaden understanding of *how* PAs are funded, they do little to further the question of whether external funding influences internal spending.[5] MEDA's literature search discovered excellent examples of funding mechanisms and their implementation in PAs, but was unable to uncover the motivations driving these funding mechanisms.

To begin to address these challenges our class conducted expert interviews with those who might be able to help fill these critical data gaps and combined these with a literature review and research on the economic conditions and legal structures in each of our targeted countries.

2. Methods

Survey Development

Duke advisors, faculty members, and partner organizations collaboratively developed a first version of the survey used for collecting primary data through one-on-one interviews. Contingent on the interviewee's experience, the survey either focused on collecting data about a specific PA or an entire network of PAs within a specific country, or both in some cases.

The first version of the survey was tested with five Duke-affiliated experts in order to check for relevance, understanding, flow of questions, time management, and question clarity. These practice interviews informed the review and adjustment of the first survey. Adjustments included separating specific PAs and PAs network questions into two different surveys, adding questions on financial mechanisms, and rephrasing and reordering other questions based on the feedback from interviewees and students.

[3] p. 2 Mennonite Economic Development Associates (MEDA). (2019). *Final Report CMP-Moore Learning Project: Long-term External Funding of Protected Areas*.
[4] Emerton, Lucy. 2006. Sustainable Financing of Protected Areas : A Global Review of Challenges and Options. IUCN. https://doi.org/10.2305/IUCN.CH.2005.PAG.13.en
[5] Verweij, Pita. 2004. "Increasing Revenues for Protected Areas: A Wealth of Financing Options." Scoping report NWS-E-2004-246. Copernicus Institute for Sustainable Development and Innovation.

The resulting PA network survey was divided into 5 sections: introduction, internal funding sources[6], external funding sources[7], funding mechanisms, and conclusion (for full survey text see Appendix A). The introductory section asked about the history of overall financial support for PAs in the country, total level of spending on PAs, and funding distribution across PAs. Internal funding questions focused on identifying the interviewees' perception on the proportion of spending sourced inside the country, generation of internal funding, and general changes in internal funding spending on PAs in the past 15 years (2005 to 2020). The external funding section included questions about main sources of funding, duration, amount, entities involved, as well as how the flow of external funding into PAs have influenced government spending on PAs. Questions about funding mechanisms aimed at identifying types of mechanisms that allow funding to flow into PAs, as well as key elements that have made these mechanisms a success or failure. Final questions cover suggestions of additional interviewees and key resources to deepen knowledge on the PA network.

The specific PA survey was divided into 6 sections: introduction, PA context, internal funding sources, external funding sources, funding mechanisms, and conclusion (for full survey text see Appendix B). The PA context section aimed at understanding the primary threats that the PA is facing, local perceptions about the PA, current governance structure, and the total level of spending on the PA. The introduction, internal and external funding, funding mechanisms, and conclusion sections repeated the questions from the PA network survey but in the context of a specific park.

Data Collection: Interviews

David Wilkie from Wildlife Conservation Society and Paulina Arroyo from the Gordon and Betty Moore Foundation provided a preliminary list of contacts with meaningful knowledge and experience in the regions of interest: Asia, Africa, and Latin America. These contacts included conservation experts, scientists, academics, practitioners, and NGO professionals with extensive experience in the fields of PA management and conservation finance.

Students used the survey to collect primary data through semi-structured interviews with experts. Students worked in teams with an interviewer and note-taker. Each team was in charge of carrying out interviews for a specific region and producing a case study for each country of interest: Thailand, India, Cambodia, Republic of the Congo, Madagascar, Gabon, Bolivia, Costa Rica, Ecuador, and Peru (Table 1). Interviews varied based on the interviewees' experience; some covered a specific PA in these countries or documented information on the entire PA system.

Each expert was contacted via email. When potential interviewees confirmed interest and availability to have a 60-minute conservation via Zoom, students scheduled interviews, shared a Zoom link, shared the survey the interviewee wanted to take (specific PA or PA network), and requested permission to record the interview. Students used Zoom to record and transcribe every interview.

[6] Any funding being spent on the park system that was sourced from within the country by the government, a government entity, or the entity that runs the PA (e.g. taxes, fees, concessions, allocations)

[7] External funding sources refer to: any funding coming from a source outside of the country (e.g. loans, grants, investments, gifts)

At the beginning of every interview, students read the introductory consent language indicating that identities would not be divulged, responses would remain confidential and would only be associated with a randomly assigned ID number. Students also re-confirmed approval for recording the interview. Using a snowball method, the first group of interviewees was asked to provide additional contacts for their specific countries that could contribute supplementary information to the study. Students conducted 15 interviews and generated a final list of 53 contacts. Table 1 outlines the number of interviews per country and region.

After each interview, students filled in a tracking spreadsheet to document all interviews and include new contacts resulting from the snowball approach. Interview notes, recordings and transcripts were saved in a box folder. Students also entered a summary of each interview into a Qualtrics form.

Table 1. Number and type of interviews in selected countries

Region	Country	Number of Interviews	Specific PA or Network	Interviewee affiliation(s)
Asia	Thailand	1	Network	NGO
	India	1	Network	NGO/Academia
	Cambodia	2	Both	NGO
Africa	Congo	1	System	NGO
	Madagascar	2	Both	NGO, Academia
	Gabon	2	Both	Academia, NGO
Latin America	Bolivia	2	Both	NGO
	Costa Rica	1	Network	NGO
	Ecuador	2	Both	NGO, Multilateral lender
	Peru	1	System	Consultant

Data Collection: Legal

Legal information for each country was retrieved from publicly accessible English language websites, primarily official government websites and gray literature reports (for full legal reports, see section 3.2 of each country report in Appendix C). For some countries, documentation in the native languages was also collected. Domestic information collected includes governance structure, managing agencies of PA systems, and significant domestic environmental legislation. Agency responsible for enforcing environmental legislation was noted where information was available. We also made note of whether countries were signatories to various international agreements relevant to PAs and biodiversity; we used "Guidelines for Protected Areas Legislation" published by IUCN in 2011[8] to identify a list of relevant agreements.

Data Collection: Socioeconomic

We collected five types of socioeconomic data for each focal country. Data were collected from publicly accessible datasets available for all countries of interest to keep data consistent. Below, we introduce each socioeconomic data type, provide context as to why we decided to collect this data, specify the obtained economic variables, and list the data sources for each data type. Data collected for each country is recorded in Appendix C. Some of these socio-economic data

[8] Lausche, Barbara. (2011). Guidelines for Protected Areas Legislation. IUCN, Gland, Switzerland. Retrieved from https://portals.iucn.org/library/efiles/documents/eplp-081.pdf

were used for correlations with PA funding data collected from interviews (GDP, corruption, environmental orientation). Other data sources (sectors of economy, quality of life) were simply used to provide context for each country so we could better understand the socioeconomic conditions that PA funding decisions are made in.

1) ***Size of Economy***
   Gross Domestic Product (GDP) data are used to detect the size of each country's economy. We wanted to use GDP data to examine whether countries that have larger scale economies spend more on PAs. The relationship between GDP and total spending on PAs as reported by our interviewees was assessed (Figures 5a,b and 9a,b).

   Size of economy data sources:
   - World Bank Country Classification: Country classification by income (i.e. Lower Income, Lower-Middle Income, Upper-Middle Income, High Income)
   - World Bank Databank: GDP in Current US$, GDP Growth (annual %)

2) ***Sectors (Composition of Economy)***
   When an important economic sector is incompatible with natural resources conservation, such as destructive extractive activities like mining, governments may be less willing to invest in PAs. We therefore felt that the composition of the economy for each country, especially with reference to natural resource extraction, provided important context for each country and was included in the country reports (Appendix C, 2.2).

   Composition of economy data sources:
   - CIA World Factbook: GDP Composition (Agriculture, Industry, Services), Industrial Production Growth Rate, Main Products per Sector (Agriculture, Industry), Natural Capital in USD (1995-2014), Protected Areas in USD (1995-2014)

3) ***Corruption / Transparency***
   A measure of corruption lends insight on the political willingness and effectiveness of fiscal contributions to conservation, executional strength and structural aspects of environmental policies and agencies, as well as the potential effectiveness of conservation management. We were interested to examine whether changes in corruption scores might be linked to the effectiveness of funding mechanisms. Also, were governments with a lower corruption and transparency index (more corrupt) allocating less to PAs? This information provides context for each country and was included in the country reports (Appendix C, 2.4).

   Corruption and transparency data source:
   - Transparency International: Corruption and Transparency Index Scores 2012-2019

4) ***Expressed Environmental Orientation***
   The Environmental Performance Index (EPI) quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how much value the country places on the environment. This contextual information is provided for each country (Appendix C, 3.1). EPI was compared to interviewees indications of adequacy of PA funding for each country to examine the relationship between these two factors (Figures 3a,b).

   EPI data source:

- Environmental Performance Index: Current and baseline scores for biodiversity and habitats, marine protected, terrestrial biome protection (global), terrestrial biome protection (national), protected area representativeness index

5) ***Quality of Life***
Quality of life can be defined broadly in terms of health, education, poverty, and gender equality. The UNDP Human Development Reports provide various types of human development data on all countries. By retrieving the Human Development Index (HDI) for each country we hoped to obtain an overview of how the quality of life in a country relates to its financial support of PAs. Such information provides important context for each country (Appendix C, 2.3).

Development index data source:
- UNDP Human Development Reports: Human development index (Table 1), Human Development Index trends, 1990-2018 (Table 2)

Data Collection: Protected Areas

We collected two types of publicly available PA data for each focal country: the extent of PAs and changes to PAs, as indicated by PA downgrading, downsizing, and degazetting (PADDD) events. Data collected for each country is recorded in Appendix C.

1) **PA Extent and Composition**
This information provides important context about the number of PAs, area covered by PAs, and the type of PAs represented (terrestrial & marine) in each country. This information is reported as context in each country report (Appendix C, 4.1).

PA extent and composition data source:
- Protected Planet: Number of PAs, PA coverage, PA types

2) ***Changes to Protected Areas***
Over time, protection for PAs may be changed. PADDD events are hypothesized to imply the attitude of the government towards PAs and can act as an indicator of how a government prioritizes PAs (or not). High levels of PADDD may be an indication that the government has low priority for PAs. We collected data on trends in PADDD events from 2004-2019 as well as key reasons for PADDD event occurrence. This information is provided as context in the country reports (Appendix C, 4.2). We compared the number of PADDD events in our focal countries to see if we could use our case studies to understand why these events might be occurring (Figure 13a,b).

PADDD data source:
- PADDD Tracker: Number of enacted PADDD events in each year, total PAs affected due to the PADDD events (km^2), percentage of PAs in country affected by PADDD events, major reasons for PADDD events

3. Regional Summaries

Summaries of interview results for each focal region (Asia, Africa and Latin America) are below. For detailed economic and interview findings reported by country, see Appendix C.

***Asia** (India, Thailand, Cambodia)*

The case studies on India and Thailand were quite similar. In both countries, internal funding sources accounted for over 90% of total spending on PAs. While these funds were largely raised through general taxation, Thailand's PA system generated significantly large revenues (around $80 million annually) from park entry fees due to significant tourist activity. Thailand has a total of 238 PAs, covering an extensive 517,787 square kilometers which is nearly 19 percent of the country's total land area.

India had the highest level of overall spending on PAs in Asia, which can be attributed to funds spent protecting charismatic species populations, in particular elephants and tigers. India's 50 tiger reserves disproportionately receive the majority of its PA funding, constituting the most prioritized PAs in the country. It is worth noting that India also contains the world's largest population of wild tigers, around 3000 individuals, making up 70% of the global tiger population.

Not only do India and Thailand rely minimally on external funding sources, but the governance of PAs in these countries is highly centralized and organizations such as NGOs have no managerial power and only operate to offer technical assistance and conduct research.

The case study for Cambodia is very different from the other two countries in Asia. Funding for PA management in Cambodia is largely provided by external funding sources. For example, at South Cardomom National Park (SCNP), the government contributes about 11-25% of the cost for operating the park. Funding for the entire PA network is less than adequate and is unevenly distributed. Many PAs receive extremely little financial support from both the government and NGOs while in other PAs, for example SCNP, funding is sufficient for conservation activities.

The Cambodian government's PA funding has increased significantly over the past 15 years, although the total funding is still marginal. This can be illustrated by the increase in wages (up to 4 times) for forest managers and rangers. Main drivers for this change are economic growth, increased environmental awareness, changes in the political administration, and Cambodia's participation in the international environmental conservation community. The government's financial support for PA management is allocated mainly from general taxation. A number of projects to protect biodiversity funded by multilateral/bilateral agencies (e.g. GEF) and development banks (e.g. ADB) in the format of loans to the government have been conducted. External funding mainly comes from private organizations. REDD+ has also become an emerging funding source significantly utilized by international NGOs in Cambodia to pay for PA management activities. With the assistance of IUCN, the Cambodian government is also exploring the expansion of their REDD+ program.

***Africa** (Madagascar, Congo, Gabon)*

For both Madagascar and Congo, the majority of PA funding comes from external sources including international NGOs, REDD+ payments, USAID, private foundations, and corporate funds. Madagascar has a decentralized governance model, so their government invests very little of their own treasury funds into PAs. Additionally, local communities are key stakeholders, and the supposed recipient of 50% of park revenues; they are critical to ensuring park success. Within Madagascar, not only is long term funding essential for management of their parks, but also for building relationships and trust with local communities. With limited funding, there is a need to prioritize conservation activities within parks. In Madagascar, the government requires not only managing the PA habitats, but also managing the traditions and health of communities.

In contrast to Madagascar, in Congo there is an understanding that external financing has not influenced national commitments to biodiversity since there was already a lack of national commitment in the first place. While both of these countries see a lack of government funding to PAs, one is intentional (decentralization in Madagascar) while the other highlights a shortcoming (lack of funding provided by Congo). In Gabon, although most of the funding does come from external sources, the actual distribution and implementation of these funds is done through the higher-level government umbrella. In fact, the repeated cycle of securing external funding goes through the government and has actually increased government awareness of PA financing. Furthermore, the government of Gabon has repeatedly worked in conjunction with smaller NGOs to effectively distribute and allocate funds to PAs throughout the country.

Madagascar has an extended network that encompasses over 100 PAs, tallying up to more than 10% of all terrestrial and marine territory. Madagascar is well known for its high biodiversity and large number of endemic species, and has long been in the focus for conservation efforts. Similarly, Congo has an extremely extended PA network that covers over 45% of its total territory. Specifically, biodiversity work in both Congo and Gabon has largely focused on preserving PAs that are habitats to African Elephants, and many recent efforts have been made to try to reduce poaching and habitat destruction.

Latin America *(Bolivia, Ecuador, Costa Rica, Peru)*

Bolivia and Ecuador are both biologically diverse countries with a rich set of PAs. Both PA systems are funded somewhat internally but interviewees stated that these funds cover minimal, operational costs such as patrolling and administration. A major difference between the PA systems in these two countries is that Ecuador, except for the Galapagos Islands, does not charge a park entry fee while Bolivia does. In Bolivia, major political changes and a change in government structure have increased the overall spending on the PA system, SERNAP, but this increase does not account for inflation or the addition of new PAs. In Ecuador, PAs largely began as “paper parks” where there was legal protection but limited funds and little operational support of the parks. Both countries are dependent on natural resource extraction to fund the national treasury, which has produced varying threats to PAs. Any economic changes in natural resource extraction can have impacts on PA funding, as has been seen in Ecuador when oil prices drop and funds to PAs decrease as a result. National trust funds provide some financial stability for PAs in both countries. International corporate funds and NGOs also both play a role in external funding of the PA systems in both countries. In Ecuador, international commitments to funding require a reciprocated commitment from the Ecuadorian government if they wish to continue receiving the external aid. In Bolivia, the influence of external funds does not appear to be as crucial to PA systems but does play a small, albeit important role.

Peru and Costa Rica are megadiverse countries, including a large number of endemic species. Both countries have robust environmental legislation and institutions in place, which has strengthened the establishment and management of PAs in the past decades. However, Costa Rica ranks higher than Peru in the Environmental Performance Index for biodiversity and habitats, marine PAs, and terrestrial biome protection.

Both countries have created more terrestrial than marine PAs. Total coverage of terrestrial PAs represents 28.3% of the Costa Rican territory; in Peru, this number is slightly less at 21.5%. Marine PAs account for 0.5 % of the Peruvian territory and 2.6% of the Costa Rican. Neither country has seen attempts to downsize or downgrade national PAs in the past 15 years. Participation in international agreements and initiatives, such as the Convention on Biological

Diversity and the Paris Agreement, has stimulated more resources for the creation and consolidation of PAs in both countries.

Both PA systems mostly rely on internal funding, being 85% of the total funding in Costa Rica and 70% in Peru. Peru has seen a dramatic increase in the proportion of internal funding for PAs—a rise from 30 to 70% in the past decade. Contributions from the Public Treasury rose by 500% between 2004 and 2010. Internal funding is complemented with external funding from nonprofits, bilateral organizations, and development banks in both countries. Peru and Costa Rica have also benefited from debt-for-nature or debt-for-adaptation swaps. Interviewees consider funding somewhat insufficient to achieve conservation objectives in Peru, but adequate in Costa Rica. While Peru has seen indirect influence of external funding on increasing funding from internal sources, Costa Rica hasn't seen any effect of external support on domestic spending, which has been fairly stable for the past 15 years.

4. Findings

The figures and tables in section 4 were developed from data collected during our 15 interviews and do not necessarily represent PAs as a whole globally. Responses reported here represent a specific, small sample and reflect the opinions and potential biases of the experts surveyed. However, we present trends from our case study countries that can help start to answer the research question: *does external PA financing influence national commitments to PAs*? Where noted, PA interview responses were combined with economic data (e.g. GDP) to try to draw conclusions about why certain response patterns appeared.

As a reminder, we conducted two different types of interviews, one for PA networks (at the country level), and one for specific PAs (see Section 2 for descriptions of the survey instruments used). Answers are therefore reported separately for PA networks and individual PAs.

Summary of findings

Roughly half our respondents answered that they believe external funding influences internal government spending on PAs (Figure 7a,b), but this influence occurs through multiple pathways and can be positive or negative.

When respondents indicated there was no influence of external funds on internal spending, the most common explanation was that the government had other priorities and was unlikely to spend money on PAs regardless of whether external funds were present or not. This answer was provided for Congo, Madagascar, and Bolivia. The other reason respondents answered that external financing does not influence internal funding was that the government does not tend to accept external funding, so it therefore has little influence (India, Thailand).

Some respondents who answered that external funding has an influence on internal spending indicated a positive relationship between the two (i.e. external funding results in increased internal government spending on PAs). In some cases, this occurred because of a stipulation built into the external funding mechanism that prevents the government from diverting funds (Bolivia, Ecuador). However, in Ecuador, this rule was not enforced because of an economic crisis that caused the government to divert funds from PAs. In Gabon, a respondent indicated that external funding positively influences political-will to support PAs, specifying that with increased external funds internal spending likewise increases. One respondent reported that increased external financing increases a park's capacity, which in turn gives it more resources

to lobby the government for additional internal funds (Cambodia). For Thailand, an interviewee indicated that external funds do not directly influence internal spending, but international NGO investment in innovations that lead to new, more effective management practices may in fact sway the government to invest more in those areas being managed effectively.

Other interviewees indicated that external funding can have a negative influence on internal spending. This was explained most often by the simple fact that if a particular park or network was receiving external funds the government felt it could divert scarce resources elsewhere (Ecuador, Cambodia, Madagascar). However, in the case of Ecuador's Galapagos National Park, external money flowing in from park entry fees and visitor fundraising more than covers the cost of the park, which actually enables the government to divert funding to other parks that receive less international attention.

We found two factors that play into the relationship between internal and external funding: GDP and level of NGO involvement in PA management. Higher GDP is loosely tied to higher levels of PA funding, indicating (unsurprisingly) that more money available means more money goes to PAs (Figure 5a,b) . NGO involvement in PA management seems to be linked to:

1) the level of internal funding (more NGO involvement is linked to more internal funding, in most cases) (Figure 8a,b);
2) the funding mechanisms being used (and some level of mechanism success) (Figures 11a,b and 12 a,b); and
3) the number of PA downgrading, downsizing, and degazetting (PADDD) events, with less NGO activity linked to increased PADDD events (though data here is scarce).

It is important to note that our interviewees were predominantly NGO representatives (>70%), so these results associated with the level of NGO involvement may be skewed because of participant biases.

Other summary findings:

- The main sources of external funding are NGOs, foundations, development agencies, and bilateral/ multilateral organizations (Figure 1a,b)
- The main sources of internal funding are entry fees, general taxation, and concessions (Figure 2a,b)
- PA funding appears to be stable or increasing across the board, but is still insufficient for meeting conservation goals (i.e. not growing fast enough) (Figures 4a,b and 6a,b)
- Conservation trust funds and public private partnerships are the most common PA funding mechanisms (Figure 10a,b)
- Funding mechanism success can be explained most often by PA management support, government support, and community support. We found community support to be the most influential at the individual park level, whereas government and management support are most influential at the PA network level (Figure 12a,b)
- We found no clear relationship between corruption level and funding for PAs. Similarly, we found no clear pattern between level of corruption and funding mechanisms used. Instances of PA funding increases were represented in countries with both increasing and decreasing corruption index scores.
- There was no clear trend in HDI change from 2000-2018 and internal PA funding changes.

Main sources of internal/external funding

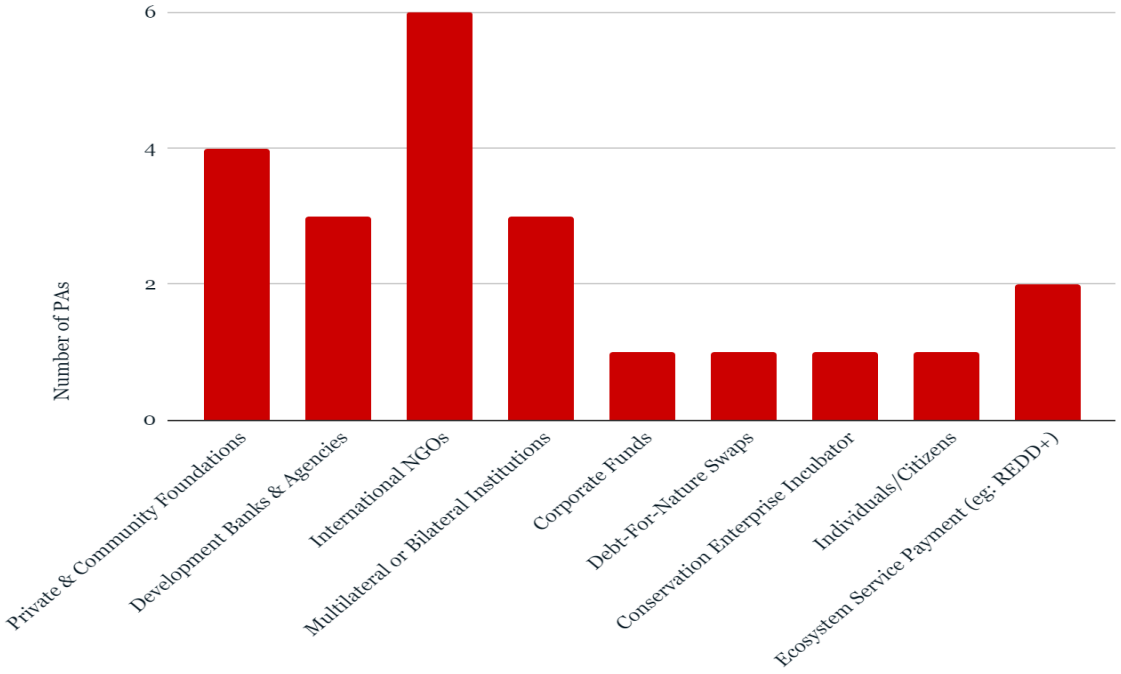
External funding[9] for single PAs comes most often from international NGOs, followed by private foundations, development agencies, and multilateral/ bilateral institutions. External funding for PA networks comes most often from international NGOs, followed by private foundations, development agencies, and multilateral/ bilateral institutions.

It is possible we may see a bias in favor of NGO funding because a lot of our interviewees (>70%) were NGO employees, and thus would be most aware of these funds.

Internal funding[10] for single PAs came almost equally from entry fees, taxation and concession fees (which includes: fundraising through visitors and sales of NTFP (e.g. Brazil nuts). Internal funding for PA networks came primarily from entry fees, and taxation, distantly followed by concession fees, mitigation payments, and other (natural resource exports)

Funding sources that are associate with debt, particularly loans, debt for nature, and mitigation payment, are categorized as external funding in our study. We recognize that internal funding sources are used to pay back the debts, thereby blurring the line between external and internal funding somewhat.

