

**The Proposition of Value:  
Leveraging Carbon Capital to Finance  
Biodiversity Conservation in Peru**

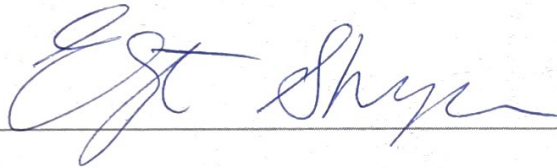
**Authors:**

Andrea Gonzalez Natera, [andrea.gonzalez.natera@duke.edu](mailto:andrea.gonzalez.natera@duke.edu)  
Yingle Su, [yingle.su@duke.edu](mailto:yingle.su@duke.edu)

Masters in Environmental Management Program  
Nicholas School of the Environment, Duke University

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**Advisor**

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Dr. Elizabeth Shapiro-Garza

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## **Abstract**

Carbon offsets and carbon markets have generated great interest in their potential as a market-based source of funding for biodiversity conservation. Since the concept of creating markets for “offsetting” greenhouse gas emissions was first discussed, there has existed an accompanying narrative that such markets would inevitably generate both profits for investors and “co-benefits” in the form of biodiversity conservation and associated sustainable development goals. However, because direct financial returns from forest-based carbon offsets seem both low, while also high risk, we ask why this approach is being so heavily promoted and implemented as a means to finance conservation.

Employing a comparative case study design, we examined four carbon-financed conservation projects in Peru to explore the set of “value propositions” offered by these projects and for whom to explore what is driving the continued interest and implementation of these schemes and to understand how various types of value (e.g. direct and indirect financial returns, reputational or social license value, political capital, etc.) are produced and captured and the barriers to doing so. Through analysis of project documents, promotional materials and the transcripts of key actor interviews, we developed detailed stakeholder maps and written case studies. Our final assessment maps and characterizes the values, costs, and risks accrued by each set of actors in the value chain and the ways in which these dynamics influence the viability of employing carbon offsets to finance biodiversity conservation.

## **Introduction**

### **Carbon Offset Markets**

The first section will give a general introduction of carbon offset markets regarding history, different market types, market mechanisms, and main players and actors. This section serves as the basis to better understand the four case studies discussed later. In this section, we explore what kinds of added values are adding to the project itself.

### **History of carbon offset markets**

The history of the development of carbon markets goes back around 30 years. According to S&P Global, the total worth of carbon markets reached \$272 billion, based on Refinitiv's analysis (Watson, 2021). The following section reviews the development of carbon markets from the idea of emissions trading back in the 1990s to the emergence of carbon markets starting in the 2000s. The first period is from the 1970s to the 1990s, representing the development of emissions trading. The second period was from the 1990s to the early 2000s, when numerous carbon markets at different regional levels were designed (Paterson, 2012). During that period, there is enormous enthusiasm in the development of carbon markets. The third period is between 2011 to 2014. The state of carbon markets had declined after its explosion from the second period due to the imbalance between supply and demand and the 2008 financial crisis (Kosoy and Ambrosi, 2010). The last period is after 2014 until now. There is still growing interest in the carbon market as more and more players entered into the projects.

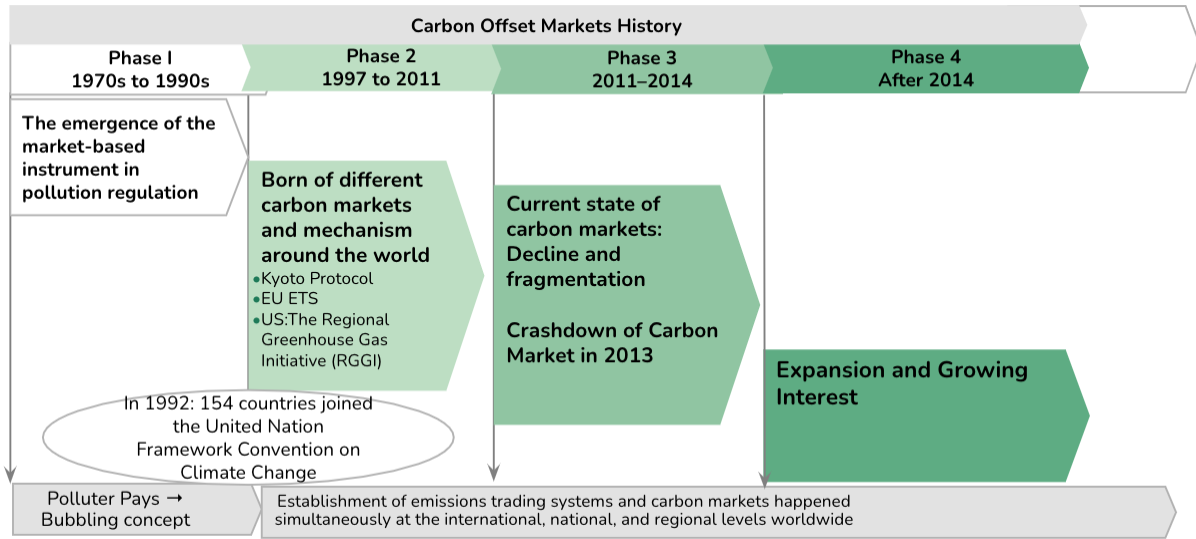


Figure 1: Carbon Offset Markets History

Figure 4: Major Carbon Market Policy Developments over Time



Source: Forest Trends' Ecosystem Marketplace. *State of the Voluntary Carbon Markets 2015*.

Figure 2: Major Carbon Market Policy Developments over Time from Hamrick, 2015

## **The 1970s to 1990s Phase I: The emergence of the market-based instrument in pollution regulation**

The emergence of carbon markets was associated with the development of emissions trading. In the 1990s, the fast economic development of industrialized nations led to stringent pollution regulations. Before that, the United States and most European governments had adopted the "polluter pays" principle to regulate pollution (Calel, 2013). The shortcoming of "polluter pays," and taxation is that business tycoons can still pollute without ceilings (Calel, 2013). A group of scholars, including Baumol WJ, David Montgomery, Roberts, and Spence, explored the possibility of market-based mechanisms for emissions trading (Calel, 2013). Even before the Kyoto Protocol was developed, the Environmental Protection Agency (EPA) in the US had come up with the first-ever policy instrument on emissions trading in the 1970s (Voß, 2007). "Bubbling" or the "bubble concept" was developed in 1972–1973 by the EPA (Voß, 2007). It referred to a factory that could transfer the quota of emissions between the facilities to reach an overall reduction (Voß, 2007). Under the "bubble concept," the idea that one facility could compensate for another facility extended to the definition of "offsetting." The first emergence of emissions trading as a policy tool was in 1977 in the Clean Air Act Amendments in the United States (Voß, 2007).

## **1997 to 2011 Phase II: Born of different carbon markets and mechanism around the world**

Between the 1980s and 1990s, the growing attention to climate change risks brought the carbon markets and emissions trading system to the international climate regime. In 1992,

166 countries agreed to collectively regulate greenhouse gas emissions during the UN Framework Convention on Climate Change (UNFCCC) at Earth Summit in Rio de Janeiro (Newell et al., 2014). The establishment of emissions trading systems and carbon markets happened simultaneously at the international, national, and regional levels worldwide. Some of the significant carbon markets in different regions will be reviewed to reflect carbon markets' evolution.

#### 1. The Kyoto Protocol

- The Kyoto Protocol was discussed and negotiated during the Third Conference of the Parties (COP3) in 1997 (European Commission, 2004). Under the Kyoto Protocol, the proposed requirements would limit GHG emissions for Annex B countries (Convention on Biological Diversity, n.d). Specifically, industrialized countries were required to reduce emissions by 5.2% below their 1990 levels during the commitment period of 2008–2012 (European Commission, 2004). The Kyoto Protocol is the first international non-voluntary carbon market, setting the GHG emission reduction targets and developing the carbon trade framework between countries (Newell et al., 2014). Countries can trade Assigned Amount Units (AAU) with each other for the sake of economic efficiency (Shishlov et al., 2016). Thus, the Kyoto Protocol set up the stage for trading emissions rights between countries. Specifically, countries that emit more can purchase emissions rights from countries that emit less, which solidifies the idea of "markets" in carbon trading (Convention on Biological Diversity, n.d). Another way to reduce the cost of compliance is to achieve the Kyoto Protocol's reduction

targets through a flexible mechanism (Convention on Biological Diversity, n.d). COP 6 in Bonn and COP 7 in Marrakech determine a series of "flexible mechanisms" to operate carbon trading between countries (Convention on Biological Diversity, n.d).

- Clean Development Mechanism (CDM) — Article 12 of the Kyoto Protocol: CDM is one of the largest schemes, with over 1,800 registered projects in September 2009 (United Nations, n.d.). Under CDM, multilateral financial institutions, private companies, NGOs, and governments can fund carbon-reducing projects, bringing over \$55 billion value in total by 2012 (United Nations, n.d.). The gathering of the carbon-reducing project from Certified Emission Reductions (CERs) generates carbon credits that can also be traded within Annex B countries except for AAUs (Shishlov et al., 2016).
- Joint implementation (JI) — Article 6 of the Kyoto Protocol: JI allows countries to purchase carbon credits generated by other Annex B countries to offset their emissions (Shishlov et al., 2016). The currency under JI is called emission reduction units (ERUs). The way JI works would not influence the overall emission reduction of the Annex B countries but redistribute the emission quotas (Shishlov et al., 2016).
- International emissions trading (IET) — Article 17 of the Kyoto Protocol: Annex B parties can trade AAUs under IET supervised by UNFCCC. Like JI, the trading of AAUs under IET would not affect the whole party's total cap (Shishlov et al., 2016).

## 2. EU ETS (Emission Trading System)

Before 1998, the European Commission introduced a carbon tax as a policy instrument to combat pollution, but it ended as a failure (Calel, 2013). The emergence of emission trading in Europe occurred between 1998 and 2003, urged by a series of internal and external actors (Wettestad and Gulbrandsen, 2017). Externally, the EU has committed an 8% reduction by the first commitment period (Newell et al., 2014). The reduction target speeds up the formation of an EU-focused emission trading policy. Internally, the carbon tax failure promotes the EU to study from the US in designing an emission-trading system (Wettestad and Gulbrandsen, 2017). The EU ETS design is highly decentralized under the consultation of relevant stakeholders and member-states (Newell et al., 2014). From 2005 to 2007 and 2008 to 2012, the allowances under EU ETS are free of charge (Newell et al., 2014).

## 3. United States

The United States has not ratified the Kyoto Protocol (European Commission, 2004); however, two crucial regional programs are being developed for emissions trading. The Regional Greenhouse Gas Initiative (RGGI) was established in 2009 by seven US states (Wettestad and Gulbrandsen, 2017). RGGI only regulates GHG emissions from the electricity and power sector. The mechanism of RGGI is allowance-based (Calel, 2013). It is different from other market mechanisms because all allowances from RGGI would be auctioned (Wettestad and Gulbrandsen, 2017). Another notable example from the United States is California's cap-and-trade program that follows the similar emission trading principle discussed before.

### **2011–2014 Phase III: Current state of carbon markets: Decline and fragmentation**

The state of carbon markets had declined after its explosion from 1997 to 2011. One main reason is the imbalance between supply and demand for the carbon markets (Kossoy and Ambrosi, 2010).

**Demand-side:** The number of available carbon credits in the compliance market (eg: CDM and JI) has started to decline for EU ETS (Michaelowa et al., 2019). As we know, the Linking Directive is the regulation that links the Kyoto Protocol carbon offsets in the EU ETS (Shishlov and Bellassen, 2012). There are different caps for countries, but the total limit for using the Kyoto carbon offsets is 1.45 billion tCO<sub>2</sub>e in Phase II (2008–2012) (Delbosc et al., 2011). Furthermore, there are other restrictions applied to the usage of Kyoto offsets. Specifically, carbon credits generated by hydropower projects, nuclear power projects, and projects registered after 2012 in countries other than Least Developed Countries (LDCs), among others, do not qualify (Shishlov and Bellassen, 2012). Although the projects for the demand of CER/ERU are around 1.65 billion tCO<sub>2</sub>e during Phase II, the actual amount might be around 1.3 billion tCO<sub>2</sub>e due to various restrictions (Delbosc et al., 2011).

**Supply-side:** According to the World Bank, the supply side follows the trend that the Clean Development Mechanism shrinks, and Joint Implementation and AAU grow (Kossoy and Ambrosi, 2010). The CER supply's downsizing is because of a reduced

number of projects, unexpected project delays, and economic recession in some countries (Kossoy and Ambrosi, 2010). The sudden significant increase of the carbon credits under JI is because, one, the political and regulatory uncertainties were being settled in Russia around carbon trading (Kossoy and Ambrosi, 2010); and, two, countries like Russia and Ukraine are afraid of the demand declining (Michaelowa et al., 2019).

Potential Demand from Industrialized Countries (MtCO <sub>2</sub> e)		Potential Supplies (MtCO <sub>2</sub> e)		
Country or entity	Kyoto assets demand			
<b>EU</b>	<b>890</b>	<b>Potential GIS</b>	<b>&gt;1,800<sup>1</sup></b>	
<i>Government (EU-15)</i>	350	Russian Federation	100	
<i>Private sector (EU ETS)</i>	540	Ukraine	400-500	
<b>Japan</b>	<b>300</b>	Eastern EU	1,325	
<i>Government of Japan</i>	100			
<i>Japanese private sector</i>	200			
<b>Rest of Annex B</b>	<b>32</b>	<b>CDM &amp; JI</b>	<b>1,225</b>	<b>range: 1,155-1,290</b>
<i>Government</i>	25	CDM	1,030	975-1,085
<i>Private sector</i>	7	JI	195	180-205
<b>TOTAL</b>	<b>1,222</b>			
<i>Government</i>	475			
<i>Private sector</i>	747			

Figure 3: The supply and demand balance for the Kyoto Protocol Market during 2008 to 2012 from Kossoy and Ambrosi, 2010

## Compliance markets vs. voluntary markets

There are two types of carbon offset markets: compliance markets and voluntary markets.

### **Compliance Markets**

Compliance markets work on a larger scale with regulatory entities at the international, national, subnational, and regional levels. In compliance markets, interested parties would surrender their emission rights to achieve the predetermined reduction or emission targets. Examples include the Clean Development Mechanism (CDM) under the Kyoto Protocol and EU ETS, as introduced earlier. Under CDM, countries can comply with the regulated targets through either emission rights trading or purchases at a global scale instead of merely reducing carbon emissions domestically (Lovell & Liverman, 2010). As mentioned before, the predetermined reduction target is 5.2% at the 1990 baseline for industrialized countries under CDM when law and regulatory entities are involved. Furthermore, project types, credit pricing, project designs, and CDM standards are all strictly regulated internationally by the CDM Executive Board of the UNFCCC (Lovell & Liverman, 2010). Another example of compliance carbon markets would be a cap-and-trade program. Under the cap-and-trade model, compliance markets can set the cap for quantities of GHG emitted for individuals or companies (Parajuli et al., 2019). Currently, California's Cap-and-Trade Program is such an initiative that enacts laws and regulations to set up standards for different carbon projects (Parajuli et al., 2019). From the above two examples, a common feature of compliance carbon markets is that they are highly regulated, with formally regulated entities at the national or international level. Due to their regulatory nature, CDM projects usually take longer to become validated; therefore, the compliance market has high transaction costs and inefficient validation time.

## **Voluntary Markets**

The voluntary market is a diverse landscape compared to the compliance market; it is more flexible, accessible, and informal. In the voluntary market, the motivation to participate in carbon offsetting can be purely personal and voluntary. It is different from compliance markets, where motivation is based on the mandatory reduction targets signed in those international environmental treaties. Due to this flexibility, there are no overarching standards and credit definitions in voluntary markets. The carbon credits' values can be changed based on various activities and calculations. The flexibility of voluntary markets diversifies what type of project falls into this category. Voluntary markets began expanding from 2003 to 2004 (Capoor & Ambrosi, 2007). Voluntary carbon markets are usually smaller than regulated ones, with only “0.1% of the global carbon market's total value.” (Peters-Stanley et al., 2011). The flexibility of voluntary markets determines several of the market's characteristics shown below.

1. **Innovation:** Since there is no regulation on voluntary markets, project developers can design various projects to trade the carbon credits. Usually, some small-scale projects can enter the market with innovative methodologies (Benessaiah, 2012).
2. **Lower Transaction Costs:** The absence of rules and regulatory entities lowers the voluntary market's transaction costs (Benessaiah, 2012). This feature attracts many small projects to the voluntary market. Meanwhile, faster validation time for small projects also enhances the voluntary markets' efficiency (Kollmuss et al., 2008).

3. **Broad Participation:** These projects are often located in non-Kyoto signatories. In this way, organizations active in voluntary markets have more opportunities to explore the Global South market.
4. **Uncertainty and Risks:** One feature of the voluntary market is that carbon credit prices may vary widely and remain fluid. According to NC State Eastern Forestry Notes, in the first quarter of 2018, MtCO<sub>2</sub>e's price varied from \$0.1 to \$70 (Parajuli et al., 2019). Furthermore, without regulations, voluntary carbon offsetting projects are questioned regarding their quality and additionality.

Within voluntary carbon markets, there are two ways that buyers can purchase carbon credits. One is through the formal exchange, and the other is through the "over-the-counter" (OTC) market (Corbera et al., 2009). The latter is a decentralized method through which buyers and sellers can interact directly or through carbon brokers (Peters-Stanley et al., 2011).

### **1. Chicago Climate Exchange:**

The Chicago Climate Exchange (CCX) is known as "the world's first and North America's only voluntary, legally binding, rules-based greenhouse gas emission reduction and trading system"(Carbon Markets|Climate Change Connection, 2014). The trade unit in CCX is called Carbon Financial Instrument (CFI). One CFI represents 100 tCO<sub>2</sub>e (Peters-Stanley et al., 2011). There are two ways for CFI to be traded: CFIs can be issued as allowance-based credits or as offset credits. CCX is membership-based, where all actors

like project developers, carbon credit suppliers, buyers, project aggregators, and carbon brokers must register as members in the CCX (Bayon et al., 2012).

## **2. The Voluntary “Over-the-Counter” (OTC) Market**

OTC Market refers to those projects that are neither regulated by a cap-and-trade system nor transacted through a formal exchange channel like CCX (Bayon et al., 2012). Due to the U.S. government's inaction on climate issues in 2010, the OTC market transaction reached 127.9 MtCO<sub>2</sub>e, making up 97% of the world's voluntary market share (Peters-Stanley et al., 2011). One OTC market characteristic is that carbon buyers' motivation for reducing emissions is purely voluntary (Bayon et al., 2012). For example, private companies could purchase carbon credits for corporate social responsibility or their emission targets.

### **Compliance Markets vs. Voluntary Markets**

**Offset Quality:** CDM projects or carbon projects in compliance markets emphasize environmental integrity so that every stage of implementing the project is highly regulated and stringent. Taking the Kyoto Protocol as an example, an international institutional structure was designed to ensure that every carbon project step is committed to achieving the reduction targets. Therefore, the CDM Executive Board was established to oversee CDM projects and affiliated methodologies (Corbera et al., 2009). The operation of CDM projects is supported by the international community, including through public databases, registries, and global transaction logs (Corbera et al., 2009). Under such an institutional

structure and detailed supervision, the quality of the offsets can be ensured. Compared to compliance markets, voluntary markets face the challenge of offsetting credibility issues. The free and flexible market mechanism makes it hard to uniformize standards and methodologies. Voluntary markets often fail “due to a lack of policing” (Gillenwater et al., 2007).

**Sustainable Development Benefits:** It is difficult to compare the co-benefits for the compliance markets and voluntary markets due to various variables. Some researchers discovered that small-scale projects yield better outcomes in terms of socio-economic benefits than large-scale projects (Olsen, 2007). As tables 1 and 2 show, the percentage of small and micro-projects in the compliance markets is only 22%, compared with 46% in the voluntary markets (Corbera et al., 2009). Furthermore, in the voluntary markets, the total offset value for micro and small projects is 14%, whereas, in the compliance markets, the value is only 1% (Corbera et al., 2009). The data shows that small-scale projects in voluntary markets generate higher offsets than in compliance markets (Corbera et al., 2009). However, the number of small-scale projects in the CDM is more significant than that of voluntary markets. This way, it is hard to determine which markets generally produce better sustainable development benefits.

**Table 4 of 5**  
**Table 4. Projects and transaction volumes by projects size in the CDM<sup>1</sup>.**

Project size	2006			2007			2008		
	Number of projects <sup>2</sup>	Percentage relative to number of projects (%)	CERs share up to 2012 (%)	Projects	Percentage relative to number of projects (%)	CERs share up to 2012 (%)	Projects	Percentage relative to number of projects (%)	CERs share up to 2012 (%)
Micro (less than 5 ktCO <sub>2</sub> e/year)	63	4.3	0.1	127	4.6	0.1	168	4	0.1
Small (5 to 14.99 ktCO <sub>2</sub> e/year)	266	18	1.2	356	12.8	1	515	12.4	1
Medium (15 to 99 ktCO <sub>2</sub> e/year)	774	52.4	14.2	1485	53.4	16.3	2293	55.2	18
Large (100 to 499 ktCO <sub>2</sub> e/year)	293	19.9	22.6	685	24.6	30.9	997	24	32.7
Very large (over 500 ktCO <sub>2</sub> e/year)	80	5.4	61.9	128	4.6	51.7	178	4.3	48.2
<b>TOTAL</b>	<b>1476</b>	<b>100</b>	<b>100</b>	<b>2781</b>	<b>100</b>	<b>100</b>	<b>4151</b>	<b>100</b>	<b>100</b>

<sup>1</sup>Data from UNEP/RISOE November 2006, 2007 and 2008 for comparative purposes.

<sup>2</sup>Includes registered, at validation and under review projects, but excludes withdrawn and rejected projects.

Table 1: Projects and transaction volumes by projects size in the CDM from Corbera et al., 2009

**Table 5 of 5**  
**Table 5. Projects and transaction volumes by projects size in the voluntary markets<sup>1</sup>.**

Project size	2006			2007		
	Number of projects <sup>2</sup>	Percentage relative to number of projects (%)	Percentage of VERs/CFIs transacted (%)	Number of projects	Percentage relative to number of projects (%)	Percentage of VERs/CFIs transacted (%)
Micro (less than 5 ktCO <sub>2</sub> e/year)	19	28.4	4	Not available	-	4
Small (5 to 14.99 ktCO <sub>2</sub> e/year)	12	17.9	10	Not available	-	8
Medium (15 to 99 ktCO <sub>2</sub> e/year)	14	20.9	22	Not available	-	38
Large (100 to 499 ktCO <sub>2</sub> e/year)	12	17.9	22	Not available	-	17
Very large (over 500 ktCO <sub>2</sub> e/year)	7	10.4	34	Not available	-	32
Mixed	3	4.5	8	Not available	-	1
<b>TOTAL</b>	<b>67</b>	<b>100</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>100</b>

<sup>1</sup>Data from Hamilton et al. (2008b; 2007).

<sup>2</sup>Projects surveyed and not all of those existing in the markets.

Table 2: Projects and transaction volumes by projects size in the voluntary markets from Corbera et al., 2009

**Future:** Currently, in light of the COVID-19 pandemic, the interest in combating climate change surged. At the end of 2020, 1,656 companies announced their net-zero climate targets (Streck, 2021). These companies represent over 3.5 gigatons of annual greenhouse gas (GHG) emissions in total (Streck, 2021). Compared to the compliance

markets, in 2019, the voluntary carbon markets achieved the highest level of offset transaction volume since 2010 (Donofrio et al., 2020). Aside from reliance on government commitments and actions, carbon offsetting provides an alternative strategy to serve as a middle way for private entities to realize their climate change commitments (Streck, 2021). The potential and impact that carbon markets drive are huge but not without risks and challenges.

**Figure 1. Historical Market-Wide Voluntary Offset Transaction Volumes, 2019**

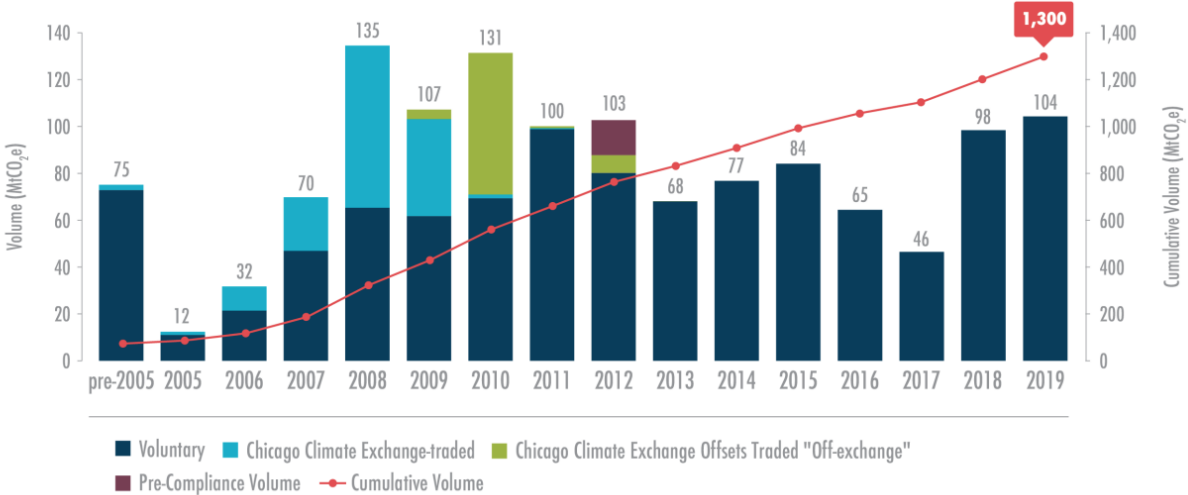


Figure 4: Historical Market-Wide Voluntary Offset Transaction Volumes, 2019 from Donofrio et al., 2020

**The mechanism and how carbon offset markets work**

Carbon offsetting is the idea of “compensation for greenhouse gas emissions through funding for carbon reduction projects in the global South”(Carton & Andersson, 2017). Specifically, the carbon offsetting model allows carbon to be reduced in the world by “compensating” for extra emissions at one place through carbon reduction projects at

another placer (Bumpus and Liverman, 2008). Before getting into how carbon offset markets work, it is crucial to know the carbon trading unit is CO<sub>2</sub>e, usually known as Carbon dioxide equivalents. CO<sub>2</sub>e "... is a measure of all greenhouse gases in their equivalence to CO<sub>2</sub>." (Climate Change Connection, 2020). In this way, the tradable carbon units are often denoted as CO<sub>2</sub>e in both compliance and voluntary markets.

### **Mechanism of CDM**

The mechanism of carbon offset markets changes a little bit between compliance markets and voluntary markets. We will use CDM as an example to illustrate how carbon offset markets work with regulation. For the compliance market, the buyer is often government or Kyoto signatory countries. Figure 4 briefly summarizes each stage and activity that a project needs under CDM.

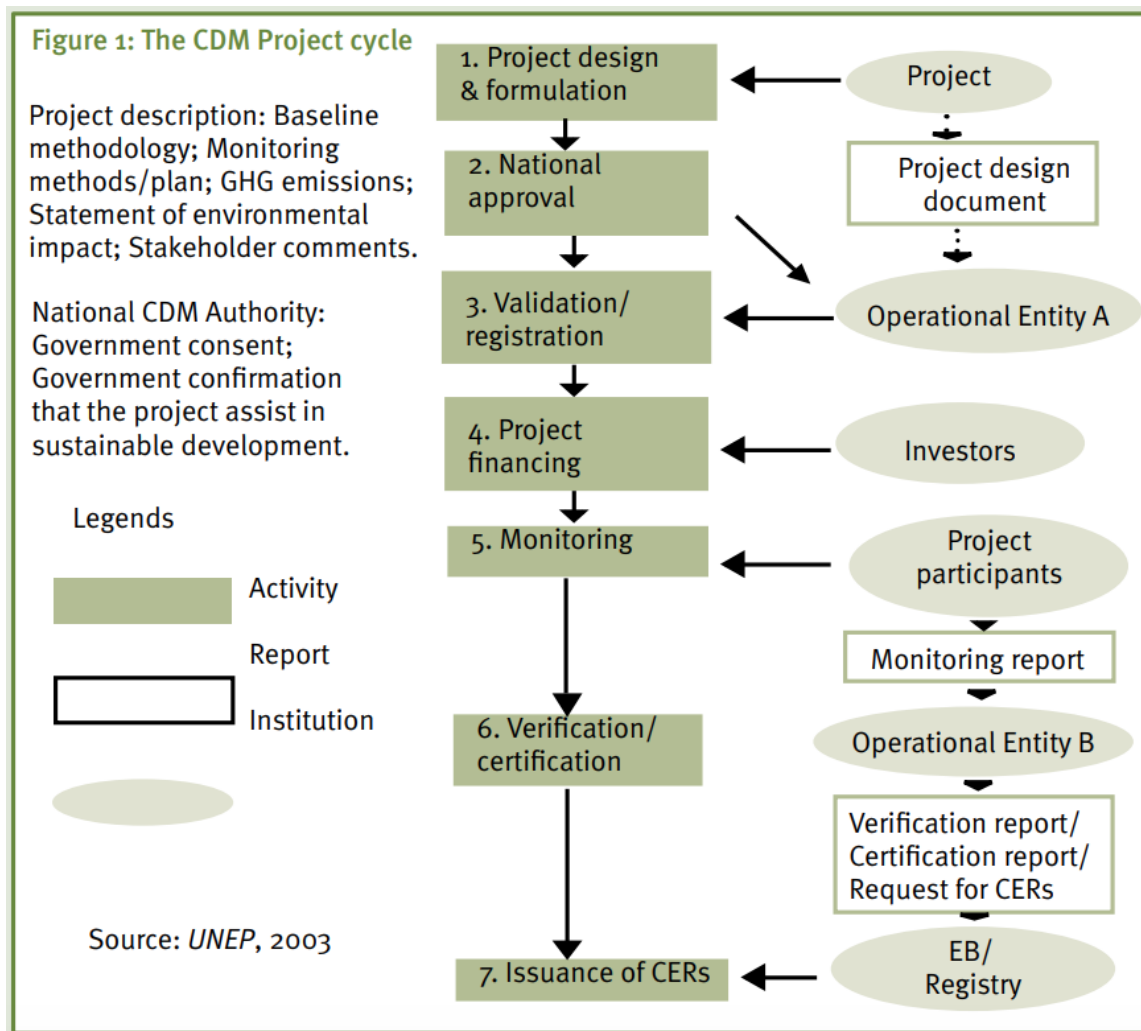


Figure 5: The CDM Project cycle from Peskett et al., 2006

### Stage one: Project Design

Project Design is the stage to determine methodology, stakeholder consultation, and initial project concepts. These elements should include in the Project Design Document (PDD) (UNFCCC, n.d.). The project participants should carry out the preparation of PDD. The content of PDD needs to have a project description, the choice of methodologies, additionality tests, duration of the project, stakeholders' opinion, selection of baseline, monitoring and regulation plan, and the description of environmental, social, and economic impacts (UNFCCC, n.d.).

- *Stakeholder Consultation:* Stakeholder consultation is vital for project developers, and it has to happen at two dimensions, both at the international and local levels. The purpose of having stakeholder consultation is to ensure that project activity would not cause any adverse effects on the project site's population and local communities' livelihoods(Kollmus et al., 2008). Project developers need to ensure that all relevant stakeholders know how to submit comments regarding the project. Last, project developers need to respond to the stakeholders' comments and make action plans to minimize the impact (Kollmus et al., 2008).
- *Choice of Methodologies:* Among these different components, two of the most critical components are applicable methodologies and feasible additionality. Project developers can either propose a new methodology or use approved methodologies. Methodologies need to address the baseline for the mitigation activity, determine the project activity's monitoring requirements and calculate emission reductions (Carbon Finance Project Development Workshop, 2008). The benefits of proposing a new methodology are that the project developer can adjust the methods based on the project's real-world situations (UNFCCC, n.d.). The downside is that the new methodology takes a longer time and steps to review high transaction costs and failure risk. The project developers widely use approved methodologies to have clear instructions and requirements (Carbon Finance Project Development Workshop, 2008).

- *Additionality*: Additionality is the concept that the project developers need to demonstrate the offsets, or the project activity would not have happened without CDM as an incentive (Kollmus et al., 2008). According to Kyoto Protocol in Article 12.5, further explains the definition of additionality as “reductions in emissions [...] are additional to any that would occur in the absence of the certified” (UNEP, n.d.).