Figure 1a. *Sources of external funding for specific PAs*



[9] External funding sources refer to: any funding coming from a source outside of the country (e.g. loans, grants, investments, gifts)

[10] Internal funding refers to: any funding being spent on the park system that was sourced from within the country by the government, a government entity, or the entity that runs the PA (e.g. taxes, fees, concessions, allocations)

Figure 1b. *Sources of external funding for PA networks*

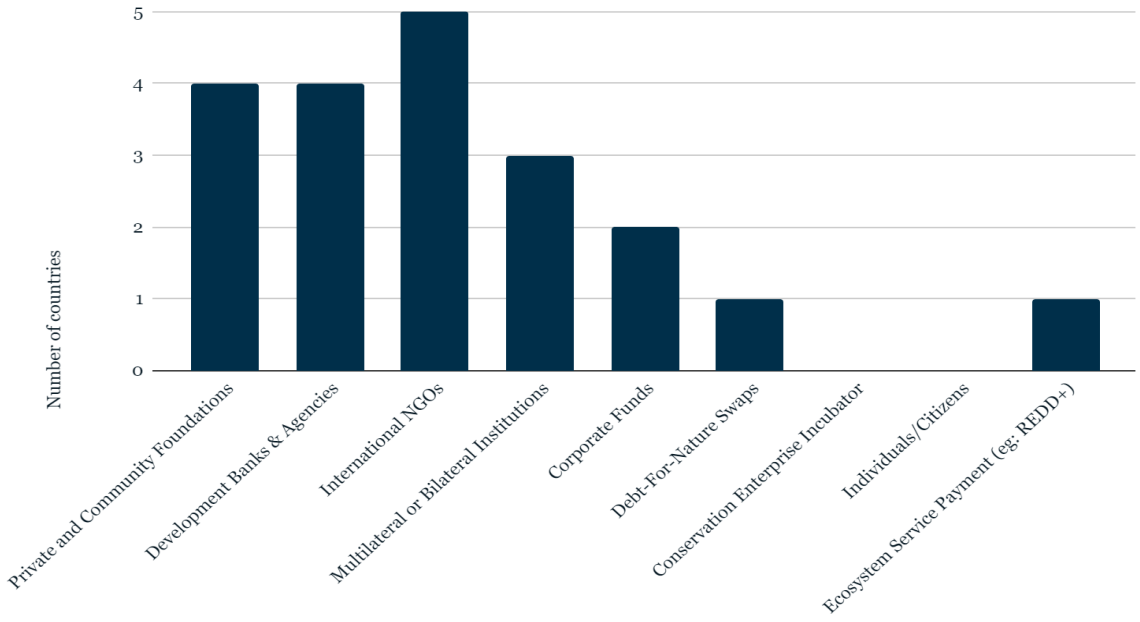


Figure 2a. *Sources of internal funding for specific PAs*

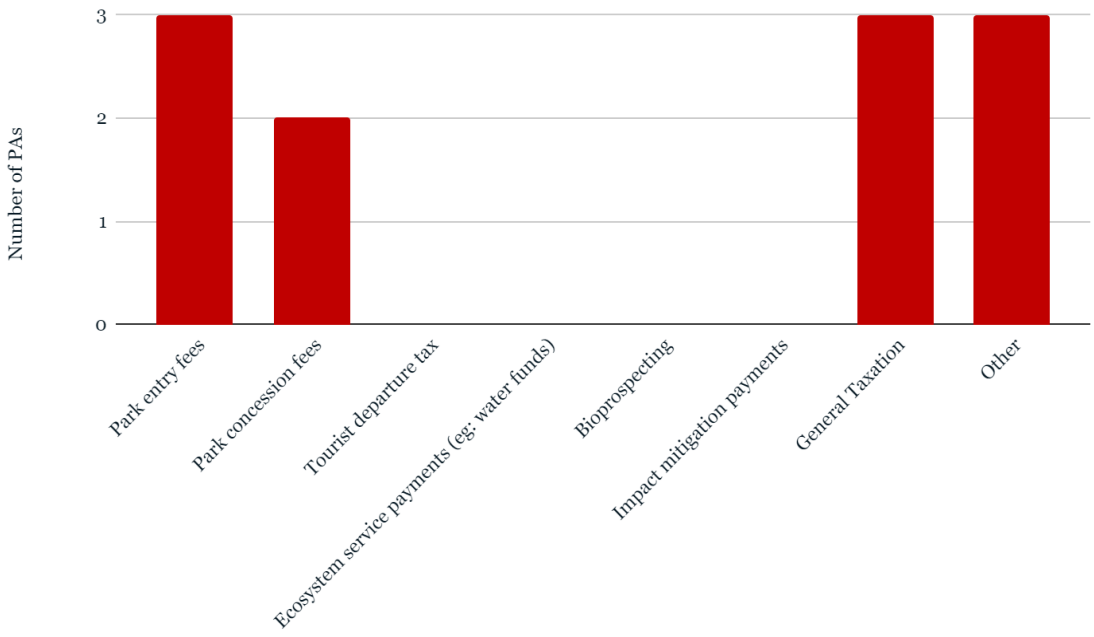
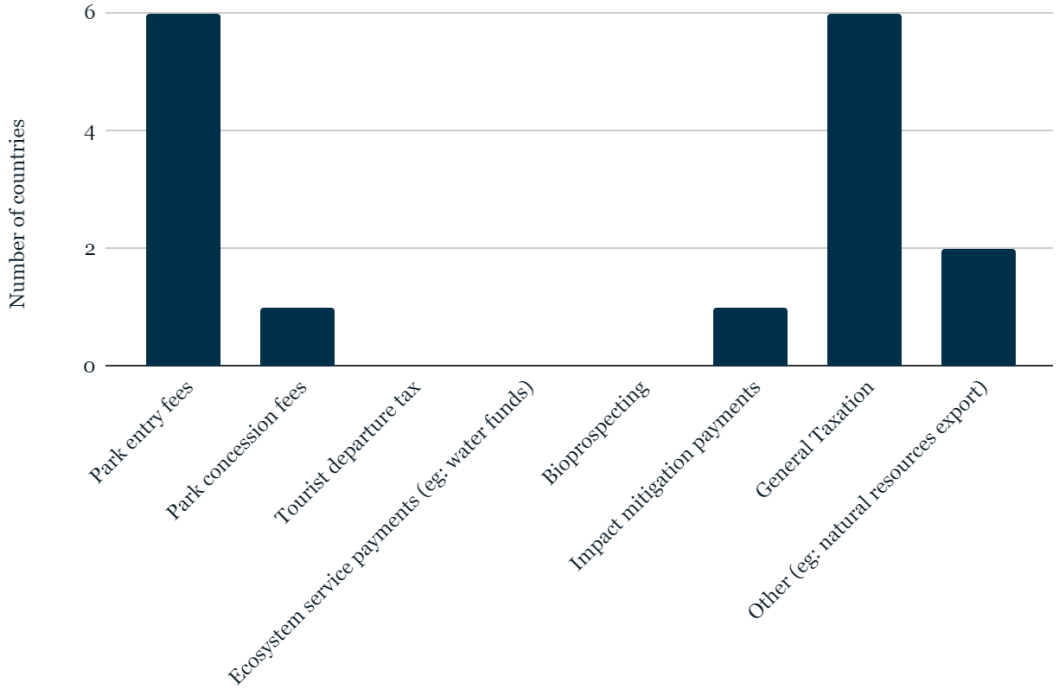


Figure 2b. *The main sources of internal funding for PA networks*



Total Spending VS Environmental Orientation

The team found no clear relationship between total perceived level of funding for specific PAs (Figure 3a) or for PA networks (Figure 3b) from our interviews and expressed environmental orientation (EPI) score. One explanation for this may be that even if a country places a large level of priority on protecting biodiversity and the environment, it does not necessarily mean that they have the funds to do so.

For the PA networks (Figure 3b), at the two most extreme levels of spending represented (grossly insufficient and adequate) there are both extremely high and extremely low EPI scores represented. This supports the claim that a country's environmental consciousness is not the only explanatory factor for its spending on PAs

Figure 3a. *Specific PAs EPI scores compared to their total spending on PAs*

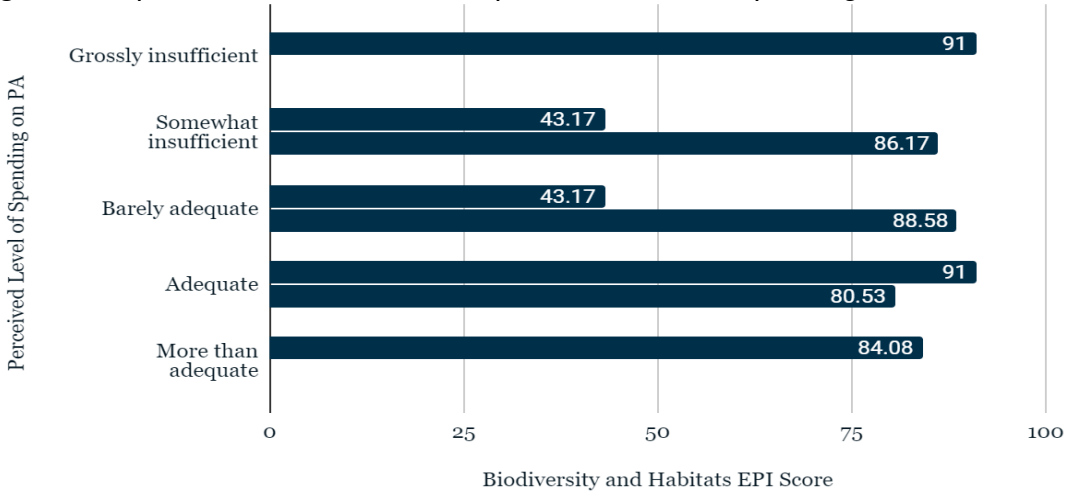
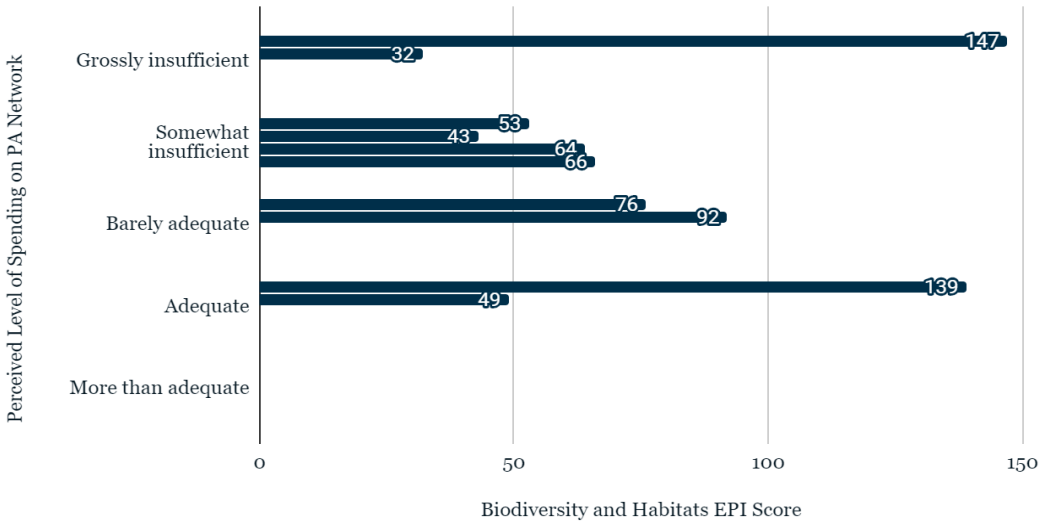


Figure 3b. *PA Networks' EPI scores compared to their total spending on PAs*



Is Funding for PAs Sufficient?

Interviewees were asked about their perceptions of the total level of funding available for a park or network to meet its conservation goals. For specific PAs (Figure 4a), the most common responses indicated funding was "adequate", "barely adequate" or "somewhat insufficient" to meet conservation objectives. For PA networks (Figure 4b), the most common response was "somewhat insufficient" (40%) to meet conservation objectives, with "adequate", "barely adequate" and "grossly insufficient" encompassing 20% each of the responses.

PA funding at network and specific PA levels had a slightly better outlook at the individual PA level. This may be because the individual PAs selected for discussion by the interviewees are likely those that are larger or more important and garner more international attention.

Figure 4a. *Perceived level of funding for specific PAs.*

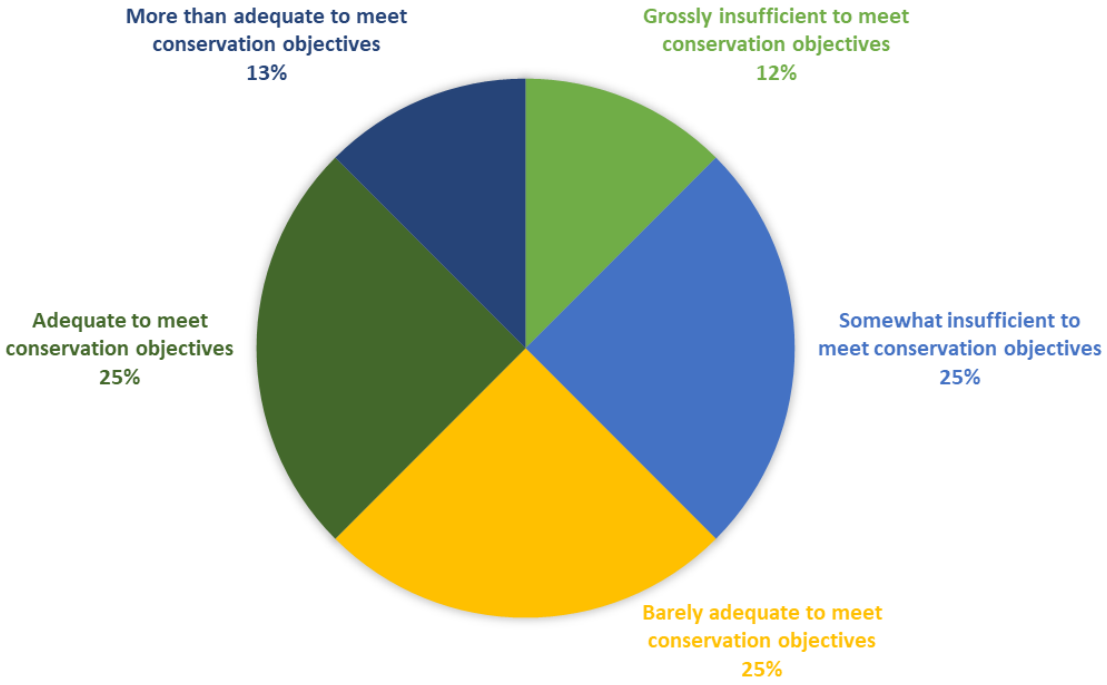
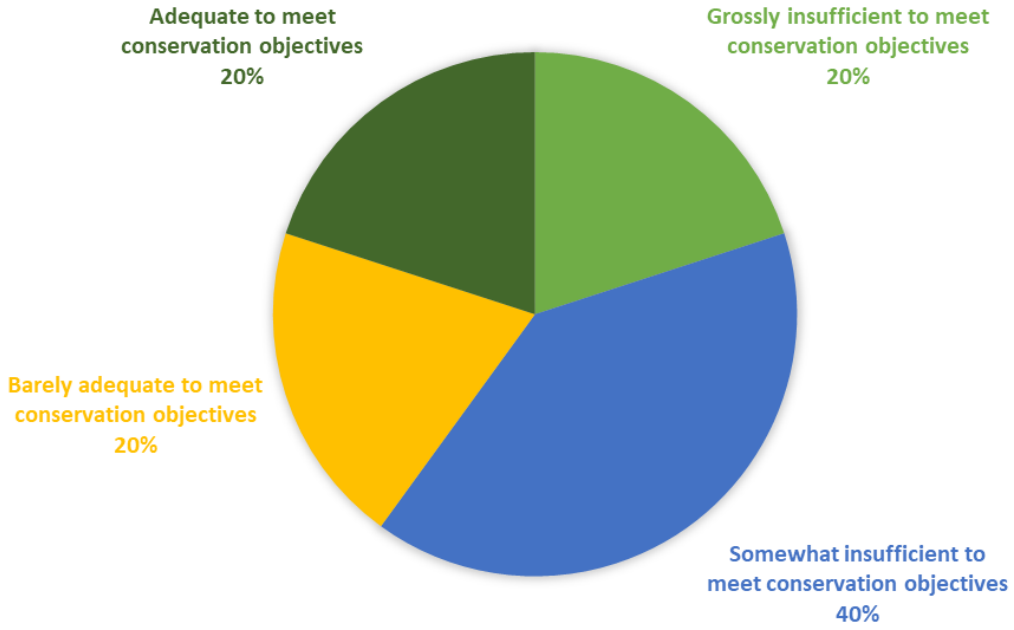


Figure 4b. *Perceived level of funding for PA networks.*



Funding Sufficiency and GDP

Perceived levels of spending on both PAs and PA networks were compared to GDP (Figures 5a,b) to assess how much the economic status of a country affects its funding of PAs. A relatively weak correlation between GDP and total spending was found. Higher GDP is somewhat correlated to a higher degree of funding for both PA networks and PAs (with a slightly clearer relationship at the network level); however there are numerous exceptions to the trend.

Figure 5a. *Perceived level of spending on specific PAs compared to countries' GDPs.*

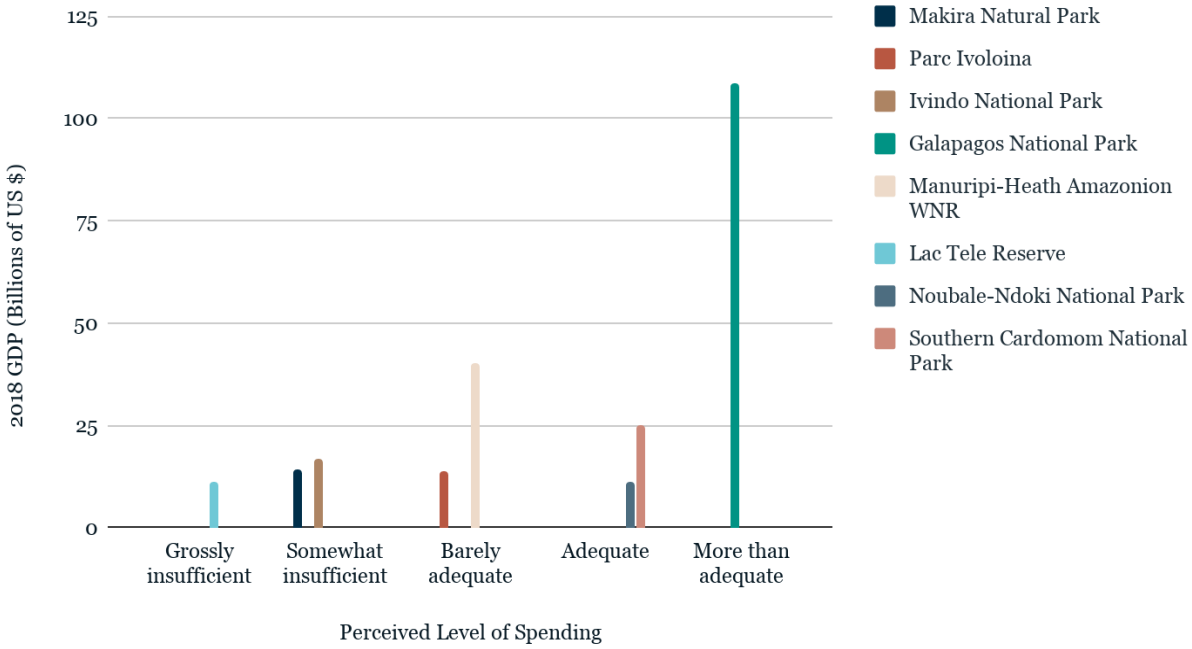
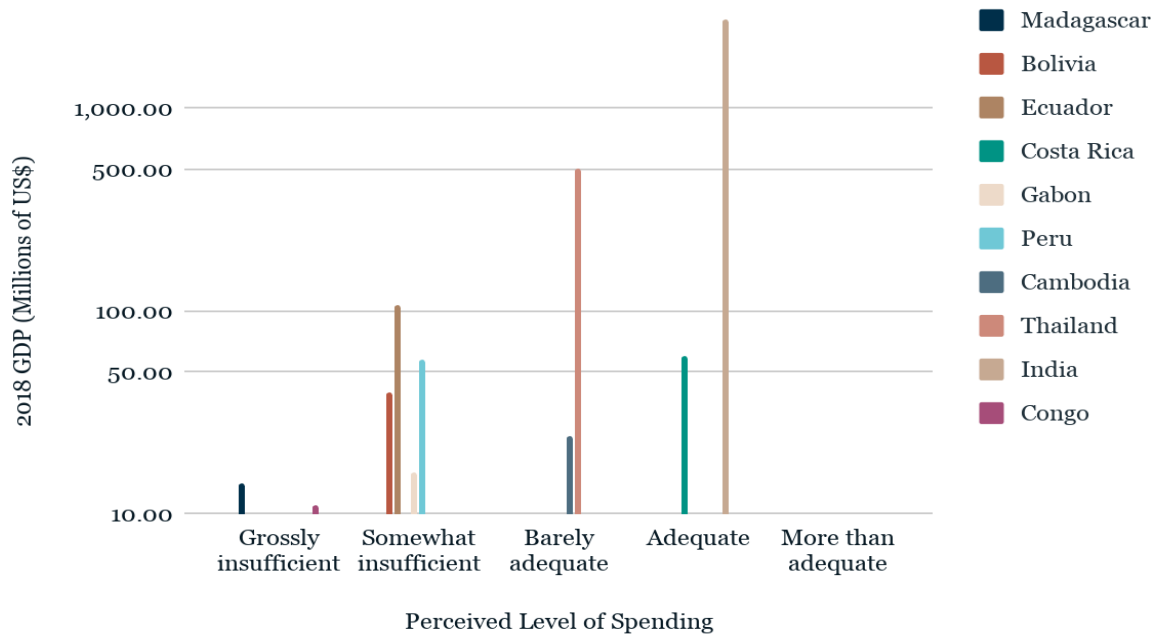


Figure 5b. *Perceived level of spending on PA networks compared to countries' GDPs.*

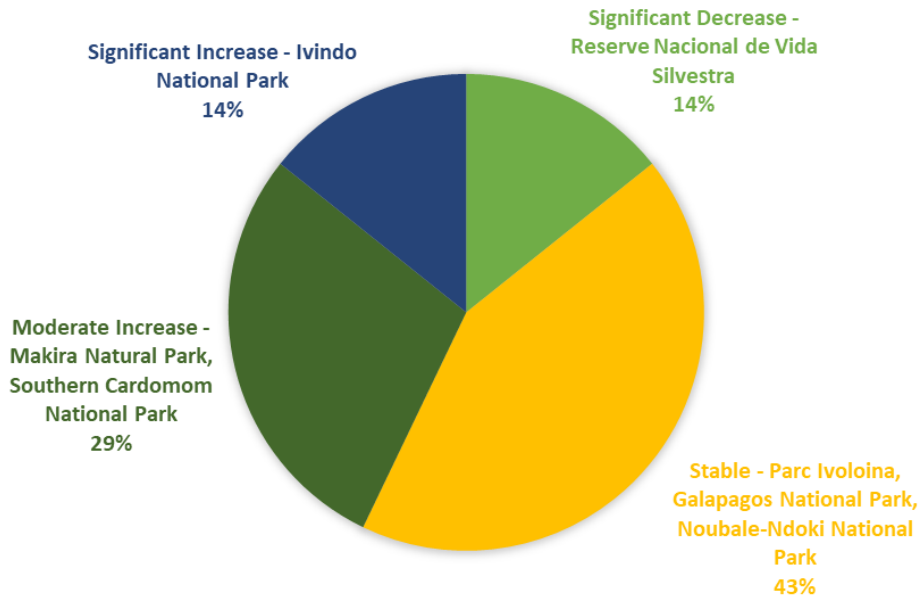


Changes in Internal Funding

When asked about how internal funding for a PA has changed over the last 15 years, interviewees reported most often that funding has either increased modestly (28.6%) or stayed stable (42.9%). Both the extremes “significantly decreased” (14.3%) and “significantly increased” (14.3%) received only 1 response each (Figure 6a). The significant increase came from a change in political will to fund PAs (Gabon), and the significant decrease came from an influx of external funds to the park, which caused the government to pull its internal funding (Bolivia).

When asked about key drivers of those changes in internal funding for specific PAs, responses included: increases in REDD+ payments, growth of the national economy, and increases in government budget for environmental expenses. Specifically, both Makira Natural Park (Madagascar) and Southern Cardamom National Park (Cambodia) saw increases in REDD+ payments, and Ivindo National Park (Gabon) saw increased government budget due to an increase in political will to allocate national treasury funds.

Figure 6a. *Changes in internal funding for specific PAs over the past 15 years.*



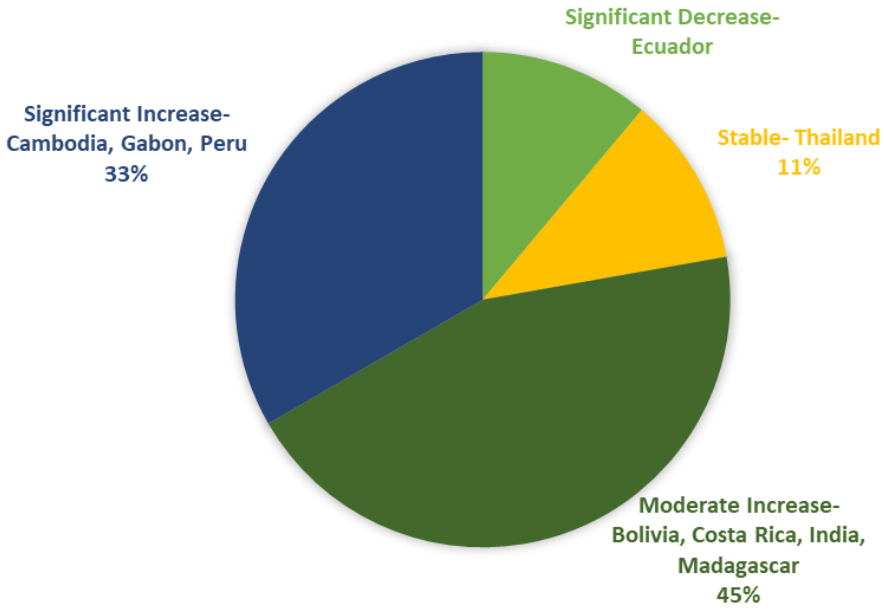
For PA networks, internal funding has generally increased modestly (44.4%) or significantly increased (33.3%) over the last 15 years (Figure 6b). There was an overall consensus for PA networks that funding has generally increased. Key drivers of change for PA network funding includes: growth of the national economy, increase in government budget for environmental expenses, tourism and international funding.

The only PA network which experienced a significant decrease in internal funding is Ecuador. This change can be explained by the reliance on funding from natural resource export, such as from the oil sector, which has been seriously affected by the plummet in oil prices in recent years.

While interviewees report that funding appears to be stable or increasing across the board (for specific parks and networks), when these responses are combined with responses about

whether funding is sufficient (Figure 4a,b), it appears that even modest or significant increases don't provide enough funds to meet conservation goals.

Figure 6b. *Changes in internal funding for PA networks over the past 15 years.*



Has External Funding Influenced Internal Funding?

For specific PAs the majority of our survey respondents, 62.5%, indicated that external funding has had some level of impact on internal financing (Figure 7a). Similarly, for PA networks 60% indicated external funding has influenced internal financing (Figure 7b).