### **Stage two: Host Country Approval**

During the approval process, the project developers need to have a Letter of Approval from the Designated National Authorities (DNA) (Carbon Finance Project Development Workshop, 2008). In this Letter of Approval, there are three primary elements: first, this project is ratified for Article 12 of the Kyoto Protocol; second, project participation is voluntary; third, this project helps the host country to achieve the sustainable development goal (UNFCCC, 2016). The submission and screen process for host country approval might differ from countries to countries (Kollmus et al., 2008).

### **Stage three: Validation/Registration**

At the validation stage, project developers need to hire independent UN-approved third-party auditors, also known as Designated Operational Entities (DOE) (Kollmus et al., 2008). The DOE would review the documents mentioned at previous stages, like Letter of Approval, PDD, and stakeholder consultation outcomes Carbon Finance Project Development Workshop, 2008). After reviewing the available records, DOE would schedule on-site tours to the project site for visits and interviews with stakeholders if needed (Kollmus et al., 2008). Furthermore, DOE will publish the project information and PDD to the public for a 30-day comment period (UNFCCC, 2016). After resolving all

apparent issues, DOE would issue a validation report and submit it to the CDM Executive Board (UNFCCC, n,d).

#### **Stage Four: Registration**

The formal acceptance of the project is when CDM EB validates the project. Before the formal registration, CDM EB has the jurisdiction to request a review of the project (Rwanda Environment Management Authority (REMA), 2010). The project can either be registered with changes after CDM EB's review or being rejected.

#### **Stage Five: Monitoring**

Monitoring stage documents all the emission data with the approved methodology and plan in the PDD. Below is an example of the monitoring plan for a project in rural households. The monitoring process is essential as it is the key to generate CERs (Rwanda Environment Management Authority (REMA), 2010). The records of emission data need to be in accordance with the parameters provided in the original PDD (UNFCCC, 2016). The recording data needs to be documented in the monitoring report.

ID number	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
A	Quantitative	Number of PV kits installed	Units	m	continuously	100%	Paper Electronic	15 years after installation	Data are recorded continuously
B	Quantitative	Number of running PV kits	units	m	monthly	100%	Paper	15 years after installation	Data are recorded monthly with the fee recovery

Figure 6: Monitoring plan for Photovoltaic kits to light up rural households :

Source: World Bank, Carbon Finance Project Development Workshop Ulaanbaatar, Mongolia, 2008

#### **Stage Six: Verification**

Verification is the stage where a third-party auditor verifies emission data. To avoid the conflict of interest, the entity that verified the emission data is not the same entity that validated the project (Kollmus et al., 2008). During the verification stage, the verifier needs to schedule on-site visits to the project site and review the documents handed in by project developers (Rwanda Environment Management Authority (REMA), n.d.). The time intervals to verify the emission are based on the decision of project developers.

### **Stage Seven: Issuance**

After the project is being verified, relevant documents and verification reports will be sent to the CDM Executive Board for review (UNFCCC, 2016). After CDM EB's approval, the issuance of CERs or other equivalent credits will transfer to the project developers (Kollmus et al., 2008).

### **Stage Eight: Commercialization**

After the issuance of carbon credits or CERs, project developers or project owners can sell the credits to any market buyers. Project developers can either sell the credits directly to the seller or through a middle man, carbon brokers, or transaction companies (Kollmus et al., 2008). Also, the selling of credits can happen at any stage before the issuance of CERs.

### **Mechanism of Voluntary Market**

On the other side, the voluntary market went through a similar mechanism to the compliance market. There are also buyers, carbon brokers, retailers, financiers, and project developers for the voluntary market. The difference is the definition of carbon credits, the value calculation, and the standards used to validate and verify. As

discussed earlier, voluntary markets do not follow any mandatory policies. Currently, there are two sources of carbon offsets being traded in the voluntary market. One is CERs from the compliance market, and another is VERs (Verified Emission Reduction) in the voluntary market (Kollmus et al., 2008). Like the compliance market, although there is no compulsory requirement, project developers in the voluntary market would also seek third-party standards to prove the “additionality” of the projects (Hamrick et al., 2015). Next, project developers also need to establish baseline emission reduction targets and other project activities in the Project Design Document (PDD). For verification and, similar to compliance markets, project developers need to find an independent auditor to validate the mitigation activity to sell the market credits (Hamrick et al., 2015). Due to the absence of a regulatory entity, the establishment of rules-based organizations in voluntary market completes the market mechanism:

1. *Voluntary standards*: It refers to the rules and standards designed to frame the project development and relevant criteria (Lang et al., 2019). The standards in carbon offsetting are known as the methodology of how the amount of carbon would be calculated, verified, registered, and enforced (Galatowitsch, 2009). The standards covered the technical part of a carbon offsetting project regarding how many carbon credits can eventually be traded (Kollmus et al., 2008). In the compliance market, Regional Greenhouse Gas Initiative (RGGI), Clean Development Mechanism (CDM), and Greenhouse Gas Abatement Scheme (GGAS) are commonly the predetermined standards that are used in the carbon offsetting projects. In the voluntary market, third-party standards are flexible enough to innovate and experiment with their practices with different tasks. The

freedom of voluntary markets also leads to the rapid expansion of third-party standards regarding projects' types and geographical location. The figure shows the mainstream offset standards in the voluntary carbon markets of 2010.

Standard	Description	Co-Benefits Req'd?	Registry	Geographic Scope	Total Projects Registered	Total VERs Verified <sup>1</sup>
American Carbon Registry Standard	Certification program for offsets, and an emissions reporting registry	No	Registry incorporated	Global	25	31.3 MtCO <sub>2</sub> e
Brasil Mata Viva Standard	Certification program for forestry offset projects	Yes	Markit	Brazil	9	0
CarbonFix Standard	Certification program for forestry offset projects	Yes	Markit	International	4	0.7 MtCO <sub>2</sub> e
Chicago Climate Exchange Offset Program	Internal system for offset credits verified to CCX standards	No	Registry incorporated	Global (historically US-focused - 60%)	340	83.5 MtCO <sub>2</sub> e
Climate Action Reserve	Registration and verification program for offsets and registry	No	Powered by NYSE Blue	US and Mexico currently; Canada soon	286	11.7 MtCO <sub>2</sub> e
Climate, Community & Biodiversity Standard	Validation & verification standard for land-based carbon offset projects	Yes	Projects on website; on VCS registries, CCB label can be added to VCUs issued from projects that are also CCBS verified	International	32	VERs not issued
EPA Climate Leaders Offset Guidance	Guidance for companies on voluntary offset use	No	No	International	4 approved projects	None
Gold Standard	Certification program for renewable energy and energy efficiency carbon offset projects	Yes	Powered by NYSE Blue	International	247	4.6 MtCO <sub>2</sub> e
Green-e Climate	Certification program for retail offset products	No	Registry incorporated	International	23	176.2MtCO <sub>2</sub> e certified
ISO 14064/5	Certification program emissions reporting, offset projects, and carbon credits	No	No	International	Unknown	Unknown
J-VER	Verification and certification scheme for offset projects	No	J-VER	Japan	75	34,148 tCO <sub>2</sub> e
Panda Standard	Certification program for offsets, and an emissions reporting registry	Yes	Under development	China	2 pilot projects selected	0
Plan Vivo Standards	Certification program for forestry offset projects	Yes	Markit	International	5	1 MtCO <sub>2</sub> e issued and retired
SOCIALCARBON Standard	Validation program for offset projects	Yes	Markit registry	South America, Asia & Europe	37	1.5 MtCO <sub>2</sub> e
VER+ Standard	Certification program for offset projects and carbon neutral products	No	TÜV SÜD BlueRegistry	International	32	3.7 MtCO <sub>2</sub> e
Verified Carbon Standard	Certification for offset project & carbon credits	No	Project Database; VCS registry system powered by Markit, NYSE Blue, and CDC Climat	International	555 validated and registered	49.4 MtCO <sub>2</sub> e

Source: Ecosystem Marketplace, Bloomberg New Energy Finance. Note: Data in table is accurate as of December 2010.

<sup>1</sup> Total refers to the entire volume of VERs verified during Standards' existence, as of December 2010, except where otherwise noted.

Figure 7: Offset Standards in the Voluntary Carbon Markets, 2010 from Peters-Stanley et al., 2011

2. *Carbon Credit Registries*: Registries serve as a tool to track and facilitate the transacted carbon credits for transparency and ownership (Peters-Stanley et al., 2011). By publicly publishing the issued carbon credits or verified projects, independent registries ensure that transacted carbon credits won't be used or claimed multiple times to keep the transparency (Lang et al., 2019). Registries utilize serial numbers to track the issued credits. Once the credits are being sold, the registries can retire the serial number so that project owners cannot resell the credits in the market (Kollmus et al., 2008). As the below table shows, registries also work closely with standards to share data and track issued credits.

5.7.1 TABLE 9: **Registries Used by Each Standard**

<b>Standard</b>	<b>Accepted Registries</b>	<b>Approval Process</b>
<b>CDM</b>	CDM Registry	Verification documents need to be approved by the CDM Executive board
<b>GS</b>	Gold Standard Registry (currently under construction, predicted start date early 2008) For CERs: CDM Registry; GS-labeled CDM serial numbers will be tracked in the Gold Standard registry For VERs: Gold Standard Registry	Verification documentation for CER and VER projects are approved by the Gold Standard Technical Advisory Committee CERs are issued by the UNFCCC and the Gold Standard label is delivered by the Gold Standard VERs are issued by the Gold Standard
<b>VCS</b>	In the process of accrediting multiple VCS registries that are electronically connected and transfer data between each other in real time. All registries will be connected to a central VCS project database which is under development and aiming to launch in March 2008.	Verification documents are approved by the third party auditor.
<b>VER+</b>	Blue Registry of TÜV SÜD	Verification documents are approved by the third party auditor and then forwarded to BlueRegistry administration. All VER+ projects must be registered in the BlueRegistry.
<b>VOS</b>	Is planning to establish their own registry	For GS VERs: see above. For other VOS VERs: verification documents are approved by the third party auditor (DOE)
<b>CCX</b>	CCX Registry	Offset projects need to be approved by the CCX Committee on Offsets
<b>CCBS</b>	N/A	N/A
<b>Plan Vivo</b>	Plan Vivo Registry	Plan Vivo sells ex-ante credits (Plan Vivo Certificates) which are recorded in their own registry
<b>GHG Protocol</b>	N/A	N/A
<b>ISO 14064-2</b>	N/A	N/A

Figure 8: Registries Used by Each Standard from Kollmuss et al., 2008

### Main players and Actors

Carbon markets involved different players and actors like governments, buyers, sellers, NGOs, and private companies. To better understand how carbon offset markets work, it is significant to learn about the carbon offset markets' leading players.

## **Project Developer**

Project developers usually refer to the entities that want to develop a carbon offsetting project. Project developers can be individuals, organizations, or specialized service providers (Kollmuss et al., 2008). For the voluntary market, project developers enjoy the power of sourcing new and interesting projects that cannot be passed in the compliance market (Kollmuss et al., 2008). In the voluntary market, the project developer can be local NGOs, local government, communities, or companies. The entities need to have a project plan, project design, definition of project activities, and assess the relevant impacts. Project developers can sell the offsets directly to the end carbon credits buyer or through a third party like carbon brokers.

## **Aggregator/Carbon Broker/Retailer**

Usually, there are two ways that a project can be sold; one is through the brokers or aggregators another is through the investors (Voluntary Carbon Market - Overview, Participants, and Advantages, n.d.). Brokers and retailers served as intermediaries to operate orders from either buyer or seller sides and thus charge a commission fee. Aggregators usually gather a group of small projects together to aggregate for more CO<sub>2</sub>e (Galatowitsch, 2009). The role that brokers or retailers play is to facilitate and assist the transaction of a project and bring both sides together into the market places. Carbon brokers serve as the “matchmaker” for the companies that are new entrants to this complicated marketplace and help them to navigate through different projects

(Hamrick et al., 2015). These intermediaries are usually affiliated with professional organizations, like registry, agency, network, to work(Galatowitsch, 2009).

### **Carbon Credit Buyer**

Buyers are at the endpoint of carbon offsetting processes and could be private companies or individuals. They are the entities that would take an offsetting approach to compensate for their emission activities. Usually, credit buyers' motivation is for varied reasons, but most are social responsibility, supply chain risk, reputational risk, and transformation to low-carbon operations (Galatowitsch, 2009).

### **Project Funder**

Financial institutions like venture capital, banks, or investment management firms could give money to fund the interested carbon projects. Sometimes large foundations or international/regional NGOs like the World Bank and USAID can also be project funders.

### **Independent, Third-Party Auditors, Verifiers and Validators**

As discussed earlier, in the compliance market, DOE is the auditor. In the voluntary market, auditors, validators, and verifiers function as the role of DOE to monitor the emission reduction and issue certified carbon credits.

### **Standard Organization**

In the voluntary market, since there is no mandatory regulation, a group of organizations serves the role of standard-setting regarding methodologies, verified carbon credits, and operation of the projects (Lang et al., 2019).

## **Forest-based Carbon Offsetting Markets**

This section will dive into the forest-based carbon offsetting markets. The following paragraphs discussed the definition, different types of forest-based carbon offsetting markets, drivers in the forest carbon offsetting markets, and main players. The four Peru case studies in our research are forest-based carbon offsetting activities. This section would help to learn about the contexts and background of forest carbons.

### **The definition of forest-based carbon offsetting**

In combating climate change, the forest plays a vital role as a carbon sink and carbon dioxide emission source in the ecosystem. According to the data, there are “2,200 gigatonnes (Gt) of carbon in the terrestrial vegetation and soils, while 1,200 Gt of carbon is stored in the globe's forests.” (Kooten & Johnston, 2016). Every year, an estimated 125 Gt carbon would exchange between the atmosphere and terrestrial vegetation, making up two-fifths of exchange between the earth and atmosphere (Kooten & Johnston, 2016). According to the US Forest Service, 16% of carbon dioxide equivalent emissions are being captured by US forests from burning fossil fuels (Vose et al., 2012). It is out of consideration of forestry's significant impact in reducing the GHG emission, and the regulatory authority started to include forestry projects as the carbon offsetting project to encourage tree-planting activities (Coleman, 2018).

Despite the significance of forests to our ecosystem, forestry investments are relatively risky. The progress in increasing forest-based carbon offsetting is relatively slow (Gaast et al., 2018). According to the research, the significant incentives for forestry projects with carbon offsetting from 2010 to 2015 come from the funding of governments to improve the forestry practices, instead of coming from the carbon market itself (HBS & ODI, 2015). One example of the development of forest-based carbon offsetting is New Zealand. New Zealand was the first country to have forestry under the New Zealand Emissions Trading Scheme (NZETS) in 2008 (Coleman, 2018). Specifically, forest owners in New Zealand could receive carbon credits for one tone of carbon dioxide sequestered during the growth (Coleman, 2018). After harvesting, the sequestered carbon credits need to pay back to the government (Coleman, 2018). Between growth and harvest, forestry owners can sell the carbon credits for financial return. However, the mechanism of NZETS is not particularly attractive to investors.

Usually, the following stages exemplified how carbon offsets are being determined in the U.S forestry projects (Forestry and Afforestation | RGGI, Inc., n.d.) :

Stage 1: Estimate the current carbon stock for the project and determine the baseline

Stage 2: Predict and estimate the carbon for the harvest trees during the project period.

Stage 3: Determine both the actual carbon stock and harvest carbon

Stage 4: Calculate the reduced GHG emissions (Forestry and Afforestation | RGGI, Inc., n.d.)

Forest-based carbon offsetting follows the exact mechanism as the carbon market, as discussed in the previous section. Compared with other offsetting activities, the difference is that forest-based carbon offset is based on a tree's growth. During the development of trees, trees would absorb carbon dioxide throughout the photosynthesis process (Parajuli et al., 2019). Absorbed carbon dioxide would store in the biomass of a tree. In this way, forest-based carbon offset refers to the carbon dioxide that is either avoided or stored, purchased by the emitter to "compensate" for their emission at another place in the world (Yankel, 2018). The unit of forest carbon is also "... a metric ton of carbon dioxide equivalent (CO<sub>2</sub>e) "(Parajuli et al., 2019). Overall, the method to generate forest-based carbon offsets is by changing the management and practices of forestry to store and sequester the additional carbon(Osborne & Shapiro-Garza, 2018).

Forest-based carbon offsetting provides the opportunity for both environmental and societal perspectives to slow down the emissions from fossil fuel and land use (Parajuli et al., 2019). Socially, managing forests can become another source of income for the landowners in the global south. We will discuss the co-benefits of the forest-based carbon offsetting projects in the following sections.

### **Different types of forest-based carbon offsetting**

According to IPCC, four activities have been widely acknowledged by the international community as qualified forest-based carbon offsetting projects (IPCC, 2000; IPCC, 2006). There are two other kinds of projects on the downstream that are also forest-based carbon offsetting across forestry projects' value chain.

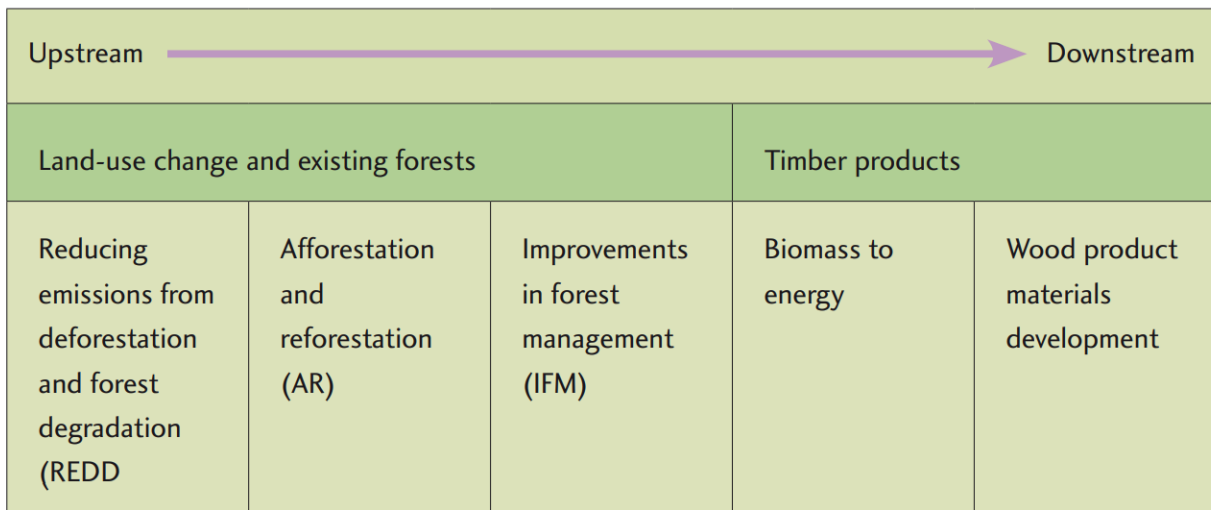


Figure 9: Types of forest project along the value chain from Chenost et al., 2010

### Afforestation

Afforestation refers to the carbon offsets generated throughout the creation of a forest that has not been forested in recent times (Parajuli et al., 2019).

### Reforestation

Reforestation project refers to the carbon offsets generated throughout the rebuilding of a forest. Specifically, trees might be planted previously on the land but cannot create the forest independently. Activities like tree-planting or others that can enhance sequester carbon's ability are qualified as reforestation (Kooten & Johnston, 2016).

### Avoided Conversion (AC)

Forests that convert on non-forest land like farms may cause extra carbon emissions. The effort to prevent the conversion for agricultural usage of a forest can generate

carbon offset through the avoided carbon emission. One thing to note is that the project developer for AC needs to prove that the current forest is under a high possibility for conversion to validate the AC project (Parajuli et al., 2019). Reduced Emissions from Deforestation and Degradation (REDD) exhibits a similar mechanism as Avoided Conversion, where both projects yield offsets through avoiding deforestation (Bertazzo, 2019).

### Improved Forest Management (IFM)

Improve Forest Management's general idea is through a better and efficient method to yield more carbon offsets. Some project types under IFM include increasing the rotation age of forests, enhancing forests' productivity by getting rid of disease trees and managing vegetation, improving harvest practices, and keeping a high stock (Yankel, 2018).

### Reduced Emissions from Deforestation and Degradation (REDD or REDD+)

Reduced Emissions from Deforestation and forest Degradation, or commonly known as REDD, is a way to combat tropical forest deforestation. The first time REDD was mentioned was during the UNFCCC in 2007 (Hamrick et al., 2015). During the 15th UNFCCC at Copenhagen, an Accord was drafted, which later served as the basis to complete REDD, to ensure that economic instruments would promote the Reduced Emissions from Deforestation and Forest Degradation (Danielsen et al., 2011). In the beginning, forestry conservation projects were not eligible as a carbon offsets program under Kyoto Protocol (Danielsen et al., 2011). In this way, voluntary market actors

mainly drove REDD projects' growth (Danielsen et al., 2011). There are two types of REDD+, which are REDD+ projects and REDD+ programs. Independent organizations create REDD+ projects to carry out forest conservation activities (Hamrick and Gallant, 2017). REDD+ programs, on the other hand, are designed by the nations or governments at a larger scale (Hamrick and Gallant, 2017). The plus sign refers to if the REDD project/program has additional benefits in sustainable development or poverty alleviation (Hamrtick et al., 2015; Bertazzo, 2019).

## **What are some drivers in forest-based carbon offsetting**

### **Mitigate Climate Change**

Among various carbon offsetting projects, forest-based carbon might be one of the most popular project formats in the landscape. According to the EDF, 20 percent of carbon emission comes from deforestation (Anser, n.d.). A reason that drives forest-based carbon offsetting is the effort to reduce GHG emissions through forests. Unlike other carbon offsetting projects, forests played an essential role in combating climate change. Forestry supports the whole ecosystem through water, air, and biodiversity. The ability to trap and keep the carbon for a long time in a relatively stable state is considered an excellent strategy to combat climate change. Also, simply planting trees or decreasing deforestation can help to avoid carbon emissions. The effort that planting trees causes is a lot smaller than investments in renewable energy, like solar panels.

### **Co-benefits**

Another drive to the implementation of forest-based carbon offsetting is the co-benefits and associated impact generated. Co-benefits refer to the benefits generated other than reducing GHG emissions throughout the carbon projects. Among the 17 Sustainable Development Goals (SDG) proposed by the United Nations, carbon offsetting activities are one method to achieve the goal “Climate Action”(United Nations, 2018). However, for forest-based carbon offsetting projects, people started to realize the high relevance and intersection with other SDGs such as “clean water and sanitation,” “sustainable cities,” (Hamrick and Gallant, 2017). In 2017, the most-mentioned co-benefits besides emissions reduction increased employment for the local community(Hamrick and Gallant, 2017). Frequently, co-benefits are the primary reason that attracts numerous buyers to buy the carbon credits or sellers to develop the projects. The International Small Groups Tree Planting programme (TIST) is an example that provides co-benefits to the local communities in Tanzania, Uganda, and Kenya through the sales of forest carbon offsets (Peskest et al., 2006). Specifically, the TIST would train the villagers to participate in the projects. Except for planting and caring for the trees, villagers are also responsible for monitoring and obtaining the data (TIST Program, n.d.). Villagers would divide into different small groups to perform the work (TIST Program, n.d.). The payments would transfer to the group quarterly (TIST Program, n.d.).

### **Drivers for REDD**

To learn about the drivers for REDD, we need to know what are the drivers for deforestation. Turning forests into farmlands is a much more lucrative option for the farmers and local people in developing countries. The massive production of

commodities like soybeans, palm oil, and the cacao has a higher financial return than forestry conservation activities (Boucher et al., 2011). The following figure shows the total value of four selected commodities was \$134 billion in 2011 (Boucher, 2015). The pressure to protect forests from deforestation seems very difficult. In this way, REDD drivers are evident that we want to slow down deforestation and increase carbon storage by providing payments to conservation activities. The following figures summarize 37 REDD+ projects for significant deforestation drivers and another 34 REDD+ projects for the drivers and activities to reduce deforestation (Hamrick and Gallant, 2017).

## Exports of the Major Drivers of Deforestation (tropics only, billion \$)

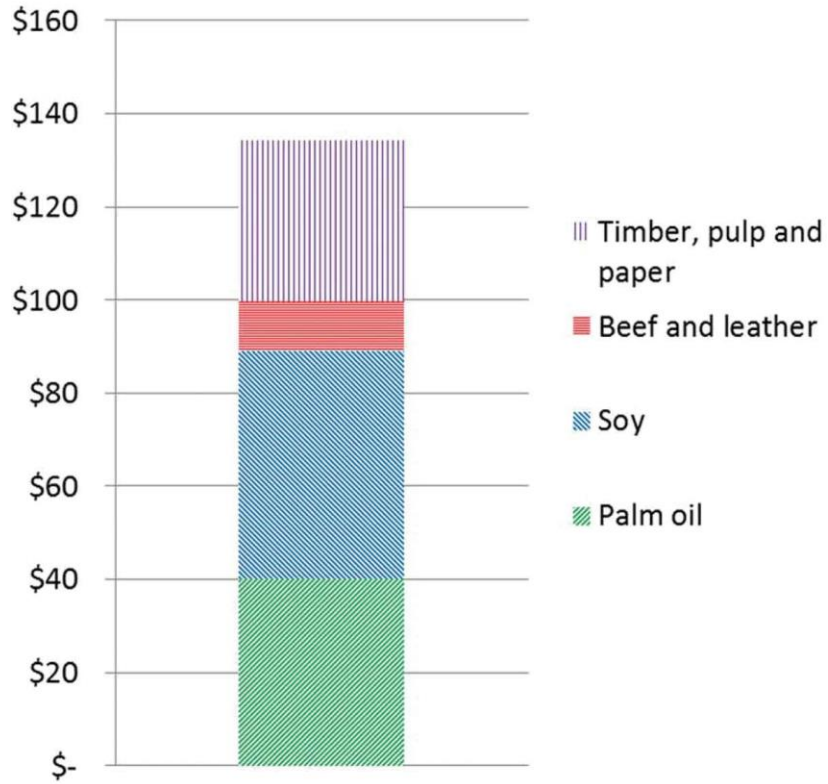


Figure 10: Exports from tropical countries of the four significant commodities driving deforestation, from United Nations Commodity Trade Database (COMTRADE)

(Boucher, 2015)

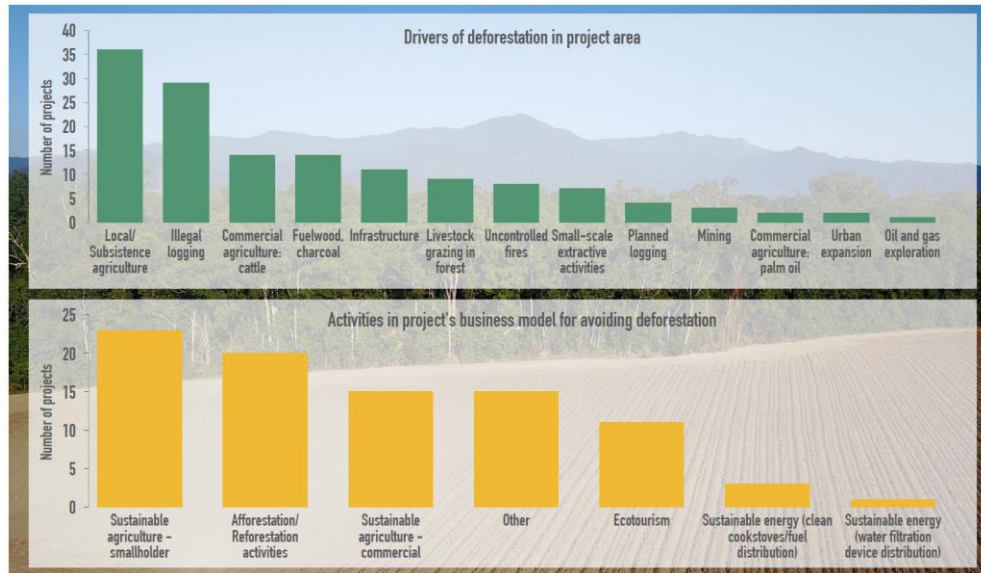


Figure 11: Drivers of Deforestation and Activities Reducing Deforestation from Hamrick and Gallant, 2017

## Revenue and Return

Forest-based carbon offsetting can benefit the circular economy, especially for the bioeconomy (Jonsson et al., 2021). A recent modeling study points out the direct linkage between wood-based production and forest-based bioeconomy (Jonsson et al., 2021). Specifically, increased production of wood products can promote the increased consumption of other relevant products like paper, biofuels, boards, and job creation. Taking European Union as an example, the extra usage of harvest wood products can decrease the import of swan wood from other countries and reduce the reliance on the resource-intensive industry (Jonsson et al., 2021).

## What are some main players in forest-based carbon offsetting

Based on the fundamental carbon markets mechanism, we can summarize the players in forest carbon projects into three categories: supply side, demand side, intermediaries, and other services providers (Chenost et al., 2010).

**Supply-side:** Project developer, Governments, International Organizations

**Demand-side:** Countries, voluntary buyers like private companies, organizations, individuals,

**Intermediaries:** Investors, Funders, financing institutions, carbon brokers

**Other services provider:** technical assistance, capacity building, risk analysis, and carbon offsets quality control

### **Demand-side Buyers**

Buyers usually refer to an entity or individual who wants to buy the offsets to meet regulations requirements or to have voluntary commitments to reduce carbon emissions. For buyers like private companies, the main driver is to brand and market themselves as a for-profit entity that cares about corporate social responsibility (Gifford, 2018).

### **Intermediaries Investor**

Investors are the people who want to gain profits from funding money for the projects or out of the purpose to support sustainable development (Fu, n.d.). There are several ways that an investor can gain money, either from the shares of the credits or from the

credits that the project successfully sold (O'Connor and Gaertner, 2018). Furthermore, funders will receive the payments from project developers through carbon offsets' sales to repay the up-front fund.

### **Critiques of the carbon offsetting market**

For this section, we focus on discussing the critiques of the carbon offsetting markets.

Carbon offsetting has always been controversial since the emergence in the market. There might be numerous criticisms that can be placed towards the carbon offsetting market. One of the major critiques might be the unequal access to resources and violent land displacement to the poor or rural communities throughout the carbon offsetting (Carton & Andersson, 2017). The nature of how carbon offsetting operates pose many challenges and obstacles to the local people. First, local communities in third-world countries lack the knowledge and capacity to fully understand a carbon offsetting project's requirement. Usually, it is difficult to have accurate data on the carbon credits gained, and carbon dioxide equivalent absorbed due to the uncertainty of harvesting, natural disaster, and local socio-economic situations(Carton & Andersson, 2017). The accountability of carbon projects in rural areas may significantly influence local people's livelihoods and sources of income. Furthermore, except for the uncertainty in carbon accounting, most of the projects are developed based on investors' and buyers' interests. Environmental benefits and social benefits are not the priority for project development (Gifford, 2018).

Except for the critiques on the local communities, the narratives that the whole carbon offsetting project creates may also lead to a less incentive society to reduce the emission fundamentally (Carton & Andersson, 2017). Carbon offsetting is an invisible tool to balance the dynamics in the markets may eventually lead to the absence of a carbon offset program one day, as investors and project developers found it difficult to determine the additionality of the projects.

## **Peru Context**

Peru is a leader in using forest-based carbon offsets to finance conservation initiatives mostly through REDD+. The following section will provide background in the political, socioeconomic and environmental context in Peru to better understand how a combination of these factors both facilitate and present barriers to the implementation of for-profit conservation. The first section will provide a brief overview on Peru's history, geography, economy and general environmental policy. The second section takes a closer look at Biodiversity conservation in Peru. Finally, the third section provides a more detailed evaluation of Forest-based carbon offsetting and carbon offset markets in Peru.

### **Short history and geography.**

Peru is Latin America's third biggest country after Brazil and Argentina. It is located in western South America, bordering Chile to the south, Colombia and Ecuador to the north, Brazil and Bolivia to the east and the Pacific Ocean to the west. Peru is known for being a megadiverse country (McNeely et al., 1990; Noss, 1990; Shanee et al., 2017) with 19 ecoregions as seen in Figure 11.