If you combine answers for specific PAs and PA networks, the response is 11 yes, 7 no. Roughly 60% of all responses indicate influence of external funding on internal spending.

Figure 7a. *Summary of responses to the question "in your opinion, has external funding influenced internal spending on this PA?"*

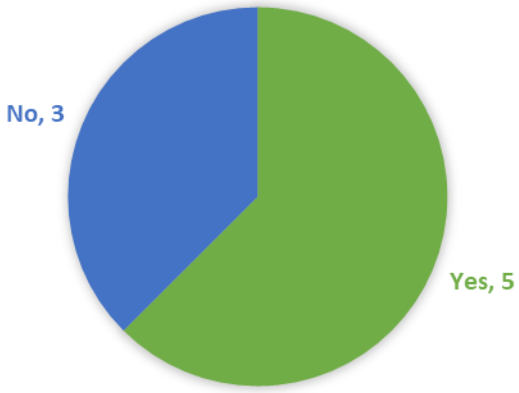


Figure 7b. *Summary of responses to the question "in your opinion, has external funding influenced internal spending on this country's PA network?"*

How Does External Funding Influence Internal Spending?

To expand on the previous finding, in Table 2 we report details on whether and how interviewees perceived external financing to influence internal spending on PAs. While roughly half our respondents answered that they believe external funding influences internal government spending on PAs (Figure 7a,b), this influence occurs through multiple pathways and can be positive or negative.

Table 2. Explanations from interviewees on whether and how external financing influences internal PA spending by governments.

Does external financing influence internal spending on PAs?	***How?***	***Reasoning provided:***
Yes	Positively	-Stipulation built into external funding mechanism -External funding influences political will to invest in PAs -External funding increases PA capacity, allowing PAs to lobby government for more money -External funding that leads to management innovations incentivize government to invest in effectively managed PAs
	Negatively	-When PAs receive external money, the government chooses to divert resources elsewhere
No		-Government has other priorities and unlikely to spend money on PAs regardless of external financing -The government does not tend to accept external funding

Has NGO Involvement Influenced Internal Funding?

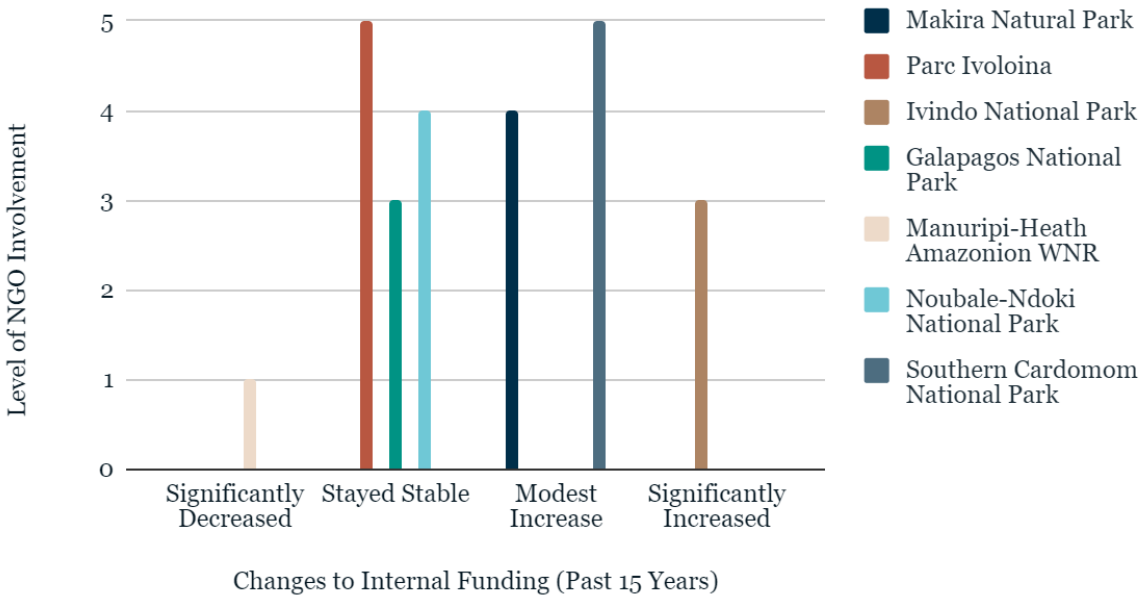
We also explored other factors that influence internal funding, and found a relationship for PA networks between the level of NGO involvement in PA management and the changes in internal funding over the past 15 years. The team developed a key to encompass the levels of NGO involvement, shown in Table 3.

Table 3. Levels of NGO involvement in PA management, and the corresponding numerical code for each level.

Level of NGO Involvement	***Value Code***
No Involvement	0
Research Only	1
Technical Support	2
Research + Some Management	3
Co-Management	4
Primary Management	5

Figure 8a was created from specific PA data and shows that NGO involvement does not seem to have a clear correlation with changes to internal funding. However Manuripi WNR (Bolivia), which has the lowest level of NGO involvement, is also the only park that has seen a significant decrease in internal funding, while all other PAs that have some degree of NGO management have seen either stable funding or an increase in funding.

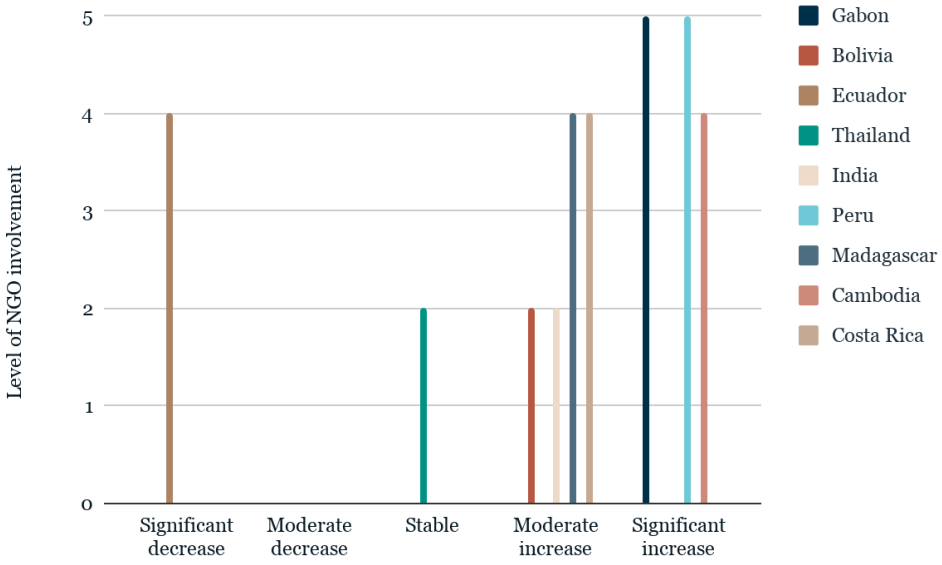
Figure 8a. *Level of NGO involvement compared to changes in internal funding over the last 15 years for specific PAs.*



For PA networks (Figure 8b) the only countries with significant increases in PA funding also have the highest level of NGO involvement. But it is important to note that the 2nd highest NGO involvement (level 4) was associated with moderate increases as well as significant decreases in internal spending.

One possible explanation for this discrepancy between countries is that in some cases high NGO involvement means more capacity to lobby for internal funds (which was indicated in Cambodia as being significant), but in other cases, it could mean that the government is passing financial responsibility onto NGOs and funds parks less.

Figure 8b. *Level of NGO involvement compared to changes in funding for PA networks.*



NGO Management by GDP Level

We observed a possible relationship between NGO management level and GDP, but with low sample size it is impossible to tell if this is meaningful. From our small sample, we noted that countries with lower GDP appear to have more intense NGO involvement for specific PAs where the partners are either co-managers or primary managers of the PAs (Figure 9a). In contrast, for PA networks we saw a slight indication for the opposite relationship with more NGO involvement for countries with higher GDP.

Because of our small (and biased) sample, we are wary of drawing broad conclusions from these particular findings (related to Figures 8a-9b). Our interviewees represent a skewed sample (mostly NGO representatives), so not only would they know most about NGO involvement, but they would also likely tout its influence. This bias may be influencing the results presented in Figures 8a-9b.

Figure 9a. *Levels of NGO management in a specific PA compared to the GDP for countries where the PAs are located*

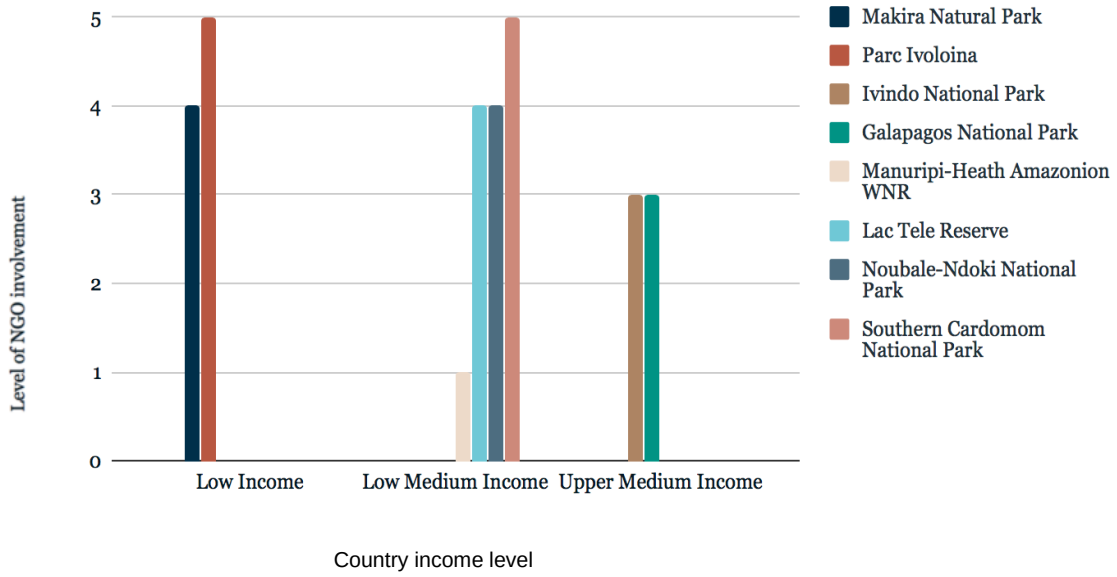
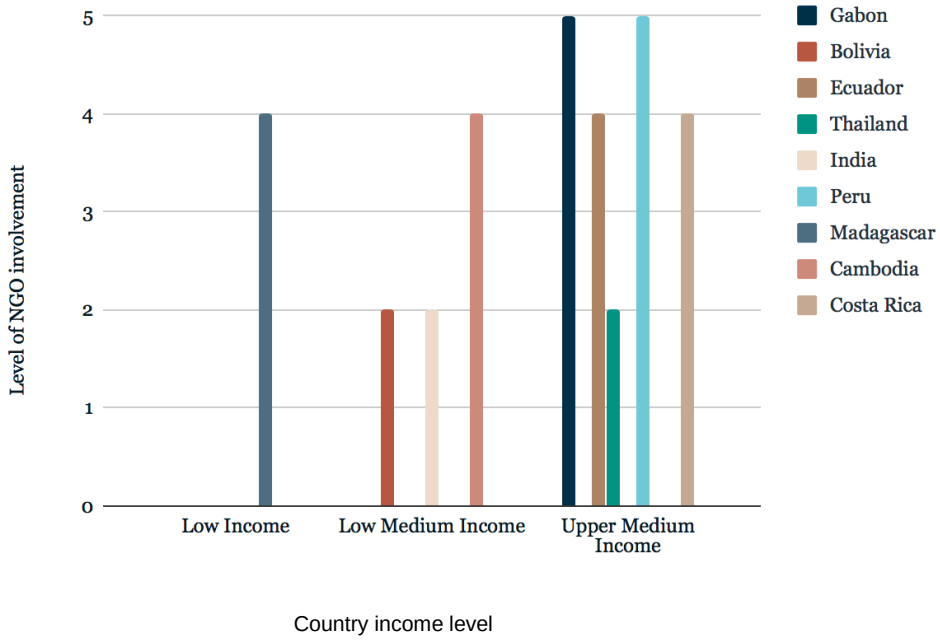


Figure 9b. *Levels of NGO management in PA networks compared to the income level of those countries.*



Main Funding Mechanisms

Interviewees were asked how sources of internal and external funds were distributed by identifying major funding mechanisms. There were 5 primary mechanism types as shown in Table 4. If the mechanism type for the PA/network was not covered in this table, the interviewee was asked to specify the mechanism. Conservation trust funds (CTFs) and public-private partnerships (PPP) were the most common mechanisms for specific PAs, and CTFs, PPPs, and grants were the most common mechanisms for PA networks (Figures 10a,b).

Table 4. List of funding mechanisms from interviews

FUNDING MECHANISM TYPES
Conservation trust fund
Grant to government or park system
Loan to government or park system
Public-private partnerships (PPP)
Payment for ecosystem-services program (Performance-based payments)

Figure 10a. *Mechanism of funding distribution for specific PAs.*

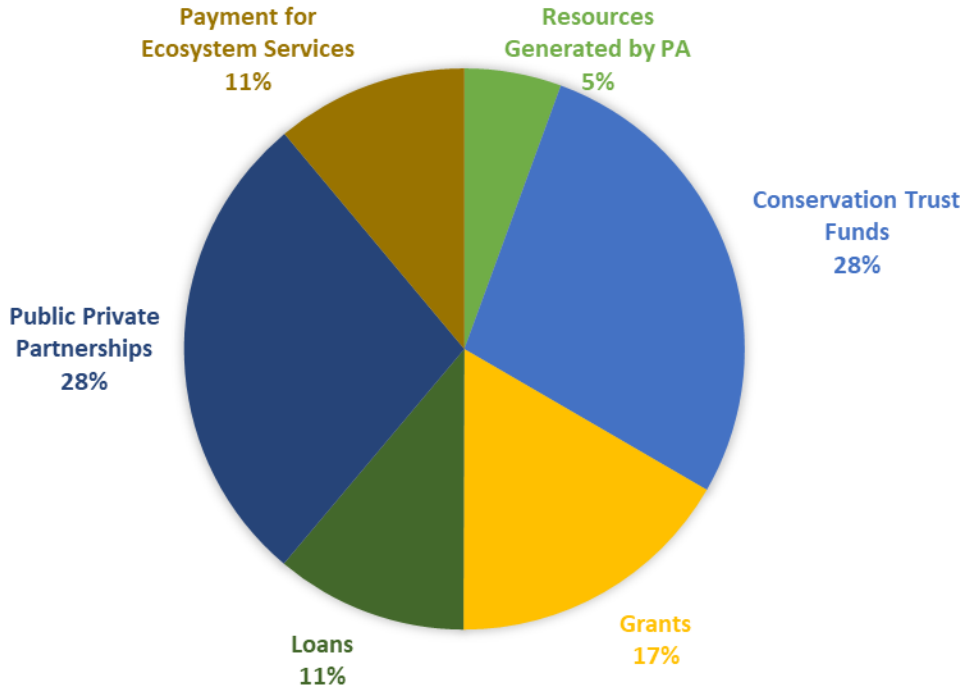
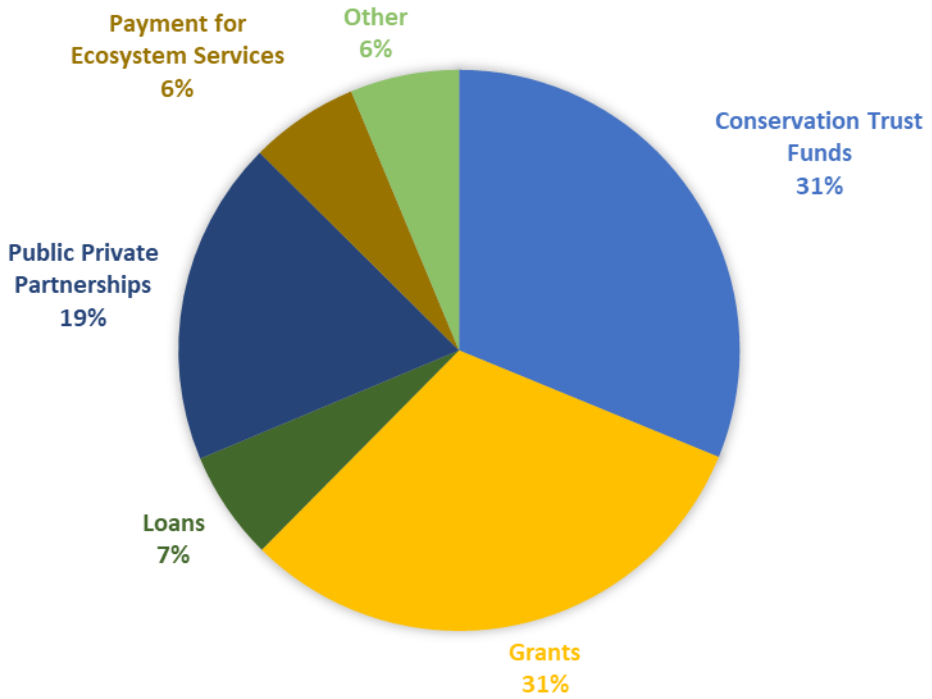


Figure 10b. *Mechanism of funding distribution for PA Network*



Main Funding Mechanisms compared to degree of NGO involvement

CTFs and PPPs, two of the three most common funding mechanisms in our sample (the three most common being CTF, PPP, and grants), are largely implemented by NGOs. Therefore, the team felt it would be helpful to examine the relationship between these two funding mechanisms and the level of NGO involvement in specific PAs. The same six levels of NGO involvement from Table 2 were used for analysis and compared to the funding mechanism utilized (Figure 11a,b).

It appears that if both a CTF and PPP were used as funding mechanisms for the same park, NGOs appear to have a higher level of involvement in managing the PA for both specific PAs (Figure 11a) and PA networks (Figure 11b). The exception is Gabon where there is the highest level of NGO involvement with no CTF or PPP. We think this is due to Gabon's strong political will for environmental protection and available government funds.

Figure 11a. *Specific PA Funding Mechanisms and level of NGO Involvement*

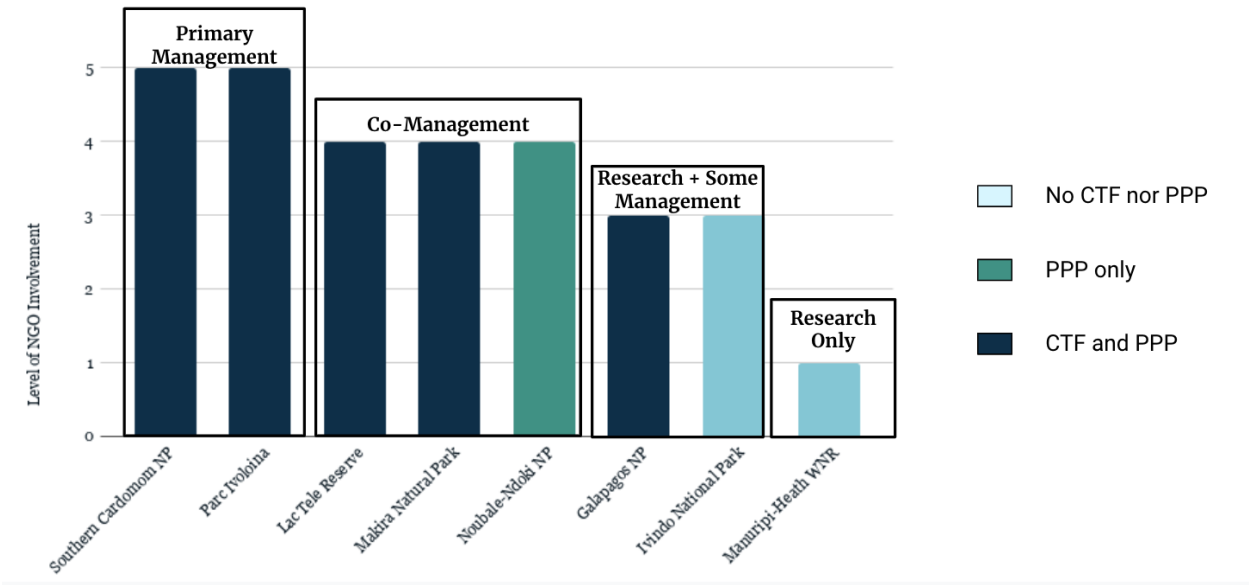
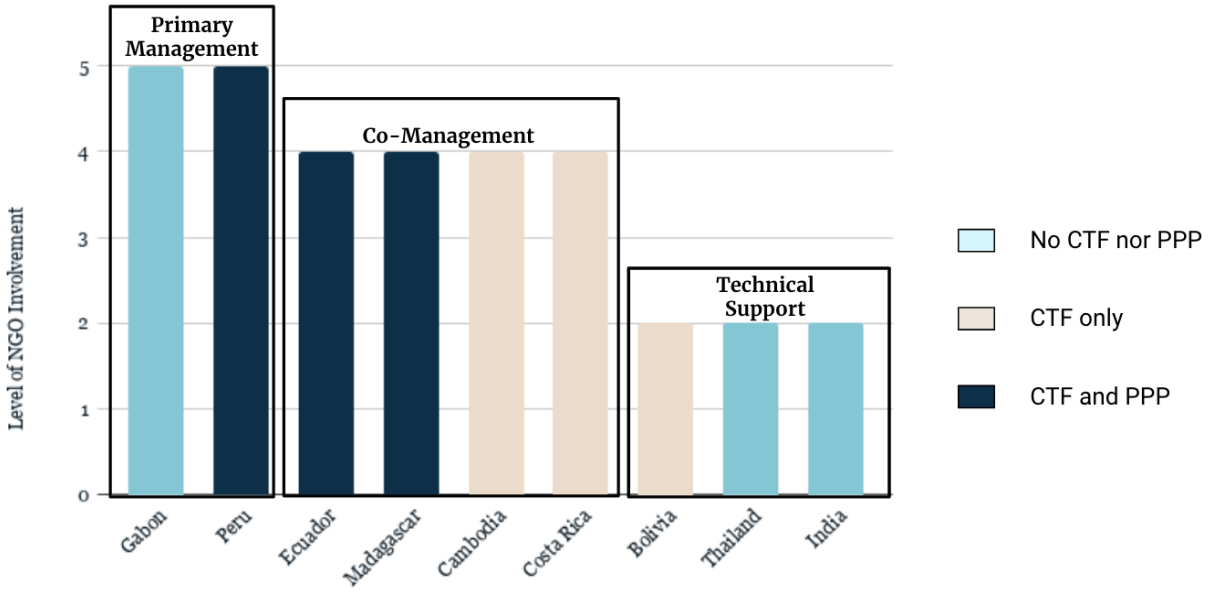


Figure 11b. *PA Network Funding Mechanisms and level of NGO Involvement*



Main Funding Mechanisms' Success and Key Drivers

Here we analyze funding mechanism success and key drivers of that success. We define successful conservation funding mechanisms to indicate instances when respondents reported that the funding mechanism had adequate capacity to accumulate and sustain funding. We define unsuccessful funding mechanisms as ones that were not able to accumulate or sustain funding over time. Mechanisms marked N/A represent those instances when interviewees did not indicate success for failure of a mechanism.

We coded responses from the completed surveys to infer categories of key drivers of successful funding mechanisms. If the respondent indicated that a mechanism was successful, we coded the explanation of why into three categories: management support, government support, and political/ community support (Table 5).

Table 5. Types of key drivers for funding mechanism success

Key Driver Types	***Definition***
Management support	The success of the mechanism was due to the international NGO that provides support through co-management
Government support	The success of the mechanism was dependent on political motivations or the local community
Political/ community support	The success of the mechanism was dependent on the government providing support or resources through funding, staffing, etc.

For Specific PAs, we found that a slight majority of responses (51%) found the funding mechanism to be successful. Of those who thought the mechanism was successful, political and community support (23%) was a key driver of the success with government support and management support from the PA's partners being equally important (13%) (Figure 12a). For PA Networks a slight majority of respondents (55%) believed that funding mechanisms were successful. Of that 55%, government and management support were equally the top two most important drivers of that success (22%) (Figure 12b).

Our results indicate that for specific PAs, community support was the key driver of funding mechanism success, while for PA networks management and government support were the most important key drivers.