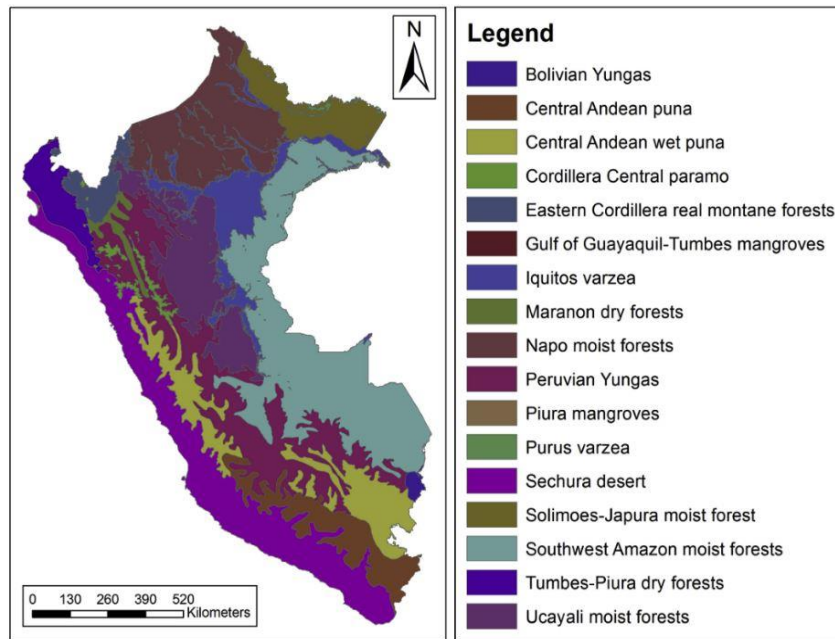


Figure 12: Peru's major ecoregions, Shanee et al. (2017), based on Olson & Dinerstein (1998) and Olson et al. (2001)

It is also home to 2,703 indigenous communities belonging to 44 native groups (INEI, 2018)

In the Peruvian Ministry of the Environment (MINAM) 2015 National Landcover map the country is divided into four main regions: Tropical Amazon (lowland forest), Yunga (highland forest), Andean (Sierra) and Coast(MINAM, 2015).

The tropical Amazon region has the highest species richness and vegetation biomass levels of the country. It has a wet climate with precipitation ranging from 1,000 to 4,000 mm/year and average temperature of over 24°C.

The Yunga is densely vegetated. Located in the eastern side of the Andes with an elevation of 800 to 3,600 meters. Like the amazon this region is also wet with annual precipitation between 2,000 to 8,000 mm but with lower temperatures. West of the Yunga is the Andean region which can be subdivided into western slope and Puna

region. The puna region limits the Yunga and has elevations higher than 3,500 m with shrubs and cold climate ranging from 6 to 15°C. The last major region is the coast, an arid region with little vegetation. (MINAM, 2015). Of all ecoregions, the Amazonian lowland and Andean montane and pre-montane cloud forest host most of the country's vertebrates (Shanee et al., 2017).

Peru, like most Latin American countries, was created after a war of independence from Spain in 1821. After a period of instability Peru prospered from 1895 to 1914 thanks in part to sugar, cotton, oil and rubber exports (need citation). Yet, following an economic depression in 1930s the region experienced political tensions, including assassination of then President Sanchez Cerro in 1933 and the 1948 and 1968 army coups. In 1968 General Juan Velasco took power. He reformed the agriculture sector and nationalized many of Peru's industries hoping to achieve a redistribution of power from elites. For example, in the Madre de Dios estate land called *latifundos* was redistributed to workers (Garrish et al., 2014).. By 1975 the country's numerous economic woes (inflation, unemployment and public debt) led to another Coup, this time led by General Francisco Morales Bermudez, he would govern until the 1980s presidential elections. Around the same time that Morales Bermudez took power, a terrorist organization called Sendero Luminoso, inspired by far-left regimes, started directing attacks that would continue until the 1990s causing the death of over 70,000 Peruvians.

After an economic crisis during the government of Alan Garcia, in 1992 Alberto Fujimori became president. He would stay in power until his resignation in 2000 after facing corruption charges. This era is known as Fujimorismo. His rule is characterized

for rightwing conservative social politics and the implemented several neo-liberal politics such as widespread privatization of state own industries and the promotion of international investment.

After Fujimori's resignation Peru enjoyed constant economic stability under the government of Alejandro Toledo (2001-2006), Alan Garcia(2006-2011), Ollanta Humala (2011-2016), Pedro Pablo Kuczynski (2016-2018) however all four were involved in one of Peru's biggest corruption scandals, the Odebrecht case (Aquino, 2020). This led to the resignation of then president and retired Wall Street investment banker Kuczynski who was succeeded by former vice president Matín Vizcarra.

In 2019 Vizcarra dissolved the conservative congress claiming their obstruction of political reform and efforts to fight corruption. In retaliation, the congress suspended his presidency (Kurmanaev & Zarate, 2019). In March 2020 a new congress was elected and in November 2020 they voted to impeach Vizcarra on grounds of moral incapacity. Peruvians, already suffering from economic decline and high coronavirus related death rates, took to the streets in protest. The newly appointed president and former head of congress, Manuel Merino resigned and was replaced by Francisco Sagasti a former engineer and first-time legislator. As of November 2020, 68 of the 130 members of congress are under investigation for corruption and fraud (Turkewitz & Kurmanaev, 2020).

### **Relationship between the economy and natural resources.**

Peru's environmental regulation has always been complicated by the country's reliance on natural resources. This dates back to the country's origins. In its early years

the country thrived on extraction and exportation policies for Guano which was the country's main commodity from 1840 to 1880 (Mathew, 1970).

Among Latin American countries Peru has been considered one of the most liberal especially regarding exportation. Gootenber argues that "Peru's liberal state (...)serve mainly to facilitate unimpeded relations between national export elites and overseas interests and markets" and that this can be traced back to the free trade policies of the Age of Guano in 1850(Gootenberg, 1954).

Central to Peru's continuous economic growth of the 1990s until the 2018s is the exportation of raw materials, reinforcing Peru's dependence on natural resources , especially mining and hydrocarbons. In 2013 Mining represented 12% of the GDP, while silviculture, fishing and agriculture sectors represented 6%. This combined with increases in consumption have contributed to an increase in degradation of ecosystems despite new environmental legislation (OCDE & CEPAL, 2017).

Regarding the Peruvian amazon region most laws have attempted to establish the "colonization" of the land with the purpose of resource management. An example of this is the 1909 Ley General de Tierras de Montaña (Ley 1220) which stated that land legislation would help promote development in eastern zones and provide stability guarantees to agricultural and rubber industries (Charpentier & Hidalgo, 1999).

The amazon colonization and exploitation trend has continued well into the twenty-first century. Between 1999 and 2009, mining oil and gas exploration land allocations in the Peruvian Amazon increased from 15 to 72%(Haselip, 2011; Monterroso et al., 2017). By 2010 around 41% of Peruvian amazon was destined for

hydrocarbon concessions. Around 50% of concessions overlapped with community titled lands and 20% of concessions overlapped with protected areas (Finer & Monterroso et al., 2017;Orta-Martínez, 2010;).

In 2008 and 2009 conflict erupted between indigenous communities in Peruvian Amazon and the government because of the 1064 proposed decree that would open up the Peruvian Amazon for international investment and provide a mechanism for obtaining petroleum exploration, hydroelectric dams and logging permits bypassing indigenous groups(Finer & Orta-Martínez, 2010; Romero, 2009). Rosa da Conceição et al. found in interviews with former high level environmental ministry decision maker and Programa Bosques staff that “the Free Trade Agreement (FTA) signed between Peru and the United States in 2007 was cited (Interviews 7, 9, 10) as one of the triggers for forest sector reforms, e.g. vis-à-vis timber trade and command-and-control policies”(Rosa da Conceição et al., 2015). The subsequent protests culminated in the 2009 Bagua province confrontation; 33 civilians were killed and 200 hurt. Three months after the start of protest the government annulled the 1064 decree. To make amends, in 2011 the government issued the Forestry and Wild Fauna Law “Ley Forestal y de Fauna Silvestre” (Ley 29763) which recognized exclusive rights of use of forest resources to native and rural communities in their lands .

Despite this, most of the government focus continues to be the expansion of privatization and investments. In Madre de Dios mining concession increased from 50 in 1978 to 2,700 at the end of 2015 and over 2 million hectares suffer from concession overlaps (Monterroso et al., 2017). The 30230 (2014) and 30327 (2015) laws loosen mining environmental regulations and facilitate the delivery of any rural property to

investment projects assigned by COFOPRI (Chase Smith et al., 2016; Monterroso et al., 2017).

A more recent example of the priority given to economic growth over environmental concerns are the tensions that aroused when Martín Vizcarra, president of the Ministry of Agriculture (Minagri) asked for the dismissal of Luis Alberto Gonzales-Zúñiga, then director of the National Forest and Wildlife Service (SERFOR). Gonzalez-Zúñiga stated that the dismissal was due his refusal to endorse an amendment of the forestry law that would encourage deforestation by enabling Amazonian forest concessioners to deforest the land if a soil analysis determines that the soil has an agricultural vocation (Sierra Praeli, 2020).

The federal government is not the only entity that supports extractive industries. Ravikumar et al. found that in 2018 the Ucayali and Madre de Dios regional governments strongly supported extractive economic activities such as oil palm, agricultural intensification, and gold mining in Madre de Dios. They speculated that these conditions made involving and collaborating with regional governments in REDD projects difficult (Ravikumar et al., 2018). This is in direct contrast to the government of San Martín where conservation and deforestation are central to government plans.

Rural areas in Peru are especially dependent on extractive activities. Evans et al. interviewed community members from Ampiyacu-Apayacu river basin, located in Loreto. They found that logging is an essential part of their economy with an estimate of 50 % of men working as loggers, most of that is illegal. Debt is a central aspect of logging, merchants from the capital pay loggers in advance (give *habito*) and later loggers give

wood to pay off their debt. Loggers usually end up deep in debt but have the financial liquidity for family needs. When asked, community members agreed that the forest was being degraded but expressed their frustration as having few economic alternatives to illegal logging (Evans et al., 2014).

### **Environmental policy in Peru.**

During the 1970s important environmental legislation took hold in Peru with the Ley General de Aguas , Ley General de la Minería and Ley Forestal y de Fauna Silverstre as well as the creation of the National Office of Natural Resource Evaluation (ONERN). It wasn't until 1979 that environmental regulation was introduced to the Peruvian constitution stating the right to live in a healthy environment (Charpentier & Hidalgo, 1999).

The 1990's Código del Medio Ambiente (CMA) introduced more integrated norms of the environmental concerns with productive activities but Peru still lacked enforcement capacity (Charpentier & Hidalgo, 1999).

### ***Institutions.***

Peru is a decentralized unitary state, governance is divided into national, regional, and local (article 189 of the Constitution). In actuality, there are three main national institutions in terms of land use and resources: the Ministry of Energy and Mines (MINEM), the Ministry of Agriculture (MINAGRI) and the Ministry of the Environment (MINAM).

MINAGRI is responsible for land classification, monitoring, promoting and distribution. All classifications must be approved by MINAM (Wieland Fernandini & Sousa, 2015).

After some failed attempts in 1981 to create a Ministry of the Environment, the National Council of the Environment (CONAM) was created in 1994 (OCDE & CEPAL, 2017; Takahashi & Meisner, 2012). To address the contradictions between sector-based laws and insufficient institutional capacity implementation the Ministry of the Environment (MINAM) was created in 2008 (Takahashi & Meisner, 2012). MINAM integrated several existing environmental institutions such as CONANP, the National Institute of Natural Resources (IRENA), the National Service of Meteorology and Hydrology (SENAMHI), the Institute of Amazon Investigations, and the Peruvian Geophysical Institute and the National Service for the Protection of Natural Areas and the Agency of Environmental Evaluation and Enforcement (Takahashi & Meisner, 2012). MINAM is responsible for territorial planning, this includes Ecological Economic Zoning (ZEE). ZEEs collect and model environmental, social, cultural, and physical data to determine best land uses, ZEEs are not binding. ““The recent economic stimulus package has essentially confirmed that the Ministry of Environment’s ordenamiento territorial [territorial planning] cannot have any legal power and that it can only be used as a guiding tool” (Kovacevic, 2014).

The National Forest and Wildlife Service (SERFOR) is an entity attached to the Ministry of Agriculture responsible for the promotion and sustainable management of Peru’s wild flora and fauna. It defines forestry policy, provides technical assistance and promotes “productive ventures and investments related to forest plantations,

ecotourism, wildlife management and management of timber and non-timber forest products" (SERFOR, n.d.). SERFOR also oversees 13 Forest and Wildlife Technical Administrations across the country.

Also under MINAGRI, the Agency for the Supervision of Forest Resources and Wild Fauna (OSINFOR) is in charge of monitoring the sustainable use and conservation of forest resources granted by the State through various forms of exploitation (FAO, n.d.).

The National Service of Natural Protected Areas (SERNANP) is a technical-regulatory authority attached to the Ministry of the Environment. It oversees the conservation of Natural Protected Areas and as such is "the governing body of the National System of Natural Protected Areas by the State" (SINANPE). SERNANP coordinates with property owners of private conservation areas, regional and local governments to carry out its duties (SERNANP, n.d.).

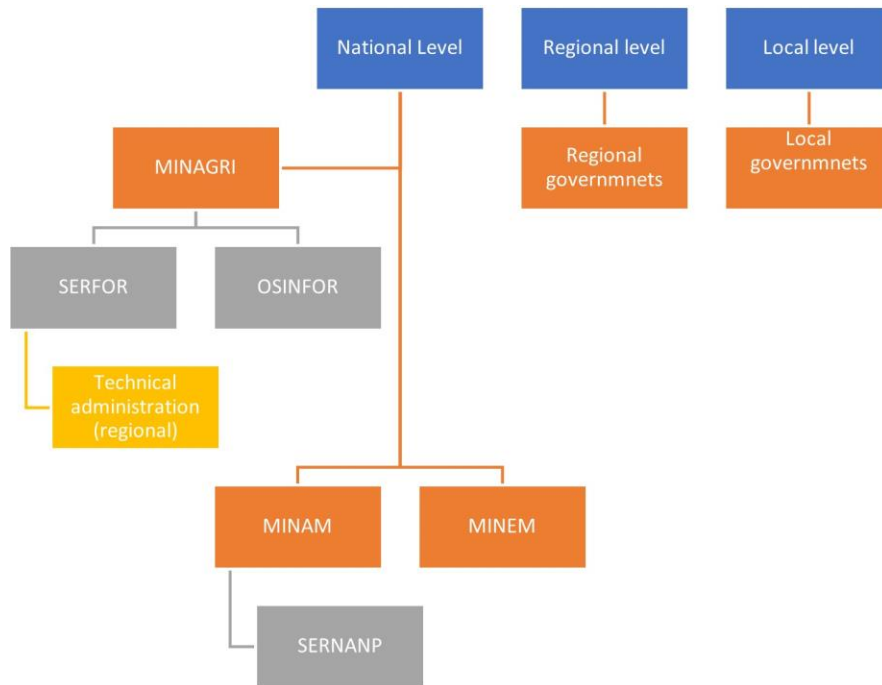


Figure 12: Peru's different government institutions chart

***Legal status of Natural Resources and Environmental Services.***

According to the Peruvian constitution (article 66), natural resources (renewable and non-renewable) belong to the state. The 1997 creation of Ley Orgánica de Aprovechamiento Sostenible de los Recursos Naturales (Ley 26821) establishes the general legislation for all-natural resources .

In the case of forest resources, it's commercial and industrial use is governed by yearly management plans and is subjected to a system of concession, authorizations

and permits under the Forestry and Wild Fauna Law “Ley Forestal y de Fauna Silvestre” (Ley 27308)(OCDE & CEPAL, 2017).

The 2014 Payment for Ecosystem Services Law “Ley de Mecanismos de Retribución por Servicios Ecosistémicos” (Ley 30215) provides mechanisms for economic retributions for ecosystem services. According to the Payment for Ecosystem Services law, ecosystem services are the social, environmental and economical benefits obtained from the correct functioning of ecosystems. “PES schemes are defined as the mechanisms, tools, instruments and incentives applied to generate, channel, transfer and invest economic resources for the conservation, restoration and sustainable use of the sources of ecosystem services. The law recognizes contractual freedom for the contributors and beneficiaries to agree on PES schemes to be implemented. However, the mechanism proposal must be assessed and approved by MINAM”(Wieland Fernandini & Sousa, 2015).

Regarding carbon credit generated from projects located in Natural Protected Areas (NPA) , the 26-2014-SERNANP resolution states that whoever has been issued a management agreement with the National System of Natural Areas Protected by the State (SERNANP) may commercialize carbon credits. For credits derived from REDD+ projects in NPA, income from the sale of carbon credits must be reinvested in the National Protected Area (Wieland Fernandini & Sousa, 2015).

### ***Land Allocation.***

Allocation In 1974, Amazonian indigenous groups protection, legal recognition and collective rights to land were formally recognized by the Law of Indigenous

Communities and Agrarian Promotion of the High and low forest "Ley de Comunidades Nativas y Promoción Agraria de las Regiones de la Selva Alta y Selva Baja " (Ley 20653) (Monterroso et al., 2017). Later, in 1975 with the introduction of the Forestry and Wild Fauna Law (Ley 27308) , forest control was centralized and only the Peruvian government could own forest land. Private companies, communities, or individuals had to have a contract with the stat to make use of forest resources. This meant that communities had to undergo a soil analysis to determine best use of land. If the land was categorized as agricultural land, they could obtain a land title, if the land was labeled as forest then communities where issued a usufruct contract(Monterroso et al., 2017).

In 1992, land titling functions were transferred to the Ministry of Agriculture (MINAGRI). Starting in 2002 a legal framework for promoting decentralization gave regional governments responsibility on land titling for indigenous communities. Low resources made the process slow and ineffective, it was not until 2006 that the transfer of responsibilities was complete (Monterroso et al., 2017).

Because of the problems created by the decentralization of land titling, MINAGRI was again assigned land titling functions. To carry out its duties the ministry created the Cadastre, Titling and Land Registry in Peru project (PTRT) (OCDE & CEPAL, 2017).

Land titling continues to be a source of conflict. The process does not include conflict resolution and in some instances the process has been blamed for loss of territory and blurring land boundaries. In 2019, Larson et al. found that 41% of title communities experienced conflicts with external actors compared to 31% for untitled

communities. They also found that village leaders considered land titling as the source of conflict (Larson et al., 2019).

In contrast, for the titling process for private investors, the regional government oversees the process so long as the land is classified as agricultural land. The land title is granted after a purchase agreement (Wieland Fernandini & Sousa, 2015).

As previously stated, if land is classified as Forest then they are managed under concessions. Concessions were established in 2000, they are overseen by the Dirección de Supervisión de Concesiones Forestales y de Fauna Silvestre (OSINFOR). Forestry concessions can either be awarded for timber purposes or for non-timber purposes. Non timber purposes include ecotourism, use of non-timber products, wildlife management, conservation, reforestation and environmental services. As of 2013, around 10 million hectares are under a forest concession, 74.8% of those are under a timber management concession. Following timber conservation (10.8%) and brazil nuts (8.6%) are the biggest (OCDE & CEPAL, 2017).

Natural Protected Areas (NPA) are recognized by their importance for biodiversity conservation and contribution to sustainable development. All NPA belong to the National System of Natural Protected Areas (SINANPE). Regional Conservation Areas are areas that do not meet the biodiversity criteria to be considered NPA but are ecologically significant. It is worth noting that unique regional governments, local governments cannot create protected areas. Additionally, private landowners can request the creation of a Private Conservation Area. The classification is granted by MINAM and only lasts 10 years (Wieland Fernandini & Sousa, 2015).

All NPA are managed by The National Service of Natural Protected Areas (SERNANP). “SERNANP may enter into administration contracts with nonprofit legal entities for a maximum period of 20 years and has the power to modify or terminate such contracts”(Wieland Fernandini & Sousa, 2015).

In 1992 a fiduciary fund managed by PROFONAPE, a private nonprofit, was established with the purpose of directing the financial resources destined for the National System of State’s Protected Natural Areas (SINANPE). The fund has channeled resources fundamentally arising from the exchange of bilateral debt for nature(Charpentier & Hidalgo, 1999).

It is worth nothing that land governance in Peru is complicated by the many entities involved in land management. An excellent example is CIFORS work on depicting the “complicated multi-level, multi-jurisdictional landscape of Madre de Dios, Peru” (CIFOR, 2015) depicted in the figure below.

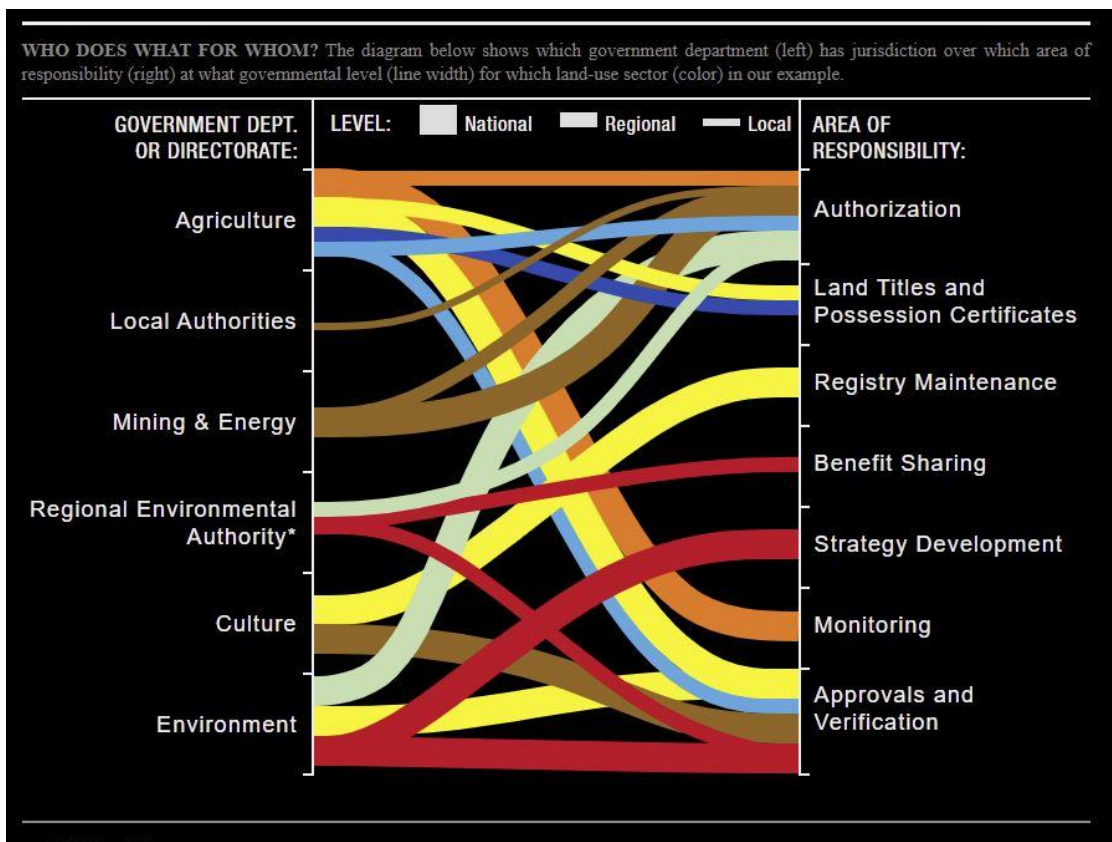
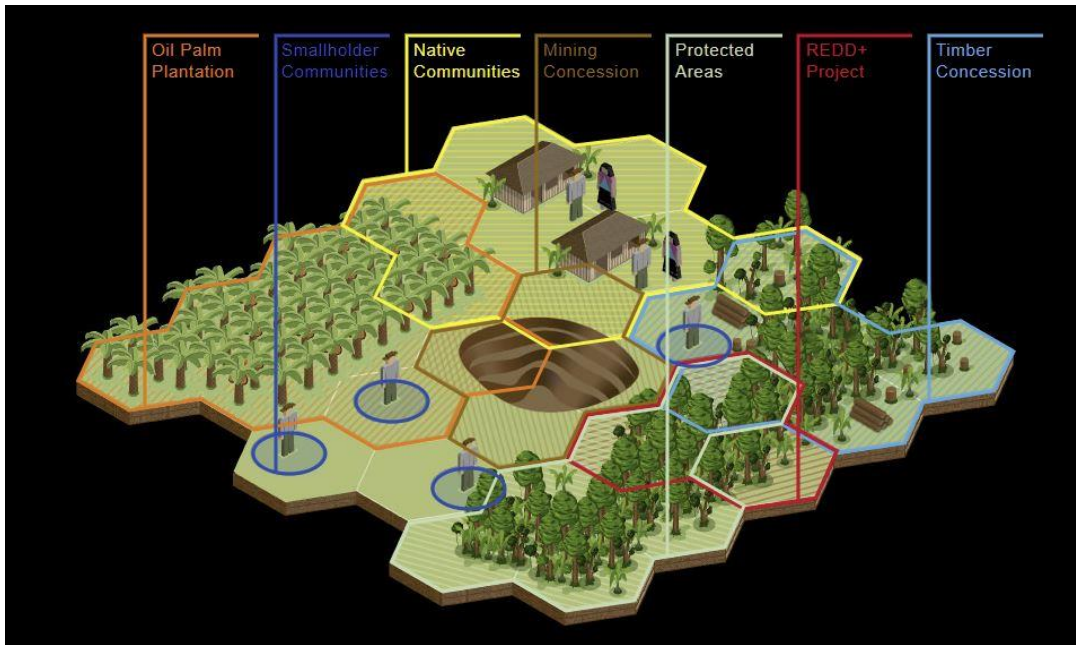


Figure 13: The Complexity of Governance | infographic CIFOR 2015

## **Biodiversity conservation in Peru**

### **History of Conservation in Peru.**

As mentioned above, article 68 of the Peruvian Constitution was the first time that reference was made to the importance of natural resources and biodiversity . In 1993 the Legislative Resolution 261818 ratified the Convention on Biological Diversity signed in Rio de Janeiro. This served as the groundwork for the 1997 Law on the Conservation and Sustainable Use of Biological Diversity (OCDE & CEPAL, 2017) and later the National Strategy for Biodiversity in 2001. The 2001 National Strategy for Biodiversity stated the need to strengthen the National System of Natural Protected Areas (SINANPE) and made the execution of the SINANPE plan a priority. It also declared that the conservation of Biological Diversity should not only be restricted to protected areas, but rather that the State must promote and encourage conservation policies for the private management of lands (Sánchez et al., 2001).

Between 2003 and 2012 Peru dramatically increased the number of protected areas (both marine and terrestrial) from 40 to 64 resulting in 18% of Peru's territory, below the 20.8% Latin American average (OCDE & CEPAL, 2017).

The 2014-2018 National Strategy for Biodiversity reported the implementation of instruments aimed at the in situ sustainable use of natural resources, with conservation, ecotourism and non-timber forest concessions amounting to an additional 20.5 million hectares of land under some sort of conservation agreement. However, many areas still suffer from land degradation (MINAM, 2014).

## Drivers of deforestation and land degradation.

The biggest driver of deforestation and ecosystem degradation in Peru is change of land use due to agricultural expansion, logging, cattle ranching, hydrocarbon extraction and mining (OCDE & CEPAL, 2017). Between 2001 and 2014, 1.7 million hectares of Amazonian forest were lost, most of it in the San Martín and Loreto departments (Piu & Menton, 2014), see figure 14.



Figure 14: Amazon Deforestación 2000-2014, from MINAM Mapa nacional de cobertura vegetal.

Since the 2014 high deforestation in the Peruvian Amazon has decreased but it still remains higher than it was before 2008.

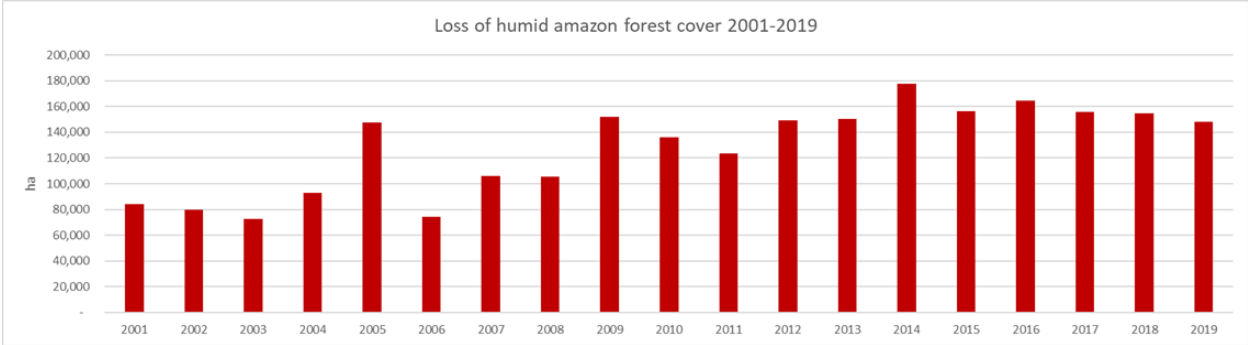


Figure 15: Loss of humid amazon forest cover 2001-2009, (GEOBOSQUES, 2019)

Deforestation drivers can be split into two categories, direct and indirect drivers. These are summarized in the table below.

Deforestation Drivers in Peru	
Direct	Indirect
Infrastructure	Demographic
Agriculture	Economic
Illegal crops	Political
Hydrocarbons	Institutional
Mining	Legal
Logging	

Table 3: Main Deforestation Drivers in Peru from Piu & Menton, 2014

It is difficult to box deforestation into simple cause and effect relationships.

Deforestation dynamics are often complex with direct and indirect causes interacting.

It has been theorized that demographic changes mainly population increases in the Peruvian Amazon have put additional pressure on the region's natural resources.

Specifically migration from Andean people driven by lack of economic opportunities. In the past, the Peruvian government encouraged and supported waves of migration in colonization strategies. Since the 2000s the narrative has changed. The Peruvian government both encourages migration through infrastructure and agricultural credit schemes while placing the blame of deforestation on migrants (Menton & Cronkleton, 2019).

Infrastructure, specifically road construction has also been shown to increase deforestation. An example is the Marginal highway in the Huallaga valley, in 1986 prior to road pavement, there was 14.8% land under human intervention, after the road construction this rose to 31.1% in 2002 (CDC-UNALM, 2004; Dourojeanni, 2006).

Moreover, agricultural expansion is often cited as one of the economic drivers for infrastructure developments in rural regions such as in the Interoceanic highway project, despite of the knowledge that agricultural and cattle expansion are direct drivers of deforestation (Dourojeanni, 2006; Menton & Cronkleton, 2019).

In their study Alvarez and Naughton found that near road deforestation rates increased during the mid-1980s as a result of the state's credit and land title programs such as PRESA (Programa de Reactivación Agropecuaria y Seguridad Alimentaria) (Menton &

Cronkleton, 2019). The PRESA program increased the number of migrants to the Peruvian Amazon from the Andes. Because for the Agrarian Bank to issue an interest free loan but only if the land was cleared for some planned use, speculative deforestation as well as agricultural deforestation increased (Mäki et al., 2001; Menton & Cronkleton, 2019). Later, once the credits from the program were removed, deforestation decreased (Alvarez & Naughton-Treves, 2003). This highlights the importance of agrarian policy in forest conservation discussions. It is also an example of how different deforestation drivers interact. ´

According to their environmental performance report, OCDE & CEPAL state that more than 90% of the Peruvian Amazon can be attributed to the expansion of agriculture(OCDE & CEPAL, 2017). They also found that 60% of occupied land in the Peruvian Amazon are abandoned due to inadequate farming techniques that have led to soil erosion and fertility loss (OCDE & CEPAL, 2017). We can also speculate that changing agrarian policy also contributes to land desertion. CDI and INDUFOR conducted a study and found that between 2000 and 2009 most of the deforestation occurred in small areas. The areas resembled small-scale agriculture conducted by migrants. deforestation in areas equal to or larger than 10 ha was only 1% of deforestation in the study (CDI & INDUFOR, 2012; Piu & Menton, 2014). In their project description CIMA also cites the advancement of the agricultural frontier as the biggest deforestation driver in the Cordillera Azul Park and Buffer Zone. Specifically, intensive farming practices applied by Andean immigrants leads to land erosion which then means that the framers abandon the land and move to a new parcel (CIMA et al., 2012).