Figure 12a. *Success of funding mechanisms for specific PAs and what the key drivers were for that success.*

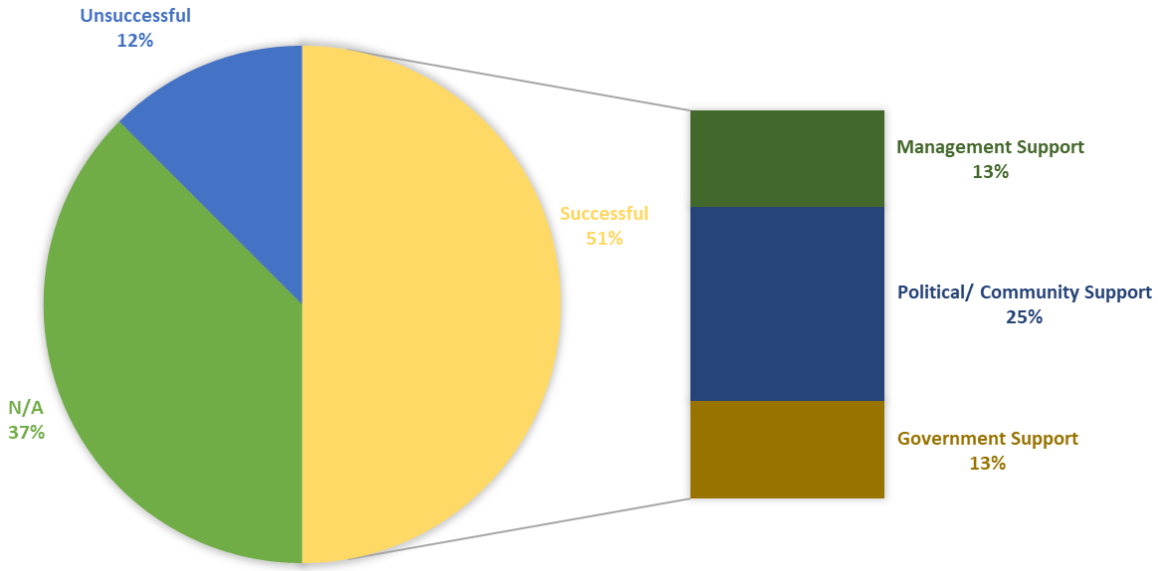
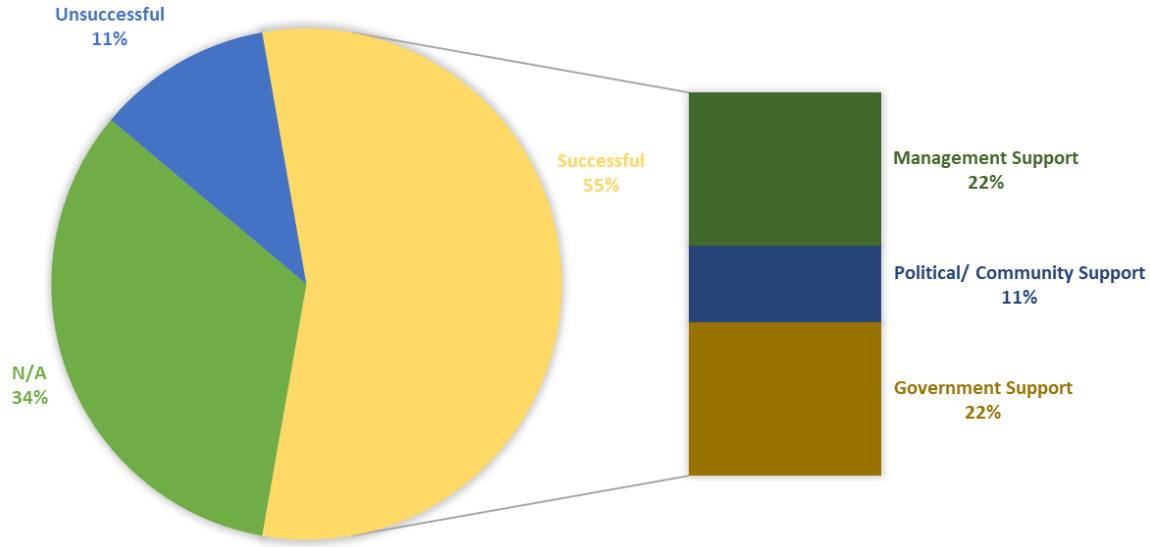


Figure 12b. *Success of funding mechanisms for PA networks and what the key drivers were for that success*



PA Downgrading, Downsizing, & Degazettement (PADDD)

In the period from 2004 to 2019, there was a significant discrepancy in the number of PADDD events in the 10 focal countries, with India (495 cases), Cambodia (110 cases) and Ecuador (9 cases) far surpassing the others. As the number of countries is limited, no correlations between the number of PADDD events and other economic indicators/indices were found. In addition, it is worth noting that infrastructure and mining are the most prevailing causes for PADDD events, which appeared in six and three events respectively out of the ten countries. However, in an

absolute number, subsistence (476 cases) and industrial agriculture (93 cases), which were recorded only in India and Cambodia, are the most popular reasons for PADDD events.

There are a few reasons that PADDD events may be so much more prevalent in India, Cambodia, and Ecuador as opposed to the other countries we examined. These reasons include:

- PADDD reporting is better in those countries, meaning that there may be just as many events in the other countries, but that they are going unreported
- Ecuador relies heavily on natural resource (oil) extraction and with dropping oil prices the country may be inclined to downgrade protections to allow for exploration in PAs
- There is low NGO involvement in India, which by far has the highest levels of PADDD, and less civil society activity means less advocating against PADDD events

Figure 13a. Number of PADDD events by country (period 2004-2019)

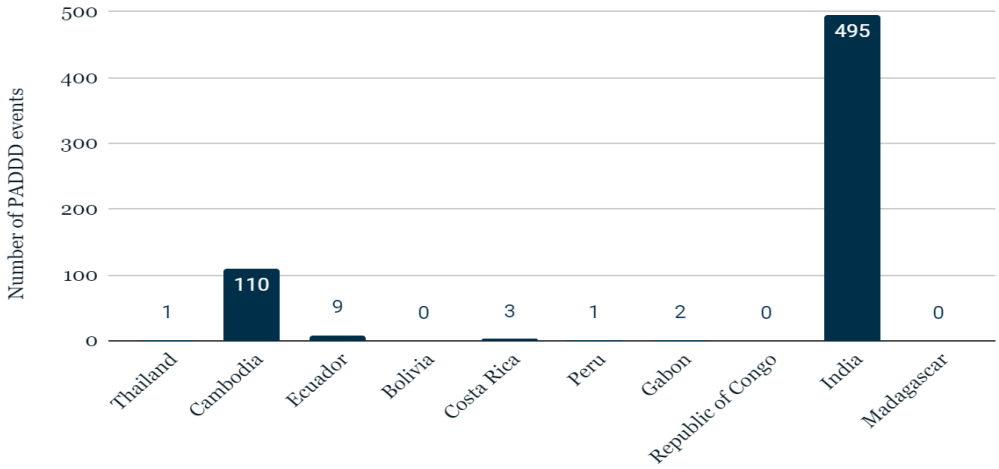
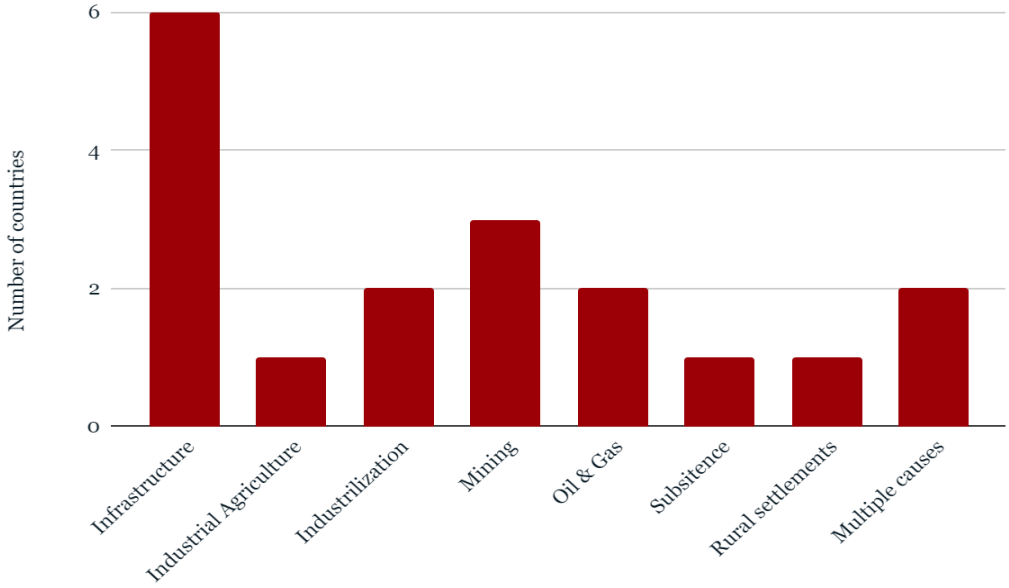


Figure 13b. Top five reasons for PADDD in each country (period 2004-2019)



5. Challenges and Next Steps

Challenges

Timeframe:

We had only a few months for data collection which did not allow for an extensive number of interviews. Corresponding with busy conservation professionals was a slow process and, the limited timeframe did not leave much room to snowball out from the initial list which focused primarily on NGO experts. A global pandemic in the middle of the semester further inhibited outreach efforts. These conditions resulted in a smaller interview sample size that we initially wanted, and though we can point out interesting trends in our data it is impossible to draw conclusions from such a small sample.

Potential Sources of Bias:

One potential bias identified was that most experts interviewed were from outside the country in question. We found response variation in one case between professionals native to a country versus professionals not of native origin. In one instance, when asking two interviewees discussing the same country about funding, there was variation in the perception of how internal and external funding sources interact.

Another bias stemmed from prioritizing experts in the conservation field, specifically those who represented NGOs. By focusing on conservation practitioners the project was limited to this perspective. Interviewing professionals outside of this field, such as a government employee not directly affiliated with conservation, would provide a more multi-faceted perspective on the topic.

Other biases centered around survey format and entering the data into the qualtrics database. Interviews were conducted verbally, but when interviewers entered responses into a database they had to 'translate' answers to fit our database format. This could have led to unintentional bias and should be considered when conducting surveys in the future, perhaps by reducing short answer questions and increasing structured questions. Another solution may be having interviewees fill out the survey themselves in written form.

Next Steps

If this research is to be continued or expanded upon, the Bass Connections team recommends increasing data collection through broadening the diversity of countries selected. The study found substantial differences between countries, even within a particular region. Although obtaining interview data was a limiting factor for several reasons (detailed in the previous section), more time to conduct the study would likely alleviate some of these limitations. Selecting additional countries in focused regions would help establish an understanding of regional trends in PA financing rather than the country snapshots collected in this pilot study. Additionally, an increase in interview numbers within and across a region, combined with regional economic data could provide the basis to conduct regionally-based statistics to examine country status trends and PA funding outcomes. For example, a future analysis could investigate whether PA funding was statistically linked to economic/social variables such as GDP, environmental orientation, and/or quality of life indicators (education, life expectancy, gender equality).

Adaptations to our interview guide could also probe into more details on specific funding mechanisms. This would allow further investigation of trends in financial mechanisms, such as the reasons specific mechanisms were chosen, enabling conditions, structure of the mechanism being used, regional trends, and the administrators of the mechanisms (i.e. governments, NGOs, or non-profits).

This study provides a foundation for future research. The methodology developed here could be applied to collect a larger, more robust dataset. In addition to the methods developed for the semi-structured interviews and collection of secondary data, we have also developed a data collection structure with a database, a Qualtrics survey for integrating interview results, and analytical template that can be expanded upon if additional research is planned.

We also note that it may be interesting to re-visit our research question in the context of the COVID-19 pandemic. It is unclear how governments will respond to the economic downturn associated with the pandemic,[11] and both external and internal PA funding will likely be affected.

Conclusion

A greater understanding of each country's economic and social priorities is needed to identify whether and how external financing may be influencing internal government spending for PA networks. As we interviewed individuals involved in the PA networks across the world we found that it is important to identify and discuss with individuals how they felt their country valued the PA networks being discussed.

Value is defined in many different ways across different countries but it is an important question to ask when trying to identify factors that go into a country's decision to financially support their PA networks. Often, governments value PA networks based on their biodiversity. We found that countries also often value PAs in terms of how they contribute to GDP, which provides park agencies the ability to make a case to increase their budgets and capacity. We found a significant lack of information on how PAs contribute to human wellbeing and national priorities across our case studies. These connections are important to get a full picture of how PA networks are valued by countries across the world.

This study allowed us to paint a cursory picture about how external PA funding influences a country's decision to finance its own PAs. We have come to understand there is not a simple answer to this question, and that the relationship between internal and external PA funding is mediated by environmental values, economic context, political will, and external partners. Further research is required to tease out those nuances and to make decisive statements about the trends we observed here, but we hope that this research provides some insight and guidance into this issue that can be expanded upon in the future.

[11] Hockings, Marc, Nigel Dudley, Wendy Ellio, Mariana Napolitano, Kathy MacKinnon, MKS Pasha, Adrian Phillips, et al. 2020. "EDITORIAL ESSAY: COVID-19 AND PROTECTED AND CONSERVED AREAS." *PARKS* 26.1: 18. https://doi.org/10.2305/IUCN.CH.2020.PARKS-26-1MH.en.

Appendix A: Protected Area Network Interview Guide

Brief Introduction:

Our interview guide is semi-structured, so some questions will be simple yes/no, while in others we will ask for a more narrative answer.

All your answers will remain confidential and your identity will not be divulged. Your identification information will be stored in a separate file, and your responses will be associated only with a randomly assigned ID number. You may decide not to answer specific questions and may terminate the survey if and whenever you wish.

1. Interview ID#: _____

2. Name of the country or Protected Area (PA) network being discussed _____

3. From your perspective, what is the history of overall financial support for PAs in the country?
    a. What do you think has been the most significant change in overall PA financial support over the last 15 years? And why has that change occurred? *(e.g. stakeholders' influence, increase/decrease of threats, specific projects success/failure, etc.*)

4. How would you describe the total level of spending on protected areas in the country?
    - Grossly insufficient to meet conservation objectives
    - Somewhat insufficient to meet conservation objectives
    - Barely adequate to meet conservation objectives
    - Adequate to meet conservation objectives
    - More than adequate to meet conservation objectives

[Optional]
    a. Any important details to provide on your answer above?

5. Is funding equally distributed across all protected areas?
   [Options]
    a. No - how is it distributed differently?
        i. Why is funding not distributed equally (political issues, prioritization of PAs)?

Internal Funding Sources

Internal funding sources refer to: Any funding being spent on the park system that was sourced from within the country by the government, a government entity, or the entity that runs the PA (e.g. taxes, fees, concessions, allocations)

6. Do you know roughly what proportion of the PA network budget comes from internal sources?
    - Less than 10%
    - 11-25%
    - 26-50%
    - 51-75%

- 76-90%
- Greater than 90%
- Don't know

7. Do you know what the primary sources of internally generated funds used by the government are to support the country's PAs? *(Select all the sources that apply)*

    - Park entry fees
    - Park concession fees
    - Tourist departure tax
    - Ecosystem service payments *(e.g. REDD+, water funds etc.)*
    - Bioprospecting
    - Impact mitigation payments
    - General taxation
    - Other: _____

8. How has internal (government) spending on the network of PAs changed in the last 15 years?

    - Significantly decreased
    - Modest decrease
    - Stayed stable
    - Modest increase
    - Significantly increased

[Options]

a. [*If spending has **increased***] Why has government spending increased? *(select all that apply)*

    - Decrease in external donor financing
    - Increase in REDD+ payments
    - Increase in political will to allocate national treasury funds
    - National economy growing
    - Compliance with international treaties
    - To keep pace with inflation
    - Other: _____

b. [*if spending has **decreased***] Why has government spending decreased? *(select all that apply)*
    - Increase in external donor financing
    - Decrease in REDD+ payments
    - Decrease in political will to allocate national treasury funds
    - Increase in allocation of national treasury funds to other sectors
    - National economy contracting
    - Civil strife and/ or insecurity
    - Other: _____

[Optional]

c. Any detail or context to add to your answer above about why spending has increased or decreased?

External funding sources

External funding sources refer to: any funding coming from a source outside of the country (e.g. loans, grants, investments, gifts)

9. Are you aware of what external financial sources are used (or have been used in the past 15 years) to fund the PAs in the country? *(select all that apply)*
    - Private and community foundations
    - Multilateral or bilateral institutions
    - Development banks and agencies
    - International NGOs
    - Corporate funds
    - Individuals/citizens *(e.g. impact investing)*
    - Insurance/guarantees
    - Green/nature/resilience bonds
    - Debt-for-nature or debt-for-adaptation swaps
    - Conservation enterprise incubator
    - Impact investing/equity
    - Other: _____
    - Don't know

[Optional]

   a. Can you provide some details on those financial sources discussed above? *(e.g. who is providing the funding, how much, over what period etc.)*
   b. Were external investments intended to be one-time or of finite duration? If finite, over what period?
   c. What happened when sources of external funding ended; were they partly or fully replaced with funding from other sources? Please explain.
      i. [If the funding was partly or fully replaced] How did the transition occur from external funding ending to new funding sources being applied?
      ii. Alternatively, if an external funding source has been successful and persisted over time, what made it work? Please explain.

10. In your opinion, have flows of external funds into the country to support PA management influenced government spending from domestic sources?
    [Options]
    a. If yes, how?
    b. If no, why not?

Funding Mechanisms

11. How are the internal and external financial sources you described above dispersed? In other words, what financial mechanism(s) is used to distribute those funds? *(select all that apply)*
    - Conservation trust fund
        - sinking fund
        - revolving fund
        - endowment fund
    - Grant to government or park system
    - Loan to government or park system
    - Public-private partnerships (PPP)

- Payment for ecosystem-services program (Performance-based payments)
- Other: _____
- Don't know

[Optional]

a. Can you provide some details on those financial mechanisms?
b. How/have these mechanism(s) been successful? What are key characteristics that made it a success or not? (*e.g. governance of the fund, how involved were local stakeholders in how the fund was spent*)

12. Are there any other important issues we should know about the financial support for the PA network in this country that we haven't discussed yet?

Conclusion

13. Is there anyone else you suggest that we interview to expand upon what we discussed today?
    Name(s):
    Email(s):

14. Are there any key resources that you think we should make sure to read on the financing of the PA network we discussed?

Appendix B: Specific Protected Area Interview Guide

Brief Introduction:

Our interview guide is semi-structured, so some questions will be simple yes/no, while in others we will ask for a more narrative answer.

All your answers will remain confidential and your identity will not be divulged. Your identification information will be stored in a separate file, and your responses will be associated only with a randomly assigned ID number. You may decide not to answer specific questions and may terminate the survey if and whenever you wish.

1. Interview ID#: _____

2. Name of the Protected Area (PA) the interviewee is discussing _____

3. What is the history of financial support for this protected area?
    a. What has been the most significant change in financial support for this PA over the last 15 years, and why did that change occur?

Protected Area Context

4. Could you talk about the primary threats that this PA is facing?
    a. How would you categorize the overall threat level (all threats combined)?
        - No threat
        - Minor threat
        - Moderate threat
        - Significant threat
        - Extreme threat
    b. Has this threat level changed over time? If yes how?
    c. Does threat level (or changing threat level) influence overall funding for the PA? If yes, how?

5. We realize that local perceptions vary amongst different groups of the community (those with jobs in extractive industries, indigenous communities that depend on non-timber forest products, etc.). Historically, have there been any perceptions that park use and access are regulated against the interests of the country and/or local communities?
    a. Have these perceptions changed over time? If yes, how?
    b. Was PA funding influenced by these perceptions (or changing perceptions)? If yes, how?

6. What is the governance structure of this PA?
    a. Has the governance structure changed over time? If yes, how?
    b. How does the governance structure affect funding for the PA?

7. How would you describe the total level of spending on this protected area?
    - Grossly insufficient to meet conservation objectives
    - Somewhat insufficient to meet conservation objectives

- Barely adequate to meet conservation objectives
- Adequate to meet conservation objectives
- More than adequate to meet conservation objectives

[Optional]

a. Any important details to provide on your answer above?

Internal Funding Sources

Internal funding sources refer to: Any funding being spent on the park that was sourced from <u>within</u> the country by the government, a government entity, or the entity that runs the PA (e.g. taxes, fees, concessions, allocations)

8. Do you know roughly what proportion of this PA's budget comes from internal sources?

    - Less than 10%
    - 11-25%
    - 26-50%
    - 51-75%
    - 76-90%
    - Greater than 90%
    - Don't know

9. Do you know what the primary sources of internally generated funds used by the government are to support this PA? *(Select all the sources that apply)*

    - Park entry fees
    - Park concession fees
    - Tourist departure tax
    - Ecosystem service payments *(e.g. REDD+, water funds etc.)*
    - Bioprospecting
    - Impact mitigation payments
    - General taxation
    - Other: _____

10. How has internal (government) spending on this PA changed in the last 15 years?

    - Significantly decreased
    - Modest decrease
    - Stayed stable
    - Modest increase
    - Significantly increased

[Options]

a. [*If spending has **increased***] Why has government spending increased? *(select all that apply)*

    - Decrease in external donor financing
    - Increase in REDD+ payments
    - Increase in political will to allocate national treasury funds
    - National economy growing
    - Compliance with international treaties
    - To keep pace with inflation

- Other: _____

b. [I*f spending has* ***decreased***] Why has government spending decreased? *(select all that apply)*
   - Increase in external donor financing
   - Decrease in REDD+ payments
   - Decrease in political will to allocate national treasury funds
   - Increase in allocation of national treasury funds to other sectors
   - National economy contracting
   - Civil strife and/ or insecurity
   - Other: _____

[Optional]

c. Any detail or context to add to your answer above about why spending has increased or decreased?

External Funding Sources

External funding sources refer to: any funding coming from a source outside of the country (e.g. loans, grants, investments, gifts)

11. Are you aware of what external financial sources are used (or have been used in the past 15 years) to fund this PA? *(select all that apply)*
    - Private and community foundations
    - Multilateral or bilateral institutions
    - Development banks and agencies
    - International NGOs
    - Corporate funds
    - Individuals/citizens *(e.g. impact investing)*
    - Insurance/guarantees
    - Green/nature/resilience bonds
    - Debt-for-nature or debt-for-adaptation swaps
    - Conservation enterprise incubator
    - Impact investing/equity
    - Other: _____
    - Don't know

[Optional]

a. Can you provide some details on those financial sources? *(e.g. who is providing the funding, how much, over what period etc.)*

b. Were external investments intended to be one-time or of finite duration?
   i. If finite, over what period?

c. What happened when sources of external funding ended; were they partly or fully replaced with funding from other sources? Please explain.
   i. If the funding was partly or fully replaced: How did the transition occur from external funding ending to new funding sources being applied?
   ii. Alternatively, if an external funding source has been successful and persisted over time, what made it work? Please explain.

12. In your opinion, have flows of external funds to support this PA's management influenced government spending from domestic sources?
    [Options]
    a. If yes, how?
    b. If no, why not?

Funding Mechanisms

13. Are you aware of how those internal and external financial sources you described are dispersed? In other words, what financial mechanism(s) is used to distribute those funds? *(select all that apply)*

- Conservation trust fund
  - sinking fund
  - revolving fund
  - endowment fund
- Grant to government or park system
- Loan to government or park system
- Public-private partnerships (PPP)
- Payment for ecosystem-services program (Performance-based payments)
- Other: _____
- Don't know

[Optional]

a. Please describe your answer above further; can you provide some details on those financial mechanisms?
b. How successful has this mechanism (or have these mechanisms) been? What are key characteristics that made it a success or not? (*e.g. governance of the fund, how involved were local stakeholders in how the fund was spent*)

14. Are there any other important issues we should know about the financial support for this PA that we haven't discussed yet?

Conclusion

15. Is there anyone else you suggest that we interview to expand upon what we discussed today?
    Name(s)
    Emails:

16. Are there any key resources that you think we should make sure to read on the financing of the PA we discussed?

Appendix C: Country Reports

Country reports:

- C.1 Bolivia
- C.2 Cambodia
- C.3 Congo
- C.4 Costa Rica
- C.5 Ecuador
- C.6 Gabon
- C.7 India
- C.8 Madagascar
- C.9 Peru
- C.10 Thailand

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Each country report follows the same structure:

1. History and Politics
2. Economic Context
    - 2.1 Scale of Economy
    - 2.2 Composition of Economy
    - 2.3 Quality of Life Indicators
    - 2.4 Corruption Index
3. Environmental Orientation
    - 3.1 Environmental Orientation Overview
    - 3.2 Legal Environmental Status
4. Protected Area Extent and Changes
    - 4.1 Number and Extent of PAs
    - 4.2 Changes to PAs
5. Interview Summary
    - 5.1 PA Network Interview Summary
    - 5.2 Specific PA Interview Summary

C.1 Bolivia

1. History/Politics

Prior to 2006, Bolivia was controlled by a populist government that followed a traditional unitary state model. Movement towards a federalized state began in the 1990s, coming to a head in 2006 with the election of Evo Morales, considered the country's first president of indigenous origins. A new, national constitution was adopted in 2009 establishing it as a "plurinational state," designating varying levels of government from federal down to municipalities and indigenous communities.

The new constitution also recognizes, by law, the value of the environment through the "Mother Earth Law". It states, "Mother Earth is a living dynamic system made up of the undivided community of all living beings, who are all interconnected, interdependent and complementary, sharing a common destiny." The law would give nature legal rights, specifically the rights to life, regeneration, biodiversity, water, clean air, balance, and restoration"[12]. With the new constitution also came the establishment of the Ministry of the Environment, whose duties were previously held by a different agency. However, since these legal changes in the country there are still concerns from environmentalists about support for extractive industries and other environmentally harmful economic practices supported by the government[13].

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Bolivia's GDP has consistently been growing by ~4% annually. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ in billions)	GDP Growth (Annual %)
2018	$40	4.22
2017	$37	4.2
2016	$34	4.26
2015	$33	4.86
2014	$33	5.46
2013	$30	6.8
2012	$27	5.12
2011	$24	5.2
2010	$20	4.13
2009	$17	3.36

[12] Buxton, Nick (n.d.) The Law of Mother Earth: Behind Bolivia's Historic Bill. Global Alliance for the Rights of Nature. Retrieved from https://therightsofnature.org/bolivia-law-of-mother-earth/ on 22 April 2020.
[13] Villavicencio Calzadilla, P., & Kotzé, L. (2018). Living in Harmony with Nature? A Critical Appraisal of the Rights of Mother Earth in Bolivia. *Transnational Environmental Law, 7*(3), 397-424. doi:10.1017/S2047102518000201

2008	$17	6.15
2007	$13	4.56
2006	$11	4.8
2005	$9.5	4.42

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				**Main products per sector**	
Agriculture	*Industry*	*Services*	*Industrial Production growth rate*	*Agriculture*	*Industry*
13.80%	37.80%	48.20%	2.20%	Soybeans, Quinoa, Brazil Nuts	Mining, Smelting, Electricity

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI Scores 1990-2018	**HDI Rank (2018)**	**Life Expectancy at birth (years)**	**Expected Years of Schooling**	**Mean Years of Schooling**	**GNI per Capita**
1990 | 0.54 2000 | 0.616 2010 | 0.655 2013 | 0.673 2015 | 0.685 2016 | 0.692 2017 | 0.7 2018 | 0.703	114	71.2	14	9	6.849

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period.

Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Bolivia's corruption index had a net decrease of 3 from 2012-2019, representing a slight increase in corruption. These data were obtained from Transparency International.

Year	Index Value
2012	34
2013	34
2014	35
2015	34
2016	33
2017	33
2018	29
2019	31

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	43
	Current score	88.58
	Baseline rank	36
	Baseline score	88.51
Marine Protected Areas	Current rank	-
	Current score	-
	Baseline rank	-
	Baseline score	-
Terrestrial biome protection (global)	Current rank	63
	Current score	97.06
	Baseline rank	48
	Baseline score	96.97
Terrestrial biome protection (national)	Current rank	60
	Current score	97.22
	Baseline rank	46
	Baseline score	97.14
Protected area representativeness index	Current rank	34
	Current score	73.36
	Baseline rank	34
	Baseline score	60.41

3.2. Legal environmental status

Type of government: Democratic Republic Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA System: SNAP (National Protected Area System)
- Agencies managing PA/PA system: SERNAP (National Protected Area Service)
- Agencies providing funding for PAs: FUNDESNAP (Foundation for the Development of the National System of Protected Areas)

Domestic Legal Documents Related to Protected Area and Environmental Management[14]

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
1.Bolivian Political Constitution Article 385 Section 2	2009	Ministry of Environment	SERNAP
2. Law 071 of the Plurinational State	2010		
3. Bolivian Political Constitution Article 349	2009		
4. Bolivian Political Constitution Article 345	2009		
Remarks: 1. Shared management with indigenous peoples where protected areas overlap those areas, common good of the country 2. Natural resource allocation to Bolivians 3. “Mother Earth” as public interest and property of Bolivian people. 4. Administration for environmental impact evaluation; environmental quality control of goods and services			

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
The Americas: Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere		Simple signature
Convention Concerning the Protection of the World Cultural and Natural Heritage		Ratify

[14] Oxford University Press & Max Planck Institute. Bolivia (Plurinational State of)’s Constitution of 2009 retrieved from https://www.constituteproject.org/constitution/Bolivia_2009.pdf

"Megadiverse" Country Designation		

4. Protected area extent and changes

4.1 PA Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
167	0	0	167

Area Terrestrial		Area Marine	
Coverage %	Total land area (km²)	Coverage %	Total marine area (km²)
30.87	1,089,909	-	-

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

No PADDD data for Bolivia were available

5. Interview Summary

PA System

A. History of financial support

a. The main change over the past 15 years has been the amount of money the government spends on protected areas, going from providing ~30% to 80-90% of the protected area funding. This was largely due to a change in government structure in the last 14 years, starting in 2006 with the election of a new president. However, this amount has not kept up with inflation and does not account for the increase in the number of protected areas and administrative costs. Overall, it is a low budget.

B. *Proportion of funding*

a. Internal Funding
   i. 75-90% of funding for the protected area network comes from internal sources.
   ii. Government spending on PAs has moderately increased because of a change in government regime and structure in the past 15 years as well as an increase in tourism that generates funds from park entrance fees. There is also hydrocarbon legislation that requires 1% of all investments to go to protected areas where the industry overlaps/neighbors a protected area.

b. External Funding
   i. International NGOs and international corporate funds were the main sources of external funding in the past but this was of finite duration and has ended. The government did not want international conservation funding as it was seen as an impediment to economic development in the country.

C. Has external funding influenced country support of protected area financing?

a. Initially, yes, when the protected area service was established. But in the last 15 years, no. The previous government was not supportive of protected areas and saw them as an imposition to economic development. The protected area system survived because the protected area service is based on participatory management. Commitment from local governments, municipalities, and indigenous peoples kept the system alive. If that had not been the case, the previous government would have acted differently. In the last 15 years, foreign funds have not impacted Bolivia's vision for protected areas.

Specific protected area: Manuripi Amazonian National Wildlife Reserve

A. Primary threats to protected area

a. Threat level – moderate
    i. Has threat changed over time? Yes. Threats have decreased due to the work of the surveillance team and monitoring systems to protect the reserve. Other factors include: management tools that implement the reserve's management plan, protection plant, and rules for the control of Brazil nut harvesting. Harvest rules control for over exploitation of the resource and the park.
b. Do threat levels affect protected area funding?
    i. Yes, all threats require actions to protect the reserve and every action requires funding. In order to raise funding, it is important to show that the reserve has been managed effectively and is consolidated. These two factors are key to have funding access.

B. *Local perceptions*

a. Sustainable management of the forest within the reserve doesn't go against local interests. However, when interventions or sanctions to punish and control illegal activities within the reserve-- such as mining, agriculture, large scale cattle ranching or other activities-- those affected turn against the protected area because their economic interests are not aligned with the PA's goals.
b. Influence of local perceptions on protected area funding?
    i. We do not think so. They could eventually affect funding but they have been manageable issues since they are isolated cases.

C. Proportion and sources of internal funds

a. This PA is 51-75% internally funded
    i. Sources include SISCO Brazil nuts, park entry fees, park concession fees, general taxation, and use of natural resources.
b. Changes of internal funds over time?
    i. Significantly decreased due to decreased funding from external donors

D. Proportion and sources of external funds

a. Sources: Multilateral or bilateral institutions, international NGOs
b. Funders: European Union, Global Environment Facility, WWF
c. Duration: Long-term but finite; currently set to end in 2-3 years.
d. Reasons for success: Because this protected area is rich in natural resources and wildlife, it attracts external funding (funders see a good opportunity in funding this PA) and allows the PA management team to create innovative processes and financial mechanisms to support the management. The main goal of the PA management is to preserve the forest and improve the quality of life of local populations.

E. *Has external funding influenced internal financial support of this protected area?*

i. In general, the country has complied with requirements from bilateral agreements, mainly to increase the government participation in the management of this PA, although funding is still insufficient. The government only ensures the payment of four permanent positions out of 14 currently working in the PA. As stated above, funding has significantly decreased for the PA due to decreased funding from external donors.

F. Funding mechanisms

a. Funding through bilateral agreements and national funding resources generated by the protected area as well as from the national treasury. The SISCO Brazil nut funds are established and managed by and within the protected area. There are also preferential marketing contracts where revenue from sales of products of the PA are used to fund the management and promote financial sustainability.

b. Success of mechanism

i. The Brazil nut operation, generating internal revenue, has been the most successful funding mechanism for this protected area.

C.2 Cambodia

1. History/Politics

Over the last hundred years, Cambodia has undergone many major political changes, greatly affecting the formation and development of protected areas in the country. Efforts to protect and manage forests and develop tourism in protected areas were developed very early in Cambodia during the French colonial period (1883-1953), and Sihanouk (1953-1970), the period of the military "republic" state (1970-1975). 173 forest reserves were established, accounting for two thirds of the country's area, of which 12% were managed by six national parks and wildlife sanctuaries. During 1975-1979, during the Khmer Rouge period, the country was closed and the economy stagnated. Records of PAs management are wiped out and a movement to convert forest land into agricultural land was encouraged. From 1979-1992, the Constitutional Monarchy of Cambodia experienced years of economic isolation and political instability and was one of the poorest countries in the world. No PAs were formed during this period and deforestation and forest conversion to agricultural land were promoted as a way to economic development. Since 1992, the Cambodian economy has opened, and a political stability has taken hold[15]. As a resource-dependent country with more than 40% [16]of its population relying directly on forest resources, forest protection in this period faces a dilemma: economic development vs. environmental protection.

From 1992 to 1999, 63% of the forest area was allocated to concession holders. Notably during this period, the government lacked the capacity to manage and monitor forest exploitation. Deforestation rates reached 180,000ha / year. Fortunately, in 1993, Royal decree on the Protection of Natural Areas was adopted: 23 new PAs - accounting for 23% of the country's land area were established to protect important biodiversity. The PAs were protected completely from concession activities. However, by 1999 Cambodia was spending very little on forest protection. The period of 1998-2002 was a start of political stability and great economic growth in Cambodia. Along with experience and capacity in forest management, law enforcement, and increasing pressure from the international community, the Cambodian government took actions and participated more fully in forest management. By the end of 2001, all concessions were postponed or canceled. Also during this period, international NGOs started to work in PA management in Cambodia[17].

From 2002 to 2019, Cambodia's economy continued to grow at an average rate of over 7% per year, with GDP increasing from 4.3 billion USD in 2002 to 24.5 billion USD in 2019[18]. Cambodia became a low-middle-income country in 2015. During this period, critical legal documents related to protected areas and many changes in the state apparatus and were implemented and enacted. Noticeably, in 2008, Protected Area Law was adopted. Although this change shows the government’s intention for forest protection, in fact, the pressure of economic development still considerably surpassed environmental benefits. In 2008-2012, 113 economic land concessions in PAs were approved[19]. Forest cover declined sharply from 61.1% in 2002 to 46.9% in 2015[20]. In 2016, the Ministry of Environment became the management body of 23

[15] IUCN, 2003, Lesson learnt in Cambodia, Lao PDR, Thailand and Vietnam
[16] https://www.usaid.gov/cambodia/agriculture-and-food-security Retrieved on 05.04.2020
[17] IUCN, 2003
[18] https://data.worldbank.org/ Retrieved on 05.04.2020
[19] Nicholas J. SOUTER, et al., 2016. Will the recent changes in protected area management and the creation of fi ve new protected areas improve biodiversity conservation in Cambodia?
[20] Zoning Guidelines for the Protected Areas in Cambodia, 2017

protected areas (previously under the management of the Ministry of Agriculture, Forestry and Fisheries). In 2016 5 other protected areas were established, bringing the total area of PA system to 34% of the total land area of the country. The area of PAs has nearly doubled but has received very little support from the government. This suggests that although the government has decent intentions of in institutionalizing PA protection and management, the lack of resources may hinder the implementation of this intention.

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Cambodia's GDP has been growing at a rate of 6-10%, with an outlier in 2009 with almost no growth at all. GDP values were obtained from the World Bank Databank.

Year	GDP (Current million US$)	GDP Growth (Annual %)
2018	24,542.47	7.5
2017	22,180.38	7.0
2016	20,159.27	7.0
2015	18,049.95	7.0
2014	16,702.61	7.1
2013	15,227.99	7.4
2012	14,054.44	7.3
2011	12,829.54	7.1
2010	11,242.28	6.0
2009	10,401.85	0.1
2008	10,351.91	6.7
2007	8,639.24	10.2
2006	7,274.60	10.8
2005	6,293.05	13.3
2004	5,337.83	10.3
2003	4,658.25	8.5

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
25.30%	32.80%	41.90%	10.60%	rice, rubber, corn, vegetables, cashews, cassava (manioc, tapioca), silk	tourism, garments, construction, rice milling, fishing, wood and wood products, rubber, cement, gem mining, textiles

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI Scores 1990-2018		**HDI rank (2018)**	**Life expectancy at birth (years)**	**Expected years of schooling**	**Mean years of schooling**	**GNI per capita**
1990	0.384	145	69.6	11.3	4.8	3,597
2000	0.419					
2010	0.535					
2013	0.555					
2015	0.566					
2016	0.572					
2017	0.578					
2018	0.581					

2.4. Corruption and Transparency

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Cambodia's corruption index had a net decrease of 2 from 2012-2019, representing a slight increase in corruption. These data were obtained from Transparency International.

Year	Index value
2012	22
2013	20
2014	21

2015	21
2016	21
2017	21
2018	20
2019	20

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	76
	Current score	80.53
	Baseline rank	46
	Baseline score	84.82
Marine Protected Areas	Current rank	101
	Current score	68.07
	Baseline rank	86
	Baseline score	68.07
Terrestrial biome protection (global)	Current rank	1
	Current score	100
	Baseline rank	1
	Baseline score	100
Terrestrial biome protection (national)	Current rank	1
	Current score	100
	Baseline rank	1
	Baseline score	100
Protected area representativeness index	Current rank	82
	Current score	45.6
	Baseline rank	75
	Baseline score	39.71

3.2. Legal environmental status

Country: CAMBODIA

Type of government:	**Type of legal system:**
Constitutional monarchy	Civil law

General information about protected area (PA) management

- **Relevant PA or PA System:** South Cardamom National Park and PAs across Cambodia
- **Agencies managing PA/PA system:** Ministry of Environment (MOE)

- **Agencies providing funding for PAs:** National Budget allocation to Ministry of Environment by the Ministry of Finance (MOF) and direct allocation from MOF through salaries for rangers, under the Royal Government of Cambodia.

Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Enforcing agencies***
Royal Decree on the Protection of Natural Areas	1993		
Law on Environmental Protection and Management of Natural Resources	1996	Ministry of Environment	Ministry of Environment
Forestry Law	2002	Ministry of Agriculture, Forestry and Fisheries	Ministry of Agriculture, Forestry and Fisheries Ministry of Environment
Protected Areas Law	2008	Ministry of Environment	Ministry of Environment's Nature Protection and Conservation Administration
Remarks: *Under 1993 Royal Decree on the Protection of Natural Areas, 23 protected areas were established. Currently, Protected Area Law is the most prevailing legal basis which directly manage protected areas in Cambodia.*			

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Convention on Biological Diversity	1995	acs
Convention Concerning the Protection of the World Cultural and Natural Heritage	1991	Ac
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (Contracting Parties Y/N)	Effective 1999	Y

Convention on International Trade of Endangered Species	Effective 1997	Y

4. Protected area extent and changes

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
			45

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
26.03	182,511	0.19	47,967

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km2)
2005	2	836.16
2008	5	789.952621
2009	19	1101.45
2010	11	450.39
2011	57	3363.529313
2012	16	1076.32
% of total areas affected by the enacted PADDD events (in %) (= total areas affected/ total protected areas in 2004)		3.31%
The five major reasons for the PADDD events	Industrial Agriculture (93), Industrialization (9), Mining (6), Infrastructure (1)	

5. Interview summary

PA systems

A. *History of financial support*

a. Prior to 2000, PAs in Cambodia received very little to no money from the government or NGOs. In the early 2000s, international NGOs began working on PA management. At the same time, law enforcement to protect forests was gradually put into effect. Particularly, there was an increase in creation of protected areas (both in the number of and size of PAs), recruitment of rangers and establishment of eco-stations. Therefore, the early 2000s saw a spike in funding for PA management, and funding has continued to slowly increase since then. Currently, funding for PAs in Cambodia has been allocated primarily from the government and international NGOs.

b. Across the PA network funding is "less than adequate" to meet conservation goals. The lack of resources is shown by the low density of rangers per hectare of forest. Our interviewee indicated that in Cambodia there are only about 1,200 - 1,300 rangers, responsible for about 7 million ha of forest. In addition, rangers receive a low level of training and are not adequately equipped with the facilities, transportation and technology needed to do their work.

c. The funding from the government is not distributed equally across PAs. Normally, PAs supported by NGOs receive more international attention and have more rangers, and in turn receive more funding from the government.

B. *Proportion of funding*

Internal funding

The major source of internally generated funds used by the government to support the country's PAs is from general taxation, disbursed by the Ministry of Forests (MOF) through salaries for rangers. Other sources, while not primary, are generated from park entry fees, carbon credits (e.g. REDD+), and concession fees within some of the PAs. These sources go to the Ministry of Finance, Ministry of Environment and Ministry of Agriculture, Forestry and Fisheries respectively. However, these sources of income do not go back directly to support PA management.

Funding for PA management coming from the government's budget has accounted for a marginal fraction of the PA system's funding over the past 15 years. An interviewee said that the amount of government funding has increased significantly in recent years, and was mainly spent on an increase in salary for the rangers. However, as the number started from a very low level, the government's budget for PA management is still insignificant.

This government funding increase can be explained by the typical path of development. As Cambodia has been emerging from the poverty line, the government has started to allocate more financial resources to other non-essential things including forest and environmental protection. The appointment of a new Minister of the Environment in 2015 according to our interviewee meant that "a younger, powerful, open minded member of the party with good political impression" helped contribute to the increase in internal funding. Moreover, protecting the environment has become a non-political concept and it is believed that everyone in the country would agree that environmental protection is beneficial to everyone and widely supported. The changed attitude toward the environment, particularly among the young Cambodian generation has influenced the political will of the government and urged the government to take real actions to protect

the environment. Lastly, as part of Convention on Biodiversity (CBD), Cambodian representatives attend regular meetings and can compare their situation with other countries. The Cambodian government can see that they are behind their neighboring countries of Vietnam and Thailand in terms of environmental protection and therefore are motivated to invest more on PAs.

External Funding

C. *Has external funding influenced country support of protected area financing?*

External funding does influence the way the government funds the PA system, particularly on the distribution of internal funding across PAs. When a PA receives external funding, it means that it receives international attention, and the government would in turn invest more on that internationally recognized PA. When a PA that receives international funding seems to be effective and successful, the PA management is able to lobby the government to gain more support.

Specific protected area: South Cardamom National Park (also known as South Cardamom Forest)

The Southern Cardamom Forest Protection Program was established in 2002 by Wildlife Alliance (WA), an international NGO. Since then, South Cardamom Forest – which was registered as South Cardamom National Park in 2018 (hereafter called as SCNP), has received extensive support from WA. At SCNP, the government developed some eco-stations, recruits and pays the PA manager and some rangers. However, as ranger salaries are low, their motivation and capacity are relatively low. WA recruits and pays for one hundred more rangers, twelve wildlife management specialists and has built and managed 7 eco-stations.

A. Primary threats to protected area

a. Threat level – Significant
    i. 1) Land speculation-driven deforestation and degazetting for future sale for agricultural development; and 2) Poaching for wildlife trade: increasing in the past 15 years, shifted from mainly tigers and elephants to generically illegally wildlife meat trade.
b. Has threat changed over time? Yes, it has increased
c. Do threat levels affect protected area funding?
    i. Yes

B. Local perceptions

a. Local perceptions about the PA changes over time. As the custom of rural to rural migration is very popular in Cambodia, the local community changes over time. The new arrivals on the forest frontiers would have more negative perception as they expect to exploit the natural resources. However, ones who have settled for a long time may have improved perceptions. At the national level, young people are more educated and influenced by Facebook. They become better informed by the influence and importance of the environment. Therefore, their perception has been changed positively, and may slightly affected the government's funding in the future.
b. PA funding is most influenced not by the local community's perception, but largely by international donor communities.

C. *Proportion and sources of internal funds*
    a. The funding for SCNP comes from both the government and the NGO. The PA manager decides the budget allocated from the government which accounts for a marginal proportion (about 11-25%), while funding for the majority of operation expenses are obtained and managed by WA.
    b. For SCNP, with the funding coming from WA, financial sources are sufficient to meet the conservation goals, However, without the external funding, there will be a significant financial inadequacy.
    c. Changes of internal funds over time?
        i. SCNP experienced a moderate increase in internal funding. Increase in tax funds, decreases in corruption; and increases in perception of the importance of PAs can help explain the trend. In addition, the government follows REDD model initiated by UNDP; however, the fund is not reinvested directly for the PA management.
D. *Proportion and sources of external funds.*
    a. External funding accounts for about 75-90% of the total expenditures for the operation of SCNP. WA has had a large reserve of private foundations to invest in PA management and stabilized the funding for SCNP over the past 15 years. Although a long-term, major grant of US$20 million (over 15 years) has been depleting, WA is able to balance their financial sources by involving greatly the voluntary REDD+ model.
E. *Has external funding influenced internal financial support of this protected area?*
    a. For SCNP, our interviewees indicated that external funding has not really had an "influence" on internal funding. But, one of the interviewees claimed that the government is heavily dependent on international organizations for PA management: “The government thinks the NGOs are golden chicken that lay golden eggs. If WA goes and says they have trouble with the donors and don’t have enough money to pay the rangers this month, the government will not believe and do nothing. If the NGO never pays the rangers, which will never happen, then the government may act differently. The government relies so much on external funding that they excuse themselves from doing things that the government needs to do.”
F. *Funding mechanisms*
    a. Conservation trust fund, Grant to government or park system (the ADB),Loan to government or park system (eg: the WB), Payment for ecosystem-services program (Performance-based payments).

C.3 Congo

1. History/Politics

The Republic of the Congo is a central African nation that was formerly a French colony and is now a Presidential Republic. The nation was inhabited by Bantu tribes at least 3,000 years ago, until the French established the colony of Equatorial Africa. The Republic of Congo gained its independence from France in 1960, and since 1992 has held multi-party elections. There have been more than 100 political parties since Congo became a multi-party state, the most active being the Congolese Labour Party and the Congolese Movement for Democracy and Integral Development. Despite having presidential elections, President Denis Sassou-Nguesso has ruled the state since 1979.

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Congo's GDP has both grown and shrank, with the highest increases occurring in 2005, 2006, 2009, and 2010; and decreases occurring in 2007, 2016, and 2017. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ millions)	GDP Growth (Annual%)
2005	$6,090.00	7.756
2006	$7,730.00	6.236
2007	$8,390.00	-1.582
2008	$11,900.00	5.572
2009	$9,590.00	7.469
2010	$12,000.00	8.752
2011	$14,400.00	3.421
2012	$13,700.00	3.800
2013	$14,100.00	3.441
2014	$14,200.00	6.780
2015	$8,550.00	2.647
2016	$9,040.00	-2.800
2017	$8,700.00	-3.100
2018	$11,300.00	1.026

2.2. Composition of economy

We report the composition of the economy for each country to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
9.30%	43.60%	36.70%	-3.00%	Cassava, sugar, rice, corn, peanuts, vegetables,	Petroleum extraction, cement, lumber, brewing, sugar,

				coffee, cocoa, forest products	palm oil, soap, flour, cigarettes

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI	HDI rank	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita
0.608	136	64.3	11.6	6.5	5,804

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Congo's corruption index had a net decrease of 2 from 2012-2019, representing a slight increase in corruption. These data were obtained from Transparency International.

Year	Index value
2012	21
2013	22
2014	22
2015	22
2016	21
2017	21
2018	19
2019	19

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	32
	Current score	91.00
	Baseline rank	94
	Baseline score	68.15
Marine Protected Areas	Current rank	38

	Current score	92.45
	Baseline rank	22
	Baseline score	57.48
Terrestrial biome protection (global)	Current rank	1
	Current score	100
	Baseline rank	104
	Baseline score	57.48
Terrestrial biome protection (national)	Current rank	1
	Current score	100
	Baseline rank	102
	Baseline score	56.89
Protected area representativeness index	Current rank	97
	Current score	40.37
	Baseline rank	96
	Baseline score	33.69

3.2. Legal environmental status

Country: Republic of Congo

Type of government: Republic under Authoritarian Dictatorship Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA or PA System: Conkouati-Douli National Park, Nouabalé-Ndoki National Park, Ntokou-Pikounda National Park, Odzala-Kokoua National Park, Ogooué-Leketi National Park
- Agencies managing PA/PA system: Ministry of Forest Economy and Durable Development (MEFDD)
- Agencies providing funding for PAs: Wildlife Conservation Society (WCS), Ministry of Forest Economy and Durable Development (MEFDD)

Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
Law No. 003/91 on environmental protection	1991	Congo Government (no specific agency)	Congo Government
Decree nº 2008-306 on the organization of the Ministry of Tourism and the Environment	2008	Ministry of Forest Economy and Durable Development (MEFDD)	Ministry of Forest Economy and Durable Development (MEFDD)
Decree 99 on the environmental protection fund	2011	Ministry of Forest Economy and Durable Development (MEFDD)	Ministry of Forest Economy and Durable Development (MEFDD)

Remarks: *These laws make up thirteen titles dealing with environmental regulation framework in the Republic of Congo, including setting up the Environmental Protection Fund. Although the law covers a vast field, it does not replace the legislation in force governing the natural environment, but it strengthens it, in particular in the field of the preservation of fauna, flora and marine and fluvial resources, as well as in planning and town planning. In addition, it aims to ensure the conservation of the cultural and historical heritage and the control of pollution and nuisances of domestic, agricultural and industrial origin.*

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Agreement on the Conservation of Gorillas and Their Habitats		Yes
African Convention on the Conservation of Nature and Natural Resources		Yes
Convention on Biological Diversity		Rtf

4. Protected area extent and changes

4.1 Number and Extent

100% Terrestrial	Coastal	100% Marine	Total
31	0	2	33

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
42.35	343,737	3.21	39,864

4.2 Changes to PAs

No data for Congo

5. Interview summary

PA Network

A. History of Financial Support for PAs in the Republic of Congo:
   a. Protected areas are vastly funded by NGOs, which receive money from the US government (e.g. USAID projects, US Forest Service), or different private foundations. Very little money comes from the Congolese government – often times the PA management needs to provide more money to the Congolese officials so they could actually do their jobs.
   b. In this expert's opinion, the political atmosphere has not affected changes in PA financial support in the past 15 years, although during the 2008 financial recession, the private company CIB did reduce their funding to the protected area network. Fiscally speaking, the reliance on private companies makes the PA system extremely vulnerable. The government provides very little to the

management of the protected areas; to make matter worse, they claim distribution responsibilities over funds that are actually distributed and provided by NGOs.

B. Proportion of funding sources:
    a. It is unclear exactly what proportion of PA funding comes from domestic sources, although it is vaguely estimated to be a minority of all funding. The primary sources of internally generated funds seem to come from park entry fees and general taxation.
    b. External funding comes primarily from private and community foundations, multilateral or bilateral institutions, and NGOs.
C. Has external financing influenced spending from domestic sources?
    a. External financing has not influenced national commitments to biodiversity due to the lack of national commitment in the first place. Since environmental protection is not top priority due to the country profiting greatly off of an extraction economy, the government gives very little to biodiversity.

Specific PA - Noubale-Ndoki National Park

A. Primary Threats:
    a. The threat level to the park is extremely high. Previously, the national park had been extremely isolated, with no roads, no housing, no human activities inside – it was complete wilderness. However, over time, as poaching activities have expanded across the country, now there is a blurred boundary between logging roads and the park. Poaching is the biggest threat to the park by far. And this threat has been increasing in recent years. Around 20 elephants can now be found dead within a month, whereas before it was just 1-2 within an entire year.
    b. While the threat level is increasing, there has also been improved management within the national park to respond. The number of eco-guards within the park has increased from 8-9 to more than 70 from 2012 to now, with the addition of permanent military-trained rangers.
B. Local Perceptions:
    a. There has never been a permanent settlement in the park, so local people don't usually get to go into the park other than to visit, but it is still a very isolated area.
C. Governance Structure:
    a. In 2014, a public-private partnership was signed between the Wildlife Conservation Society and the government. It established a foundation to manage national parks in the Congo. This foundation was comprised of a foundation board and a park management unit. Private sector representatives outweigh the government, and have more management power.
    b. As the type of governance structure becomes more transparent, funding will increase. Currently, the level of spending on this protected area is adequate to meet conservation objectives.
D. Internal Funding:
    a. Less than 10% of this protected area's funding comes from internal sources, mainly generated from general taxation.
    b. Within the last 15 years, internal spending on this PA has stayed relatively stable.
E. External Funding:
    a. Vast majority of funding for the protected area comes from external financing, including private and community foundations, multilateral or bilateral institutions, development banks, and international NGOs.

b. Most of this funding comes in the terms of grants and are long-term with a 3-5-year cycle. In recent years, as biodiversity and conservation became high profile targets for philanthropists in the global market, more and more money also came from individual donors.