Other extractive activities have also been linked to deforestation in Peru such as hydrocarbons, mining and logging. Mining and hydrocarbon prospection area increased from 15 to 72% between 1999 and 2009 (Haselip, 2011; Monterroso et al., 2017; Piu & Menton, 2014) and by 2010, 41% of the Peruvian Amazon was classified as hydrocarbon concessions even though about half of the permits overlapped with protected areas (Finer & Orta-Martínez, 2010; Monterroso et al., 2017). In the case of mining, increase in gold prices has led to an increase in informal mining operations. Swenson et al. found that during the 2006-2009 period deforestation rates increased at a rate of 1915 hectares per year (Swenson et al., 2011). Mosquera et al. estimated that the total area of deforestation in Madre de Dios that can be attributed to mining was 17,837 hectares by 2009 (Mosquera et al., 2009).

As for logging, it is estimated that the proportion of illegal timber is at least 60% of total timber extracted (Dourojeanni, 2020). Dourojeanni goes so far as to say that even legally source timber in Peru is rarely sustainable and that overly complicated legislation, institutional deficiencies, lack of enforcement capacity, corruption and low technical and financial assistance and low formalization incentives have contributed to poor timber management (Dourojeanni, 2020).

The study conducted by Evans et. al exemplifies how lack of economic incentives lead to illegal logging and deforestation. In the study community members from Ampiyacu-Apayacu river basin, located in Loreto were interviewed . They found that logging is an essential part of their economy with an estimate of 50 % of men working as loggers. Most of the logging is illegal. Debt is a central aspect of logging, merchants from the capital pay loggers in advance (give *habito*) and later loggers give wood to pay off their

debt. Loggers usually end up deep in debt but have the financial liquidity for family needs. When asked, community members agreed that the forest was being degraded but expressed their frustration as having few economic alternatives to illegal logging (Evans et al., 2014).

## **International Development**

A 2014 study commissioned by the Gordon and Betty Moore foundation, showed that most international funding for conservation comes from 24 major funders and the top three funders are The Norwegian Agency for Development Cooperation (NORAD), The World Bank and the Gordon and Betty Moore Foundation. Total funding in the amazon biome was approximately \$206.2 million dollar per year. Peru received around 16% which amounted to \$212.6 million dollars in total from 2007 to 2013 (Castro de la Mata & Riega-Campos, 2014).

The follow-up 2017 study found that “substantially higher contributions identified from three very large bilateral funders (Norway, Germany and USAID) make up the gap.” (Strelneck & Thais, 2017). Specifically, for Peru, the Amazon Funding Tool provides funding information from 2013 to 2020.

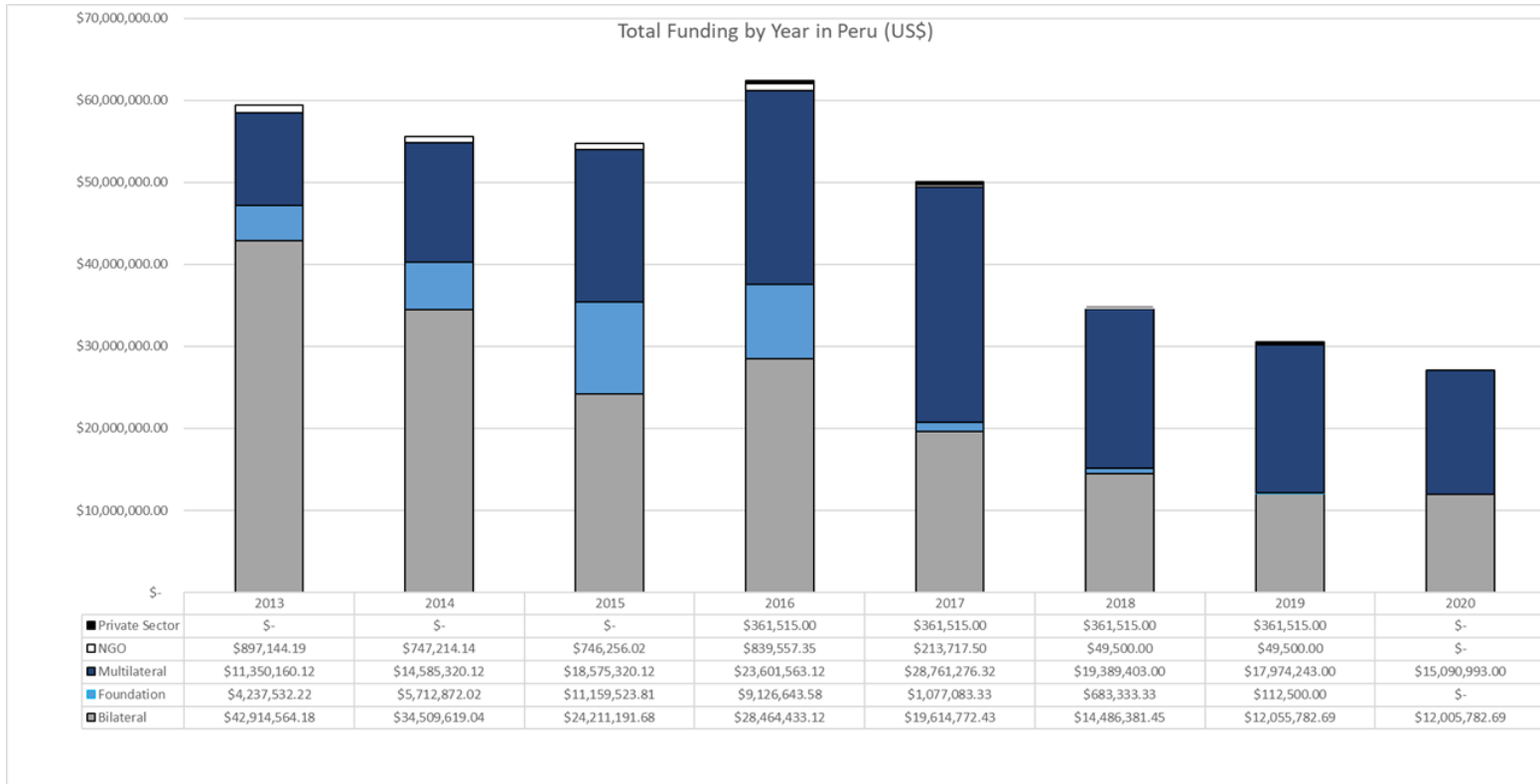


Figure 16: Total International Funding for Conservation in Peru per year, (Gordon and Betty Moore Foundation, n.d.)

According to the report an overwhelming amount of funding that Peru receives comes from bilateral and multilateral institutions. The Funders included in the study are summarized in the following table:

Bilateral	Foundations	Multilateral	NGOs	Private Sector
Switzerland (SECO, SDC, COSUDE)	The Overbrook Foundation	World Bank	Wildlife Conservation Society	Various
Italy	The Mitsubishi Foundation for the Americas	Green Climate Fund (UNFCCC)	Critical Ecosystem Partnership Fund (CEPF)	
Spain	Tinker Foundation	Forest Carbon Partnership Facility	Conservation International	
Korea	Fundación Avina	European Union	Rainforest Foundation Norway	
Finland	MacArthur Foundation	United Nations -REDD	The Nature Conservancy	
Sweden & Netherlands		Forest Investment Program	World Wildlife Fund	
Denmark -DANIDA		Interamerican Development Bank		
Belgium		Corporación Andina de Fomento		
United Kingdom (DFID, DEFRA, DECC)		Global Environmental Facility		
USA (USAID, FWS) Norway (NICFI, NORAD) Germany (KFW, IKI)				

Table 4: Funders included in study (Strelneck & Thais, 2017)

## Forest-based carbon offsetting and carbon offset markets in Peru

### History of REDD in Peru.

Shortly after the creation of the Ministry of the Environment, Peru committed to the creation of a National Program for Forest Conservation (Flores, 2018). In February 2008, WWF Peru invited several national actors to establish a baseline for REDD projects. Three months later, seventeen organizations including AIDSESP, AIDER, CIMA, CONAM, DAR, FONAM, TNC and WWF created the REDD Working Group (Che Piu, 2010). The REDD Working Group helped establish the first national REDD workshop in October 2008 in the city of Tarapoto in San Martin (Che Piu, 2010). Peru's central and regional governments, indigenous organizations, nonprofits and private sector actors demonstrated their commitment to the creation of a REDD plan for Peru

by signing the Tarapoto Declaration (Che Piu, 2010; de Jong et al., 2014; Piu & Menton, 2014).

Parallel to the creation of the REDD Working Group, the Madre de Dios Regional government collaborated with research institutions and private sector actors to create Consorcio REDD, an inter-institutional working groups dedicated to establishing the historic deforestation rate of Madre de Dios (Rodriguez-Ward et al., 2018).

In 2011 the Madre de Dios Regional Government reactivated Consorcio REDD which had been dissipated the previous year for lack of funding. Consorcio REDD became part of the REDD+ Working Group, the main goals now included increasing local knowledge on REDD+ (Rodriguez-Ward et al., 2018). Besides Madres de Dios, three other regional groups (San Martin, Cusco and Piura) were created by the REDD+ Working Group (Che Piu, 2010).

The Interethnic Association for the Development of the Peruvian Rainforest (AIDSESP), financed by the International Development Bank, created several indigenous REDD+ working groups to ensure indigenous people's territories and informed consent (Piu & Menton, 2014; Rodriguez-Ward et al., 2018). Initially, indigenous organizations mistrusted REDD+. The main areas of concern were indigenous land use and self-determination rights as well as the idea that REDD would provide a way for rich nations to buy carbon credits as a way of avoiding changing production and consumption systems in their own countries (Flores, 2018). Additionally, David Nilsson's attempt to obtain Matsés people's carbon rights through abusive contracts raised indigenous people's concerns of the risks that REDD+ presented over their territories (AIDSESP, 2011; de Jong et al., 2014; Flores, 2018; Piu & Menton,

2014; Rodriguez-Ward et al., 2018). In 2010 AIDESEP questioned the “lack of land or carbon property rights over forest or carbon stocks” (Evans et al., 2014) and lack of measure to protect indigenous communities from “invasion of REDD projects into people’s territories” in Peru’s Readiness Preparation Proposal (R-PP) draft. (Evans et al., 2014). In March 2011 AIDESEP and MINAM reached an agreement on the R-PP. The agreement included reformation of national land legislation to ensure recognition of ancestral territories, the prioritized the use of REDD+ project funds towards indigenous territories and Indigenous REDD + working group recognition (Piu & Menton, 2014).

At an international level, in 2008 Peru signed an initiative submitted by Paraguay requesting the use of a ‘nested approach’ methodology for REDD (Perla Alvarez et al., 2014; Piu & Menton, 2014). During the COP 15 in Copenhagen MINAM committed to reach net zero deforestation by 2021 (Flores, 2018; Piu & Menton, 2014). In so doing Peru became the first developing country to pledge net zero deforestation by 2021 (Edwards et al., 2017). Needless to say, Peru did not meet that goal and deforestation between 2013 and 2016 continued at an approximate rate of 150,000 ha/year (Geobosques, 2021).

Between 2009 and 2011, Peru joined the Forest Carbon Partnership Facility (FCPF), the Forestry Investment Program (FIP) of the Climate Investment Fund (CIF), the UN REDD+ Program and the REDD+ Partnership UN-REDD+ program (Flores, 2018; Piu & Menton, 2014). After the FCPF’s approved Peru’s R-PP draft, \$3.6 million dollars were allocated to Peru’s REDD Readiness Fund (Piu & Menton, 2014).

In 2012 during the UN climate conference in Doha, Qatar, the Independent Association of Latin America and the Caribbean (AILAC), of which Peru is a member, was formed (Edwards et al., 2017).

In 2014 Peru reached a bilateral agreement with Norway and Germany known as the Joint Declaration of Intent (JDI), with the goal of reducing greenhouse gas emissions from deforestation while “contributing to the sustainable development of Peru’s agricultural, mining and forestry sectors”(Flores, 2018). Under the JDI Norway committed \$300 million dollars. Of the total \$50 million will be used to generate instruments (financial, public policy,) for REDD+ implementation. The remaining \$250 million would be transferred as payments on verified emission reduction (Flores, 2018). As of 2018 Germany had committed \$20 million for REDD readiness activities, further aid depended on Peru’s progress and results (Flores, 2018).

In 2014, Peru hosted the U.N. Framework Convention on Climate Change (UNFCCC)’s 20th annual Conference of the Parties. In his inauguration address then Minister of the Environment Manuel Pugar-Vidal mentioned the need to “strike a balance between climate action and sustainable development” and expectations that the conference “will bring to Peru unprecedented opportunities on international cooperation, support, and projects we will develop together.” (Pulgar-Vidal, 2014)

During the Paris Agreement, in contrast with other developing countries ‘right to develop’ position, the AILAC (of which Peru is a member) championed a flexible principle of Common but Differentiated Responsibilities and Respective Capabilities, committing to reducing emissions and further actions conditional to international support

(Edwards et al., 2017). AILAC also advocated for the implementation of a legally binding agreement for nationally determined contributions (NDCs)(Edwards et al., 2017).

In 2016, Peru ratified the Paris Agreement, proposing an unconditional reduction of 20% below the business as usual emissions scenario by 2030 (131 MtCO<sub>2</sub>e) and a reduction of an additional 10% below business as usual (116 MtCO<sub>2</sub>e) for 2030 subject to availability of international finance (the Republic of Peru, 2015).

In October 2020 Peru and Switzerland signed a bilateral agreement under article 6 of the Paris Agreement where Peru would transfer rights to retire offsets to Switzerland, In exchange, Switzerland will finance sustainable development projects in Peru (Sommaruga & Echeagaray, 2020).

### **National policies that establish country-level criteria for Monitoring and Verification.**

From 1950 to 1980 Peru's main interest in forest monitoring was a forest inventory for timber extraction and forest concessions. In 1970 the First National Forestry Inventory was conducted which resulted in the first forest map of Peru (Malleux, 1975; Ochieng et al., 2016). The Forestry and Wildlife Law No. 21147 was issued in 1975. It stated that contractors with more than 100,00ha of forest had to "present technical-economic feasibility studies including inventory details of all commercial trees"(Ochieng et al., 2016) However, in practice most contractors circumvented the law by subcontracting parcels. A new Forestry and Wildlife Law No 27308 was created in 2000 with the aim of enforcing stricter requirements for

management of forest concessions but once again concessionaires did not comply and sometimes even falsified forest inventories (Ochieng et al., 2016).

From 1980 to the early 2000s Peru experienced a shift towards sustainable forest management. In 2000 the Program for the Strengthening of National Capacities to Manage the Impact of Climate Change and Air Pollution was created by the National Institute of Natural Resources and the National Environmental Council (Ochieng et al., 2016). The aim of the program was to examine and assess deforestation and associated CO<sub>2</sub> emissions. In 2003, the National Multisectoral Commission Against Illegal Logging was created (Ochieng et al., 2016). With the creation of REDD Peru developed a stronger emphasis on forest assessments. For example the Ministry of the Environment has been measuring forest cover and carbon stock changes since 2011 (Ochieng et al., 2016). In 2011 a New Forestry Law No 29763, created the National Forest and Wildlife Service to perform periodic national forest assessments with the support of regional and local governments, public and private organizations.

International donations for forest assessment have increased. This includes the Gordon and Betty Moore Foundation, FCPF and the German Development Bank, who have committed more than USD 12 million for the advancement of REDD including REDD+ MRV system (Ochieng et al., 2016).

### **Forest monitoring Infrastructure**

As part of MINAM'S National Forest Conservation Program for Climate Change Mitigation (PNCBMCC) The Geobosques platform was created to monitor changes in forest cover, and to distribute this information through reports and maps (Geobosques, 2017). Forest Coverage Monitoring Module (MMCB) is under the coordination of

MINAM in collaboration with SERFOR and is part of the National Forest and Wildlife Information System (SNIFFS) and the National System of Environmental Information (SINIA) as indicated by Legislative Decree No. 1220 of 2015 (Geobosques, 2017).

MMCB is divided into five modules:

- Deforestation (Forest and forest loss): generates geo-referenced information on remaining forests, as well as the loss of forests on an annual basis.
- Early Alert: generates georeferenced alerts, indicating disturbances in forests in short periods of time. This will help understand and visualize the behavior of deforestation and its causes and implement preventive actions and control of deforestation by the different entities of the Public and Private Administration.
- Degradation: generates periodically georeferenced data on forest degradation, based on forest disturbances without reaching deforestation.
- Land Use and Land Use Change: generates geo-referenced data every two years or more, through which it is possible to identify changes in the use of forests, through monitoring previously deforested areas, classifying the causes of this deforestation; contributing with official information from the land use, land use change and forestry sector (USCUSS) in the National Inventories of Greenhouse Gases (INGEI)
- Reference levels: synchronizes historic activity data, mainly, deforestation, degradation, land use change, carbon stocks, carbon emission factors and GHG to measure the performance of the country or jurisdiction, within the framework of compliance with the country's climate commitments.

(Geobosques, 2017).

## **Peru's Current Carbon Markets.**

Peru is part of Reduction of Emissions through deforestation program (REDD), it is managed under the Programa Nacional de Conservación de Bosques para la Mitigación del Cambio Climático (PNCBMCC). The National Environment Policy Decree No. 012-2009-MINAM, issued in 2009 which establishes the implementation of evaluation, valuation and financing for the conservation of natural resources. It also promotes methodologies for valuing natural resources and ecosystem services (MINAM, 2009).

The first example of a large-scale payment for ecosystem services program is Programa Bosques. In the 2008 COP 14 Peru committed to conserve 54 million hectares of forest (Flores, 2018; Rosa da Conceição et al., 2015), this marked the beginning of Program Bosques which was created in 2010. The program consists of paying indigenous communities \$10 soles per hectare per year if they commit to stop deforestation or illicit crop production (Hiedanpää & Salo, 2017; Rosa da Conceição et al., 2015). In order to be included in the program project participants had to have land titles, a bank account and develop and execute a five year investment plan for the money received from the program (Rosa da Conceição et al., 2015). By 2014, 47 communities (956 families) had enrolled which resulted in 431,540 hectares under conservation (Rosa da Conceição et al., 2015).

Few efforts were made to include non-governmental stakeholders in the project design with the exception of a few close door meetings with AIDSESEP (Rosa da Conceição et al., 2018). Furthermore, because of the tension between the Peruvian government and indigenous communities as a result of the Bagua incident and a desire

to establish credibility for the newly created MINAM there was a lot of pressure for a quick completion(Rosa da Conceição et al., 2018).

Interestingly, despite providing economic incentive for conservation, the Peruvian government considers the program to be a grant and not payment for ecosystem services (PES). Hiedanpää & Salo speculate that the reason for this is that the aim of the program is to promote entrepreneurship through the implementation of a business plan (Hiedanpää & Salo, 2017). It has been noted that while Programa Bosques design is suboptimal in terms of environmental conservation and benefit distribution (Rosa da Conceição et al., 2015, 2018), deforestation monitoring capacity has increase in Peru and the program has promoted cooperation between MINAM and regional governments (Rosa da Conceição et al., 2018).

As for monitoring and registration of ecosystem services, MINAM launched a digital information tool called the pre-register for compensation mechanisms for ecosystem services (MERESE). The tool allows systematizing and mapping all MERESE initiatives at the national level in preparation for the Single Registry of Remuneration Mechanisms for Ecosystem Services(MINAM, n.d.).

However, little information can be found on the current state of MERESE. Instead, the Peruvian State has established Huella Peru, a climate action tool created to officially recognize the effort of public and private organizations to reduce their Greenhouse Gas emissions, by measuring their emissions and reporting of actions to reduce and/or neutralize them. It is a system of 1-4 stars, the first star is awarded for calculating company emissions using the in-site tool, the second star is awarded after companies have their footprint validated by an organization with NTP ISO 1406

accreditation, the third star is awarded when companies show a decline in their footprint for two years, the fourth star is given when a company offsets their emissions (MINAM, 2018) . Because this is a voluntary process participation has been low. The ministry of the environment has even started a social media campaign using a bear named Nono to get the public to pressure companies to be accountable for their emissions(BAM, 2019; MINAM, 2018). Despite of the slow progress Peru has been working on a national system on carbon pricing, an example of this was the “Carbon Pricing Week” held in February 2020(BAM, 2019; Gob.pe, 2020).

As part of its strategy for meeting Paris Agreement targets, Peru launched the National Registry of Mitigation Measures (RENAMI) at New York’s 2020 Climate Week. The platform will allow institutions to register and transfer contributions to greenhouse gas emissions. It will also allow organizations to participate in both national and international carbon markets and will allow the transfer of contributions to organizations, Peru’s national NDCs, or other country's NDCs. The tool was developed with the technical assistance of the United Nations Development Programme (UNDP) (MINAM, 2020). It is also worth noting that the Peru-Switzerland bilateral agreement mentioned above took two years to negotiate and one of the specifications is that each country must have a publicly available registry (*Implementing Agreement to the Paris Agreement between the Swiss Confederation and the Republic of Peru, 2020*).

This tool will complement both Huella de Carbono Peru and Infocarbono, Peru’s Greenhouse Gas emission .

## **Case Studies**

Employing a comparative case study design, we will examine the following six carbon-financed conservation projects in Peru to explore the set of “value propositions” offered by these projects and for whom to explore what is driving the continued interest and implementation of these schemes.

### Tambopata-Bahuaja Biodiversity Reserve

Tambopata and Bahuaja are two national parks located in Madre de Dios. The National Service of Natural Areas Protected by the State (SERNANP) contracted AIDER a non profit Peruvian conservation organization to run the REDD associated conservation projects in return for the rights to funds generated by the “ecosystem services” of the park. The carbon offsets generated are used as collateral for a loan from Athelia to AIDER to implement cacao agroforestry with landowners in the northern buffer zone of the parks (Althelia).

### Parque Nacional Cordillera Azul

The National Service of Natural Areas Protected by the State (SERNANP) contracted CIMA a non profit Peruvian conservation organization to run the REDD associated conservation projects in return for the rights to funds generated by the “ecosystem services” of the park. The carbon offsets generated are used as collateral for a loan from Athelia to CIMA for conservation activities (Althelia,2015).

### REDD+ Project in Brazil Nut Concession

Started in 2009, BAM began working with 405 families who are part of a confederation of Brazil nut producers who have concessions on 300,000 ha of forest in the Amazon region. “Under the contract, in exchange for carbon rights to 405 Brazil nut concessions, BAM provides participating producers with technical and financial support and a share of profits from carbon offset sales.” (Garish et al., 2014)

### Bosque de Protección Alto Mayo

SERNANP contracted with Conservation International to run the REDD+-associated projects in the park in return for rights to funds generated from the “ecosystem services of the park.” CI sells carbon offsets to corporate partners. CI signs “incentive-based conservation agreements” with farmers in the park’s buffer zone as a means to reduce deforestation (Conservation International)

### **Objective**

For us to understand the dynamics of value creation in carbon finance in the case studies we plan to address the following primary questions:

- What set of roles are required to be played in order to implement projects that integrate forest-based carbon offsetting with biodiversity conservation?
- What consistency or variation do we see in the sets of actors or entities who take on these roles?
- What added value(s) does the introduction of carbon offsetting bring to these conservation projects?

- What is the specific “value proposition” for each of the actors and entities involved in promoting, supporting or implementing these projects?
- Through what narratives and mechanisms is that value created and by whom?
- What are the primary barriers to both creating and capturing those values?
- What are the costs and risks associated with these attempts to create value?
- Are there values of some of the actor groups involved in or impacted by these projects that are not represented, or are even denigrated, through these processes?

### **Methods and Sources of Support**

To determine the set of roles needed for these projects and the types of actors who play these roles we develop a stakeholder analysis for each of the case studies. Using the software Kumu, we researched and graphically depicted the primary stakeholders involved in promoting, facilitating, implementing or participating in each of the projects. We also classified the connection among actors by the exchange of value among themes for example the flow of carbon credits, financial transactions such as grants, investments or payments or knowledge transfer through technical assistance. Using a review of the available documents (e.g. project reports, websites, popular press articles, academic articles, publicly available data sources, financial statements and investment

portfolios, etc.), and the types of connections to other actors we define the roles played in the project by each stakeholder.

With this information, we were able to characterize the general roles (the work) that are necessary to develop and maintain such projects, but also the variations we see among our case studies of the roles played and the types of actors or entities that have taken these roles.

Once we had identified roles and actors involved in the projects we proceeded to characterize the value generated by carbon credit conservation projects for each stakeholder group. We contacted organizations involved in the projects and conducted semi-structured interviews. We also used the transcripts collected during the summer of 2019 for the Tambopata project to complement missing information. All interviews, with the exception of the 2019 interviews, took place on zoom and were recorded with the participants' consent (see appendix for Interview Guides).

Stakeholder Group	People Interviewed	Affiliation
Project Developer/Implementer	13	Alto Mayo, Cordillera Azul, Tambopata* and Brazil Nut Projects
Project Participant	9	Tambopata Project*
Peruvian Government Employee	2	MINAM
Project Financier	1	Brazil Nut Project
Carbon Credit Expert	3	N/A
*Interviews for the Tambopata project were conducted as part of another master project in the summer of 2019		

Table 5: Stakeholders interviewed

Next, interviews were transcribed and along with additional project reports were coded using the software NVivo. Below is a table for the complete coding structure.

Research Question	Parent Node	Subnode	Description
Roles and Actors required for conservation through carbon offsets	Roles	Roles	Main functions that needed to be executed (financing, implementing)
		Role Overlap	Instances where different roles are combined
	Actors	Overlapping Actors	Actors that take on overlapping roles
		Governmental Actors	Government Actors involved in projects
		NGOs	NGOs involved in projects
		International Development Actors	International Development actors involved in project
		For Profits	For profits involved in project
		Communities, Families or Individuals	Communities, Families or Individuals involved in the project
		Verifier	Verification agency for carbon offsets generated
		Funder/Investor/Asset Manager	Investment fund, financier that fund the project
Value Proposition by Actor	What is the added value for each actor involved		
Narratives of value creation	Added Value Created	Financial Value Narratives	Narratives used to describe financial value creation
		Social Network Creation Narratives	Narratives used to describe social network creation for project participants
		Participant Benefits Narratives	Narratives used to describe benefits for participants
		Reputational Value Narratives	Narratives used to describe Reputational Value creation
		Environmental Value Narratives	Narratives used to describe environmental value creation
Mechanisms of value creation		Political Value Narratives	Narratives used to describe political value creation
		Financial Value Mechanisms	Mechanisms through which land is monetized
		Social Network Creation Mechanisms	Project Activities that create social networks in participants
		Participant Benefits Mechanisms	Project activities that create benefits for participants
		Reputational Value Mechanisms	Activities that create reputational value creation
Costs and risks	Costs and Risks	Environmental Value Mechanisms	Project activities that contribute to environmental value
		Political Value Mechanisms	Activities through which political value is generated
		Costs	Cost associated with project
		Risks	Risks associated with project

Table 6: Nvivo Coding structure

Once coding was finalized, qualitative data was analysed to answer our research questions.

## Results

### Case Study Descriptions

After conducting a thorough review of publicly available documents such as project reports, participant websites, press articles and academic articles we have created a case description for each of the case studies.

#### **Tambopata-Bahuaja Biodiversity Reserve**

##### ***Downstream***

The Reduction of Deforestation and Degradation in Tambopata National Reserve and Bahuaja-Sonene National Park within the area of Madre de Dios Region in Peru is a 20 year REDD+ project co-managed by Peru's National Service of Protected Areas (SERNANP) and the Asociación para la Investigación y Desarrollo Integral (AIDER).

The Tambopata National Reserve, located in the Tambopata and Inambari districts of Madre de Dios, has an extent of 274,690 ha and consists of Upper Amazonian ecosystems.

The Tambopata watershed has one of the highest index of biological diversity in the world (SERNANP, n.d.). The area was originally designated as: Tambopata-Candamo Reserved Zone, though it was still vulnerable to land use designation changes. Starting in 1990 Conservation International working with the peruvian government carried out land use assessments and conducted a participatory planning process with local citizens groups, government officials and nongovernmental organizations. The result was a proposal for the creation of a protected area (ANP)(Foster et al., 1994). In 2000

through the Decreto Supremo N<sup>o</sup> 048-2000-AG the Tambopata National Reserve was created (SERNANP, n.d.).

AIDER, a Peruvian-nonprofit in environmental conservation and sustainable development was founded in 1986 and was originally focused on improving livelihoods in forest dwelling communities using good forest stewardship programs to ensure conservation (AIDER, n.d.). AIDER conducted the project design and is responsible for the project implementation and monitoring (Recavarren Estares et al., 2012).

In 2008 AIDER obtained a partial administrative contract for both the Tambopata National Reserve and the Bahuaja-Sonene National Park. In this contract AIDER would be responsible for the biological monitoring activities in the parks as well as scientific investigation for the conservation of the area (Ochoa Cámara et al., 2010). AIDER is also responsible for the creation of a pro social environment in both the protected areas as well as the buffer zones and of proposing sustainable economic alternatives to alleviate pressure in the ANP. From the start the use of environmental services as means of bridging the ANP budget gap was proposed (Ochoa Cámara et al., 2010).

Urged by the additional pressure created by the construction of the South Interoceanic Highway adjacent to the Tambopata buffer zone and the expansion of illegal mining driven by a rise in gold prices (Recavarren Estares et al., 2012), the Tambopata and Bahuaja-Sonene REDD+ project came into effect in 2010. with a timeframe of twenty years. The objectives of the program are the conservation of 570,000 ha natural forest which would result in 4 million tonnes of tCO<sub>2e</sub> in the first ten years (Ormeño & Gregory, 2017) in comparison to the baseline scenario which estimated the annual

deforestation on 1189.31 ha (Recavarren Estares et al., 2012). The emissions are certified by the VCS carbon standard.

The program also focuses on the implementation of shade-grown fine cocoa agroforestry systems in 1,250 ha within the protected area's buffer zones to restore the land and generate income for 350 smallholder farmers. The project estimated the production of 1,100 metric tons of cocoa per year after the first five years of plantation (Ormeño & Gregory, 2017). This is known as the first phase of the agroforestry project. Phase two focuses on engaging farmers and expanding along the Puerto Maldonado road. Because of the added benefits the project has the additional Climate, Community and Biodiversity (CCB) Gold Level standard (Recavarren Estares et al., 2012).

In order to manage the cocoa production and to connect small hold farmers to markets, a producer cooperative called Cooperativa De Servicios Multiples Tambopata Candamo (COOPASER) was created in 2014 (COOPASER, n.d.). Initially the cooperative consisted of 21 producers, over time this has grown to 350 members. To receive membership farmers must provide: "a formal land title or proof of farm possession, GPS farm location, personal ID, validation that there has been no deforestation on the farm since 2012 [this is verified by AIDER using satellite imagery] and a signed zero-deforestation commitment form. COOPASER also performs background checks on prospective candidates to ensure that they comply with Peruvian laws and regulations, and credit assessments to ensure that they do not have delinquent debts with private or public financial institutions. Each new member must also commit to establish at least three hectares of cocoa." (Ormeño & Gregory, 2017).

AIDER invested \$200,000 USD in COOPASER for the creation of a fermentation and drying facility with the objective of meeting high quality standards and improving traceability. This allows COOPASER to be able to sell cocoa at specialty markets for a higher price. In addition to the facility the Peruvian Ministry of the Environment (MINAM) awarded COOPASER with a grant of \$60,000 USD for a cocoa quality control lab(Ormeño & Gregory, 2017).

Each COOPASER member receives \$2,000 US per hectare distributed over three years in farming inputs. The package contains: “1,111 fine cocoa seedlings, high quality grafting materials, 1,111 banana suckers (to provide shade and act as a cash crop), 2,670 timber species (long-term crop), 27 fertilizer and farm tools. In addition, AIDER provides technical assistance and a variety of post-harvest services such as processing infrastructure and routes for export.”(Ormeño & Gregory, 2017). AIDER has also teamed up with local producers and cooperative members to establish additional cocoa nurseries for seedlings. In 2016 AIDERS nursery provided 313,000 cocoa seedlings to 312 families and acquired 280,000 seedlings from local private nurseries(Ormeño & Gregory, 2017).

By providing in-kind support rather than loaning money COOPASER can purchase in bulk and access economies of scale while minimizing risk of capital leakage. In addition to the package, COOPASER producers are paid against delivered cocoa, with fair-trade certification and deforestation-free price premiums. Certification expenses are covered by COOPASER. Meanwhile a revenue sharing agreement between AIDER and COOPASER establishes that AIDER receives 1.5% of annual sale proceeds. This will

be used to support conservation in Tambopata National Reserve and Bahuaja-Sonene National Park (Ormeño & Gregory, 2017).