F. Has external financing influenced spending from domestic sources?
   a. No, it has not influenced spending from domestic sources. It can however, improve the awareness of the government to biodiversity issues. The government simply does not have the money necessary to fund the parks at an adequate level by itself.

C.4 Costa Rica

1. History/Politics

Costa Rica has been governed as a Democratic Republic since the mid-19th century. Due to the country's relative political stability, high education level, and stable economic growth since 2010, the country has attracted the highest levels of foreign direct investment per capita in Latin America. Costa Rica has been heralded as a "green republic" due its dramatic increase in creating and implementing environmental policies during the 20th century. The country's well-publicized conservation efforts have emerged in response to extensive environmental destruction that occurred between 1950 and 1990. During that time over 65% of Costa Rica's forest cover was lost due to agricultural development. To this day policymakers are working to balance agricultural development needs alongside environmental conservation. The core of conservation programs has become its system of protected areas.[21]

In 1998 Costa Rica adopted the Law on Biodiversity (No. 7788).[22] This law bolstered the National System of Conservation Areas known as SINAC that was created in 1995. This government agency is under the authority of Ministry of Environment, Energy and Telecommunications (MINAET). This agency is the institutional coordinator that utilizes both decentralized and participatory management practices to dictate policy, plans and implementation of plans to achieve sustainable natural resource management across the protected area network.[23] It places all existing areas into 11 Conservation regions, which created the current management strategy of the protected area network.[24]

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Costa Rica's GDP has been growing (except for 2009 when GDP decreased by almost 1%). GDP growth has been as high as 8% (in 2007), but has generally been between ~2-4%. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ in Millions)	GDP Growth (Annual%)
2018	60	2.63
2017	58	3.4
2016	57	4.25

[21] Stuart McCook; The Green Republic: A Conservation History of Costa Rica. *Hispanic American Historical Review* 1 August 2000; 80 (3): 617–618. doi: https://doi.org/10.1215/00182168-80-3-617

[22] Full legislative language can be found https://www.wipo.int/edocs/lexdocs/laws/en/cr/cr018en.pdf

[23] http://www.sinac.go.cr/EN-US/conozca/Pages/default.aspx

[24] Pfaff, A., Robalino, J., Sanchez-Azofeifa, G. A., Andam, K. S., & Ferraro, P. J. (2009). Park Location Affects Forest Protection: Land Characteristics Cause Differences in Park Impacts across Costa Rica. *The B.E. Journal of Economic Analysis & Policy*, *9*(2). https://doi.org/10.2202/1935-1682.1990

2015	55	3.63
2014	51	3.52
2013	50	2.27
2012	46	4.8
2011	42	4.31
2010	37	4.95
2009	31	-0.97
2008	31	4.65
2007	27	8.17
2006	23	7.24
2005	20	3.87

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition (2017)				Main products per sector	
Agriculture	**Industry**	**Services**	**Industrial production growth rate**	**Agriculture**	**Industry**
5.50%	20.60%	73.90%	1.30%	bananas, pineapples, coffee, melons, ornamental plants, sugar, corn, rice, beans, potatoes; beef, poultry, dairy; timber	medical equipment, food processing, textiles and clothing, construction materials, fertilizer, plastic products

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI Scores 1990 - 2018		HDI rank (2018)	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita
1990	0.655	68	80.1	15.4	8.7	12

2000	0.711					
2010	0.754					
2013	0.777					
2015	0.786					
2016	0.789					
2017	0.792					
2018	0.794					

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Costa Rica's corruption index had a net increase of 2 from 2012-2019, representing a slight decrease in corruption. These data were obtained from Transparency International.

Year	Index value
2012	54
2013	53
2014	54
2015	55
2016	58
2017	59
2018	56
2019	56

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	49
	Current score	87.71
	Baseline rank	33
	Baseline score	88.76
Marine Protected Areas	Current rank	80
	Current score	80.49
	Baseline rank	61
	Baseline score	80.49

Terrestrial biome protection (global)	Current rank	79
	Current score	87.09
	Baseline rank	61
	Baseline score	87.09
Terrestrial biome protection (national)	Current rank	67
	Current score	94.39
	Baseline rank	49
	Baseline score	94.39
Protected area representativeness index	Current rank	20
	Current score	82.97
	Baseline rank	19
	Baseline score	72.88

3.2. Legal environmental status

Type of government: Democratic Republic Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA or PA System: National System of Conservation Areas (SINAC)
- Agencies managing PA/PA system: Sistema Nacional de Areas de Conservacion (SINAC)
- Agencies providing funding for PAs: Ministry of Environment, Energy and Telecommunications (MINAET)

Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
Article 22 – Biodiversity Law No 7788	1998	MINAET	SINAC
Article 24 – Biodiversity Law Article 24, 25, 27, 28, 31,	1998	MINEAT	National Council of Conservation Areas (CONAC)
Article 29	1998	MINEAT	Regional/Local Councils - CONAC

Remarks:
In 1998, Costa Rica approved the Costa Rica Biodiversity Law. This law was developed in response to the comprehensive biodiversity law in response to the UN Convention on Biological Diversity. It focuses around three main objectives: conservation of biodiversity, sustainable use of resources, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources.[1]

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Convention on Biological Diversity	1994	rtf

Convention Concerning the Protection of the World Cultural and Natural Heritage	1977	R
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	1992	Yes
The Americas: Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere	1967	Yes

4. Protected area extent and changes

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
135	15	15	165

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
28.29	51,636	2.61	576,110

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2009	1	271.465
2010	1	10
2018	1	1.3
% total area affected by PADDD events	0.05%	
Major reasons for PADDD events	Industrialization, Infrastructure	

5. Interview summary

PA System

A. History of financial support

a. Since 1998 SINAC has been the government agency that coordinates the management of the 11 designated conservation regions across Costa Rica. The funding of protected areas is distributed from a larger bucket of funding such as conservation trust funds. Approximately, $15 million per year is dispersed equally across the protected area network. The government equally disperses these funds to support essential infrastructure and management such as park ranger salaries, fuel and vehicles. The government does not have the funding to support additional conservation measures and implementation of conservation objectives

across the protected area network. To achieve this, nonprofit organizations such as Forever Costa Rica Association, have found ways to mobilize donors from international organizations and private foundations to compliment government funding and provide reoccurring funds to implement conservation measures identified in protect area management plans.[25] NGOs have also seen a gradual shift by the government to identify different financial mechanisms to support more recurring funding sources to cover capacity for the protected areas. There has been a notable paradigm shift to have nonprofits complimenting government spending by targeting conservation objectives within management plans. In the last 15 years this has created adequate funding to meet conservation objectives, providing a steady and long-term source of funding.

B. *Proportion of internal funding*
    a. Approximately 85% of the protected area network budget comes from internal sources. Most funds are provided by internal sources due to the protected area network management structure established by SINAC. There has been a modest increase in internal spending in the last 15 years. This is due to a variety of reasons, including an increase in political will to allocate national treasury funds toward protected areas management due to the objective to comply with the commitments Costa Rica has made within the Convention on Biological Diversity and the National Biodiversity Strategy.[26] Improvements have been made by the government to allocate funds to the protected area network. These improvements include removing legal barriers by prioritizing land purchase and being more efficient in capturing fees through taxation and park entry fees and being creative with financial mechanisms to create more efficient investing strategies to reduce underspending (Interview 5960, pers. comm.). The primary sources of internal funding include park entry fees, general taxation through the Forestry Finance Fund (FONAFIFO), the National Park fund and the Wildlife Fund and occasionally ecosystem service payment such as water funds.[27]

C. *Has external funding influenced country support to protected area financing?*
    a. External funding has not influenced country support for protected area financing. Government spending is earmarked and prioritizes infrastructure and capacity such as park ranger personnel, fuel and vehicles. The government has continued to provide a stable source of funds to maintain the infrastructure of the protected areas networks however these funds are not enough to achieve conservation objectives. Thus, external funds are often viewed as complementary to government spending rather than supplementary. The primary sources of external funding include development banks and agencies, international NGOs and debt-for-nature or debt-for adaptation swaps.

[25] For more information on Forever Costa Rica Association and their financial mechanisms please go to https://costaricaporsiempre.org/quienes-somos/?lang=en

[26] For more information on the implementation of the National Biodiversity Strategy and Action Plan (2000 – 2005) https://www.cbd.int/countries/profile/?country=cr#facts

[27] For more information on these funds please review these websites Forestry Finance Fund: https://www.fonafifo.go.cr/es/, National Park & Wildlife Fund explanation https://www.cbd.int/doc/nbsap/finance/CaseStudy-NationalStrategy_CostaRica_Nov2001.pdf,

C.5 Ecuador

1. History/Politics

Ecuador is a country rich in oil resources, but oil has been the trigger of many national conflicts in the country's history. From 1997-2005, three presidents were ousted due to protests opposing national oil polices and actions by the oil industry.

In 2008, a new constitution was approved by voters in a referendum under President Rafael Correa's administration, and Ecuador became the first country to recognize the Rights of Nature. Articles in the constitution include the State's motivations to protect and respect nature, nature's right of restoration, the State's responsibility to prevent species extinctions, and people's rights of benefiting from nature[28].

After re-election in 2009, President Correa reinforced control on the economy and oil industry, which established state ownership of "100% of oil and gas produced"[29]. As the country adopted the US dollar as the national currency, Ecuador's oil trade with neighboring countries crumpled due to the drop of oil prices and the rise of dollar values[30]. Aiming to increase crude oil production to support fiscal sustainability, Ecuador withdrew from Organization of Petroleum Exporting Countries (OPEC) at the beginning of 2020[31].

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Ecuador's GDP has consistently been growing between 0.1 and 7.8%, with an outlier in 2016 when GDP shrank by 1.2%. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ in millions)	GDP Growth (Annual%)
2005	$41,507	5.29
2006	$46,802	4.4
2007	$51,008	2.19
2008	$61,763	6.36
2009	$62,520	0.57
2010	$69,555	3.53
2011	$79,277	7.87
2012	$87,925	5.64
2013	$95,130	4.95

[28] "Ecuador Adopts Rights of Nature in Constitution," *The Rights of Nature* (blog), accessed April 9, 2020, https://therightsofnature.org/ecuador-rights/.

[29] "Ecuador Profile," BBC News, accessed April 9, 2020, https://www.bbc.com/news/world-latin-america-19506216.

[30] "Ecuador: Oil-Rich Country in Crisis," France 24, October 9, 2019, https://www.france24.com/en/20191009-ecuador-oil-rich-country-in-crisis.

[31] "Ecuador to Quit OPEC in 2020 in Search of Bigger Export Revenue," *Reuters*, October 1, 2019, https://www.reuters.com/article/us-ecuador-opec-idUSKBN1WG4KB.

2014	$101,726	3.79
2015	$99,290	0.1
2016	$99,938	-1.23
2017	$104,296	2.37
2018	$108,398	1.38

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
6.70%	32.90%	60.40%	-0.60%	bananas, coffee, cocoa	petroleum, food processing, textiles

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI Scores 1990-2018		HDI rank (2018	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita
1990	0.642	85	76.8	14.9	9	10,141
2000	0.669					
2010	0.716					
2013	0.751					
2015	0.758					
2016	0.756					
2017	0.757					
2018	0.758					

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Ecuador's

corruption index had a net increase of 6 from 2012-2019, representing decreasing corruption. These data were obtained from Transparency International.

Year	Index value
2012	32
2013	35
2014	33
2015	32
2016	31
2017	32
2018	34
2019	38

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	*64*
	Current score	84.08
	Baseline rank	51
	Baseline score	83.66
Marine Protected Areas	Current rank	1
	Current score	100
	Baseline rank	1
	Baseline score	100
Terrestrial biome protection (global)	Current rank	103
	Current score	72.01
	Baseline rank	80
	Baseline score	71.56
Terrestrial biome protection (national)	Current rank	71
	Current score	91.16
	Baseline rank	56
	Baseline score	90.99
Protected area representativeness index	Current rank	41
	Current score	69.78
	Baseline rank	53
	Baseline score	49.72

3.2. Legal environmental status

Type of government: Democratic-republic Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA or PA System: NSPA (The national system of protected areas, aka Sistema Nacional de Areas Protegidas-SNAP)

- Agencies managing PA/PA system: Directorate of Biodiversity and Protected Areas (DBPA)
- Agencies providing funding for PAs: Protected Areas Fund (FAP) that operates within the National Environmental Fund of Ecuador.

Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
Articles 10 and 71-74	2008	The Ecuadorian Constitution	The Ecuadorian Constitution
The Forestry and Conservation of Natural Areas and Wildlife law	1981	The Ecuadorian Constitution	Ministry of Environment
Executive Degree 931	2008	The Ecuadorian Constitution	Ministry of Agriculture
The Environmental Management Law	1999	The Ecuadorian Constitution	Ministry of Environment

Remarks: *(provide brief description of the legal documents)*

In 2008, Ecuador approved a Constitution recognize the Rights of Nature, which was the first country in the world to do so. The Ecuadorian Constitution in Articles 10 and 71-74 states "the inalienable rights of ecosystems to exist and flourish, gives people the authority to petition on the behalf of ecosystems, and requires the government to remedy violations of these rights"[32].

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Convention on Biological Diversity	1993	rtf
Convention Concerning the Protection of the World Cultural and Natural Heritage	1975	Ac
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	1991	Yes

4. Protected area extent and changes—

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

[32] "Ecuador | Forest Legality," accessed March 27, 2020, https://forestlegality.org/risk-tool/country/ecuador.

100% Terrestrial	Coastal	100% Marine	Total
63	10	13	86

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
21.8	258,139	13.15	1,079,901

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2004	1	156.6
2005	1	582.8
2006	1	1740
2008	1	198.6
2009	1	2.4
2011	1	2.9
2012	2	40.5
2013	1	9.8
% total area affected by PADDD events	52.80%	
Major reasons for PADDD events	Oil and Gast, Infrastructure, Mining, Multiple Causes	

5. Interview summary

PA System

A. History of financial support

a. The protected area system was started in the 1930s, and the first national park was established in 1959. Natural disasters and economic crises in the country influenced park management, but not all areas at the same level – there are varying levels of political and financial support for different PAs. Some areas are in initial phase or still in the “paper park” phase, which means the PA is legally protected but has little management. Financial aspects have become more central in newer conservation strategies, for example charging entry fees for some PAs to raise management funds. However, significant changes have occurred since 2007 when a Ministerial decree determined that protected areas would be free to enter except for the Galapagos. No tourist fees indicate no budget will be generated. Though government budgets cover some expenses, these funds are still not sufficient. A national trust fund, the Protected Areas Fund (FAP), is managed

by an NGO with a mixed board. The Minister of Environment is President, and it is supported by various donors. Income generated by the trust fund is used to cover some of the basic expenses of protected areas. Currently, Ecuador is aspiring to close the protected area funding gaps.

B. *Proportion of funding*
    a. Internal funding
        i. 26-50% (more specifically, about 35%) of funding for the protected area network comes from internal sources.
        ii. The primary source of internally generated funds used by the government to support the country's PAs is exporting natural resources like oil. However, due to the economic crisis of lowering oil prices, such internal funding has significantly decreased in the last 15 years.
    b. External funding
        i. The primary sources of externally generated funds to support the country's PAs include private and community foundations, international NGOs, and international corporate funds such as the German government KFWU bank. The German government is now the main donor in Ecuador to improve protected areas by capitalizing a trust fund of 30 million dollars and covering recurring expenses such as patrolling and fuels.

C. *Has external funding influenced country support of protected area financing?*
    a. No. Donors don't want to pay for everything since they believe that international donors should be a completement to internal spending. They think staff should be covered by the national budget. Therefore, donors use specific conditions by requesting the government maintain or increase investments so that the government cannot reduce the budget even when additional external funds come in. However, in reality this is difficult because of the country's economic crisis. While the government has recently made cuts to PA funding, hopefully internal spending on PAs will increase again in the future.

Specific protected area: Galapagos National Park

A. *Primary threats to protected area*
    a. Threat level – Extreme threat
    b. Has threat changed over time? Yes. The threat level is dynamic: historically, the major initial threat to the island in the 1700 –1800s was overharvesting. Then pirates and whalers brought non-native animals to the island. Large invasive species include (before the 1960s): goats, pigs, dogs, cats, and rats. Starting with increased tourism in the 1970s new threats were introduced (e.g. marine invasive species, which are coming because ships are moving to the island, as well as insects, *Aedes aegypti* mosquitoes, coming in as vectors, but not yet with disease). The threat now and in the future is primarily from the indirect effects of tourism through invasive species.
    c. Do threat levels affect protected area funding?
        i. Yes. The Galapagos is a special area. It's "easy" to raise money for the Galapagos, and once there are new threats, the PA can raise more money. Some people have commented that the threats are

actually a manipulation by conservationists to generate cash for themselves, which is a common misconception.

B. *Local perceptions*
    a. There's a perception that the Park was created against the interest of local communities. One of the problems is the level of sharing tourism revenues with local communities. This is a $600-800 million dollar tourist industry in the Galapagos, but main benefits flow to big companies, such as external airlines and external companies. Despite efforts to force the benefit flows into local communities, there are still concerns raised by communities about how much money flows and who controls those flows. The standard of living in the Galapagos is relatively high, so locals are seeing some benefits from the flows. This is one of the main reasons for immigration to the Galapagos.
    b. Influence of local perceptions on protected area funding?
        i. The local perceptions have impacts on funding from local NGOs. The aforementioned local perception of unfair benefit sharing is one source of conflict. There are local NGOs that are trying to generate cash through similar strategies, like donations, in order to tackle this conflict.

C. Governance structure
    a. For Marine Reserves like the Galapagos, the previous governance was through a multi-stakeholder committee that has representation of all major decision makers. This system is slightly modified now; in essence, mayors and regional governments are involved in the central governance. The Charles Darwin Foundation plays an advisory role. Ecuador's terrestrial Reserves are typically run through a top-down structure. Because the Galapagos is a national park that includes both terrestrial and marine zones, there is an increasing amount of stakeholder engagement because the terrestrial management is taking a cue from the marine reserve. Changes happen because of the change in stakeholders and the influencing power of each stakeholder on the committee.

D. Proportion and sources of internal funds
    a. Greater than 90% is internally funded
        i. Sources are park entry fees (primary source), park concession fees, and fundraising through visitors.
    b. Changes of internal funds over time?
        i. No, the internal funds have stayed stable

E. Proportion and sources of external funds
    a. Sources: Private and community foundations, multilateral or bilateral institutions, development banks and agencies, international NGOs, corporate funds, individuals/ citizens (e.g. impact investing), debt-for-nature or debt-for-adaptation swaps, conservation enterprise incubators.
    b. Duration: These external funds have been one-time, ongoing (funds are still being dispersed)
    c. Reasons for success: The Galapagos is unique and has a significant amount of name recognition which supports sustainable external funding sources. In addition, a model of retaining contact with visitors and fundraising through these visitors after they have left the PA has been successful here.

F. *Has external funding influenced internal financial support of this protected area?*
    a. No. In this particular case there is no need to invest beyond what's coming from the entrance fees as that amount is sufficient.

G. Funding mechanisms
    a. Conservation Trust Fund: Multiple types of funds (sinking funds, revolving funds, and endowment funds) have been used
    b. Grant to government or park system: small grants usually go to local NGOs. Big grants tend to go straight to the government, such as grants from the Global Environment Facility (GEF)
    c. Loan to government or park system: Inter-American Development Bank (IADB) contributions
    d. Public-private partnerships: these partnerships are primarily in the tourism sector, such as Lindblad Expeditions example - Lindblad Expeditions raise money from passengers (in the cruise), who receive discounts in their next expedition with the company, so Lindblad uses it as marketing tool as well. It's a win-win situation. Lindblad Expeditions is connected to National Geographic.
    e. Success of mechanism
        i. There is a dependence from the regular flows that come from the entrance fees and contributions from individuals that visit Galapagos. These have been the true main sources of funding. Bilateral and multilateral funding come in with a lot of money, not so much recently. This money has been delivered directly to the PA.

C.6 Gabon

1. History/Politics

Gabon was originally part of French Congo, then the French Equatorial Africa until 1910 until gaining their independence in 1960. Since independence, exports of timber, oil, manganese, and uranium have supported the 1.2 million population. In August 2002, a National Park System was created by Presidential decree that established full protection for 10.8% of the country's land area. This was done to protect the natural heritage and develop an ecotourism industry. The Gabonese government and NGO community worked together to establish these parks and regulations, build capacity for conservation personnel, and spread awareness of their natural resources. The major identified threats within Gabon are illegal hunting, offshore trawler fishing beyond the legal limit off the coast, onshore fishing using illegal techniques or not following quotas, logging, low-standard oil operations and poor pollution response on-shore and off, lack of land use planning, and lack of sustainable developments strategies to provide economic alternatives to natural resource extraction. The government manages these threats, assisted by NGOs and private companies through law enforcement, ecotourism, education and research.[33]

President Ali Bongo Ondimba of Gabon announced at the UN Ocean Conference the creation of a massive marine protected area consisting of 9 new marine parks and 11 aquatic reserves. This initiative expands Gabon's protected waters by 53,000 square km and the stimulus came from when the President visited the marine research vessel "Plan B" and was exposed to the wonders and threats that exist in Gabon's marine environment. "Gabon Blue" complements what the late President Omar Bongo Ondimba did for the forests when he created 13 national parks in 2002. These MPAs will be managed by Gabon's new Nature Preservation Agency.[34]

In addition to presidential support for protected areas the wildlife-loving new environment minister, Lee White, has vowed to fight illegal logging by strengthening governance of forests.[35]

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. Gabon's GDP has been consistently growing since 2009, ranging in increase from 0.13% to 7.09%. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ millions)	GDP Growth (Annual%)
2005	9580	2.676
2006	10300	-2.807
2007	12400	6.008
2008	15500	-3.308
2009	12100	0.130

[33] https://www.researchgate.net/publication/237071459_The_Gamba_Complex_of_Protected_Areas_an_illustration_of_Gabon%27s_Biodiversity

[34] https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/10114/Gabon-Announces-Vast-Marine-Protected-Area-Network-at-UN-Ocean-Conference.aspx

[35] https://www.reuters.com/article/us-gabon-environment-forests-trfn/wildlife-loving-gabon-minister-seeks-to-stamp-out-illegal-logging-idUSKBN1XO231

2010	14400	7.090
2011	18200	7.092
2012	17200	5.251
2013	17600	5.639
2014	18200	4.315
2015	14400	3.879
2016	14000	2.091
2017	14900	0.480
2018	16853	0.836

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
5%	44.7%	50.4%	1.8%	cocoa, coffee, sugar, palm oil, rubber; cattle; okoume (a tropical softwood); fish	petroleum extraction and refining; manganese, gold; chemicals, ship repair, food and beverages, textiles, lumbering and plywood, cement

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI	HDI rank	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita
0.702	114	66.2	12.9	8.3	15,794

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Gabon's corruption index had a net decrease of 4 from 2012-2019, representing increasing corruption. These data were obtained from Transparency International.

Year	Index value
2012	35
2013	34
2014	37
2015	34
2016	35
2017	32
2018	31
2019	31

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	53
	Current score	86.17
	Baseline rank	58
	Baseline score	81.84
Marine Protected Areas	Current rank	76
	Current score	81.34
	Baseline rank	63
	Baseline score	79.71
Terrestrial biome protection (global)	Current rank	72
	Current score	93.93
	Baseline rank	66
	Baseline score	86.4
Terrestrial biome protection (national)	Current rank	75
	Current score	89.66
	Baseline rank	60
	Baseline score	87.41
	Current rank	85

Protected area representativeness index	Current score	45.18
	Baseline rank	90
	Baseline score	36.19

3.2. Legal environmental status

Country: Gabon

Type of government: Republic (decentralized) Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA or PA System: National network of protected areas
- Agencies managing PA/PA system: Ministry for the Protection of the Environment and Natural Resources, Forests and the Sea of Gabon, National Park Agency
- Agencies providing funding for PAs: National Park Agency, *Agence Nationale des Parcs Nationaux* (ANPN)

Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
Loi 3 of 2007 (national parks of Gabon)	2007		
Lettre de Politique Sectorielle Forêt, pêche et aquaculture aires protégées, environnement et formation 2004.	January 1, 2004		
Forest Management Plan Requirements (Forest Code, Law No 16/01, Articles. 70, 20-23, 3) Forest Legality Initiative			
National Ivory Action Plan of Gabon	2015-2016	DGFAP and ANPN	*Ministry for Forestry, Environment, and the Protection of Natural Resources*
Statement of Expansion of MPAs	2017	Government of Gabon	*Gabonese Navy, Gabon's National Fisheries Agency, outside stakeholders*
Land Rights in Gabon (state owns all PAs)	2012	FERN	
The Gamba Complex of Protected Areas	1962 & 1966	Government of Gabon	*Government and NGOs*

Remarks: *(provide brief description of the legal documents)*

Limited access to documents – some documents are available but are in French and provide a brief statement of Gabon's commitment to protection of the environment

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Agreement on the Conservation of Gorillas and Their Habitats	2008	
African Convention on the Conservation of Nature and Natural Resources	1988	
Convention on Biological Diversity	1997	rtf
CITES	1989	A
I*nternational Convention for the Conservation of Atlantic Tunas*	(1966?)	
Convention on the Conservation of Migratory Species of Wild Animals	2008	Party
United Nations Convention to Combat Desertification	1967	A
C*onvention concerning the Protection of the World Cultural and Natural Heritage*	1986	Rtf
Memorandum of Understanding concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa	1999	

4. Protected area extent and changes—

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
33	9	20	62

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
22.44%	266,045	28.83%	193,292

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2004	*1*	49.3
2005	1	303874
% total area affected by PADDD events		3.22%
Major reasons for PADDD events		Infrastructure, Oil & Gas

5. Interview Summary

PA System

A. History of financial support

a. The Gabon National Parks Network was established in 2002 but provided no financing. In 2007, through international support, Gabon managed to get financing but it was limited, about $2 million USD. Lee White from WCS became national park director and began seeking international donors. This doubled/tripled the financing between 2007 and 2012. The park service hired international conservation experts who helped the government co-finance everything. This leveraged a lot of additional funding including private sector funds as well as government commitments to support until 2017 when oil prices crashed. The government then reconsidered the allocation of limited resources and the governmental dollar match started to go down as a result. The President ultimately diversified the investment portfolio, developing the Green Gabon Project. This still works on financing but Project revenue is not going directly to parks, it's being funneled to address climate change adaptation and to carbon credits for reducing emissions within forestry sector.

B. Proportion of internal funding

a. Taxes from the forestry and oil sector provide internal funding. 2020 is Year 5 of the PA funding plan, in which $7 million from US government has been distributed to the National park network. The government is trying to establish a stable investment model. They have to invest a lot into the system before they will be able to generate income from tourism. This has to create an institutional enabling situation, so the implementation is hard. It is still a young program, so it's not generating money itself, but they are hopeful it will start generating revenue next year (2021).

b. Still do not have the system enabling conditions set up to absorb funds properly which are coming suddenly so there is a waste as all incoming funds cannot be properly implemented. This is something financing conditions need to resolve.

c. Funds are distributed at a conference at the beginning of the year about the national annual planning process. The government arranges the priority setting process with all stakeholders (national parks) and prioritizes how money should be used. This is done through a threat assessment, thinking about main goals (e.g. stop elephant poaching). They put more money to the urgent objectives to define national park network against, and also decide funding allocations based on where parks are spatially.

C. Has external funding influenced country support of protected area financing?

a. Yes. Political support stems from the structure of the external agreements. However, within external financing agreements, high level politics usually plays a very minor role in the governance structure. The repeated cycle of securing external funding may work to increase government awareness of and interest in protected area financing. The pieces of the puzzle are slowly coming together. As long as you have political will and strategic oversight, then big things happen because efforts are synergistic. When the government doesn't lose sight of the bigger picture, working in conjunction with smaller NGOs, these things become inextricably tied up with one another, and external funding sometimes comes directly as a result of government action. 50% of funding came from external investments prior to the oil collapse.

Specific protected area: Ivindo National Park (est. 2002)

G. Primary threats to protected area

a. Threat level – moderate to significant
    i. Major threats: Poaching, erosion
b. Has threat level changed over time? Yes, it has increased
c. Do threat levels affect protected area funding?
    i. Yes

H. Local perceptions

a. There are almost no user groups within Ivindo National Park. One of the most important things to consider are the semi-nomadic populations, who have seasonal movements along with the animals, and occasionally wander into the park. In order to really understand that we have to think a lot more on historical village mapping, not mapping where the village is in relation to the park boundary, but historical land usage habits and movements, which tend to be punctuated and infrequent. Even if the villages are 30km from the park, animal movements become an issue because the animal movements are so broad and widely spread out, irrespective of where these people are.

b. Locals think the access and use of the park is regulated in a manner counter to their interests because they are not allowed to take and use the resources in a way that they used to.

c. Changes of perceptions over time: There is pervasive human-elephant conflict, which leaves a negative impression of the park on locals.
    i. Villagers blame increasing elephant conflict on logging occurring outside of the park as they believe noise and people associated with logging acts to chase elephants towards crops.

I. Proportion and sources of internal funds

a. This PA is funded roughly 30% by the State, 50% by the US Fish and Wildlife Service, and 20% by France.
b. The state has a national treasury, and congress prioritizes and allocates budgets to network agencies, these agencies allocate the funds to different parks.
c. Changes of internal funds over time?
    i. Significant increase (government spending has increased due to an increase in political will to allocate national treasury funds).

J. Proportion and sources of external funds.

a. Funders: WWF, WCS, USFWS, European Countries
b. Duration: Gabon does not allow for long term funding contracts

c. Reasons for success: Development and tourism are the keys to success to conservation and sustainable funding. The government has to explore new funding sources, for example carbon payments.

K. Has external funding influenced internal financial support of this protected area?

a. Yes, every dollar raised will also be contributed by the government (matching funds).

L. Funding mechanisms

a. Annual treasury disbursements
b. Factors that lead to success of funding mechanisms: Gabon is more stable and richer than other countries. So not only is there political will, but also the luxury to conserve.

C.7 India

1. History/Politics

With a population of more than 1.2 billion people, India is the world's largest democracy. Over the past three decades there has been rapid economic growth and integration into the global economy[36]. In 1990, India's GDP stood at around $270 billion. Since then, the economy has grown nearly 9 times to its current level at $2.3 trillion today. This economic boom has also driven the government's annual budget to grow to nearly 19 times the size it was[37]. India is also a megadiverse country, accounting for 7-8% of all known species and 4 out of 34 globally identified biodiversity hotspots[38]. Protected Areas fall under the jurisdiction and management of the Ministry of Environment, Forests and Climate Change. The Ministry has also benefitted from economic growth, and has an annual budget of over $400 million USD as of 2020[39]. The overall spending on protected areas has increased steadily since the 1990s.

On the downside, India's rapid population growth, urbanization, expansion of agricultural land and industrial growth fuel major threats to protected areas vulnerable to habitat loss, encroachment and environmental degradation from pollution.

The Constitution of India mandates that government must promote the conservation of biological diversity and protected natural areas. Article 51-A (g) states "It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures"[40]. Article 48-A states "the state shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country"[41].

The Wildlife Protection Act (WPA) of 1972 is the primary piece of legislation to govern environmental conservation activities, including the establishment and management of national parks and wildlife sanctuaries and prohibition of hunting[42]. Under the WPA, various authorities have been set up, such as the National Tiger Conservation Authority that is responsible for the management and funding of India's tiger reserves[43].

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. Between 2005-2018 India's GDP has consistently been growing between 3.0-8.5% annually. GDP values were obtained from the World Bank Databank.

[36] https://www.worldbank.org/en/country/india/overview
[37] https://economictimes.indiatimes.com/markets/stocks/news/since-1991-budget-size-grew-19-times-economy-9-times-your-income-5-times/articleshow/62735382.cms?from=mdr
[38] https://www.iucn.org/asia/countries/india
[39] https://economictimes.indiatimes.com/news/economy/policy/environment-ministry-gets-rs-3111-crore-in-budget-a-20-per-cent-increase/articleshow/67794117.cms?from=mdr
[40] The Constitution of India; https://www.india.gov.in/sites/upload_files/npi/files/coi_part_full.pdf
[41] Ibid. (4)
[42] https://www.conservationindia.org/resources/the-legal-framework-for-wildlife-conservation-in-india-2
[43] https://www.tigernet.nic.in/aboutntca.html

Year	GDP (Current USD millions)	GDP Growth (Annual %)
2018	$2,720,000	6.81
2017	$2,650,000	7.17
2016	$2,290,000	8.17
2015	$2,100,000	8.00
2014	$2,040,000	7.41
2013	$1,860,000	6.39
2012	$1,830,000	5.46
2011	$1,820,000	5.24
2010	$1,680,000	8.50
2009	$1,340,000	7.86
2008	$1,200,000	3.09
2007	$1,220,000	7.66
2006	$940,000	8.06
2005	$820,000	7.92

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
15.40%	23%	61.50%	5.50%	rice, wheat, oilseed, cotton, jute, tea, sugarcane, lentils, onions, potatoes; dairy products, sheep, goats, poultry; fish	textiles, chemicals, food processing, steel, transportation equipment, cement, mining, petroleum, machinery, software, pharmaceuticals

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI	HDI rank	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP)
0.647	129	69.4	12.3	6.5	6,829

2.4. Corruption and Transparency

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). India's corruption index had a net increase of 5 from 2012-2019, representing decreasing corruption. These data were obtained from Transparency International.

Year	Index value
2012	36
2013	36
2014	38
2015	38
2016	40
2017	40
2018	41
2019	41

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	139
	Current score	49.13
	Baseline rank	123
	Baseline score	49.46
Marine Protected Areas	Current rank	83
	Current score	79.19
	Baseline rank	64
	Baseline score	79.19
Terrestrial biome protection (global)	Current rank	143
	Current score	36.04
	Baseline rank	126
	Baseline score	35.81
Terrestrial biome protection (national)	Current rank	144
	Current score	30.03
	Baseline rank	133

	Baseline score	29.64
Protected area representativeness index	Current rank	154
	Current score	12.36
	Baseline rank	147
	Baseline score	10.16

3.2. Legal environmental status

Type of government: Democratic-republic	**Type of legal system:** Civil Law
General information about protected area (PA) management	

- **Relevant PA or PA System:** Western Ghats, and PAs across India
- **Agencies managing PA/PA system:** Ministry of Environment, Forests and Climate Change
- **Agencies providing funding for PAs:** National Budget allocation to Ministry of Env/F/CC by the Ministry of Finance under the Central Govt. of India, along with State-level budgets allocated to state forest department.

Domestic Legal Documents Related to Protected Area and Natural Resources Management

Document	Year of issuance (or effectiveness)	Initiating agencies	Enforcing agencies
Wildlife Protection Act	1972	Parliament of India	National Board of Wildlife, Forest Department, National Tiger Conservation Authority, Central Zoo Authority, Zoological Survey of India, Botanical Survey of India, Wildlife Crime Control Bureau, Central Bureau of Investigation
Environmental Protection Act	1986	Parliament of India	Central Government, Ministry of Environment, Forests, and Climate Change
Indian Forest Act, Forest Conservation Act	1927, 1980 respectively	Parliament of India	Forest Department

Remarks: *Wildlife Protection Act is the primary piece of legislation to govern environmental conservation activities, including the establishment and management of PAs in India. Under the WPA, various authorities have been set up, such as the National Tiger Conservation Authority that is responsible for the management and funding of India's ~ 50 tiger reserves.*

Global/Regional Treaties related to protected area management

Name of treaty	Year of latest action	Affiliation
Convention on Biological Diversity	Effective 1994	rtf
Ramsar Convention	1982	Y
CITES	Signed 1974, Effective 1976	rtf

4. Protected area extent and changes

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
			672

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
5.97	3,061,193	0.17	2,301,226

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2004	1	No data
2005	2	No data
2007	2	No data
2008	1	No data
2009	2	No data
2010	12	No data
2011	470	No data
2012	1	No data
2013	2	No data
2014	1	No data
2016	1	No data

% total area affected by PADDD events	No data	No data
Major reasons for PADDD events	Subsistence (476), infrastructure (11), mining (5), rural settlements, multiple causes	

5. Interview summary

***PA System* – Western Ghats and Tiger Reserves of India**

A. *History of financial support*

a. Before 1990, PAs in India received very little money from the government and were hardly funded. The British Raj and a long history of monarchs, kings and rulers of various kingdoms and princely states in India marked significant years of hunting wild game, which led to loss of numerous populations of tigers and other charismatic species. Conservation of wildlife and the establishment of protected areas garnered attention after Independence in 1947. Protected areas were formally established in the early 1970s through National Wildlife Policy and the Wildlife Protection Act of 1972, along with various species conservation projects of which Project Tiger is considered as the top priority. However, funding for these established national parks and sanctuaries was very low.

From 1990 onwards, the economic liberalization of India and the opening up of the Indian economy to foreign export-import markets led to an economic boom. This marked the end of long years of socialist policies and a movement towards market capitalism. India's economy boomed and thus the government has been able to spend more on PA management since the 1990s.

The government's spending on PAs is influenced by the willingness of the dominant political party/leaders to support conservation issues. In general, the amount has been increasing in the past 15 years, reaching about US$400 million per year. However, there is a notion amongst the conservation community that the increased government spending is also an indicator of corruption.

B. *Proportion of internal funding*

a. Greater than 90% of funding for Protected areas across India comes from internal sources. Approximately 70% of these funds are allocated to the Ministry of Environment from the national annual budget at the central level and are thus funds that originate from general taxation. The remaining (approximately 30% or more) come from the state level budget where the PA is located. Therefore, funds are distributed via a joint portfolio with a larger contribution from the central government and smaller by the state. Low-income state budgets contribute even less (say, 20-30%) and the central government allocates more.

Joint portfolio holding allows state and central governments to both have an voice in decision making regarding financing of conservation activities and PAs. It allows some level of diversified commitment. There is a higher likelihood of well managed funding because if at least the state or central government is motivated

to provide funds, it will happen. This structure helps to avoid poor management that could result when a single entity is managing funds and starts to slack on its responsibilities.

b. Park entry fees are very low, and tourism is also relatively low; hardly any revenue comes from those sources. Primary PA funding is through general taxation. There has been a modest increase in the budget for tiger reserves across the country. This increase comes as a result of the growing economy, inflationary adjustments, and the importance of tiger population conservation due to its charismatic value. Tigers are the main driver of wildlife tourism and have international importance.

D. *Has external funding influenced country support of protected area financing?*

a. External funding has not really had an "influence," rather the interviewee said that there is a negative influence, such that the government prefers to fund PAs strictly internally. It is noticeable that as part of the regulations, Indian PAs are not allowed to receive money from NGOs to fund their management and operation. However, NGOs and other international finance institutions may provide funding for specific programs or research. The Indian government in the past has received loans from GEF and the World Bank for specific activities, but almost all PAs are 100% government managed and funded now, and it has been like that for some time.

C.8 Madagascar

1. History/Politics

Before Madagascar's independence, the French administration established 10 Strict Nature Reserves in 1927, and by 1997, 46 protected areas that encompassed almost 1.8 million hectares were designated. These designations included Strict Nature Reserve (IUCN Category I), National Parks (IUCN Category II), and Special Reserves (IUCN Category IV). The new System of Protected Areas of Madagascar (SAPM) was established in 2002 to manage both the original PAs and the new PAs. There are 116 NPAs that cover 6.5 million hectares, not including MPAs.[44]

Madagascar has experienced more than five political crises since the early 1990s. This instability has left many international organizations wary of investing in Madagascar. However, in the 1990s and 2000s, internationally driven policy changes drove improvements in the success of their protected areas. The following international conventions were signed and ratified: CBD ratified in 1995, Ramsar Convention on Wetlands ratified in 1998, and the Convention on the Conservation of Migratory Species of Wild Animals was ratified in 2007. Additional legislation was enacted to further protect Madagascar's biodiversity and endemic species. Specifically, the protected area legislation Code des Aires Protégées was legalized in 2003 along with revisions to the hunting law and CITES to control exploitation of wild animals.[45]

International influence did not stop at treaties, however. Until the early 2000s, the State organization, the ANGAP (l'Association Nationale pour la Gestion des Aire Protégées), now referred to as Madagascar National Parks, governed the protected areas. The ANGAP was given coordination responsibility, but no enforcement power for the 44 protected areas that includeded both the 10 national parks and Strict Natural Reserves. Enforcement powers remained with the DEF (Water and Forestry Service), who insisted on its right to set entry fees for parks. ANGAP had neither field management responsibility nor authority over funding, except for two small reserves and Isalo Park, for which they were the principal operator. In 1996, ANGAP was finally authorized to set fees and manage park revenues. From the beginning of this authority, it was established that 50% of all park fees would be shared with the local communities. ANGAPs coordination tasks were carried out with the aid of several long-term international advisors, under SAVEM (Sustainable Approaches to Viable Environmental Management), who helped develop the organizational structure of PA management. The remaining nine parks and some of the reserves were each assigned an international operator/partner that managed the parks during this period when ANGAP was still becoming operational. The seven parks mentored with USAID support were: Andasibe-Mantadia (principal operator:VITA), Ranomafana (SUNY/Stony Brook), Amber Mountain (WWF/CARE), Masoala (WCS/CARE), Andohahela (WWF), Zahamena (CI), and Isalo (ANGAP).[46]

AGNAP's management carried on until the international community, primarily through the World Bank, pushed the Malagasy government to implement forest governance devolution through greater engagement of local populations in the decision-making process and management of forests and protected areas. Madagascar ultimately implemented the New Environmental Action Plan (NEAP), which brought a decentralization in the governance of natural resource management. The new protected areas (NPAs) follow this shared governance model, managed by the regional government and local communities, with partners usually

[44] https://www.intechopen.com/books/protected-areas-national-parks-and-sustainable-future/parks-and-reserves-in-madagascar-managing-biodiversity-for-a-sustainable-future
[45] IBID
[46] https://www.usaid.gov/sites/default/files/documents/1860/exsumm_paradise_lost_25years_env_programs.pdf

consisting of international NGOs, sometimes national NGOs, universities, or mining companies. More than 450 transfers to co-management happened in a fairly short time.[47]

The main threats to protected areas are deforestation, particularly through slash-and-burn agricultural practices. Rosewood and ebony have largely been the focus of logging exploitation, and while laws are in place around the take of certain species (e.g. lemurs), this is difficult to enforce. There is an overarching mistrust between communities and park agents, due to lack of communication. It has been found that the core areas of the original parks showed much slower deforestation than areas under co-management, which may be partially due to their higher restrictions.[48] Increasing protected area coverage does not automatically guarantee increased protection, and Madagascar struggles with governing and managing its vast protected areas system. There are currently over 1 million hectares of "paper parks" that are not managed at all. Due to the decentralization of their governance model, the Malagasy government invests very little, if anything, into protected areas. The international community is almost entirely responsible for the safeguarding of their protected areas network.

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. From 2005-2018 Madagascar's GDP has consistently been growing between 0.62 and 6.7% annually, with an outlier in 2009 when GDP shrank by 3.98%. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ millions)	GDP Growth (Annual%)
2018	$13,900.00	4.56%
2017	$13,200.00	4.02%
2016	$11,800.00	3.99%
2015	$11,300.00	3.13%
2014	$12,500.00	3.34%
2013	$12,400.00	2.30%
2012	$11,600.00	3.01%
2011	$11,600.00	1.58%
2010	$9,980.00	0.62%
2009	$9,620.00	-3.98%
2008	$10,700.00	6.71%
2007	$8,520.00	6.24%
2006	$5,520.00	5.02%
2005	$5,040.00	4.60%

2.2. Composition of economy

[47] https://www.intechopen.com/books/protected-areas-national-parks-and-sustainable-future/parks-and-reserves-in-madagascar-managing-biodiversity-for-a-sustainable-future

[48] IBID

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
5%	44.7%	50.4%	1.8%	cocoa, coffee, sugar, palm oil, rubber; cattle; okoume (a tropical softwood); fish	petroleum extraction and refining; manganese, gold; chemicals, ship repair, food and beverages, textiles, lumbering and plywood, cement

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI	HDI rank	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita
0.702	114	66.2	12.9	8.3	15,794

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Madagascar's corruption index had a net decrease of 8 from 2012-2019, representing increasing corruption. These data were obtained from Transparency International.

Year	Index value
2012	35
2013	34
2014	37
2015	34
2016	35

2017	32
2018	31
2019	31

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	53
	Current score	86.17
	Baseline rank	58
	Baseline score	81.84
Marine Protected Areas	Current rank	76
	Current score	81.34
	Baseline rank	63
	Baseline score	79.71
Terrestrial biome protection (global)	Current rank	72
	Current score	93.93
	Baseline rank	66
	Baseline score	86.4
Terrestrial biome protection (national)	Current rank	75
	Current score	89.66
	Baseline rank	60
	Baseline score	87.41
Protected area representativeness index	Current rank	85
	Current score	45.18
	Baseline rank	90
	Baseline score	36.19

3.2. Legal environmental status

Country: Madagascar

Type of government: Semi-Presidential Representative Democratic Republic

Type of legal system: Civil Law

General information about protected area (PA) management

- Relevant PA or PA System: MNP
- Agencies managing PA/PA system: Madagascar National Parks Association (PNM-ANGAP)
- Agencies providing funding for PAs: Ministry of Environment and Forests
    - Not a specific mechanism, although several independent organizations, including Madagascar Biodiversity Fund provide financial support

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Domestic Legal Documents Related to Protected Area and Environmental Management

Name of document	***Year of issuance (or effectiveness)***	***Initiating agencies***	***Regulating agencies***
National Environmental Action Plan (NEAP)	1990		
Code des Aires Protégées and Revised (N. 2015-005)	2003, 2015	Ravalomanana	USAID
Charte de l'Environnement Malagasy actualisé2	2015		
GELOSE policy (Gestion Local Sécurisée, secure local management)			
Remarks: *Code* des Aires Protégées is protected area *GELOSE regulates the transfer of property rights from State to local communities (forests, pastures, water and wildife)*			

Global/Regional Treaties related to protected area management

Name of treaty	***Year of latest action***	***Affiliation***
Convention on Biological Diversity	1995	Rtf
Convention Concerning the Protection of the World Cultural and Natural Heritage		Rtf
Convention on Wetlands and International Importance especially as Waterfowl Habitat		Acs
Convention on the Conservation of Migratory Species of Wild Animals	2007	Yes

African Convention on the Conservation of Nature and Natural Resources		Yes
Framework Convention on Climate Change	1992	Signed
Ramsar Convention on Wetlands	1998	Rtf

4. Protected area extent and changes—

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
33	9	20	62

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
22.44%	266,045	28.83%	193,292

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2004	1	49.3
2005	1	303874
% total area affected by PADDD events		3.22%
Major reasons for PADDD events		Infrastructure, Oil & Gas

5. Interview Summary

PA System

A. History of financial support

a. All funding falls under the governmental agency Madagascar National Park (MNP), they're responsible for the management of the national protected area system. Many years ago, PAs were managed by the Water and Forest Department who also managed the exploitation of wood. With the push of international conservation organizations, the Madagascar government divided up control of the PAs. The international organizations taught the government how to split the management of PAs and formed ANGAP (protected area management). They received substantial USAID funding and could not have managed the PAs without these funds. ANGAP evolved and turned into Madagascar National Parks (MNP). While the interviewee was unsure if MNP still gets international funding,

they were certain that if MNP gets any outside support it is not much. MNP has been pushed to support management of the parks through entry fees and is obliged to share a certain percentage of that revenue with the local communities. With the establishment of parks in the 1980s and 1990s different organizations or individuals received USAID funding to help support new parks. Smaller projects began and started doing conservation and development projects in tandem. More recently, the parks are often managed by NGOs like WWF and WCS. MNP gets a lot of their budget from tourism revenues, but this is still not a large budget.

B. *Proportion of internal funding*
    a. Interviewee was unsure of what proportion of funding for the protected area network comes from internal sources. They guess that the government budgets a flat amount, but the funds are not distributed equally to all PAs. This funding has likely increased because there has been a big push in the last 10 years, and they have tripled the amount of PAs in Madagascar. The MNP director for the Sava region has had to push NGOs for funding since they are working on such a small budget.
    b. They do know that the major source of income they have coming in, aside from what they get from the government, is through visitor fees. Other sources include Ecosystem Service Payments, like the REDD+ program in Makira Nature Preserve. Payment for Ecosystem Services (PES) is an undersold mechanism in Madagascar. Tourist concessions are definitely not a mechanism of funding as building hotels inside PAs is not allowed.
C. *Has external funding influenced country support of protected area financing?*
    a. Yes, but it is hard to say overall. Anywhere the government sees that an NGO is going to support a PA, they will move their resources somewhere else. A lot of these PAs would not exist if not for international and national NGOs that manage them. However, this does come with a potential negative impact from the community perspective as the PA is no longer accessible for resource extraction. International and National NGOs in Madagascar are very important, not only for the protection of these areas, but they have also really helped to build a generation of Malagasy conservation professional and researchers. In the late 1980's all the researchers from conservation NGOs were foreigners, but now these organizations are almost completely Malagasy-run on the ground. Native Malagasy have been trained and provided professional development opportunities, which is an unseen contribution of these organizations. The Integrated Conservation Development Program provides skills for alternative lifestyles (bee keeping). This is run primarily by international organizations such as USAID. Relationships and trust need to be built; you can't throw a ton of money over a very short period of time and expect it solve the conservation problems in an area for the long term.
    b. Other potential sources of outside funding come from bioprospecting and filming agencies who pay to have access to the parks. Pharmaceutical companies take samples from Madagascar, come up with million-dollar drugs and Madagascar does not see any of this money.

Specific protected area: Park Ivoloina

A. *Primary threats to protected area*
    a. Threat level – significant threat

i. Threats come from invasive species; slash and burn agriculture; illegal logging (rosewoods); hunting for lemurs, mammals and birds; farming encroachment into PAs; and mining

b. Do threat levels affect protected area funding?
    i. There has been funding coming in trying to do address certain threats like invasive toads.

B. Local perceptions

a. PAs are still doing their job, even though they're not perfect. People by and large are respectful and worried about repercussions, but there are threats that are difficult to manage for (e.g. the fires from slash-and-burn spreading into PAs). The community perspective on PAs is extremely variable. Benefits to local communities only come from the PAs that get the most tourists (e.g. from researchers hiring people, tourists hiring guides, cooks etc.). 50% of park fees should be going back into community projects, but really it comes down to whether or not there enough money to cover PA costs and then the rest goes to the community.

C. Proportion and sources of internal funds

a. The interviewee was unsure what proportion came from internal funds.
    i. It's odd because it technically the park still belongs to the Water and Forest department, but Madagascar Foundation for Flora and Fauna operate it. The reason they did this was because of corruption, pieces of it were being carved out for politicians and half of the total surface area was lost over time. It's currently over 200 ha and used to be about 500 ha.

b. Changes of internal funds over time?
    i. Government (internal) funding has stayed stable at zero. They don't spend any money on this park. The local government did make a contribution a long time ago. The government doesn't spend any money on Ivoloina because it was never an MFP PA so they aren't involved at all. The Water and Forest Department (that oversees this park) has a main goal to oversee forest exploitation.

D. Proportion and sources of external funds

a. Interviewee did not have a response for this section.

E. Has external funding influenced internal financial support of this protected area?

a. Yes, Madagascar just does not have any money to spend anyway. Ivoloina probably wouldn't exist without external funding. If the MFG wasn't working, it wouldn't be there, most of it would be gone as there's been an influx of immigrants into the area.

F. Funding mechanisms

a. Funding through Park Entry Fees

Specific protected area: Makira Natural Park

A. Primary threats to protected area

a. Threat level – moderate

i. There are various pressures but they are very localized. Slash and burn is almost everywhere, up to the limits of the park. In general, the trend is a reduction of the threats over time. Except the illegal logging - which is still continuing. There is a widespread problem of precious wood logging in Madagascar. Before 2012, the park didn't exist. Between 2009-2013 there was a sociopolitical crisis in Madagascar where there a lot of waste of natural resources

b. Do threat levels affect protected area funding?
    i. Not really. Between 2009-2013 there were many donors who didn't want to continue because of the political crisis, not because of the threats.