To help establish COOPASER, AIDER hired Ecotierra to connect the cooperative to international cocoa markets. In turn, Ecotierra hired an external manager and a commercialization expert for COOPASER, however managerial roles should be slowly transferred to cooperative members (Ormeño & Gregory, 2017).

In 2017, AIDER announced that they had reached a total of 1,000,000 cocoa trees planted since the start of the project and were expecting the completion of 4,000 cocoa hectares by 2020 (AIDER Prensa, 2017).

### ***Upstream***

The main upstream finance actor in the Tambopata REDD+ project is Althelia Climate Fund. Althelia Climate Fund is a fund that is dedicated to investing about ecosystem services, sustainable land-use, and conservation. The management company behind Althelia Climate Fund is known as Althelia Ecosphere. As the major financier, ACF invested around \$7 million for the project.

The launch of Althelia Climate Fund was in 2011. In its first round of raising money, a total of \$80 million was gathered by the fund. (“Althelia Raises \$80 Million For REDD And Ecosystem Services,” n.d.) Behind Althelia Climate Fund, there are multiple financing partners, mainly from the public sector in Europe, which are “Credit Suisse, the European Investment Bank, the Netherlands Development Finance Company (FMO), Finland’s Fund for Industrial Development (FinnFund), the Church of Sweden Pension Fund and AXA Investment Managers.” (Ormeño & Gregory, 2017) After the

first round of raising money, Althelia expected more attraction of private funders into the project.

In 2017, Mirova, an affiliate of Natixis Investment Managers specializing in sustainable investment, announced acquisition of 51% of Althelia Ecosphere ownership. In 2019, Mirova finished the whole acquisition of Althelia Ecosphere, and thus renamed as Mirova Natural Capital. According to Natixis’s press release, under the premises of aligning the medium-term interests, the withdrawal mechanism would gradually proceed and thus increase the participation of Mirova’s capital by 2022. (Acquisition of Althelia Ecosphere | Natixis Investment Managers, n.d.)

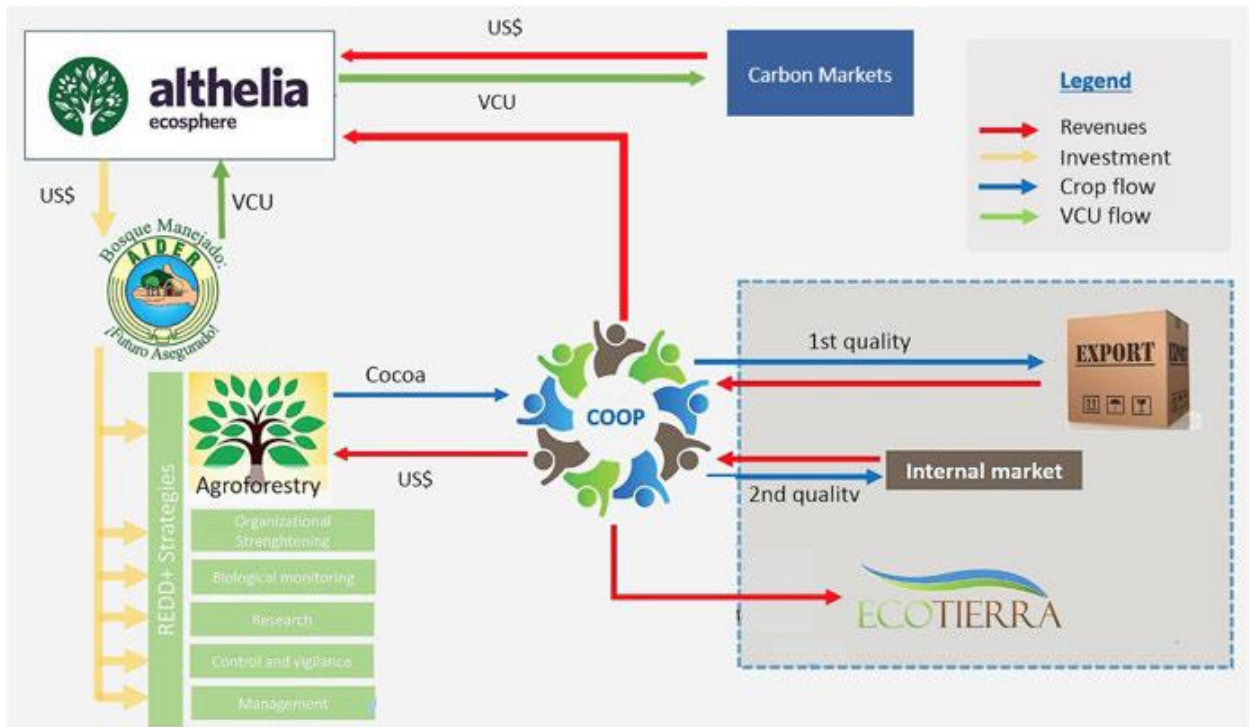


Figure 17: Althelia’s financing flow graph from Ormeño & Gregory, 2017

In the Tambopata project, Althelia lent the loan to AIDER at a competitive interest rate. Furthermore, Althelia set a longer grace period for the repayment which is three years. There are varied sources for the repayments to Althelia, including carbon credits, certified agroforestry products.

According to the *Forest Trend report*, there are 2 parts of investment structure for Tambopata (Ormeño & Gregory, 2017). The first is called the “production leg”, with the creation of an agroforestry system and cacao social business. Another is called “protection leg”, where most of the money goes into the daily operational and surveillance work of Tambopata National Reserve. (Ormeño & Gregory, 2017) The investment structure is built based on the nature of a mixed use of both production and protection activities in the Tambopata project.

## **Parque Nacional Cordillera Azul**

### ***Downstream***

The Cordillera Azul National Park REDD + project is a project co-managed by Peru’s National Service of Protected Areas (SERNANP) and the (CIMA).

The project’s objectives are to prevent deforestation in the Cordillera Azul National Park (PNCAZ) by improving park protection to deter human encroachment, increasing sustainable land use and life quality in buffer zone communities and strengthening relationships between park administration and government agencies to improve conservation (CIMA, 2018).

The Cordillera Azul National park consists of riparian, lower-montane forest (Kowler et al., 2016) located in the eastern Andes. It has a total area of 1,351,963.85 ha, that covers four departments in Peru: San Martín, Ucayali, Huánuco and Loreto (CIMA et al., 2012). The park's buffer zone consists of 2,303,414 ha which was officially recognized by the Peruvian government and expanded to its current extent in 2007 and 2011 (CIMA et al., 2012; Kowler et al., 2016). There is a designated strict protection zone in the southeastern part of the park that was implemented because of the possible presence of uncontacted indigenous people from the Cacataibo group (CIMA et al., 2012).

Cordillera Azul was designated a National Park in 2001 (Kowler et al., 2016) by the supreme decree N° 031-2001-AG (SERNANP, n.d.) after the 2000 park survey conducted by a Rapid Biological Inventory team formed by both Chicago Field Museum and Peruvian scientists and international collaborators resulted in the registration of 1,800 species and the identification of conservation risks (CIMA et al., 2012; The Field Museum, 2002). The purpose of the park is to protect both the ecosystems and the environmental services it provides from intensive agriculture and colonization from the buffer zone (Kowler et al., 2016; The Field Museum, 2002).

After the park's creation, members of the Rapid Biological Inventory team founded the Center for Conservation, Investigation and Natural Area Management (CIMA) in 2002 (CIMA, 2021). Shortly after its creation CIMA consented to support PNCAZ management. The agreement signed with the Peruvian government consisted of one-to-two-year contracts that were periodically renewed (CIMA et al., 2012). This continued until 2008, when after the PNCAZ faced financial crisis in 2007 (Kowler et al.,

2016; Pequeño, 2013), CIMA signed a 20 year full management contract which authorized CIMA to use carbon credits to finance park activities (CIMA et al., 2012; Kowler et al., 2016). Financially PNCAZ and CIMA receive very little money from the Peruvian government to carry on its activities (CIMA et al., 2012). Both CIMA and its advisor the Field Museum found that REDD+ offsets would provide a more sustainable source of park funding, the alternative was for CIMA to cease all protection and management activities in the park and buffer zone(CIMA et al., 2012). Strong interest from the Chicago Climate Exchange -CCX for the commercialization of REDD carbon credits as well as interest and financial help from institutions and corporations such as Exelon Corporation, The Boeing Company, USAID and the Gordon and Betty Moore Foundation channeled through the Field Museum contributed to the project proposal creation (Pequeño, 2013). For SERNANP the project would serve as a carbon pilot project and provide experience and lessons learned for more REDD+ for other national protected areas and regional governments (Pequeño, 2013).

Because only threatened areas are eligible for REDD projects, the first carbon credit estimates focused on the park's critical areas. They were conducted in 2008 by Winrock International, and using the Avoided Deforestation Partners (ADP) methodology as reference (Pequeño, 2013). Originally, the project's reference region would consist of 18.6 million ha. This was abandoned because of the enormous cost associated with data gathering. Instead, the area between the Huallaga and Ucayali rivers was selected and divided into four sections: Tarapoto, Tochache-Aucayacu, Contamana and Huimbayoc (Pequeño, 2013). With the use of land cover maps from 1990,2000 and 2005 it was determined that the deforestation area for the years studied

was 10%,11% and 13% respectively(Pequeño, 2013). The initial results were very different from CIMA's expectations. They showed very little risk of deforestation for the next 30 years in the National Park but a risk for 16% of total area for the buffer zones (Pequeño, 2013).

This probably dictated the focus of the project on the buffer zones with the establishment of priority areas in three rings around the park. Around 180,000 people live within the buffer zone but an additional 141,000 people have access to the park for subsistence hunting and fishing (CIMA et al., 2012). There are vast differences between the western and eastern communities in the buffer zone. The western side is more populated and consists of mostly mestizo residents with the exception of the Quechua-Lamista indigenous community. In contrast, the eastern side located in the Ucayali region consist of mostly indigenous communities such as Shipibo, Piro/Yine and Kakataibo groups (CIMA et al., 2012).

Interestingly, under the administrative contract CIMA is responsible for financing park activities including paying for park guards. To meet its duties, CIMA has established a decentralized structure with field offices in Tarapoto, Tocache, Contamana and Aguaytia overseeing park management activities which report to the Lima headquarters, in addition the headquarters work closely with SERNANP and other national government offices (CIMA et al., 2012).

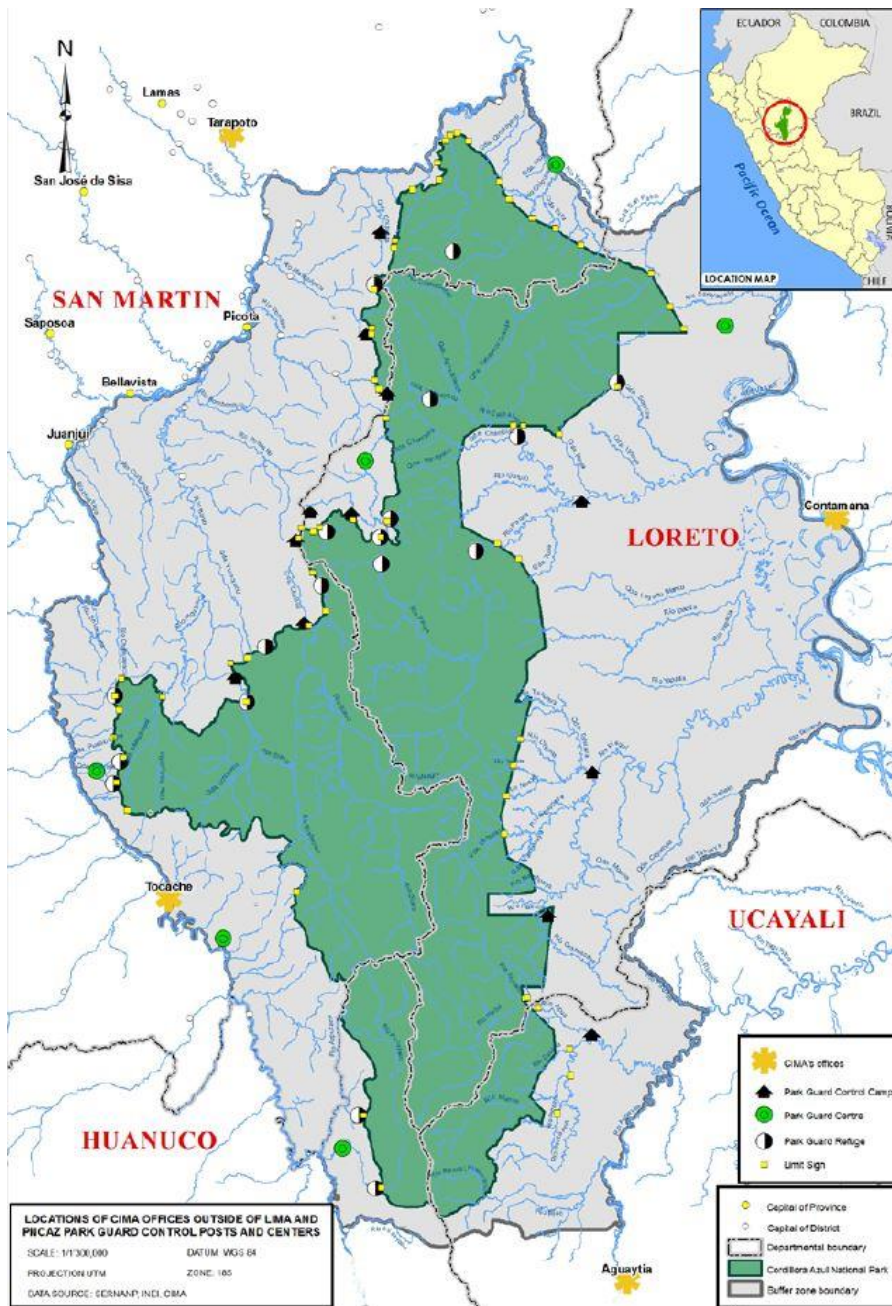


Figure 18:2008 Cordillera Azul project area and CIMA offices locations (CIMA et al., 2012)

After further projections of deforestation analysis conducted during 2010 a Project Design Document (PDD) was developed with the participation of CIMA, Terra Carbon and The Field Museum in 2011. The PDD was revised by VCS and approved 2012(Pequeño, 2013).

In 2014 CIMA signed a contract with Althelia Climate Fund, under the agreement Althelia would finance 75% of Parque Nacional Cordillera Azul's operational cost in exchange for carbon credits. Considering the difficulties in selling credits across August 2014, the Althelia partnership was deemed a success (CIMA, 2015). Althelia committed €8.55 million over 6 years towards the conservation and protection of PNCAZ (Building Agroforestry Systems around Cordillera Azul National Park, n.d.).

Shortly after the Althelia partnership was finalized, an alliance was established with PROFONANPE to set up an Endowment Fund and for PROFONANPE to manage the PNCAZ's REDD+ Project funds (CIMA, 2015). Currently PROFONANPE lists its participation in Cordillera Azul National Park REDD Project to have finished in 2018 after having financed a total of \$2,720 US dollars (Profonanpe, n.d.).

Besides international buyers several Peruvian institutions have purchased carbon offsets from the PNCAZ REDD Project such as Unión Internacional para la Conservación de la Naturaleza (UICN), Notaria Paino and Scotiabank Perú (CIMA, 2016).

### ***Upstream***

The Althelia Fund invested in another project called Parque Nacional Cordillera Azul based on the model from Tambopata. The Althelia Fund (now renamed as Mirova Natural Capital as referred in the last project) committed €8.55 million over 6 years for the conservation project at Cordillera Azul. Cordillera Azul national park was established in 2000 and the project start year was in 2008. In November 2014, the Centro de Investigación y Manejo de Áreas Naturales (CIMA Cordillera Azul) signed with Althelia

on loan agreement. The investment for Cordillera Azul shares a similar structure with Tambopata, where both projects fund productive activities and biodiversity in the buffer zone (Ormeño & Gregory, 2017).

## **REDD+ Project in Brazil Nut Concession**

### ***Downstream***

The REDD Project in Brazil Nut Concessions in Madre de Dios Peru is located in the Tahuamanu and Tambopata provinces close to the Inter-Oceanic Highway, see figure 19.



Figure 19: Map of the REDD+ initiative in Madre de Dios from Garrish et al. 2014

Brazil Nut harvesting in the region dates back to the collapse of rubber prices in 1912 and the need for alternative sources of livelihood (Duchelle et al., n.d.; Garrish et al., 2014; Stoian, 2000). Starting 2002 the Peruvian government established Brazil nut harvesting concessions in Madre de Dios. The system encompasses around 1 million

hectares for forest. For non-protected areas, Peru's Regional Directorate of Forestry and Wildlife (DRFFS) has the responsibility of granting concessions as well as other administrative functions while OSINFOR is responsible for forest monitoring and regulation compliance. (Willem et al., 2019). In Madre de Dios there are over 2.5 million hectares of brazil nut forest cover (Cossío-Solano et al., 2011; Escobal & Aldana, 2003; Willem et al., 2019). For every harvested kilogram of brazil nuts farmers must pay about 0.01 USD to DRFFS which is cheaper than the 0.03 USD that farmers must pay to SERNANP for brazil nut harvesting in protected areas (Willem et al., 2019).

The 2004 forest legislation (Nº 294-2004-INRENA-IFFS) allowed the extraction of up to 5m<sup>3</sup> per hectare of timber in brazil nut concessions. The decree was revoked in 2007 but it has also been noted that in Madre de Dios, significant timber extraction is common among brazil nut harvesters as a way to supplement their income (Garrish et al., 2014; Willem et al., 2019) and that between 2009 and 2010 extracted timber volume in brazil nut concessions was larger than timber extracted from timber concessions in Madre de Dios (Cossío-Solano et al., 2011; Garrish et al., 2014).

Brazil nut-rich forests have been linked to slow down deforestation (Willem et al., 2019). However, in their study Willem et al. found that while Brazil nut concessions within protected areas are doing well, those outside of protected areas suffer from "overregulation, ineffective monitoring and accompanying sanctions, and overlapping property rights and tenure types are common issues [...]while illegal, uncontrolled logging is rampant." (Willem et al., 2019). Moreover, they also found that weak social capital is responsible for the small number of collective action among concessioners

which has resulted in a propensity to “manipulation by elite groups for financial or political advantage” and poor financial management of brazil nut harvester associations. Bosques Amazonicos (BAM) is a for-profit forestry and environmental services company. As of 2019, BAM administered 24,433 hectares of land plus a 700 plantation. BAM’s mission is to “recover and maximize the value of the ecosystems of the Amazon in order to preserve its biodiversity and contribute to the economic, social and environmental development of Peru” (BAM, 2019).

BAM estimated that 107,981 ha of forest (35% of project area) would be lost by 2040 without intervention (Garrish et al., 2014). In 2009 Brazil Nut Concessionaires were approached by Bosques Amazonicos . After initial meetings between BAM and key Brazil nut stakeholders and a visit to BAM’s existing reforestation project in Ucayali an agreement was signed in September 2009.(Garrish et al., 2014). Also, in September 2009 The Federación de Productores de Castaña de Madre de Dios (FEPROCAMD) was established. It assembles different associations formed by Brazil Nut Concessionaires most of which had been granted their concession between 2002 and 2007 (BAM, 2012).

Below is a list of 2012 FEPROCAMD members listed in the 2012 VCS Project Description (BAM, 2012).

- Association of Brazil nut and Agroforestry Growers of Alerta (APROCAAL)
- Association of Forestry and Agroforestry Growers and Extractor from La Novia
- Association of Brazil nut Growers and Extractors from Loreto (APECAL)
- Agroforestry Brazil nut Association from Varsovia (ASOCASVAR)
- Association of Brazil nut Growers from Alegría

- Agroforestry Association Alegría, Alto Malecón, San Carlos and nearby areas
- Agroforestry Brazil nut Association Carmen Rosa (ASOCAR)
- Association of Brazil nut Growers and Extractors of Mavila (APECMA)
- Association of Brazil nut Growers and Extractors of Planchón (APECAPLAN)
- Association of Brazil nut Producers and Extractors of Río Paríamanu and affluent (APECARPA)
- Association of Brazil nut Growers and Extractors from Shiringayoc (APECASHIR)

Under the agreement FEPROCAMD would give participating concession's carbon commercialization rights to BAM. In return BAM would invest at least 1 million dollars in nut commercialization activities. Most of that investment would go towards the construction of a nut processing plant and some from revenue obtained from carbon credits.

The federation signed individual contracts with Brazil nut concessionaires where the concessionaires would transfer their environmental service rights to FEPROCAMD.

Afterward FEPROCAMD would concede those rights to BAM (Garrish et al., 2014).

Because of this flexible agreement new concessionaires are welcome to join the project at later dates. Between 2012 and 2014, 28 new concessionaires joined the project, resulting in a total of 405 concessionaires. The following table summarizes concessionaires' project requirements and benefits.

<b>Project Participant Requirements and Benefits from REDD Project in Brazil Nut Concessions</b>	
<b>Requirements</b>	<b>Benefits</b>
Proof of concession rights and compliance	Access to processing plant benefits
Signing of contract FEPROCAMD	Capital to cover initial cost during harvesting season
Accepting long-term agreement conditions between FEPROCAMD and BAM	Assistance with concession documentation
Not having signed a competing carbon right contract.	Income from carbon credit sales
Compliance of FSC certification requirements (In case of timber extraction)	

Table 7: Garrish et al. 2014

There is very little financial access for concessionaires as concessions can't be used as collateral. The project is attractive to Brazil Nut Concessionaires as it helps them break out of the low intensity- shifting cultivation system (Garrish et al., 2014). Under the agreement, BAM is entitled to 70% of revenue generated from the sale of carbon credits. The remaining 30% will go towards project participants (Sánchez & Peña Ortiz, 2020).

In their 2019 report BAM stated that in addition to carbon credit benefits, they assigned an annual budget of 120,000 soles for FEPROCAMD administrative expenses (BAM, 2019).

With the help of Carbon Decision International and AIDER deforestation data from 2000 to 2008 was used to generate Reference Levels (Garrish et al., 2014). Through the Madre de Dios REDD+ consortium other institutions were recruited to help establish the deforestation model with the intention that it would “serve as a regional baseline for all subnational REDD initiatives in the region” (Garrish et al., 2014).

As part of the project BAM with the technical assistance of CAMDE established a consultation process between 2009 and 2010 (BAM, 2012). The process included meeting with local leaders and officials as well as media broadcasts, promotional events and a “public dialogue held through mainstream media” (Garrish et al., 2014). CAMDE Conservación Ambiental y Desarrollo en el Perú, is a Peruvian nonprofit based in Madre de Dios that specializes in sustainable management of natural resources (BAM, 2012). However, the study presented by Garrish et al. raises some concerns about the project participants' knowledge of the REDD+ project . Of the 126 participating households surveyed, 62% reported knowledge of the REDD initiative. Of the 72 participants 25 had concerns about either their compensation, the project not being implemented or loss of land rights (Garrish et al., 2014).

In their 2019 BAM stated that FEPROCAMD meets once per month in a general assembly where program progress is discussed. The president of the federation, acting as a link between the federation and BAM, then conveys this information (BAM, 2019).

Other project concerns are related to land boundaries. In their study Garrish et al. found that overlapping land boundaries caused by the registration of concessionaires by different actors and lack of boundary verification process from the Regional Forestry Direction is a source of conflict (Chavez et al., 2012; Garrish et al., 2014). This includes a 8053 ha project zone that overlaps with a mining zone.

Moreover, they also reported community members commented that nut concessionaires would allow miners in their concessions for a share of the profit. In their study Garrish et al. mentioned that BAM does not consider this activity as a source of concern for the project (Garrish et al., 2014).

Carbon Credits are certified under the Verified Carbon Standard (VCS) and CCBA standard. The credit period started on the first of January of 2010 and will continue for 31 years (Garrish et al., 2014).

In the original project conception, all small concessionaires would first join FEPROCAMD and then join the project, but not all FEPROCAMD members agreed to participate in the project and some project participants are independent and not associated to FEPROCAMD (Garrish et al., 2014).

To reduce deforestation, BAM developed project activities divided into Climate, Community and Biodiversity categories. These activities are summarized in the table below:

General Objective	Categories	Specific Objective	Expected Results	Actions
Reduce Deforestation while contributing to the development of local people and preservation of biodiversity	Climate	By the seventh year of the project's lifetime, deforestation will be minimum or even zero, and in the Leakage Belt, deforestation will have a decreasing trend	RCL1: Reduction of GHG emissions in the Brazil Nut Concessions	A1: Implementation of the Forest Monitoring and Surveillance System A2: Training deforestation agents in alternative and sustainable productive initiatives
		Increase carbon stocks in the Project Area	RCL2: Carbon reserves have been increased in the Project Area	A3: Training and establishment of community tree nurseries A4: Forest enrichment through plantation of native species
	Community	By the end of the first year, the concessioners will be legally organized and represented, and will also have their management documents updated	RCo1: FEPROCAMD is a formal and efficient organization in the management of its areas	A5: Organization and legal formalization of their grassroots organizations A6: Implementation of the Early Alert System A7: Implementation of the Conflicts and Complaints Management System
		By the fifth year, income from concessioners and local people will be significantly increased	RCo2: Brazil Nut Concessioners produce high quality products with a defined market	A8: Implementation and Start-up of the Brazil Nut Processing Plant A9: Certification of their products and processes (organic, FSC, fair trade)
			RCo3: The Government of Madre de Dios and local communities have strengthened their capacities in Sustainable Forestry Management, and the local communities have raised their living standards	A10: Training of actors in forestry management, reduced-impact techniques and use of the Alert System A11: Establish cooperation agreements and alliances with the Government of Madre de Dios and other local entities. A12: Local Campaigns for preservation of the Amazon Rainforest, its goods and services
		Biodiversity	Guarantee and maintain ecological integrity in Brazil Nut Concessions and contribute to the preservation of biodiversity in the Leakage Belt	RB1: Biodiversity and water quality in the Project Area have been preserved

Table 8: Organization of Project objectives, expected results and activities (BAM, 2012).

CAMDE worked with BAM in the implementation of the forest enrichment pilot project with 13 concessionaires. This included identification of suitable areas in each concession and low intensity plantation of native species (BAM, 2012).

During 2019, BAM reported selling 1.5 million carbon credits which earned them approximately \$1 million USD. In 2019 BAM announced that Imaflorea, a Brazilian consulting firm, would start the verification process for the 2013-2016 REDD+ carbon credits in 2019 (BAM, 2019). BAM expects that by mid-2020 they will have incorporated 5 million new carbon credits.

### ***Upstream***

The REDD Project in Brazil Nut Concessions in Madre de Dios is financed by the project proponent Bosques Amazonicos S.A.C.(BAM S.A.C). BAM S.A.C was established in 2007, it was acquired by Bosques Amazónicos SFM S.A. (BAM SFM) in

2016 (Sánchez & Peña Ortiz, 2020). BAM SFM is a natural resource corporation that invests in forestry companies, they are divided into three business units, forestry plantations, carbon credits and aquaculture. BAM S.A.C is responsible for the first two units (Sánchez & Peña Ortiz, 2020). Currently BAM SFM holds 72.6% of BAM S.A.C shares, the remaining 27.4 % are held by Asterix Ltd. an offshore company. However, because BAM SFM holds 71.53% of Asterix shares they hold a 19.6% of indirect participation of BAM S.A.C (Sánchez & Peña Ortiz, 2020). BAM SFM group structure is illustrated in figure 20.

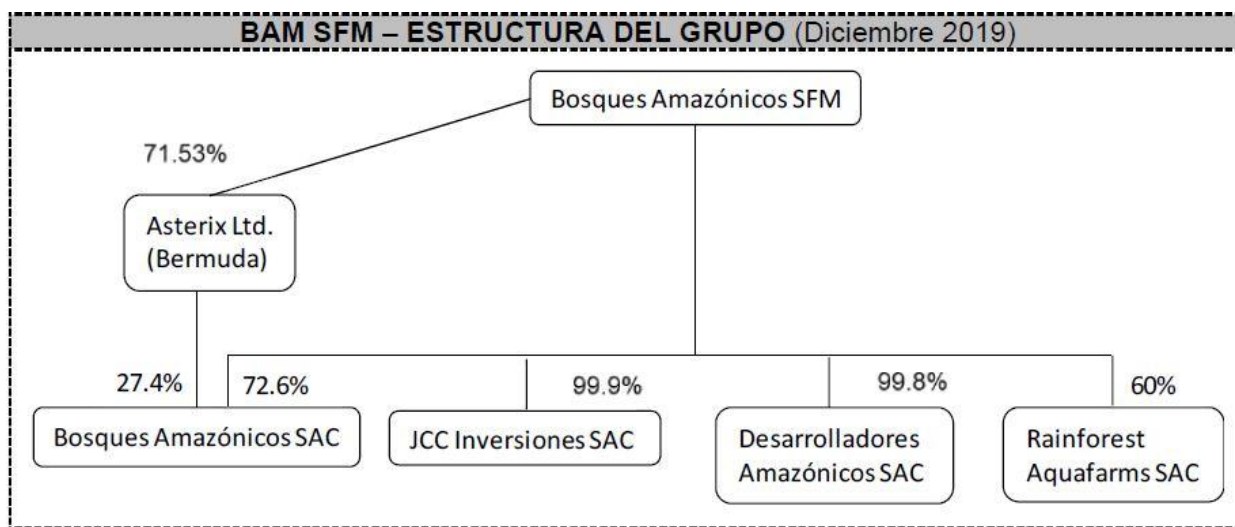


Figure 20: BAM SFM Group Structure from Pacific Ratings Report (Sánchez & Peña Ortiz, 2020)

A news report by Ojo Public stated the BAM S.A.C was funded in 2007 by Sustainable Forestry Management Limited (SFM ) an offshore company based in Bermuda. They claimed that BAM had executed transactions of more than 71 million with SFM (Cabral & Luna, 2017). In a notarized letter published by Ojo Publico, BAM’s general manager Jorege Canturias stated that this was false, but it did state that BAM was financed by SFM (J. Canturias Falconi, personal communication, February 14, 2019). According to

the ojo publico report BAM received a \$4426,000 loan from SFM in 2007. It also stated that in 2011 BAM mortgaged three properties for \$11.4 million to Octavian Special Master Fund L.P. an offshore company in Cayman Islands (Cabral & Luna, 2017).

The Ojo Publico report also stated that in 2007 in exchange for a commitment to finance reforestation and forestry operations BAM would sell carbon credits to SFM at the price of \$0.5 per credits and noted that carbon credit prices in the voluntary market reached \$52 in Europe (Cabral & Luna, 2017). In 2019 BAM's average price per carbon credit was \$0.53, according to Pacific Ratings this credits belong to the 2010-2012 crediting period and are therefore lower. It is expected that the 2013-2016 credits will have a base price of \$2.04(Sánchez & Peña Ortiz, 2020).

According to Pacific Ratings report, BAM's current revenue corresponds to carbon offset sales from REDD+. There has been an increase of sales from verified carbon units (VCUs) see figure 21.

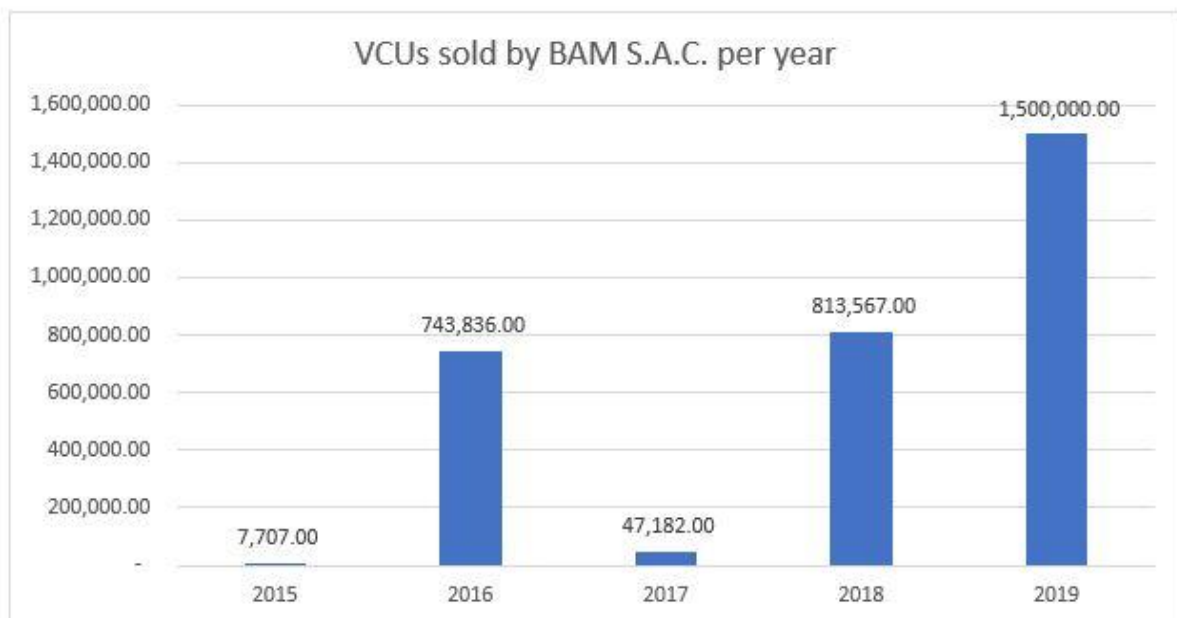


Figure 21: VCUs sold by BAM S.A.C. per year, data from Pacific Credit Report (Sánchez & Peña Ortiz, 2020).