B. Local perceptions

a. Local communities think that park use and access are regulated against their interests. Locals used to extract resources from the forest but now these actions are forbidden. Officially, it was always forbidden but was previously rarely enforced. Collecting lemurs has always been prohibited for example, but the park means there is now regular control. Makira was a pilot REDD+ project but took 10 years to establish because that was the first sale of carbon credits in Madagascar. Even though they have always had community development as part of the park activities, at the beginning they had to give priority to the carbon project and NOT the development. So at the beginning there was this perception that the park was against development.
b. Influence of local perceptions on protected area funding?
    i. In general no, but still there are some donors (or carbon credit purchasers) that think the communities' perception will impact their ability to sell/ establish credits. The carbon credit purchasers come to Madagascar to check out and verify the project. One buyer came to Madagascar and did not buy because there were not convinced of the longevity of the carbon.

C. Proportion and sources of internal funds

a. This PA is 26-50% internally funded
    i. While the park doesn't receive direct funding from the government, the carbon funding can be considered internal since the forest is owned by the government. Makira also receives funding from the Madagascar Foundation of Protected Areas and Biodiversity each year. If carbon and the foundation count as internal, then it's between 26-50%.
b. Changes of internal funds over time?
    i. Modest increase because there are more people paying into the REDD+ carbon fund.

D. Proportion and sources of external funds

a. Sources: Private and community foundations (e.g. Rasmuson Foundation), Development banks and agencies (World Bank, EU, French Development Fund, The African Development Fund), International NGOs (WCS, CI), Corporate Funds (Chocolat le Ba)
b. Funders: There are many funding sources. Others include USAID and Australian Aid.
c. Duration: most of these funding souces are just one-time payments
d. Reasons for success: Because this protected area is rich in natural resources and wildlife, it attracts external funding (funders see a good opportunity in funding

this PA) and allows the PA management team to create innovative processes and financial mechanisms to support the management. The main goal of PA management is to preserve the forest and improve the quality of life of local populations.

E. Has external funding influenced internal financial support of this protected area?

a. No, because funding from the government is just for carbon funding in terms of credits, they don't receive direct funding from the government anyways.

F. Funding mechanisms

a. Mixture of conservation trust funds (sinking, revolving, and endowment funds), loans to the government or park system, public-private partnerships, and payment for ecosystem services programs (performance-based payments).
b. Success of mechanisms
    i. For the REDD+ project, 50% of revenue from the carbon credits should go to the community, and it passes through the community foundation but they have trouble getting it to the communities. The process is not very efficient.
    ii. Funding available is not enough to cover all the needs. Due to decentralization, the park has to not only manage the PAs, but also the communities around it.

C.9 Peru

1. History and Politics

Over the past decades, Peru has restructured environmental regulations and institutions and considerably expanded and strengthened the protection of priority habitats and biodiversity hotspots. These efforts reduced deforestation, advanced water resources protection, and created one of the most consolidated protected areas systems in Latin America.[49] The country has established numerous relevant entities, including the Ministry of the Environment (MINAM), the Peruvian National Protected Areas Service (SERNANP) and the Agency for Environmental Assessment and Enforcement (OEFA) in 2008, and the National Service of Environmental Certification for Sustainable Investments (SENACE) in 2012.[50] The Natural Resource Law, enacted in 2001, has significantly contributed to strengthening biodiversity conservation and testing innovative approaches to manage protected areas, such as co-management schemes with local communities and nonprofit organizations and decentralization from the national to regional governments.[51] Other pieces of law, such as the Structural Framework for Environmental Management of 1993, the National Environmental Management System Law of 2004 and the General Environmental Law of 2005 have been fundamental for improving governance of natural resources and biodiversity.

Peru has undertaken several international policy initiatives to further environmental stewardship. The country has integrated the Convention on Biological Diversity goals into the National Biodiversity Strategy. At the UNFCCC COP 21, Peru pledged to halt net deforestation rates by 2020 and developed the National Programme of Forest Conservation for Mitigating Climate Change, affecting 542,000 hectares of protected forests. Peru also presented the country's intended nationally determined contributions (INDC) and committed to reduce GHG emissions by 30%.[52]

The Peruvian National Protected Areas Service (SERNANP) has experienced steady growth and currently covers 22% of the country's total territory versus 17% in 2015.[53] The most well known protected areas are in the Amazon rainforest, while others are in the coastal desert and in the Andes. Management of protected areas is improving, as the number of staff members and master plans has substantially increased from 2003 to 2015.[54] However, progress remains

[49] World Bank (2006) Republic of Peru Environmental Sustainability: A Key to Poverty Reduction in Peru. Country Environmental Analysis. Volume 2: Full Report. Retrieved from: http://siteresources.worldbank.org/INTPERUINSPANISH/Resources/PERU_CEA_Full_Report_eng.pdf

[50] OECD (2016) Environmental Performance Reviews Peru 2016: Highlights and recommendations. Retrieved from: https://www.oecd.org/environment/country-reviews/16-00312-environmental%20performance%20review-peru-web.pdf

[51] World Bank (2006) Republic of Peru Environmental Sustainability: A Key to Poverty Reduction in Peru. Country Environmental Analysis. Volume 2: Full Report. Retrieved from: http://siteresources.worldbank.org/INTPERUINSPANISH/Resources/PERU_CEA_Full_Report_eng.pdf

[52] OECD (2016) Environmental Performance Reviews Peru 2016: Highlights and recommendations. Retrieved from: https://www.oecd.org/environment/country-reviews/16-00312-environmental%20performance%20review-peru-web.pdf

[53] UNEP (2020) Protected Area Coverage per Country/Territory by UN Environment Regions. Retrieved from: https://www.protectedplanet.net/c/unep-regions

[54] OECD (2016) Environmental Performance Reviews Peru 2016: Highlights and recommendations. Retrieved from: https://www.oecd.org/environment/country-reviews/16-00312-environmental%20performance%20review-peru-web.pdf

insufficient. The biggest challenge is to ensure these areas are protected not just on paper but also in reality.

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. Between 2005-2018 Peru's GDP has consistently been growing between 1.1 and 9.1% annually. GDP values were obtained from the World Bank Databank.

Year	GDP (Current US $ million)	GDP Growth (Annual%)
2018	$58,731.03	4.17
2017	$66,768.70	4.96
2016	$76,060,60	6.29
2015	$88,643.19	7.53
2014	$102,171.00	8.52
2013	$120,551.00	9.13
2012	$120,823.00	1.10
2011	$147,529.00	8.33
2010	$171,762.00	6.33
2009	$192,649.00	6.14
2008	$201,175.00	5.85
2007	$200,789.00	2.38
2006	$189,805.00	3.25
2005	$191,896.00	3.95
2004	$211,007.00	2.52
2003	$222,045.00	3.98

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition (2017)				Main products per sector	
Agriculture	**Industry**	**Services**	**Industrial production growth rate**	**Agriculture**	**Industry**
7.60%	32.70%	59.90%	2.70%	Artichokes, asparagus, avocados, blueberries, coffee, cocoa, cotton, sugarcane, rice, potatoes, corn, plantains, grapes, oranges, pineapples	Mining and refining of minerals; steel, metal fabrication; petroleum extraction and refining, natural gas and natural gas liquefaction; fishing and fish processing

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI Scores 1990 -2018		HDI rank (2018)	Life expectancy at birth (years)	Mean years of schooling	GNI per capita
1990	0.613	82	76.5	9.2	6
2000	0.679				
2010	0.721				
2013	0.742				
2015	0.750				
2016	0.755				
2017	0.756				
2018	0.794				

2.4. Corruption indices

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8

(Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Peru's corruption index had a net decrease of 2 from 2012-2019, representing a slight increase in corruption. These data were obtained from Transparency International.

Year	Index value
2012	38
2013	38
2014	38
2015	36
2016	35
2017	37
2018	35
2019	36

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	66
	Current score	83.52
	Baseline rank	77
	Baseline score	75.02
Marine Protected Areas	Current rank	88
	Current score	76.49
	Baseline rank	78
	Baseline score	72.9
Terrestrial biome protection (global)	Current rank	76
	Current score	90.11

	Baseline rank	70
	Baseline score	81.68
Terrestrial biome protection (national)	Current rank	73
	Current score	90.29
	Baseline rank	63
	Baseline score	85.36
Protected area representativeness index	Current rank	23
	Current score	82.17
	Baseline rank	60
	Baseline score	46.78

3.2. Legal environmental status

Type of government: Democratic-republic **Type of legal system:** Civil Law

General information about protected area (PA) management

- **Relevant PA or PA System:** SINANPE (The national system of protected areas, aka Sistema Nacional de Areas Naturales Protegidas por el Estado)
- **Agencies managing PA/PA system:** SERNANP (National Protected Areas Service, aka Servicio Nacional de Areas Naturales Protegidas) within the Ministry of the Environment
- Agencies providing funding for PAs: **SERNANP, Public Treasury, National Fund for Natural Pro**tected Areas within PROFONANPE (private fund)

Domestic Legal Documents Related to Protected Area and Natural Resources Management

Name of document	**Year of issuance (or effectiveness)**	**Initiating agencies**	**Regulating agencies**
Forest and Wildlife Act	1975	The Peruvian Constitution	Ministry of Agriculture
Natural Protected Areas System	1990	The Peruvian Constitution	Ministry of Agriculture

Environmental Code	1990	The Peruvian Constitution	Ministry of Agriculture
National Trust Fund for Natural Protected Areas (Decree-Law 26,154)	1992	The Peruvian Constitution	Ministry of Agriculture
Article 68 of the National Constitution of Peru	1993	The Peruvian Constitution	Ministry of Agriculture
Biological Diversity Conservation and Sustainable Use Act (Law 26831)	1997	The Peruvian Constitution	Ministry of Agriculture
Natural Protected Areas Act (Law 26834)	1997	The Peruvian Constitution	Ministry of Agriculture
Master Plan for Natural Protected Areas (Supreme Decree 010-99-AG)	1999	The Peruvian Constitution	Ministry of Agriculture
General Environmental Act (LAW 28611)	2005	The Peruvian Constitution	Ministry of Agriculture
Law establishing the Ministry of the Environment and the National Service for Natural Protected Areas (Legislative Decrees 1013 and 1039	2008	The Peruvian Constitution	Ministry of Environment

Remarks:

Peru has a centralized government system. Legally, the national protected areas system includes only national-level protected areas, while regional and private protected areas are referred to as "complementary." Until 2008, the Ministry of Agriculture managed the protected areas system through various branches and administrative levels. In 2018, duties were transferred to the National Service for Natural Protected Areas under the new Ministry of the Environment.[55]

Global/Regional Treaties related to protected area management

Name of treaty	Year of latest action	Affiliation

[55] Solano, P. Legal Framework of Protected Areas: Peru. IUCN-EPLP No. 81. Retrieved from: https://www.iucn.org/downloads/peru_en.pdf

Convention on Biological Diversity	1993	Ratification
Convention Concerning the Protection of the World Cultural and Natural Heritage	1982	Ratification
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	1992	Ratification

4. Protected area extent and changes

4.1 Number and Extent
Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
245	8	1	254

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
21.53	279,620	0.48	4,037

4.2 Changes to PAs
Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2015	1	2.78
% Total area affected by PADDD events	0.00%	
Major reasons for PADDD events	Infrastructure	

5. Interview Summary

A. History of financial support

a. In the 1990s and early 2000s the majority (70%) of funding to protected areas was coming from external sources. The public budget was grossly insufficient to manage the protected areas network, as it totaled only USD $500,000 to manage 90% of all areas. By 1992, the Peruvian Trust Fund for Protected Areas, PROFONANPE, was created with seed funds (US$5.2 million) from GEF in order to raise funding for protected areas. PROFONANPE's endowment has increased significantly as the private fund financed several protected areas with funding from donations (GEF), grants (McArthur and Moore Foundations, and international NGOs, such as TNC, CI, and WWF), and bilateral debt-for-nature swaps with Canada, Finland, the United States, Netherlands and Germany. By 2008, external pressure from the United States-Peru Trade Agreement (PTPA) forced the Peruvian government to increase governance and funding for protected areas. This led the country to create the Ministry of the Environment and the Peruvian National Protected Areas Service (SERNANP) in order to signal commitment to natural resources.

b. By 2008, the national budget for protected areas increased from USD $3M to $6M, while international cooperation stayed the same. This increase was partially due a "results-based" mechanism SERNANP adopted to improve internal performance and prove the capacity to efficiently manage large flows of funding. By 2015, the proportion of funding sources flipped to 70% internal and 30% external.

c. The level of spending on Peruvian protected areas is somewhat insufficient to meet conservation objectives. The vast extension of the Protected Areas System (283,657 km^2 or 22% of the country) requires an annual budget of roughly US$ 35 million.[56] In addition, some protected areas are located in remote or extremely poor areas, which complicates management and presents budgetary challenges. Managing PAs in Peru not only requires funding to protect biodiversity, but to alleviate poverty, engage local populations, encourage sustainable economic activities, and fight increasing threats, such as illegal mining and logging.

B. Proportion of internal and external funding

a. Approximately 70% of the funding for protected areas currently comes from internal sources. Contributions from the Public Treasury rose by 500% between 2004 and 2010, but still falls short of needs.[57] Compliance with the United States-Peru Trade Agreement (PTPA) pressured the public treasury to increase investments in conservation and signal internal commitment to protected areas to the world.

[56] OECD (2016) Environmental Performance Reviews Peru 2016: Highlights and recommendations. Retrieved from: https://www.oecd.org/environment/country-reviews/16-00312-environmental%20performance%20review-peru-web.pdf

[57] Ibid.

Park entry fees are the main economic instruments to generate funding for these areas. Approximately 20% of protected areas generate revenue for the entire network through eco-tourism; more than 70% of entry fee proceeds are reinvested in other protected areas. Part of this revenue is directly transferred to indigenous and rural communities for forest conservation.[58]

b. External funding represents 30% of the total funding for protected areas and mostly comes from bilateral institutions, private foundations, and development banks and agencies such as GEF, KFW, and Inter-American Development Bank. The most relevant funding mechanism in Peru has been conservation trust funds, especially PROFONANPE, grants from foundations and International NGOs to the government or park system, and public-private partnerships through management contracts with nonprofits.

c. Funding is not equally distributed across protected areas. Areas that generate income from tourism and other sources receive more investment. In addition, international cooperation has "favorite" protected areas to invest in, with emphasis on those with the highest levels of biodiversity.

C. Has external funding influenced country support to protected area financing?

a. External funding has indirectly influenced government spending, especially at the SERNANP level. SERNANP wanted to have more weight in decision-making processes and protection of natural resources, as well as increase matching funding to external financing. This motivation led SERNNAP to review and reform administrative processes and thus improve internal performance. Improved performance and demonstrated capacity to manage high sums of money convinced the Ministry of the Economy to channel more public funding to SERNNAP.

[58] Ibid.

C.10 Thailand

1. History and Politics

Thailand is a constitutional monarchy and the second largest economy in South-east Asia after Indonesia[59]. The last four decades have seen Thailand grow into a widely cited development success story, moving from a low-income to an upper-income country in less than a generation. Between 1960 and 1996, the Thai economy grew at an average annual rate of 7.5 percent, and at 5 percent between 1999 and 2005 following the Asian Financial Crisis[60]. This marked remarkable social and economic development, with poverty declining from over 60 percent in 1988 to under 10 percent in 2018[61].

Thailand has a long history of forest management. The Royal Forest Department was established in 1896, and the first Act to conserve forest and wildlife, namely elephants, was adopted in 1900. Following years of logging activities and timber harvesting, the Royal Thai government banned the exploitation of forest resources in 1989[62]. Today, over 200 protected areas spanning nearly 20 percent of the country's land area. Thailand's protected area landscape is home to tigers, elephants, deer and various other charismatic species. The Western Forest Complex is considered the largest remaining forest track in Mainland Southeast Asia[63].

Thailand's rapid economic growth has given rise to environmental challenges such as air and water pollution, biodiversity loss, watershed degradation and habitat conversion[64]. Notable threats to protected areas and biodiversity in Thailand include illegal logging, poaching, crop burning, and tourism-based disturbances[65].

2. Economic context

2.1. Scale of economy

Gross Domestic Product (GDP) represents the total market value of all goods and services produced by a country for a specific period, and GDP growth represents how much GDP is changing over time. A growing GDP indicates a growing economy. Between 2005-2018 Thailand's GDP has consistently been growing between 0.8 and 7.2% annually, with an outlier in 2009 when GDP shrank by 0.7%. GDP values were obtained from the World Bank Databank.

Year	GDP (Current USD millions)	GDP Growth (Annual %)
2018	$504,993	4.1
2017	$455,276	4.0
2016	$412,353	3.4
2015	$401,296	3.1
2014	$407,339	1.0
2013	$420,333	2.7

[59] https://santandertrade.com/en/portal/analyse-markets/thailand/economic-political-outline
[60] https://www.worldbank.org/en/country/thailand/overview
[61] Ibid. (2)
[62] http://www.fao.org/tempref/docrep/fao/005/AC921E/AC921E11.pdf
[63] https://thailand.wcs.org/About-Us/Overview.aspx
[64] https://www.iucn.org/asia/thailand/countries/thailand
[65] https://www.cbd.int/countries/profile/?country=th

2012	$397,558	7.2
2011	$370,819	0.8
2010	$341,105	7.5
2009	$281,710	-0.7
2008	$291,383	1.7
2007	$262,943	5.4
2006	$221,758	5.0
2005	$189,318	4.2

2.2. Composition of economy

We report the composition of the economy to provide context for the types of economic activities taking place that could potentially be in conflict with protected areas (e.g. natural resource extraction). GDP composition describes the percentage of the economy represented by the three main areas of agriculture, industry, and services. These data were obtained from the CIA World Factbook.

GDP composition				Main products per sector	
Agriculture	Industry	Services	Industrial Production growth rate	Agriculture	Industry
8.20%	36.20%	55.60%	1.60%	rice, cassava (manioc, tapioca), rubber, corn, sugarcane, coconuts, palm oil, pineapple, livestock, fish products	tourism, textiles and garments, agricultural processing, beverages, tobacco, cement, light manufacturing such as jewelry and electric appliances, computers and parts, integrated circuits, furniture, plastics, automobiles and automotive parts, agricultural machinery, air conditioning and refrigeration, ceramics, aluminum, chemical, environmental management, glass, granite and marble, leather, machinery and metal work, petrochemical, petroleum refining, pharmaceuticals, printing, pulp and paper, rubber, sugar, rice, fishing, cassava, world's second-largest tungsten producer and third-largest tin producer

2.3. Quality of life indicators

The Human Development Index (HDI) represents an index value for the overall level of development in a particular country, and HDI rank represents how a particular country ranks in terms of all the countries assessed (the lower the rank, the higher the development level). Life expectancy, years of schooling, and GNI per capita are input values to the index that we provide here as context, and represent 2018 reported values. These values were obtained from the UNDP Human Development Reports.

HDI	HDI rank	Life expectancy at birth (years)	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP)
0.765	77	76.9	14.7	7.7	16,129

2.4. Corruption and Transparency

The corruption index represents an annual snapshot of the relative degree of corruption in a particular country. Higher corruption scores indicate *lower* levels of corruption. For reference, in 2019 global corruption index scores ranged from 87 (New Zealand, least corrupt) to 9 (Somalia, most corrupt). The index scores for the countries we examined ranged from 19 (Congo, 2018-19) to 59 (Costa Rica, 2017) over the 2012-2019 period. Score changes for our focal countries over the 2012-2019 period ranged from -8 (Madagascar, getting more corrupt) to 6 (Ecuador, getting less corrupt). Thailand's corruption index had a net decrease of 1 from 2012-2019, representing a slight increase in corruption. These data were obtained from Transparency International.

Year	Index value
2012	37
2013	35
2014	38
2015	38
2016	35
2017	37
2018	36
2019	36

3. Environmental Orientation

3.1. Environmental orientation overview

Environmental orientation is expressed through the Environmental Performance Index (EPI), which quantifies the environmental performance of a country's policies across 10 issue categories. EPI, as an indicator of a country's dedication to its environment, can help provide context as to how a country places value on the environment. These data were obtained from the Environmental Performance Index.

Biodiversity and habitats	Current rank	92
	Current score	74.91
	Baseline rank	76
	Baseline score	75.11
Marine Protected Areas	Current rank	53
	Current score	87.79

	Baseline rank	35
	Baseline score	87.66
Terrestrial biome protection (global)	Current rank	115
	Current score	62
	Baseline rank	103
	Baseline score	58.32
Terrestrial biome protection (national)	Current rank	97
	Current score	77.43
	Baseline rank	79
	Baseline score	75.48
Protected area representativeness index	Current rank	113
	Current score	31.87
	Baseline rank	105
	Baseline score	28.23

3.2. Legal environmental status—

Type of government: Democratic-republic	**Type of Law:** Hybrid, mainly civil law
General information about protected area (PA) management	

- **Relevant PA or PA System:** Western Forest Complex
- **Agencies managing PA/PA system:** Ministry of Science, Technology and Environment
- **Agencies providing funding for PAs:** National Budget allocation to Western Forest Complex by the Ministry of Finance (MOF) and direct allocation from MOF through salaries for rangers.

Domestic Legal Documents Related to Protected Area and Natural Resources Management

Document	Year of issuance (or effectiveness)	Initiating agencies	Enforcing agencies
Wild Animal Preservation and Protection Act	1960		Ministry of Agriculture
National Park Act	1961		Minister of National Resources and Environment
National Forest Reserves Act	1964		Minister of Agriculture
National Forest Policy	1985		
Enhancement and Conservation of National Environmental Quality Act	1992		Ministry of Science, Technology and Environment

The Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality	1997		Ministry of Science, Technology and Environment

Global/Regional Treaties related to protected area management		
Name of treaty	**Year of latest action**	**Affiliation**
Convention on Biological Diversity	2003	rtf
Convention Concerning the Protection of the World Cultural and Natural Heritage	1987	Ac
Ramsar Convention	1998	rtf
CITES	1983	Y

4. Protected area extent and changes

4.1 Number and Extent

Data on PA number, coverage, and types were obtained from Protected Planet.

100% Terrestrial	Coastal	100% Marine	Total
			238

Area Terrestrial		Area Marine	
Coverage %	Total land area (km^2)	Coverage %	Total marine area (km^2)
18.81	517787	1.88	306891

4.2 Changes to PAs

Changes to PAs are represented by instances of PA downgrading, downsizing, or degazettement. PADDD events are hypothesized to represent an indicator of how a government prioritizes PAs (or not). High levels of PADDD events may be an indication that the government has low priority for PAs. These data were obtained from the PADDD Tracker.

Year	Number of enacted PADDD	Area affected by PADDD (km^2)
2010	1	0.18
% total area affected by PADDD events	0.00%	
Major reasons for PADDD events	Infrastructure	

5. Interview Summary

***PA System* – Western Forest Complex, overall PA system in Thailand**

A. *History of financial support*

In Thailand the government has been playing a central role in environmental conservation from the beginning. PAs in Thailand receive a decent level of financial support from the Thai government. The government has invested large amounts of money to protected area systems. They are under the department of natural parks, wildlife and land conservation. The annual budget is about $350 million USD. The annual budget has remained quite stable ($300-350 million) over the last decade.

The Department of Natural Parks, Wildlife and Land Conservation was formed by splitting from the previous Royal Forest Department. The new department categorized areas into national parks and wildlife sanctuaries, and then smaller systems called non-hunting areas. National parks are promoted for tourism. Wildlife sanctuaries are more protection based. Under the Royal Forest Department, there were logging concessions which resulted in many fights between conservationists and loggers. Conservationists were successful in convincing the government to split the Forest department and the Department of Natural Parks, Wildlife, and Land Conservation, as this was also seen as a way to reduce corruption arising from mismanagement of natural resources (logging) and wildlife. The people who used to work in logging were either replaced or re-assigned to work inside national parks and wildlife sanctuaries. The department split was meant to keep conservation interests safe from interests related to natural resource extraction.

B. *Proportion of internal funding*

a. Greater than 90% of funding for protected areas comes from internal sources.

b. The Ministry of Natural Resources and Environment has an approximate annual budget of $350 million, and the level of spending on the PA network is considered barely adequate to adequate. The budget is sourced from general taxation, on top of which an additional $80 million of park entry fee revenue goes back to conservation activities. 5% of park revenue has to be given to communities around the park, 20% of park revenue is used to improve the park, and the rest goes back to the central government, but will be reallocated to parks eventually. Park concession fees are zero since logging concession activity has been stopped.

While revenues from entry fees have increased, the government budget has remained stable over the last 15 years. This is because the government feels that the funding is adequate. On the other hand, the government has pushed for increased management efficiency by introducing a SMART patrol system that monitors the movement and activities of park rangers, to reduce corruption and poaching. To quote our interviewee:

"When you try to convince the government to hire more rangers, pointing to India and Nepal – sometimes the government will want to use technology instead. To protect endangered species, you need people on the ground, not just drones […] but the government wants to use technology to drive down corruption."

C. *Has external funding influenced country support of protected area financing?*

External financing for PAs accounts for a small fraction of total spending on PAs and is considered "supplementary". NGOs such as WCS and WWF advise on management practices, and conduct research within the PA network.

The interviewee felt that there has been no significant influence. External funding is considered only supplementary, and thus the government will accept whatever it feels is applicable on a project basis. Money will usually come from international NGOs like WCS and WWF, however that international funding is not very reliable and is rather negligible. Sometimes extra funding comes from GEF to help on a 5-year project basis. NGOs are more influenced by management and improving the model of management. The Thai government is open to ideas; however, they prefer to keep funding internal.

Thus, rather than external funding, it is the introduction of innovative management practices and scientific protocol that is seen as more influential in incentivizing government funding. The government doesn't really care much about external funding, but the government does appreciate suggestions and practices of NGOs that help improve current PA and conservation management practices. This in turn attracts internal funding towards such practices, such as the development of SMART patrol.