BAM's clients include carbon credit brokers such as Climate Partners, First Climate and Forest Futures. Together those three clients account for 77.4% of BAM's total revenue in 2019 (Sánchez & Peña Ortiz, 2020). Other clients mentioned include the Andean Development Fund (who preaches credits equivalent to 160,000 tons of CO<sub>2</sub>) and South Pole (BAM, 2019). BAM has sales commitments of 200,000 carbon credits (Sánchez & Peña Ortiz, 2020).

BAM started conversations with newer offsetting platforms such as Pachama, GreenCloud and Compensaid (BAM, 2019) and international companies such as British Petroleum, Shell and LATAM (Sánchez & Peña Ortiz, 2020).

At the end of 2019 BAM had just started the verification process for the 2013-2016 credits, and had purchase intentions of around \$7 million for those credits (BAM, 2019). Because of the growing demand and anticipated increase in international carbon credit prices at the end of 2019 BAM had plans to increase their REDD+ portfolio hoping to reach 3 million additional credits per year in 2022 (BAM, 2019).

## **Bosque de Protección Alto Mayo**

### ***Downstream***

The Protected Forest Alto de Mayo is located in San Martín department between the Rioja and Moyobamba provinces. The forest has a total extension of 182,000 hectares (Conservation International Peru, 2015; SERNANP, n.d.). Because of its

location south of the Huancabamba depression the forest is a priority area for conservation (SERNANP, n.d.). Alto de Mayo is part of the Abiseo-Condor-Kutukú Conservation Corridor, which houses a high number of endemic species (Conservation International Peru, 2015).

The forest is home to the Aguaruna native people as well as some more recent Andean migrants. Migration to the area accelerated after the construction of the Marginal highway during the 1970s (SERNANP, n.d.). Alto de Mayo was designated a protected forest in 1987 with the Supreme Resolution N°0293-87-AG/DGFF (SERNANP, n.d.), but even with the designated protection lack of funds as well as the pressures from development projects and migration have contributed to Alto Mayo being the Natural Protected Area with the highest deforestation rates in Peru (CI Peru and IUCN, 2014). Since the 1990s the production of coffee has been the principal source of finance in the area. (CI Peru and IUCN, 2014). Rising coffee prices put further pressure in the area with increasing slash and burn activities (CI Peru and IUCN, 2014).

To counteract the growing deforestation in the area Conservation International (CI) founded the Alto Mayo Conservation Initiative (AMCI) (Conservation International Peru, 2015). Conservation International is a global NGO based in the United States whose mission is the empowerment of societies to sustainably care for nature and biodiversity (Conservation International, 2021). The organization would focus on reducing deforestation through increasing forest monitoring, education (Gifford, 2018) and conservation agreements with local communities to increase coffee plantation productivity and reduce the need to abandon existing plantations and deforest other areas (Conservation International Peru, 2015).

In 2012 CI was issued an administration contract with SERNANP with the objective of promoting the sustainable management of the protected area. CI enlisted AIDER as a technical advisor. AIDER developed the biomass inventory and driver of deforestation analysis and contributed to the development of the project design document. In 2012 REDD+ project was validated under VCS and CCBS although the project start date is 15 of June 2008 with a o 20 years duration period(CI Peru and IUCN, 2014; Conservation International Peru, 2015).

To design and establish conservation agreements with local settlers CI enlisted ECOAN a Peruvian NGO(Conservation International Peru, 2015). 848 families have signed conservation agreements and have received agricultural training, educational materials and medical supplies in return (Implementing Forest Conservation in Peru's Alto Mayo Region, 2021).

However, not all settlers agree with the project. This has led to conflict between settlers that oppose REDD often organized in defense groups called rondas campesinas and park rangers and SERNANP officials (Mider et al., 2020). In 2018 the head of CI Alto Mayo operation fled de region after receiving threats (Mider et al., 2020). When asked about these conflicts Claudio Schneider, a Conservation International official in Lima said that the opposition was just a disgruntled minority and that most of the people living in the area approved of the project (Mider et al., 2020).

### ***Upstream***

Disney came in early at the start of the Alto Mayo project as a financier in 2008 (Escobar, 2013). Disney was looking for conservation projects to help with the

company's emission reduction projects during that time. Under the help of Conservation International, an international environmental organization based in Virginia, Disney found the Alto Mayo project (Conservation International,2021). One year before the Alto Mayo project began, in 2007, Disney committed \$3.5 million dollars as an investment to the project (Gifford, 2018). Disney was expecting to earn money back through the sales of carbon credits. After two years, Disney again donated \$1 million to help the Alto Mayo project (Mider and Quigley, 2020). In the project contract, the managers of the project need to raise a \$17 million of funding in total (Benavides, 2016). Despite Disney, another corporate financier is mining giant, BHP Group. Based on a project document, BHP group committed \$5 million for the Alto Mayo project (Conservation International, 2021). The investment from BHP is part of a joint initiative called "Finance for Forests (F4F)", promoting the private finance into the conservation project (Conservation International, 2021). Partnered with Conservation International, BHP would want to incorporate the REDD+ investment into the company's climate strategy and also create a portfolio for conservation projects (Conservation International, 2021). Other than BHP and Disney, there are also other carbon credit buyers like Microsoft, Gucci, and United Airlines for the Alto Mayo Protected Forest (Mider and Quigley, 2020). Among different carbon offset buyers, Disney is the largest carbon credits buyer, taking up to 90% of the total generated offsets (Gifford, 2018). Alto Mayo's carbon credits helped a lot in offsetting Disney's GHG emissions during the project period (Mider and Quigley, 2020). Meanwhile, the initial role of Conservation International is local management and implementation partner, however, CI also started to invest into the project in 2018 (Conservation International, 2021). With the establishment of Conservation International

Venture, the organization provided a \$US 120,000 loan in 2018 to support the coffee buying (Conservation International, 2021). Later in 2020, CI continued to provide another three-year loan to the cooperative (Conservation International, 2021). Furthermore, there are other multiple donors donating the money through CI to support the Alto Mayo project from different perspectives. Specifically, the embassy of Finland supported the research of payments for water services; USAID donated money to support the research on public and private partnership around the area for building a green economy model (Benavides, 2016) .

### **Stakeholder Maps**

The following stakeholder maps are coded by project Role and were created using Kumu.

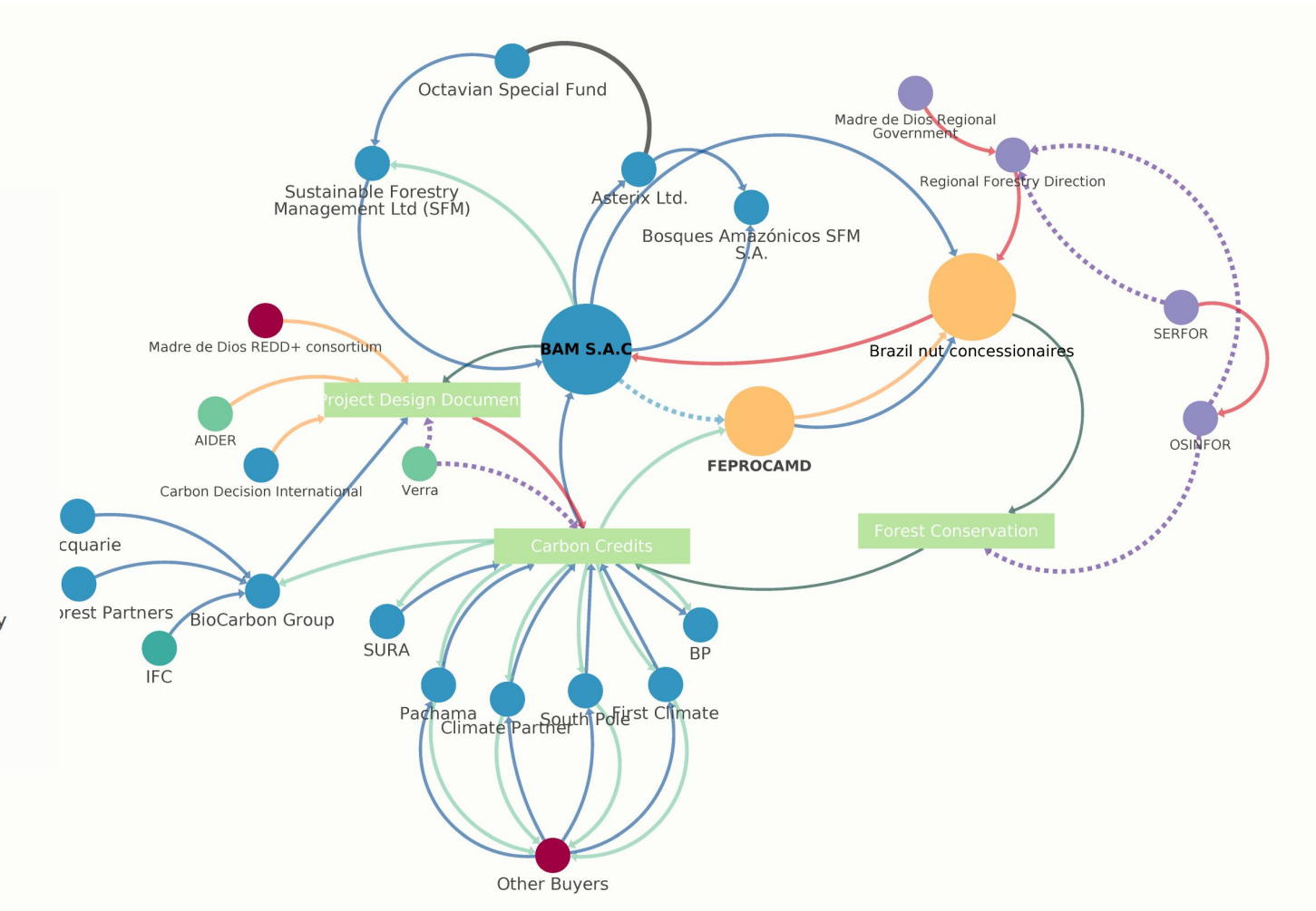






### Legend

- - - Non-profit Financial Transactions
- For-Profit Financial Transactions
- Knowledge Transfer
- Carbon Credit Transfers
- Activity
- - - Regulation
- Authority
- Partnership
- Commodity
- Unknown Relationship
- For-Profit
- Non-profit
- International Development Agency
- Government Agency
- Cooperative
- Participant
- Other



## Discussion

### **Roles required in the implementation of forest-based carbon offsetting and biodiversity conservation projects**

In this section we summarized what we identified as the essential roles that need to be performed by actors in order to implement forest-based carbon offsetting and biodiversity conservation projects.

#### ***Investor/Donor:***

Financial actors mainly support the conservation project with the financial stream at the early stage or the middle of the project. The financial stream can take place in various forms with different purposes from the actor groups. Investors of the project usually seek financial returns from the projects. The returns can be the sales of carbon credits or the revenues from agroforestry products and other sustainable farming activities. Another way investors seek financial returns is the repayment (capital plus interests) of a loan from farmers or a local implementation partner. Investors can both from the public and private sectors without limitations of the industry. Another way to bring money into the project is through donations. Donors usually do not ask for financial returns or profits from the projects directly. The significance of investors and donors for forest-based carbon offsetting in Peru is that they can support the project's initial stage of implementation. As discussed in the earlier section, forest-based carbon offsetting activities largely depend on forestry management and practices. So, it is a long-term investment that needs time to wait for the generation of revenue. The initial money

stream serves as a tool to initiate the project and then keep the project running until profits are generated.

### ***Carbon credit buyer***

Carbon credit buyers are the end actor group across the whole value chain of carbon offsetting projects. In our case, buyers are mainly corporate buyers from the private sector, and there are also buyers from individuals, foundations, NGOs, and other organizations. Carbon credit buyers are significant for a couple of reasons:

1. The revenues for the project participants and investors are generated through the sales of carbon credits. This revenue helps the ecosystem of carbon offsetting continue to sustain and prosper.
2. The buyers need to find a way to reduce the carbon footprint and greenhouse gas emissions by offsetting. The sales of carbon credits help buyer groups to achieve this goal.
3. Sometimes the carbon credit buyers would take the credits as a good to trade or resell in return for a higher profit.

### ***Marketer***

Marketers are the actor group that is mostly invisible but important to the value creation and storytelling of carbon offsetting projects. Marketers connect the sellers, project participants, and carbon credits buyers to promote the carbon offsetting project and develop branding strategies. In the Tambopata case, Ecotierra, a Peruvian-Canadian social business serves as both implementation partner and marketer for the project

(Ormeño & Gregory, 2017, p.7 ). As a marketer, the company focuses on developing linkage with domestic and international cacao buyers (Ormeño & Gregory, 2017, p.7). Ecotierra also hired external commercialization experts to work on how to highlight the premium quality, social and environmental value, and fair-trade certification as the selling point in exchange for a higher selling price (Ormeño & Gregory, 2017, p.7).

### ***Carbon Broker/Retailer***

Carbon brokers are the group of people that act as agencies or middlemen to sell the carbon credits from different projects to the end buyers. Some agencies are specialized in working as carbon brokers. On the other side, carbon credit buyers can also be the carbon barkers as they can resell their credits to another group of buyers.

### ***Verifier***

Verifier refers to the third-party auditors that adopt the in-house methodology and registry to verify the produced carbon credits from the baseline. It is vital because the verification agency decides the number of carbon credits sold. Verifying agencies play the role of gatekeeper to ensure the integrity of the carbon offsetting projects.

***Carbon Credit Owner:*** As part of the VCU methodology projects must provide rights to emission reductions. For Jurisdictional and Nested REDD+ VCS right of use is sufficient to meet this requirement although resolving emission rights through legislation is recommended. "In the absence of laws and regulation, right of use can be clarified using contractual arrangements between the jurisdictional proponent and the land

tenure holders or any other means in accordance with the VCS Standard” (O’Sullivan et al., 2015).

**Project Developer:** Also called project proponent is the figure in charge of generating the necessary project documentation for the project design which includes the generation of a deforestation baseline and deforestation risk assessment. Project proponents are also in charge of project implementation and monitoring which includes data collection and mapping, as well as the creation of documentation needed to certify carbon offsets such as coordinating project validation and verification.

**Community Organizer:** Community organizers are responsible for communication with project participants (buffer zone communities, cooperative members, concessionaires, local settlers) and function as a link between them and Project Developers.

Communication with project participants is key to ensure that the project generates social benefits in the area.

**Project Promoters:** Similar to community organizers, project promoters are responsible for project promotion to generate project participation and enrollment as well as educating and creating awareness of the environmental and social benefits generated by the project to stakeholders.

**Forest Monitors:** Their main function is to discourage and prevent deforestation in project areas by the implementation of project area Control and Surveillance. This can include legal support, law enforcement, and project area patrolling.

**Participant:** private actors who live within the project area or project buffer zone and participate in project activities usually through the implementation of alternative productive activities that meet sustainability requirements such as agroforestry systems,

changing agricultural practices, or ecotourism. These alternative productive activities are listed as social benefits in project promotional documentation and contribute to the narrative value of the carbon credit offsets.

**Forest threat:** refers to private actors who due to their physical proximity to the project area provide an ongoing threat to generating deforestation in the area.

### **Consistency or variation across types of actors and roles**

Next, for each of the roles mentioned above we identify who is the actor or actors performing the roles.

#### **Investor**

In the case description, we identify that the investors mostly played a consistent role in supporting the projects' initial implementation phase through financial resources. After examining each case study, we found out that traditionally defined investors can take many other roles like supporting local technical assistance and providing resources for implementing the project to ensure the successful implementation. On the other hand, nonprofits are also involved as investors to finance the carbon offsetting projects.

In the Tambopata case, without the up-front investment from Althelia, the project can never be achieved at such a big scale with profound influence. Althelia was not just investing money into the project and leaving. Instead, Althelia took many invisible but vital roles. According to the former Managing Partner of Althelia Climate Fund, Christian del Valle, who presented at Althelia Peru Presentation Conservation Finance Investor

Conference on Jan 9, 2019, he talked about Althelia's role "... to find local implementation partners, to build up this blended financial approach with repayment structure, to source pathways and access for broad participation of buyers, and eventually to open up the carbon market" (Conservation Finance conference recording, 2019). The complexity of carbon offsetting markets determines that investors "... cannot trade carbon credits like the goods in the liquid markets," according to Jessica Verhagen, VP Business Development & Strategy of Ecosphere+ (Conservation Finance conference recording, 2019). There is a long waiting time for the investor to wait for revenues and other forms of returns. According to one investor from Althelia Climate Fund, the types of projects like Tambopata, involving conservation and community-based sustainable practices, "... are not seen as business as usual in the market." (Conservation Finance conference, 2019). In this sense, the role Althelia takes also involves implementing the project locally so that the fund can be responsible to both LPs and the project participants. In the previous case descriptions, Althelia chose to work with AIDER. This organization had a "...lengthy track record working on the ground in Peru for this type of project." according to Christian del Valle (Conservation Finance conference, 2019). The partnership between Althelia and AIDER led forest-based offsetting projects towards a more commercial and practical approach in investing in nature-based solutions instead of relying on donations or philanthropic sources.

In the Cordillera Azul case, USAID donated millions of dollars at different project phases with resource partners for on-site work with Peruvian and international organizations (USAID,2014). Furthermore, Cordillera Azul national park receives

investment from Blue Moon Fund, Exelon Corporation, and MacArthur Foundation (Lang,2018). These funders' roles are similar to Althelia at the beginning stage of the project: providing money for technical assistance, supporting local organizations' fieldwork, and smoothly transforming from the beginning phase to the implementation phase. What makes this consistency slightly different from Althelia and other donors or funders in Cordillera Azul's case is one funder called Poseidon Foundation. As a nonprofit organization, the Poseidon foundation does not donate or invest money directly to the project (Ecosphere+, 2018). Instead, the foundation utilized blockchain technology's power to include retailers' carbon credits when selling the products (Ecosphere+, 2018). Taking Poseidon's collaboration with ice cream shop Ben&Jerry's as an example, customers would be able to participate in the carbon offsetting projects when they purchase scoops of ice cream (Lang,2018). Specifically, for one scoop of ice cream, there will be one penny that goes to purchase carbon credits from the Cordillera Azul project (Lang,2018). With blockchain power, Poseidon can get the money quickly, and then the foundation donated "...around 2.1 million Euros" to the Cordillera Project, taking up to 80% of the public fundraising (Ecosphere+, 2018). Poseidon's role in playing as a donor/investor focuses on providing solutions to change the general public's behavior and awareness to combat climate issues. The foundation takes an extra step to connect people with carbon offsetting activities while donating the project's money. This extra step can also boost the carbon market's growth, leading to a considerable carbon credit demand potential in the future.

In the Alto Mayo case, investors' composition changed slightly from the traditional asset management firms or venture funds to big multinational companies. Private corporations like Disney corporation and mining giant BHP acted as the investors in the project. At the beginning of the Alto Mayo case, Disney has already actively involved and invested more than four million dollars into scaling up the project (Lang,2020). Different from Althelia, Disney seems more likely to invest in its interest to reduce the company's emissions. Of all carbon credits generated throughout the Alto Mayo project, Disney booked more than "...half of the carbon credits" to offset the company's greenhouse gas emission (Mider and Quigley, 2020). The more money Disney invested, the larger the project's scale, the more carbon credits generated, and then the more offsets that Disney can buy. Since Disney has been bothered by its massive emissions from cruise ships (Mider and Quigley, 2020), the carbon offsetting project provides a shortcut for the company to show its commitment to climate issues. As for another investor in the project, BHP exhibited similar motivation to advocate for company-side environmental strategy. According to a quotation from BHP's VP of sustainability and climate change, "...taking action on REDD+ now may avoid the need for more disruptive or more costly action in the future for a company like BHP" (Widge et al., 2018). Indeed, South America is an important and strategic mining site for many BHP projects (Toscano, 2019). Numerous mining waste and tailing-dam waste were generated. The Alto Mayo project's investment is just one of the projects that BHP participated in advancing its efforts to protect forested land in the world. Another source of investment for Alto Mayo comes from project implementation partner Conservation International. CI is an environmental NGO headquartered in Virginia, and its Peruvian

branch provides technical assistance to the Alto Mayo Project. Starting in 2018, with CI Venture's establishment, this NGO also provided a \$120,000 loan to Alto Mayo's coffee cooperative (Conservation International, 2021). Later on, in 2020, CI Venture continued to provide another "...\$235,000 loan to support COOPBAM to buy coffee and then fulfill the contracts with European and US retailers." (Conservation International, 2021). The fact that an NGO became an investor is not unusual in the voluntary carbon offsetting market. According to the interview with a project manager from the investor side, the manager said "... nonprofits do not create any funding, but they are looking at us for sources of funding...our interest with that source of funding was to derive an investment return, and that is where two worlds did not work together" (Interview, Investor, 2021). NGOs like Conservation International possess extensive expertise and significant local presence, and they are more likely to observe the gap between the project implementation and money stream (Interview, Investor, 2021). To resolve the pain point of the project, Agustin Silvani, Conservation International's Senior VP of conservation finance, explained the logic behind the establishment of CI Venture, "Conservation is really about investing in businesses and people growing economies, providing livelihoods like any other sector—but typically that is not the way that conservation has been positioned." (Peters, 2019) Another carbon offsetting expert expressed a similar idea regarding NGOs' investment in carbon offsetting projects, "I think that is a pretty regular model... they are interested in seeing a return on their investment not necessarily from a profit perspective, but from a like continuing to make projects happen and fund their staff... it is a little more like core to their missions." (Carbon Offsetting Expert, Interview, 2021)

Overall, the variation for investors across the four projects is complicated yet insightful. We capture many different actors engaging as investors with different motivations and rationales. The capture of this variation would serve as a basis when analyzing the value proposition later in the section for each actor group in the for-profits world.

### **Carbon Credit Buyer**

Carbon credit buyers are usually seen as the end actor group in the value chain of carbon offsetting; however, in our case analysis, corporate buyers can also actively engage in the project with other kinds of roles like investors and carbon retailers.

1.From Donor to Carbon Credit Buyer: In the Alto Mayo case, Disney initially donated \$3.5 million to the local implementation partner, Conservation International (Escobar, 2013). This donation made it possible for the Alto Mayo project to continue and survive during the early stage (Escobar, 2013). Later on, Disney Corporation gradually became the largest carbon credit buyer of the project. Among all of the corporate buyers, Disney purchased more than 50% of the project's offsets (Mider and Quigley, 2020).

2.From Carbon Credit Buyer to the Reseller: In the Cordillera Azul project, Shell, oil, and gas giant in the world bought the carbon credits from Cordillera Azul REDD Project (Shell Invests in Nature as Part of Broad Drive to Tackle CO2 Emissions, 2019).

On its company website, Shell advocates the idea of driving carbon neutral (Shell, 2020), which is to let the drivers pay 2 cents per liter of petrol to buy the offsets from Cordillera Azul (Lang, 2020). Furthermore, in the first month of 2021, Etihad Airways announced the collaboration with Shell to expand its carbon offset program (Etihad, 2021). Etihad Airways stated the purchase of carbon offsets is through Shell, and the president of Shell Aviation said that "Offsetting is not a choice but a necessity if companies within the aviation sector are to meet net-zero emissions targets." (Otley, 2021).

3.From Carbon Credit Buyer to Investor: In 2019, Shell announced the plan to invest around \$300 million in nature-based solutions for the next three years (Danganan,2019). Specifically, nature-based solutions refer to the projects that restore, conserve, and protect the land (IUCN,2021). Although Shell did not use the term carbon offsetting projects in the news announcement, the company admitted that the investment would lead to the purchasing, trading, and branding of the carbon credits (Otley, 2021).

From the above three illustrations, we can capture that the variation of the large corporations' roles generally follows the pattern "from carbon credit buyer to the investor."

Companies with massive capacity and influence like Disney, Shell, and BHP showed the commitment to step forward in conservation finance by taking the role of

investors and conservation leaders instead of purely buying offsets. For private companies, investment in carbon offsetting is the most cost-effective to achieve the multiple purposes of protecting the forests and earning revenues. According to our interview with a carbon offsetting expert who works in the leading organization, the expert shared this changing landscape observation. "A lot of companies don't actually invest in the projects, they just purchase the credits once they're produced." (Carbon Offsetting Expert, Interview, 2021) As the expert shared with us, many large companies realized that buying offsets may not satisfy the vast commitments they made (Carbon Offsetting Expert, Interview, 2021). In this way, many private companies started to invest in the project from the beginning stage. The benefit of investing in the carbon-offsetting project is that companies do not need to worry about if there are not enough offsets available or short of supply in the market. Second, the companies can control the offsets quality and project design to a certain degree as they are the primary financial stream. Third, companies can purchase the offsets in the first five or six years when the credits are just being produced so that the carbon credit price may still be relatively fair. Later on, companies can resell the carbon credits at a higher price to other buyers to gain profits, just like what Shell did. Based on the evidence from case studies, we see this trend of incorporating carbon offsetting investment strategy together with the company's environmental commitment. In the future, more and more corporations may transform the role and increase the involvement with carbon offsetting projects investors.

## **Marketer**

Marketer promotes the sales of carbon credits and brands the multiple benefits behind the project. In our Tambopata case, Ecotierra serves as both the implementation partner and marketer for the project (Ormeño & Gregory, 2017, p.7). As a marketer, the company utilizes a digital marketing strategy to set up the websites and polishing the promotional materials to tell the stories of Tambopata. Another actor group for the marketer in the Tambopata project is Ecosphere, or E+, an affiliate of Althelia. Ecosphere is specialized in marketing and sales of carbon credits. According to Jessica Verhagen, the VP of Business Development & Strategy at Ecosphere+, she saw the uptake in the market after the generation of carbon credits, "... We are seeing a lot more clients that we started working with a year ago, two years ago, they're coming to the table and looking to transact now. And so we're in a much better position to start delivering returns to investors" (Conservation Finance conference, 2019) Ecosphere+ usually works with pre-compliance buyers from corporates that wish to offset the greenhouse gas emissions (Ormeño & Gregory, 2017, p.13). Ecosphere+ spent much time on "... channeling pathways for new sources of demand that were not historically necessarily part of the voluntary offset market," according to Christian del Valle (Conservation Finance conference, 2019). For the other three cases, due to the limited resources, little information available for such roles or platforms that specialize in marketing and targeting the buyers from corporates to attract more carbon credit purchasing power.

## Carbon Credit Owner

In our case studies right of use can be found under the Proof of Title section in the project description (AIDER, 2012; BAM, 2012; CIMA et al., 2012; Conservation International-Peru, 2015).

Project	Land Owner	Carbon Credit Owner	Proof of Title Documentation
Alto Mayo	SERNANP	SERNANP	*Supreme Decree No. 0293-87-AG/DGFF, dated July 23, 1987. *Administrative Contract
Tambopata	SERNANP	SERNANP	*Tambopata National Reserve land title *Bahuaja-Sonene National Park land title *Administrative Contract
Cordillera Azul	SERNANP	SERNANP	*Cordillera Azul National Park government designation as a national park *Administrative Contract
Brazil Nut	Peruvian State	Concessionaires	*Investment Commitment Agreement between BAM and FEPROCAMD *Assignment of rights contract from individual concessionaire to the federation. *Concession Contract between the State and the Concessionaires.

			*Organic Law for Sustainable Use of Natural Resources (Law N° 26821)
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Table 9 : Ownership of Carbon Credits

In the Tambopata, Alto Mayo, and Cordillera Azul case studies, the Peruvian state through SERNANP holds the right of use of the project areas, this is later transferred to project proponents through the administrative contract as mentioned in the case descriptions. A Tambopata project proponent stated that through the administrative contract the executor “is allowed to implement projects approved by the government (...) to achieve the financial sustainability of the natural protected area that they had in the contract and it also allows to implement environmental services necessary to achieve this objective.” (personal communications, 06-28-2019 )When the project was created “there was no other legal framework that was in place to do any transaction for carbon credits or something like that. So basically, the project was the first one to implement this and because of this kind of implementation we make, the government started to create the regulations from SERNAMP to approve the sales, the marketing of carbon credits.” (personal communications, 06-28-2019 ) This refers to the 2014 payment for ecosystem services law mentioned in the Legal status of Natural Resources and Environmental Services section of the introduction.

The administration contract is an essential legal figure that allows REDD+ projects to be conducted by a non-government entity in national protected areas but this only applies to non-profit actors (Reglamento de la Ley de Áreas Naturales Protegidas, 2001). Another important aspect of national protected area projects is that all carbon credits transactions must be approved by the state. A Cordillera Azul project developer explained the process as follows: “We have to request an authorization from the government of such volume at such price, justify that price in a technical study and have the government approve the sale, then the sale can be finalized” (personal communications 03-05-2021).

In the Brazil Nut case study, rights of use are transferred first by the state to the Brazil nut concessionaires, then from the concessionaires to the Federation and from the Federation to BAM. A project implementer stated in an interview that an important initial step for the project creation was the formalization of FEPROCAM. “When BAM arrived, it found a high level of community organization (...) but when we tried to sign an agreement (...) although a real organization existed there was no formal organization that could act as a legal counterpart” (personal communication 03-16-2021). According to the project implementer, BAM was a key player in instituting the formalization of the Federation supporting “the actual legalization in public registries of the regional federation that was renamed FEPROCAM” (personal communication 03-16-2021).

Because the forest continues to be state-owned, Brazil-nut concessionaires must submit both a Forest Management Plan and an Annual Operating Plan (BAM, 2012). OSINFOR is the governmental entity in charge of supervising and monitoring forest resources. A project developer stated that the federation plays an essential role in

providing technical, accounting, and legal support to concessionaires “so that they can be up to date, with the forestry authority. Have their management and operational plans in order”(personal communication 03-16-2021).

For all case studies, carbon credit rights are transferred from the state by a governmental institution to project actors, in the case of national protected areas to non-profit organizations and for forest concessions from the state to a private actor (the concessionaire), from the concessionaire to a civil organization (the Federation) and from the federation to a for-profit actor (BAM). In all case studies, a significant amount of administrative and legal work must be done to maintain the right of use of environmental services. In all case studies, this is carried out by a non-profit actor.

#### **Project Developer.**

As mentioned above national protected areas can only be co-managed by non-profit actors it should come as no surprise that for the Tambopata, Cordillera Azul, and Alto Mayo case studies all project developers are NGOs.

Moreover, because of the technical nature of forest-based carbon offsets, all project proponents specialize in forest management, reforestation, deforestation mapping, nature conservancy, and similar activities (AIDER, 2012; BAM, 2012; CIMA et al., 2012; Conservation International-Peru, 2015). Also, all project developers are based in Peru. All but Conservation International are national Peruvian organizations, while Conservation International is a global NGO based in Washington D.C. USA with a presence in Peru since 1989(Conservation International-Peru, 2015). Knowledge and connection with the local context of projects is an important aspect of project developers for these projects. As a Tambopata project developer put it: “you really need to have an

organization or someone to play this role of connecting both, like both worlds or both stakeholders to create this kind of relationship for the project”(personal communications,06-28-2019)

Because of the large amount of technical expertise and work required to produce a project design document all project developers except for AIDER list other organizations as providing technical assistance in the creation of the project design document, see figure 22.

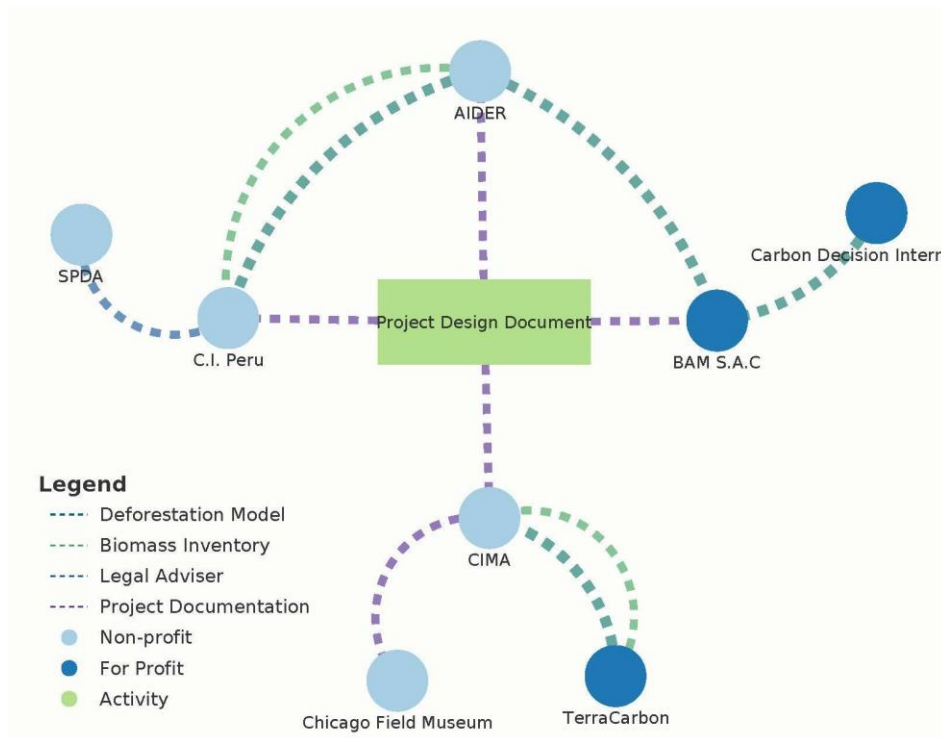


Figure 22: Actors Involved in Project Design Document

CIMA even went as far as to state in the Cordillera Azul design document that “The Field Museum has the authority to act on CIMA’s behalf to develop the project documentation, manage the validation and verification of the avoided deforestation carbon project and to provide advice on the sale of the carbon credits generated. This

authority was initially outlined in a Memorandum of Understanding between the two organizations and was later formalized in a contract”(CIMA et al., 2012). When asked about the CIMA’s current relationship with the Field Museum a Cordillera Azul project implementer states that “there is still a good peer relationship, but there is no joint project at the moment” and that CIMA manages the REDD project by itself (personal communications 03-05-2021).

As stated above, Project Developers must conduct all the necessary documentation for periodic project monitoring and verification reports, we believe that for our case studies project developers create their project documentation.

### **Community Organizer**

In the case studies, we see how civil organizations, cooperatives, or NGOs take on the role of communicating organizer and functions as a bridge between participants and project developers. Sometimes this organization is created with the assistance of the project developer as in the case of COOPASER in the Tambopata case study, FEPROCAMD in the Brazil Nut case study, or COOPBAM, in the Alto Mayo case study.

In the Alto mayo case study C.I. Peru hired ECOAN, a Peruvian NGO, to design and implement conservation agreements and work with local settlers (Conservation International-Peru, 2015). Because there are a variety of different productive projects ECOAN serves as the general point of contact with participants.

According to an interview with a project implementer for the Brazil Nut project the federation oversees “social aspects and concessionaire relations”(personal communications 03-18-2021). In the interview, the project developer also stated that

throughout the project BAM employees would periodically travel to Madre de Dios and attend assemblies as well as communicate project results.

In the Tambopata project, COOPASER serves as a point of contact for project participants. The cooperative is managed by an external manager hired by Ecotierra; the technical assistance team also belongs to the cooperative. A project developer explained that the rationale for that decision was that “the farmers need to actually feel like the technical assistance comes from the cooperative, from their own cooperative not from AIDER, they need to get more involved, the cooperative, that’s why we decided that the technical assistance team has to be part form the cooperative” (personal communications 06-28-2019 ).

Cooperatives also play the part of project implementers for the productive aspects of the projects. They provide both technical assistance to participants and added value through certification and linking commodities to international markets.

Because the Cordillera Azul project is distributed across different regions and involves a variety of different communities, community organization is more complex. CIMA carries out all communication with communities living in the Cordillera Azul’s buffer zone. A project developer also stated that part of the communication includes close communication with all regional governments. It is also important to note that as was mentioned in Cordillera Azul’s case description above CIMA has field offices in Tarapoto, Tocache, Contamana, and Aguaytia which must facilitate contact with project participants.

In this case study by serving as a communication point with project participants community organizers also play the role of project promoters.

## **Forest Monitors**

For the national protected area projects the role of forest monitors falls on park rangers. Park rangers are paid in their majority by project developers although they do receive some funding from SERNANP (personal communications, 03-05-2021 & 03-12-2021 ). Even so, park rangers, as well as park operational staff, are hired by the state according to an Alto Mayo project developer. In the Alto Mayo case study by signing conservation contracts in site dwellers also become forest monitors.

In contrast, in the Brazil Nut case study, the overseeing body is OSSINFOR. However, the more constant monitoring and deterrent for deforestation are the Brazil Nut concessionaires. While BAM is in the process of designing an early alert tool for detecting deforestation the concessioners are the ones monitoring on the ground. The Federation, by providing legal assistance, reporting illegal deforestation to the authorities, following up on complaints, and as a Brazil Nut project developer put it “create situations that may intimidate these invaders” (personal communications, 03-18-2021).

## **Participants**

For the Cordillera Azul and Tambopata projects participants are communities that live inside or near the park’s buffer zone. For Alto the Mayo, although communities living in the protected forest’s buffer zone are also participants, most of the attention has centered on forest dwellers. In the Brazil Nut project participants are Brazil Nut concessionaires, most but not all belong to FEPROCAMD. Even though not all of the federation’s members are part of the project some of the indirect benefits such as assistance from the federation are transferred to them. Project developers are okay with

this stating that “It is convenient that this is so, because the activity, the chestnut sector, is strengthened in general, for the good of the forests, for the good of Madre de Dios”(personal communications, 03-16-2021).

### **Forest threat**

In project descriptions additionality is proved by the presence of a set of conditions that make a deforestation scenario likely. Without these conditions, the project would not be possible because it would not be needed. The Alto de Mayo project description states that “As a result of this historical process, the AMPF is currently suffering significantly from the large population of settlers within and around its boundaries that depends heavily on forest conversion to sustain their income generating activities, dominated by coffee production. If nothing is done to revert this trend, this human-caused pressure will only become more severe. The AMCI aims to reduce GHG emissions from deforestation that occur due to the historical and social factors described above, and are independent from the project.”(Conservation International-Peru, 2015) While the Tambopata project description warns that “Without a substantial profitability improvement of activities associated to forest conservation, family unit decision (local and immigrant) will prioritize activities associated to land-use change and unsustainable uses of the forest.”(AIDER, 2012)

In contrast, the Brazil Nut project description cites the population increase from migration as a threat to the forest under conditions before project initiation but the additionality section focuses exclusively on the economical additionality of the project.

Finally, Cordillera Azul’s project description argues that lack of government funding and increasing pressure from immigration. “In the absence of this REDD

project, the intense deforestation surrounding PNCAZ would overwhelm any weight that a national park designation carries when it is only a “paper park” and the intact forests of the park would succumb to fragmentation and deterioration. When the park was established, there were large-scale illegal logging settlements operating in the park. These operations were all removed from the park peacefully, in coordination and collaboration with surrounding communities” (CIMA et al., 2012).

“In addition, the regional governments’ resources are severely strained, especially given the rapid, large influx of immigrants. There is currently insufficient capacity to ensure awareness of and adherence to national, regional and local laws in the buffer zone. Without the project, land-use zoning and tenure processes would be limited to nonexistent and illegal activities would seldom be reported to the correct law enforcement authorities by community members” (CIMA et al., 2012)

### **Carbon offsetting added value for conservation projects**

In this section, we explore what kinds of added values are adding to the project itself.

#### **Financial Value**

Financial value brings a long-lasting economic return to the project. Financial value from carbon offsetting projects can take place in various forms. For the carbon offsetting project, the project developer or funder can establish sustainable livelihood activities to ensure long-term revenue for the local communities. In Cordillera Azul National Park REDD+ Project, 26 sustainable enterprises were created to support the local communities (ACF Impact Report, 2020, p.21). Except for the investment in carbon

offsetting activities, Althelia Climate Fund also invested in the livelihood activities at the project sites for Tambopata and Cordillera Azul to ensure that profits from agroforestry and sustainable farming can create a long-lasting economic return for the local communities (ACF Impact Report, 2020, p.17). For example, there are 2,930,310 Euros of investment dedicated to Tambopata's livelihood activities and supply chain, creating 12,949 Euros of non-carbon revenues for the local communities. (AltheliaClimate Fund, 2020, p.17). According to an internal document prepared by Althelia and Mirova, among the cocoa profit distribution, more than 85% of the profits would go directly to the communities (Credit Suisse 2019 Annual Conservation Finance Investor Conference Presentation, 2019, p.6). The rest of the profits should be shared with the investors through contracts (Credit Suisse 2019 Annual Conservation Finance Investor Conference Presentation, 2019).

### **Social Value**

Forest-based carbon projects where there is not a single land-owner or where important parts of the strategies employed to reduce deforestation involve changing land-management practices of rural communities often refer to the impact the project is having in the communities as social benefits. Sometimes social benefits are validated through an additional certification, like VERRA's CCB standard. The premise is that “, well-designed carbon projects can improve livelihoods, create employment, protect traditional cultures and endangered species, and help secure tenure to lands and resources, all while still making a key contribution to combating climate change.” (VERRA, s. f.) However, it is also important to remember that these projects also produce a set of additional social values that are not related to participants'

development and well-being. For instance the reputational value for companies buying carbon offsets or for project developers and financiers. There is also the political value generated for government entities such as SERNANMP. These value propositions by actor groups will be further explored in the next section.

### **Value proposition, costs and risks by actors involved in REDD projects**

In this section, we identified four actor groups: project developers, for-profits, governmental and participants. We identified the specific value propositions for these actors in our case studies as well as their particular costs and risks from participating in the projects.

#### **Project Developers**

##### ***Value Proposition***

For non-profit project developers, their mission is to develop projects aimed at biodiversity conservation, therefore the environmental value generated is an important project component. In the case of CI Peru, a project developer stated that the project arose out of CI's looking for "opportunities" to address water issues in San Martin. After conversations with the mayor, they started investigating the protected forest and looking for ways to stop deforestation (personal communications,03-12-2021).

As mentioned above, carbon offset projects have a deforestation threat which gives the project additionality. However, projects argue that to stop deforestation, area monitoring activities are not sufficient, and a social value must be produced, usually through a productive activity. Therefore, non-profit actors promote the narrative that project participants, who before participating in the project were considered a

deforestation threat, through participation with the project would become a forest steward. Most non-profit developers emphasize in their communication with project participants that the protected area should be preserved because it brings them benefits. “We also put a lot of effort in communicating to our, we say “our farmers”, our partners, that are the farmers finally that the project wouldn’t be possible if there is not a protected area.” said a Tambopata project developer (personal communications,06-28-2019 ). The logic follows that if conservation brings benefits to participants then caring for the protected area is the logical thing to do. According to an Alto Mayo project developer, “what we have seen is that the villager has become an ally.” (personal communications, 03-12-2021).This narrative also helps bring additional financial value through the sale of carbon offsets . Non-profit actors have expressed their opinion that the carbon credits generated from the project are “high quality” credits because of the story behind their creation (referring to the social benefits of the projects), this is validated through the additional CCB certification(personal communications, 03-12-2021).

Non-profits also argue that because most deforestation in Peru is micro-deforestation from low-income farmers, without social components conservation projects are doomed to fail. A project implementer and REDD+ consultant stated that in Peru “deforestation is not to get rich, but to survive economically, to support your children, to educate them, to support your family. So, you must create viable economic alternatives for those families that come from forest products. Right now, there are not. And I think that is where we have to go. This requires significant resources”(personal communications 03-16-2021). In this sense, income from carbon offset projects should

provide the economic incentives necessary to make forest conservation attractive.

Interestingly, not all non-profit actors think this is the case. A CIMA project developer stated that CIMA has finished paying Althelia's loan and is now looking to use the income generated by carbon credits to create an endowment for Cordillera Azul National Park. "CIMA's dream is for the park to be able to be maintained with the services that the park itself generates" (personal communications, 03-05-2021)

Regarding the volatility of carbon offset markets, they also stated that they "are in a fight against time, trying to create a trust fund that allows for the generation of park income in perpetuity. That is the great goal that CIMA has at the moment. That way whatever happens in the future with carbon does not matter anymore because the park will always have its budget assured"(personal communications, 03-05-2021). It is some non-profits' views that other financial alternatives for park management such as donations and grants from international cooperation are no more stable than carbon markets. A CIMA project developer said that grants " are not always there. There could be periods when one project runs out and until the other begins there is no money to pay park rangers"(personal communications, 03-05-2021).

In the Tambopata project, even though carbon credit income is supporting the cooperative and its farmers, according to a project developer AIDER's goal is for the cooperative and the shade-grown cacao project to become economically self-sustaining (personal communications, 06-28-2019). For the Alto Mayo project even though carbon credit income supports technical assistance as part of the conservation agreements, the cooperative receives loans from C.I. 's Conservation Venture department directly and does not receive any financial assistance from the carbon credits generated. For these

actors, carbon-credit income is a way to bridge a temporal financial gap, while striving for productive projects' or in the case of Cordillera Azul, the park conservation's, financial independence.

### ***Costs and Risks***

Because of the considerable investment needed to develop the project design document, including developing the project's baseline deforestation scenario and a thorough description of current conditions, administrative tasks, and paying for the project design document validation, project developers take on a large amount of risk at the start of the project. As was shown in figure 22, often project developers do not have all the required skill sets needed for the creation of the project development document and must hire external actors. In the case of Alto de Mayo, the risk was counteracted through a \$3.5 million donation received from Disney. Cordillera Azul, on the other hand, was going through a funding crisis in 2007. "By 2007, grants received by The Field Museum and CIMA for the operation of the park and conservation-based activities in the buffer zone were nearly exhausted. CIMA began limiting its activities in the first quarter of 2007 due to budget cuts. In July of 2007, all CIMA staff resigned because program funding ended. Some were rehired as new funding permitted"(CIMA et al., 2012). After deciding that a REDD+ project was the most viable way for Cordillera Azul to obtain sustainable funding, the field museum help obtained sufficient funding for the project development through grants from USAID, the Gordon and Betty Moore Foundation, the MacArthur Foundation, the JRS Biodiversity Foundation and AECID (CIMA et al., 2012). The Gordon and Betty Moore Foundation awarded 3 grants to CIMA between 2008 and 2011 for a total of \$3,380,175 (Gordon and Betty Moore

Foundation, 2020), while USAID awarded \$ 2,800,000 and USAID's resource partners which include Blue Moon foundation, the field museum, and MacArthurFoundation provided and additional \$ 2,943,000 from 2007 to 2011 (USAID, 2014). A Cordillera Azul project developer stated that afterward the loan agreement made with Althelia helped offset the risk of carbon markets and that it allowed the project to survive (personal communications,03-05-2021). According to a Cordillera Azul project developer, the project finished paying its debt to Althelia and has been contacted directly by an interested buyer for a large carbon credit sale (personal communications,03-05-2021).

The Tambopata project originally lists Bosques Amazonicos as its financial partner in their 2012 Project Design Document (AIDER, 2012a) but a following non-permanence risk report states that due to insufficient human resource capacity, as of July 2012 BAM is no longer part of the project and AIDER assumed the financing and implementation of the entire project(AIDER, 2012b). The 2015 non-permanence risk report lists Althelia Climate Fund's \$6,903,294 secure investment for the project and also mentions additional revenue by PROFONANPE. Under the financial viability section, the 2015 report also states that "The project has secured 71.49% of funding needed to cover the total cash out required before the project reaches breakeven.

This percentage was obtained from investment of US\$ 6,903,294 compared to the cumulative costs totaling US\$ 9,656,463 until the 5th year, which is the year the project reaches the breakeven point."(AIDER, 2015). Based on both non-permanent risk reports we theorize that AIDER and SERNANP had to rely on internal funding until 2014

when the investment from Althelia was secured. This highlights the high initial risk of REDD+ projects as the income generated from the sale of carbon credits is uncertain and not available until the first crediting period.

We have little information about how the Brazil-Nut project was financed in its initial stages but a non-permanence risk report states that “The project has sold forward approximately 1.5 million VCUs. The project received an up-front payment to cover the initial costs and will receive the rest in the next few months. Part of the forward sales has been prepaid (~US\$1.3m) and part will be received upon delivery of the Monitoring Report to the VCS auditor (US\$675,000) and upon delivery of credits to our clients in their registry account (US\$730,000). The most important forward sales transaction was done with BioCarbon Group Pte Limited for 1,116,504 VCUs”(Bosques Amazónicos, 2013). An actor connected to BioCarbon group stated that after they got the carbon credits the voluntary carbon marks were at a low point and they had difficulties selling the credits. This was also expressed by a Brazil Nut project developer. Because the project was being developed by a for-profit company Bosques Amazonicos could not apply for grants to finance the project like Cordillera Azul did or receive some state support like the Tambopata project. It also lacked a direct connection to an international carbon credit end-buyer like the Alto de Mayo project. Project Developers express how they struggled for many years with the project being forced to close down the Madre de Dios office, not being able to build the nut processing plant and at one point reducing Bosques Amazonicos staff working on the Brazil Nut project to 2-3 people (personal communications,03-18-2021 ). The project reached out to numerous carbon brokers, as one project developer puts it: “They are the main beneficiaries. We have learned that as

we go. They could pay us 50 cents for the credit and that credit ended up in the hands of the client at 1.2 dollars 1.8 dollars. But it was better than not selling and not moving the credit because(...)every year that passes, your credit looks less attractive because it is from an older vintage” (personal communications,03-18-2021 ). Amazingly, the project survived, and begging in 2018 started selling significant amounts of carbon credits.

Carbon credit projects also bring reputational risks for project developers. An example of this is the controversy surrounding the Alto de Mayo project because of the conflict between some rondas and the project in the protected forest(Mider et al., 2020).

Bosques Amazonicos reported having lost a 4.6 million euro investment from First Climate Markets (J. Canturias Falconi, comunicación personal, 14 de febrero de 2019) after an Ojo Publico report linked the project to controversial offshore investments leaked in the Panama Papers(Cabral & Luna, 2017). In the letter, BAM cites the following email from First Climate Markets that says “Unfortunately our client has decided to remove the Brazilnut project from their portfolio. This is because they thought that the reputational risk from the connection between your project and the Panama Papers was too high”(J. Canturias Falconi, comunicación personal, 14 de febrero de 2019).

The difficulty in convincing communities to enroll in the projects is another risk for the project developer. Besides Alto de Mayo's example with non-participating rondas members, AIDER also expresses difficulty in the initial phases of the project in enrolling participants. A project implementer stated that “the previous regional government had a dissenting position against NGOs and against projects that were developed in favor of

farmers. This had permeated many of the farmers, they believed that working with organizations or NGOs or with any foreign capital would take away their agricultural funds, so this was believed”(personal communications,06-27-2019). According to a project implementer, AIDER struggled to get participants until they reached a turning point in 2017.

Finally, conservation projects are vulnerable to increases in deforestation pressure from external actors. For example, a Cordillera Azul project developer stated that the San Martin region of the protected area is “is a more populated area, with more deforestation. Besides, the main highway passes through there so it is an area of high deforestation and it was very conflictive years ago due to coca. Even now there is coca, so it is an area with more pressure(...) It is complicated, it is not an easy task. This is the fourth largest area in Peru. It is 1 million 400 thousand hectares and, with its buffer zone, there are more than 4 million hectares. It is more or less the size of Switzerland. You have a thousand problems every day”(personal communications, 03-05-2021).

## **Governmental Actors**

### ***Value Proposition***

A recurring theme in interviews with project developers and the project documentation is the lack of finance that the state can provide for the implementation of conservation activities in national protected areas. A MINAM employee stated in an interview that the figure of an administration contract for a protected area arouses to provide a way for a country without a lot of resources to have civil society support in conserving protected areas. They also mentioned that the figure facilitates the process

through which a protected area can receive funding from nongovernmental organizations as opposed to having funds transferred from the public treasury which “always has complications” (personal communications, 03-18-2021b). This view is also shared by project developers (personal communications,03-05-2021 ).

Also relevant, as mentioned by a project developer is the fact that Peru has assumed many international commitments and, as mentioned in the introduction section, has received large amounts of funding from international cooperation to develop the infrastructure needed for REDD projects. Thus Peruvian REDD+ projects' success and promotion have political and reputational value for the Peruvian state and specifically for the Ministry of the Environment. Peru is currently in the process of implementing the “nesting” strategy for REDD+ and other emission reduction projects in Peru. This means that all projects will now have to use the states' recently approved baseline for the Peruvian Amazon and all emission reductions must be entered in the recently created National Registry (see Peru's Current carbon markets). According to a peruvian ministry of the environment employee, emission reductions in the registry will count to Peru's Nationally Determined Contributions for the Paris Agreement (personal communications, 03-18-2021b). However, given that the majority of carbon credit buyers for the case study projects are international organizations they should not be considered as Peru's national contributions to avoid double counting. In any case, as an ex-MINAM employee states, future projects will benefit from the nesting approach as they will no longer have to invest a significant amount of capital in determining the project baseline (personal communications, 03-16-2021).

Specifically for SERNANP, who ultimately is responsible for the conservation of Peru's protected areas, as a project developer said, the projects have been empowering (personal communications,06-28-2019).

### ***Costs and Risks***

Through administrative contracts, SERNANP assigned a non profit responsibility over the protected area financing. As we saw above, this has brought benefits to SERNANP. However, as a project developer clarified, if the administration contract executors does not meet the expectations, SERNANP can cancel the contract but this would mean that it would have to find another non-profit organization to operate the project through a new administrative contract (personal communications,03-12-2021).

Regarding the sale of carbon offsets, the Ministry of the Environment is concerned about who the carbon offsets are being sold to. According to a project developer, "we have a commitment with SERNANP that the offset buyer is the end-user of the offsets. We do not want these carbon credits that are high quality, have a story behind them, two certifications, and come from a protected area to be used for greenwashing"(personal communications,03-12-2021).

In terms of costs, SERNAMP continues to pay for a small part of conservation activities in the Protected Areas. In the Tambopata project, the Ministry of the Environment made a contribution of \$60,000 for the construction of a quality control lab (Ormeño & Gregory, 2017).

Finally, as mentioned in the Forest Monitoring Infrastructure and Peru's Current Carbon Markets section, the Ministry of the Environment has made significant investments in REDD+ infrastructure. Most noteworthy are the infrastructure built to, in

the words of a MINAM employee , “ provide the framework established by the Paris agreement, because this year the agreement will begin to be implemented”(personal communications,03-18-2021b). This includes the National Registry of Mitigation Measures and determining the Peruvian Amazon’s deforestation reference level which was sent to the United Nations Framework Convention on Climate Change. Once emission reduction nesting is implemented, REDD+ projects must use the nationally determined reference level for their project. This means that project developers will no longer have to incur one of the project proposals biggest costs.

## **Participants**

### ***Value Proposition***

For the Tambopata project a key added value for participants, at least from the project implementer’s perspective is the focus on the whole value chain which includes creating relationships with international markets (personal communications,06-27-2019 & 06-28-2019). This is different from most other projects in the region which focused on maybe providing seeds or farming assistance but then, according to project implementers, “ abandoned farmers to their faith” when the time came to find buyers for their products (personal communications,06-27-2019). A success story for the Tambopata project is the exportation of 50 tons of organic cacao to ICAM S.p. A. Project participants that hold positions in the cooperative expressed how proud the exportation made them as well as stating that the loan provided by AIDER made it possible. “We farmers feel satisfied because what use would it be to have plantations if we are not able to sell the product? Farmer wants to plant to make a profit and right

now my colleagues are bringing their grain and they are being paid on the spot, so the work is reflected” (personal communications, 6-27-19b).

Projects also generate added value for participants by financing certifications like USDA Organic or Fair Trade for their crops which makes the commodities more attractive to international buyers and fetch a higher price. This was done in Tambopata, Alto Mayo and Cordillera Azul.

The technical assistance provided by the project also allows participants to “recover” previously degraded or eroded land. A Tambopata project implementer stated that at first, participants were skeptical of the success of cacao “producers began to see that the cocoa was growing and that it was effective. They thought that cocoa would not yield saying that ‘ it will not yield, it will not be possible to recover a pasture’, and when they began to see that there was indeed cocoa and people who produced cocoa, the producers began to return [to the area], it was also a lot of fieldwork from the technicians and the site visits because we went and worked one by one with each producer”(personal communications, 6-27-19).

A common theme of how projects are transferring value to participants is by providing accessible financing, for example in the Tambopata project participants receive an in-kind package and technical assistance, 50% of the in-kind package is paid back to AIDER through the cooperative by discounting a small fee from the total amount of cacao sold to the cooperative. According to a project implementer, without the aid, it would be very difficult for farmers to have the finance needed to invest in agroforestry due to high interest rates (personal communications, 6-27-19c).

Similar to the Tambopata case study, the Alto de Mayo project participants have benefited from the technical assistance and connection to markets from the cooperative. COOPBAM was created in 2014 with 71 members. In 2015 it obtained USDA Organic certification and by 2017 had grown to 280 members (SERNANP & Conservation International Peru, 2017). Increase in coffee yields from 90 kg/ha in 2014 to 256 kg/ha in 2016 which translate into additional income for families (SERNANP & Conservation International Peru, 2017). In their report Voces de Alto Mayo, a participant expressed his satisfaction with the project stating that, “Now I am a farmer who sees his farm as a business. I am a member of a cooperative, I'm already a businessman, I am exporting my coffee” ( Junior Torres interview, SERNANP & Conservation International Peru, 2017).

Benefits in the Brazil Nut project, participating concessionaires for the first time received their share of utilities from the project in December 2020, receiving around 2,500 to each of the 405 participants. Regarding the amount a project developer stated that “\$ 2,500 for a year does not make you rich or fix your life, but it is a significant income and it will help” (personal communications, 03-18-2021 ). BAM also expressed that it will change the profit-sharing agreement with the participants from 30% to 50% of the project profits (personal communications, 03-18-2021 ).

Additionally, throughout the project the federation has received financial support from BAM, this, in turn, has brought non-financial benefits to project participants in the form of legal and administrative assistance. It was also expressed that now that the project is generating profits the much-promised brazil-nut processing plant will be built. According to a project developer, “the plan is the following, and happily there is the

budget to do it: we are going to prepare a technical file (...), with market research and everything that corresponds to that. We already have a couple of parcels of land that we are transferring to the federation. That is the starting point. The other point is that we are also talking with some organizations that provide this capital, especially in the case of a social aspect, this is not a private plant (...), this is a social plant where there are 405 families involved. We have made progress and we could get that financing from these soft loans to be paid in a certain number of years, with more just interests. (...) The idea is that at that moment their chestnut will be worth double or triple when they end up in Germany or France the price they are going to get is 2, 2.5, or 3 times and that would be equivalent to having three crops in a year or two and a half crops. That would already be an advance, there would be more money in the concessionaire's pocket and that would, we think, take pressure off the forest”(personal communications,03-18-2021 ).

A project developer stated that the federation has generated benefits for the concessionaires through their administrative and legal support. “The federation supports them [the concessionaires] legally, supports them in accounting, supports them technically so that they can be up to date with the forestry authority. To have their management plans, operational plans in order. But it also supports them when they have any illegal and illicit activity within their territory to make complaints and above all to follow up” (personal communications,03-16-2021).

### ***Costs and Risks***

As mentioned, carbon-financed conservation projects are designed to bring benefits to participating communities. The rationale is that by providing sustainable

economic development activities participants will no longer have to rely on extractive activities that have led to deforestation. In the Tambopata project, the risk of switching land management activities to shade-grown cacao is reduced by having the cooperative buy all of the participants' cacao production. According to a project implementer, this “guarantees that the producers will not lose production” (personal communications,06-27-2019 ). However, when they agree to participate in the project, farmers receive a loan, not a donation. This is part of the project's attempts to change farmers' management practice to, as an project implementer puts it, a more “business or micro business management”(personal communications,06-27-2019 ). By taking on this debt participants are also taking on some level of risk. Initially, the project participants had to pay off the full equivalent amount of the in-kind package they received,according to a project implementer this was then lowered to 50% to make the project more attractive (personal communications,06-27-2019 d).

According to a project implementer, AIDER and COOPASER have yet to define what will happen if a participant is unable to pay their debt, but an implementer stated that in instances when a plot of land has burned down, AIDER has worked with the participants to try to recover what they can. So far it looks like COOPASER will assume these losses (personal communications,06-27-2019 ).

A Tambopata project implementer stated that in the region there are not many farmers, most people participate in extractive activities such as mining or logging. Because most of them do not live in their plots, they hire workers called jornales to manage the crops and harvest them. Joranles are paid daily, a project implementer stated that labor cost is significant. A plot owner described stated that the project was

not profitable for him “A harvest gives me an average of five hundred soles, sometimes I have reached up to a thousand soles and I have to pay each worker fifteen hundred, I have two workers, so that’s three thousand, it is not enough, apart from the fact that you have to buy supplies, you have to buy a series of things, food, electricity, water and everything else”(personal communications,06-27-2019 e) another farmer stated that “The costs have been quite a lot, for example, there was no production during the first four years, now in the fifth year I am recovering the expense”(personal communications,06-27-2019 f) . Another participant did not mention costs but said that even though he is happy to participate in the project, cacao yields were low and not profitable but hopes that with the help of the technical experts this could change (personal communications,06-27-2019 g). Farmers who manage the plot themselves with the help of their families do not have this expense but they also do not have an additional source of funding like the other landowners (personal communications,06-27-2019 h).

Another risk is that the participants who are farmers are getting old when they die their children tend to abandon the farm. An implementer stated that “there is a cultural issue that is very strong that families closely associate working in agriculture in the fields to poverty, so they are looking for a way to get out and lift their children out of poverty” (personal communications,06-27-2019 ).Another project implementer mentioned that most participants had never farmed cacao before (personal communications,06-27-2019 h).

There has been difficulty in establishing a sense of ownership and buy-in from participants towards the cooperative.According to an implementer “they do not feel that

the cooperative is theirs, they feel like a producer who harvests and sells and that's it, and that the cooperative is a buyer”(personal communications,06-27-2019 h).. A project participant and active cooperative member stated that some participants “do not want to participate, they do not want to be in their organization, they do not participate in meetings, they do not want to work”(personal communications,06-27-2019 b).

Some cooperative members expressed their desire to sell carbon offsets as a way of providing additional finance for the cooperative. They also emphasized the importance of the cooperative and the cooperative’s technical team. “if we don't have a technical team here, it will be almost impossible to do all this work” (personal communications,06-27-2019 b). They also expressed concerns about what will happen to them and the cooperative once the project is over. A big source of concern is how will COOPASER manage its cash flows once the project is over, especially because the cooperative pays farmers before it can sell the cacao. Moreover, according to a cooperative member, there are no other accessible sources of funding in the region (personal communications,06-27-2019 b).

Because we could not conduct interviews with project participants in the Cordillera Azul, Alto Mayo, and Bosques Amazonicos projects we have less information about their specific risks and costs. We do know that in the Bosques Amazonicos, participants did not receive the monetary compensation until 2020 because there were no project utilities. We also know that the much promised nut processing plant was not built for lack of funding, although BAM has said that they are in the process of finding finance for the nut-processing plant. Project participants still receive support from the Federation but it is unclear what additional costs they had to undertake to participate.

## **For-Profit Actors**

### ***Value Proposition***

The fact that private companies with large capacity are actively involved with forest-based carbon offsetting project can be concluded for the following motivation: 1) Offset greenhouses emission in a cost-effective way 2) Generate revenue while conserving the valuable lands 3) Fulfill the requirement from the capital market to disclose climate-related risks and align with standardized Environment, Social and Governance (ESG) rating agency's guidelines 4) Reputational Value 5) Explore the potential to build an innovative but sustainable financial model to combat climate change in the future.

#### 1) Offset greenhouses emission in a cost-effective way

For companies in the resource-extractive industry like BHP, Shell, or other oil and gas companies, it is challenging to reduce the greenhouse gas emission from companys' operations (Toscano, 2019). Similar things also apply to the airline industries; as sustainable aviation fuel is still underway, airlines need to find a way to offset their huge emissions (Otley, 2021). Private companies acknowledge that it takes longer with more resources and capital invested in using decarbonization technology. The carbon offset strategy is a lot more straightforward, cost-effective, and easy to operate in delivering a low-carbon portfolio for the current situation.

2) Fulfill the requirement from the capital market to disclose climate-related risks and align with standardized ESG rating agency's guidelines

During the conference hosted by Credit Suisse, Jessica mentioned that Althelia observed from its clients that "... more and more private, large companies are looking at ways to tackle climate issues." (Conservation Finance conference, 2019). One reason why many private companies started to buy carbon credits or invest in carbon offsetting activities is that the climate-related risks are being discussed and assessed for companies' performance. "... Why financial institutions have been coming to us more recently is because TCFD requirements started to shape up into regulations, either Green Growth law that was passed in France last year or somebody requires investors to disclose carbon-related risks. That means that they're also looking for ways to demonstrate how they're mitigating those risks. So starting to come to us to discuss how to decarbonize their portfolios in the transition rate to offset", Jessica delivered at the conference (Conservation Finance conference, 2019).

Taking BHP as an example, on its sustainability annual report website, the company mentioned that "the report aligned with Task Force on Climate-related Financial Disclosures (TCFD) guidelines to disclose the financial impacts of climate-related threats and opportunities." (BHP Climate Change Report, 2020, p.4). Furthermore, based on Figure X derived from BHP's climate change report, investing in carbon offsets have been listed as an important investment strategy to achieve its net-zero goal (BHP Climate Change Report, 2020, p.27). The company also talked about acquiring more offsets from the Alto Mayo project (BHP Climate Change Report, 2020, p.33).

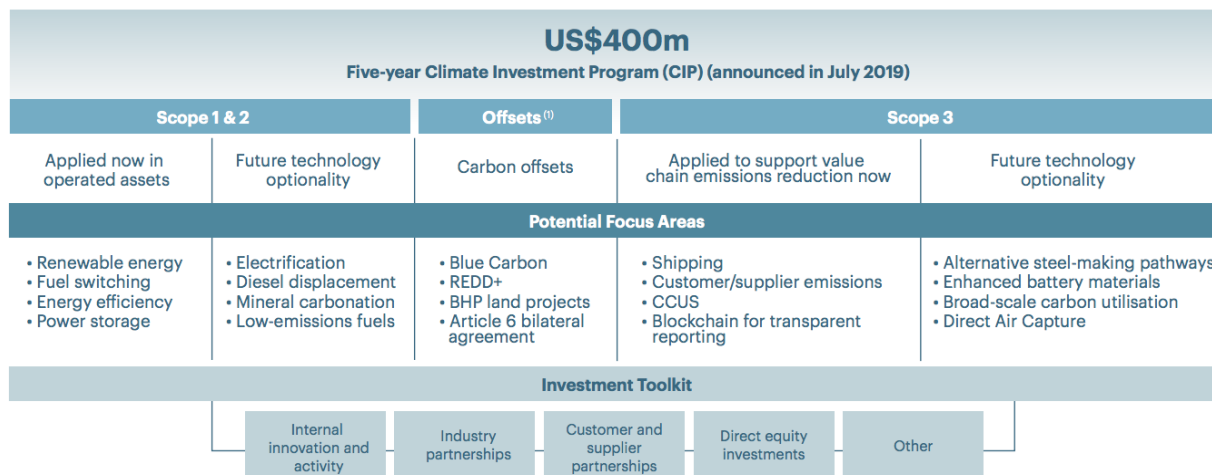


Figure 23: Climate Investment Program plan from BHP Climate Change Report, 2020

### 3) Reputational Value

The actively involved carbon offsetting projects' companies' websites showed that reputational value in promoting corporate responsibility and commitment to solving climate change are the main drivers that these corporations are interested in carbon offsetting projects. According to Molly Peters-Stanley, associate director of Ecosystem Marketplace, in 2012, 90% of the voluntary market buyers are corporate buyers (Gonzalez,2013). For Disney, corporate social responsibility (CSR) in reducing the environmental impact is the main driver behind its carbon offset program, according to Bob Antonopolis, assistant general counsel of Disney (Gonzalez,2013). The Alto Mayo project earned Disney the "Most Socially Responsible Company" in 2013 (The Walt

Disney Company, 2013). The prize was based on the result of a survey participated by 55,000 consumers in 15 countries "to identify companies with the strongest CSR (Corporate Social Responsibility) reputation." (The Walt Disney Company, 2013) Furthermore, the Alto Mayo project's NGO partner, Conservation International, also accredited Disney's efforts on their website to serve as proof (See Figure X). Similarly, Conservation International also acknowledge another strategic alliance from the private sector, BHP, on its website for the contribution that BHP made "to deliver significant and lasting benefits to the environment" (Conservation International, 2016)

Furthermore, some project developers or investors like Althelia usually would emphasize the importance of telling the project's stories. A good storytelling strategy can attract large corporations to buy off the reputational value behind the project. According to our interview, a carbon expert told us that "... in some cases, you actually have these really big project developers who have a very sophisticated marketing program" (Carbon Offsetting Expert, Interview, 2021). Disney is such a model in successfully advertising and polishing the story of the Alto Mayo project. For example, Disney may consider preparing a documentary about the project at Alto Mayo on their cruise ships (Escobar, 2013).

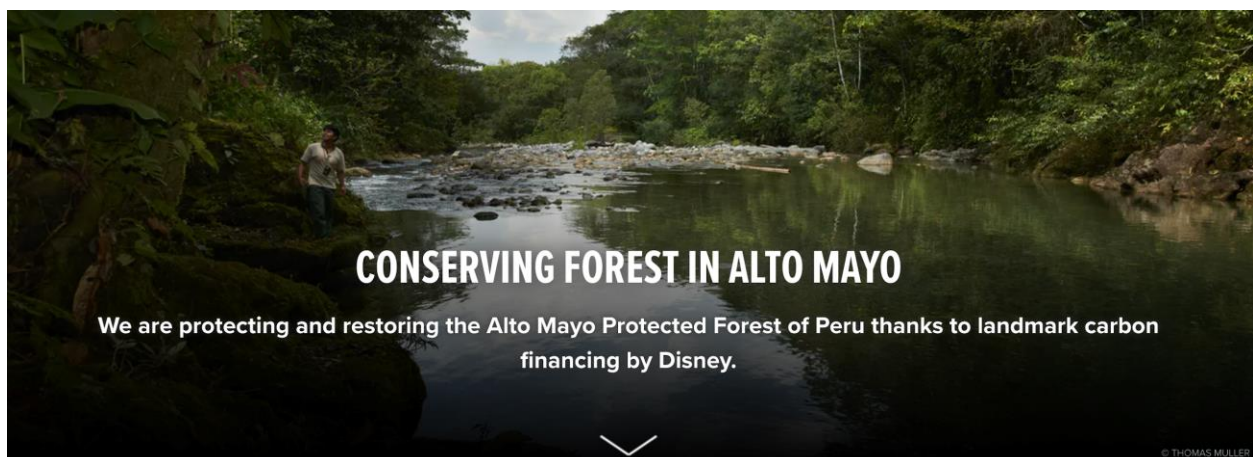


Figure 24: Conservation International highlights Disney's efforts in conserving forest in Alto Mayo from Conservation International Website, 2021

4) Explore the potential to build an innovative but sustainable financial model to combat climate change in the future.

In the Tambopata project, the financial mechanism that Althelia set up with other stakeholders is innovative in controlling risks, ensuring the flow of repayment, and establishing revenue-sharing agreements with local communities (Ormeño & Gregory, 2017, pp.10-13).

During the Credit Suisse conservation finance conference, AXA investors mentioned that investment in promoting conservation for forestry and supporting sustainable practices is not "business as usual" (Conservation Finance conference, 2019). The smallholder farmers are viewed as risky borrowers from the traditional financial capital market (Ormeño & Gregory, 2017, p.11). To reduce this risk, Althelia set up the loan at a low-interest rate to AIDER, with a three-year grace period to pay back (Ormeño & Gregory, 2017, p.10). Peru's agricultural development bank lends the loan to smallholder farmers at an interest rate of 18% (Global Nature Fund and OroVerde-Tropical Forest Foundation, 2019). Althelia's interest rate is extremely low, 6.5%, compared with 18% (Global Nature Fund and OroVerde-Tropical Forest

Foundation, 2019). These flexible terms largely relieve the financial pressure for AIDER to pay the principal and interests back in a short time.

Another method to reduce risk is the loan guarantee from USAID. USAID's loan guarantee is operating from two ends. One end is that the USAID partial loan guarantee can reduce the risk of financial institutions and the private sector that borrow the money (Ormeño & Gregory, 2017, p.12). As the figure is shown, the partnership would allow USAID to guarantee up to 50% of Altelhia's portfolio. (USAID,2011). On the other end, USAID conducted "... the best-in-class due diligence" on the Tambopata to ensure the rights of carbon credit buyers (Ormeño & Gregory, 2017, p.12).



Figure 25: USAID Loan Guarantee Model from USAID,2011

Another innovative feature of the financial mechanism for Tambopata is that AIDER can use carbon credits generated out of the project as the repayment and

collateral for the loan (Ormeño & Gregory, 2017, p.12). It is highly innovative because Althelia allows AIDER to use the future value of carbon and other environmental assets to repay. This financial infrastructure certainly decreases the risk of farmers who bear the costs to repay the loan with all its agroforestry products. Moreover, Althelia also proposed to provide in-kind packages to the members of COOPASER instead of a loan (Ormeño & Gregory, 2017, p.13). In-kind packages include seeds, farm tools, fertilizers, and banana suckers (Ormeño & Gregory, 2017, p.13). This model again reduces the risk of "... local community members using the loan in other places for other purposes" (Ormeño & Gregory, 2017, p.13).

The last point about this innovative and sustainable financial mechanism is the revenue-sharing agreement. Under this agreement, AIDER would receive 1.5% of sales from COOPASER to continue the sustainment of conservation projects, and the rest would go to the community(Ormeño & Gregory, 2017, p.14). Also, the cacao buyer would send the money to an "escrow account" to ensure the distribution of the revenue is under control(Ormeño & Gregory, 2017, p.14).

These three features presented in Tambopata's financial mechanism are certainly groundbreaking for REDD+ projects in the world. According to Christian del Valle, founder of Althelia Ecosphere and Althelia Climate Fund, he expressed the efforts that Althelia tried to identify a distinctive financial model that can work for other REDD+ projects as well. "... We really wanted the Tambopata investment and indeed the entire Althelia climate fund portfolio and the sustainable solutions portfolio to be pilots in all

their forms. We'll demonstrate activities that are scalable and replicable" (Conservation Finance conference, Christian del Valle, 2019).

For Althelia, the value proposition is not only "demonstrate a credible and achievable ROI model" for the investment (Conservation Finance conference, Christian del Valle, 2019) but also to design a replicable financial mechanism that the other financial institutions can utilize.

In the Alto Mayo project, BHP also explores the possibility of establishing a financial mechanism with stakeholders from different industries to raise more private funding to deal with deforestation collectively. Early in 2014, BHP sent out requests for proposals for projects to support company-wide REDD+ strategy. The IFC (International Finance Corporations), a branch of the World Bank, reached out to BHP and helped develop carbon bonds (Widge et al., 2018). The initiative was also under support from Baker Mckenzie, a multinational law firm, and Conservation International. In 2016, IFC issued the Forests Bond with BHP. It is a first-of-kind and innovative financial approach that BHP tried to scale up the conservation finance from the private sector (Widge et al., 2018). The deal's total value reached \$152 million, which is the largest transaction deal at that time (Widge et al., 2018). Specifically, the way that forest bonds work is that it provides three choices for the investors: cash coupon, forest carbon credits, and the combination of cash coupon and carbon credits (Evans, 2019). The generated forest carbon credits are from two REDD+ projects: the Kasigau Corridor REDD Project in Kenya and Alto Mayo Project in Peru (Evans, 2019). In this innovative financial model, BHP engages as the initiator to start the project and acts as a coordinator to work with

various stakeholders. Most importantly, BHP offered a \$12 million "price support system" to support the mechanism's operation to make sure that this initiative can sell a minimum quantity of carbon credits until the maturation of the bonds (Widge et al., 2018). BHP itself also would benefit from either getting cash coupons or forest-based carbon credits from the project.

For this financial model, the distinguished nature is that BHP successfully gathered large amounts of private finance into the REDD+ projects. For companies that are middle-sized or not interested in carbon finance, this model provides an effective and convenient way to buy carbon credits. BHP has always been incentivized to find a better financial design to attract private money and sustain carbon credits trading dynamics. It is certainly easy to keep the demand-side satisfied as there is much less work required. However, the supply side or financial instrument design side faces a much more complex landscape regarding regulation, compliance, and the potential to lose social value. Overall, BHP continued to explore the options to advance private capital into REDD+ projects. The company then established the Finance for Forests Initiative to search for a better financial infrastructure for private capital (Widge et al., 2018). In a Conservation Finance Report written by Credit Suisse and the McKinsey Center for Business and Environment, Tidjane Thiam, CEO of Credit Suisse, talked about how investors are "seeing conservation impact investing as a way to achieve substantial environmental and social impact alongside market-rate returns." (Credit Suisse AG and McKinsey Center for Business and Environment, 2016). This again

suggests that the need to channel financial return is why private capital is interesting in conservation investment.

### ***Costs and Risks***

#### Reputational risk for investors

In the voluntary market, the loose regulation and flexibility to trade make it easy for companies to utilize the loopholes in the system to manipulate the price and avoid taxation. Some of these actions may lead to potential reputational risk for the investors.

According to an article disclosing some information about BAM's case, to avoid paying tax, one of the subsidiaries would sell carbon credits at an extremely low price to a purchasing company based in tax havens like Bermuda and Cayman islands (Cabral & Luna, 2017). Later, the purchasing company would resell the credits at a higher price to the parent company (Cabral & Luna, 2017).

Bosques Amazonicos is the financing company in the REDD Project in Brazil Nut Concessions in Madre de Dios. As discussed in the case study, Sustainable Forestry Management Limited (SFM) sponsored Bosques Amazonicos in investing in carbon offsetting projects. Bosques Amazonicos had over \$71 million transactions with three companies that operated in the tax havens (Cabral & Luna, 2017). According to the International Consortium of Investigative Journalists (ICIJ), the investigation also showed that besides price manipulation, the tax heaven scheme can also become a practice for the rich businessmen to hide shady investments for potential financial crimes (Cabral & Luna, 2017). Peru's government's branch, the National

Superintendency of Customs and Tax Administration (Sunat) actively fights against price manipulation (Cabral & Luna, 2017). However, due to the nature of voluntary carbon markets, there are no financial regulations that are targeted on trades and sales between two private parties (Cabral & Luna, 2017).

Although some of the information in this article needs to be confirmed and do the cross-check, the article suggests a potential reputational risk associated with financial scandal for the carbon-offsetting projects' for profit actors.

## **Conclusions**

**What set of roles need to be played to make these projects come together, what actor groups are taking on these roles, and what “value” is created for each of them (e.g. what motivates their involvement)?**

We identified the following key roles needed for a forest-based carbon offset conservation project: Investor, Carbon Credit Buyer, Marketer, Carbon Credit Owner, Project Developer, Community Organizer, Forest Monitors, and Participants.

After analyzing our case studies we identified some consistencies across actor groups who play the roles needed for the projects to take place.

In the case of carbon credit owners, because all land belongs to the state the Peruvian government is the carbon credit owner. The state then transfers carbon credit rights through contractual arrangements. In the case of the Tambopata, Cordillera Azul, and Alto Mayo project this arrangement is an administration contract between the project developer and SERNANMP. In the case of Brazil Nut concessionaires, this takes place in the form of land concession. In all case studies, a significant amount of

administrative and legal work must be done to maintain the right of use of environmental services. In all case studies, this is carried out by a non-profit actor.

Three of the four project developers are non-profit actors. This consistency is attributed to the fact that under Peruvian law administrative contract executors can only be non-profit organizations. Also, all project developers are based in Peru. We believe that this is because of the importance of knowledge and familiarity with the local context to establish the relationships required for the projects to be successful.

In all case studies, project participants are community members that live in or whose livelihood is within the project area or the project area's buffer zone. All projects also state that without the REDD+ project and the sustainable land use opportunities the project will generate for participants, human-caused pressure will result in land-use change.

For investors, we identified the variation that there are for-profit actors and non-profit actors who played the role of investing in the case studies. In the Cordillera Azul case, USAID and other corporate buyers support the project with their financial resources. In Alto Mayo's case, investors in the private sector are multinational companies like Disney and BHP, and the investors in the public sector include NGO Conservation International. In the Tambopata case, Althelia Climate Fund gathered many investors from both the European public and private sectors.

We identified that different actor groups from the public and private sectors would buy the carbon credits for various reasons. Moreover, there is a tendency for carbon credit buyers to gradually engage as investors in the carbon offsetting projects. For

instance, in our case studies, BHP, Shell, and Disney all participated in the investment of carbon-offsetting projects while they also purchased the offsets. The tendency suggests the potential of gathering private finance into the forest-based offsetting activities.

Marketers are the actor group that is somehow invisible but important to the value creation and storytelling of carbon offsetting projects. Marketers are usually associated with the project implementation partner or investors as they need to know well about the project situation to maximize the value behind it. Marketers focus on creating the value of carbon offsetting projects to channel more resources. In the Tambopata case, the marketing strategy company Ecosphere+ is an affiliate of the investor Althelia Climate Fund. Ecosphere+ utilizes online websites, blogs, videos, and infographics to depict the stories of Tambopata as a successful case of conserving the environment using private finance.

We also identified some variations across actor groups. For instance, community organizers are sometimes civil organizations (FEPROCAMD), cooperatives(COOPASER & COOPBAM), or an NGO (ECOAN, CIMA, AIDER). Likewise, forest monitors are often park-rangers but in the Brazil Nut case study project participants with the help of FEPROCAMD are the forest monitors.

*Added Value*

Financial value is one of the added values brought to the project itself. Forest-based carbon offsetting activities build a new model to create sustainable livelihoods for the local communities while conserving the land. The alternative livelihoods can create a long-lasting and impactful economic return for the local communities. Besides that, the financial model also brings another possibility to the private corporations to find ways to gather more private capital into carbon-offsetting projects. Private offset buyers gradually transformed as the investors of these forest-based carbon offsetting projects. The reason behind is transformation is that large companies realize the limitation of only buying offsets as the company's climate change strategy. To improve the companies' environmental performance, the leading corporations need to find a large platform to attract more resources. With the solid and impactful financial stream from these multinational companies, they are able to call on more private companies to either join the investment or buy the offsets from the projects.

### *Narratives*

Narratives from investors are utilized in a way to emphasize the creation of financial value. In Tambopata's case, Althelia markets its innovative economic model and investment structure as the pioneer in the landscape. However, without the guarantee from USAID, the risks at the project level would be extremely high. Also, Althelia can't lend the money to the local farmers at a competitive interest rate compared with other lending institutions. In Althelia's promotional materials, the fund advertised this innovative financial model as replicable in the future for other carbon

offsetting projects. The truth is that it would be difficult to replicate without help from international development organizations like USAID. Also, funds or private investors that are domestic-based with limited resources may face the difficulty of raising enough money to initiate the projects. Another common narrative that the investors use is the high-quality offsets generated out of the projects. There is no standardized methodology to define the quality of offsets purely looking at financial returns produced, social enterprise created, cacao sold, or other indicators. In Altheila's case, the internal document showed that deals in the portfolio rely more on sales of commodities and agroforestry products and less on carbon credits. Investors may use the narratives of carbon-reduced value to polishing the story without presenting the facts that the non-carbon value may have a better revenue performance.

### **Benefits, Costs and Risks**

#### *Project Developers*

Non-profit project developers are concerned with the creation of environmental value in the form of biodiversity and forest-cover conservation. The rationale then follows that because land-use pressure comes from population increase and inadequate land use then a social value must be produced to incentivize conservation and reduce the economic drivers of deforestation. Therefore, non-profit actors promote the narrative that project participants, who before participating in the project were considered a deforestation threat, through participation with the project would become forest stewards.

The social benefits generated by the project can also produce additional financial value for project developers who have stated that both they and carbon buyers can better communicate their positive impact through social benefit narratives and validation from additional certification.

Carbon offsets allow the financing of the initial implementation of these projects. Carbon-credit income is a way to bridge a temporal financial gap while striving for productive projects' or in the case of Cordillera Azul, the park conservation's, financial independence.

The high initial costs of implementing forest-based carbon offsetting projects mean that project developers take on a large amount of risk at the start of the project. Some developers mitigate that risk through non-profit financial streams such as grants or donations to cover the initial project costs (Alto de Mayo & Cordillera Azul), secure connections early on to international carbon credit buyers (Alto de Mayo), loans using carbon credits as collateral (Tambopata and Cordillera Azul ) or forward sale of carbon credits (Brazil Nut). What is apparent is that connections to international organizations are an important part of reducing risk and securing finance for projects. This highlights the asymmetrical relationships between the global north and the global south regarding emission reduction schemes.

Besides the risks associated with securing project funding developers also must contend with the costs and difficulty of getting communities to agree to participate in the projects and the environmental risks caused by increases in deforestation pressure from external actors.

### *Government Actors*

For government actors, the lack of finance available from the government funds towards national protected areas has made administration contracts very attractive. The central premise is that administrative contracts facilitate the process through which a protected area can receive funding from nongovernmental organizations. As stated above the Peruvian government assumed international commitments and has received substantial international cooperation funding for the infrastructure required to implement REDD+ projects in Peru. This means that successful forest-based offsetting conservation projects represent reputational and reputational value for Peru and more specifically for the Ministry of the Environment. Because of the international nature of most large carbon credit buyers for our case studies, it is not likely that most of the emission reductions generated will count towards Peru's national contributions to avoid double counting. This raises further questions about carbon credit's role in promoting or inhibiting equitable and fair risk and benefit distribution of the transition towards a low-carbon economy and overall emission reductions. Especially considering that SERNANP still covers a (small) part of protected area management. Also important is that in the future, forest-based carbon offset will use the national baseline which will reduce project proposal costs.

### *Participants*

A central part of the value proposition for project participants is not just the financing of alternative productive activities and the technical assistance provided for

the transition towards more sustainable practices but also the connection to international markets needed for these projects to be economically viable. Another benefit the technical assistance provided is that better land management practices enable farmers to “recover” previously degraded land or generate additional value for their commodities by undergoing additional certifications like fair-trade or providing the infrastructure needed to add commodity value like a cacao fermentation facility or a nut-processing plant. Project developers often state their intention that productive projects eventually become independent from the developers and by extension from carbon finance. However, Tambopata project participants have stated that the income generated by the project is not enough to offset the costs of managing their plot for shade-grown cacao. Furthermore, cooperatives struggle to become independent and gain enough buy-in from community members. Finally, the case of the Brazil Nut project where project participants did not receive any financial benefits from the project until eight years after the first carbon credit validation.

### *Investors*

The primary benefit for investors is financial returns. The financial returns can be repayments of the loan with interests, the sales of carbon credits, or the sales of agroforestry products from alternative livelihoods. Except for the financial benefits, investors like corporates also enjoyed the benefits of reputational value. Companies like Disney, Shell, and BHP would advertise their dedication and investment towards climate change and therefore achieve Corporate Social Responsibility. Moreover, the offsets that private corporate investors purchased can reduce GHG emissions, which is a lot

more cost-effective than other options like developing renewable energy. However, investors also endure risks throughout their investment activities. In BAM's case, the investment companies suffer reputational damage due to the potential tax avoidance and financial crimes. Also, in Alto Mayo, Disney questioned the methodology to calculate the baseline of the company's emissions may be problematic. Moreover, the critics also mentioned that the scenario is false. Other radical comments that criticized Disney's environmental initiatives were greenwashing. Besides the reputational risk, investors may also face opposition from project participants and the local community to impede the project's smooth implementation. In Alto Mayo's case, there is a conflict between the local people and the government regarding land tenure. In BAM's case, illegal timber extraction is another problem. The resulting costs from the risks above are collectively shouldered by the project developers, participants and investors. Investors can't receive the expected financial return and reputational value if the project is unsuccessful. In Tambopata's case, the non-carbon revenue actually exceeds the revenue from sales of carbon credits, which is not what Althelia investors expected.

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## **Appendix I: Interview Guides**

### **Interview Guide: Peruvian Government Agency Employees**

- How are carbon rights established?
- o Is there a relationship between land-rights and carbon offsets?
- o How are carbon rights validated or issued?
- o Have there ever been conflict over ownership of carbon rights? If yes through what mechanisms are the conflicts resolved?
- o Are there plans for the establishment of a carbon market in Peru?
- What makes carbon offset programs attractive to the Peruvian government?
- o How are carbon offset programs contributing to Peru's international agreements of emission reduction.
- o Have carbon offset programs increased National Protected Area funding, if yes by how much?

- o Are there any specific numbers or data you could share or do you know where I could find the data?
- In what ways have the politics at the federal level either presented challenges or support to REDD or other carbon offset projects?
  - o What were some of the issues that people had opposing opinions about and how did that get worked out?
  - o Have REDD projects created tension between the Peruvian government and project participants?
  - o Has there been an investment from the organization in order to oversee REDD projects?
  - o Are non-environmental federal government entities ever involved in the projects? Do they play a role?
  - o What are the challenges of selling carbon offsets in Peru?
- What roles does your organization (MINAM, regional government, SERFOR etc) play in REDD project implementation?
  - o Can you tell me more about your partnership with (other organization) in the project? How is that partnership structured?
  - o How much of the National Protected Area funding come from the offset program? What are additional sources of funding?
  - o Are government entities involve, in other carbon offset or for-profit conservation mechanisms besides REDD?

o How does (your organization) coordinate with other government agencies in REDD projects?

o Does your organization participate in mesa REDD, or other REDD+ organization? If yes, what is the dynamic like?

How often are mesa REDD meeting conducted?

Who attends?

What topics are discussed during these meetings?

- Are there any additional thoughts that you would like to add?
- Are there any other people that you think have relevant perspectives and experiences in this topic that we should talk to? If yes, would you be willing to share their contact information and/or make an introduction?

### **Interview Guide: Carbon Offset Project Implementers**

- Were you involved in the project from its initial phases?

If YES,

o How did the idea for the project started? Has it changed in any significant way? How? Why?

o Was the project conceptualized as a carbon offset project from the start?

o Is there an added benefit to using carbon offsets in the conservation project, besides financing?

o What were the initial motivations for the projects?

o In promoting the project what aspects of the project makes this attractive to investors?

- What would you say are the project's biggest achievements?
- o In what ways is impact being measured for this project?
- o What types of impacts have already been noted for the project, environmental, economic, climate, social, etc.?
- What would you say has been the most challenging part of the project?
- o How did you overcome that?
- o What would you say is the biggest cost that (organization) has to pay for the project to take place?
- o How about in terms of time, what activities are the most time consuming?
- What activities were or are needed to engage with project participants?
- o Who conducted these activities?
- o How are project participants selected?
- o What were the terms of agreement with project participants and how were they formalized?
- o What is your point of contact with project participants?  
How do you communicate?
- o How and through what mechanisms are benefits distributed to participants?
- o Could you walk me through the consultation process with community members?  
  
Who attended?  
  
How often were the meetings held?  
  
Where did the meetings take place?

- How would you define the financial model of the project?
- o In what ways is the financial model for this project similar or different than other projects (the organization) is implementing? Why?
- o What are the benefits of using carbon offsets as loan collateral?
- What are the sources of funding for the project, have they always been exclusively through carbon offsets?
- o Have the institutions that finance this project changed over time? If yes, why?
- o Were (source of funding) funding specific parts of the project?
- o Does carbon offsetting provide a reliable source of funding for the project?

In what ways?

- o Have the sources of funding been stable?
- What is the process for the project to generate a carbon offset?
- o Is the verification process done in-house?
- o How closely do you work with third party verifiers?
- o How did you go about conducting an initial biomass inventory?
- Are all the carbon credits sold to (Financer)? If not, what has happened to the credits?
- o (In case the project developer sells credits),can you walk me through the process of establishing carbon offset clients? Do you work with carbon brokers?
- o What are the challenges of selling carbon offsets in Peru?
- Why does this project choose to sell in the voluntary carbon market?

- o Have fluctuations in the carbon market been an issue?  
Was this expected?  
Has it affected confidence in the project?
  - How would you describe the Peruvian context in terms of risk or support for conservation project in general and carbon offsets specifically?
    - o What has been the regional government's view and interactions with the project? Do their views differ from national government's?
    - o What does your collaboration with SERNANP/SERFOR/MINAM look like?  
In what project areas do they participate?
    - o How much would you say that the project relied on the Peruvian state's REDD infrastructure (for example Geobosques etc)
      - Are you involved with mesa REDD, or other REDD+ organization? If yes, what is the dynamic like? (does mesa REDD serve as an advisor, etc)
        - o How often are mesa REDD meeting conducted?
        - o Who attends?
        - o What topics are discussed during these meetings?
      - Can you tell me more about your partnership with (other organization) in the project? How is that partnership structured?
        - Are there any additional thoughts that you would like to add?
- Are there any other people that you think have relevant perspectives and experiences in this topic that we should talk to? If yes, would you be willing to share their contact information and/or make an introduction?

## Interview Guide: Carbon Offset Project Participants

- When did you first hear of the project?
- o Had you heard about similar project done previously?
- o What were your impressions of those projects at the time?
- What motivated you to get involved with the project?
- o What were your expectations at the start of the project regarding project benefits?
- o In what ways is the community benefiting from this project?
- o Do individuals receive direct payments.
- o If they are communal benefits, who manages them?
- o How would you rank project benefits in terms of how much you value them?
- o If the project was not implemented, can you think of a different way of getting the same project benefits? For example, of setting up a cacao or Brazil nut processing plant, or getting a loan for agricultural development?
- Can you walk me through the process of becoming a project participant? For example, did you sign any agreements did you have to get land titles etc.
- o What kind of agreements did you have to sign?
- o What are the terms of the agreements?
- o Were there any reasons that made you hesitant about participating in the project?

- Are there members of the community that are responsible for servicing as intermediaries between community and project implementers?

- o What roles do they play?

- o Was everyone at (your community) on board to participate in the projects?

Did some form of community organizing take place before or during the project implementation?

- How is being involved with the project changed your land management.

- o How much time is involved in a weekly or monthly basis to the projects?

- Do you know or are you aware that the funding from this project comes from carbon offsets?

- o Could you describe the process of carbon offsetting?

- o What do they think of the process? Do you have or had any concerns about it?

- o In your understanding of the project, who owns the carbon that is sequestered?

- Is there anything in the way things are done in the project that you wished were different?

- o Were there people that wanted to participate but where not included?

- o Do you feel that the implementers take your suggestions into account ?

- Are there any additional thoughts that you would like to add?

- Are there any other people that you think have relevant perspectives and experiences in this topic that we should talk to? If yes, would you be willing to share their contact information and/or make an introduction?

## Interview Guide: Carbon Offset Investors

### Organizational Involvement in Carbon Offsetting and Conservation

- How would you characterize your organization's involvement in climate change and conservation projects and initiatives?
  - o What are some of the primary projects, or project types, that you have funded?
  - o What other roles does your organization generally play in these projects?
- Do you have other partnerships with other funders or organizations to participate in carbon offset projects? If yes, what are their roles?
  - o Third party experts to support your involvement with the carbon offsetting project?
  - o Do you have other partnerships with other funders or organizations to participate in carbon offset projects? If yes, what are their roles?
  - o Do you have other organizations in the middle to help with the trading of carbon credits when investing in projects?
  - o What type of contact do you generally have with the in-country organizations implementing the projects or project participants?
- What are some factors that your organization considers when selecting carbon offsetting or conservation projects to invest in?

- What are some types of biodiversity conservation projects that would select in a carbon offsetting project?
- What are some of the primary motivations for your organization to become involved in these projects?
- How would you characterize the primary benefits to your organization through your involvement in these types of projects?
- How would you characterize the primary risks for your organization through your involvement in these types of projects?

#### History & Logistics of Carbon Offset and Conservation Project Involvement

- How did your organization first get involved in XXX project?
- What motivated your organization's initial interest in the project?
- In what ways has your organization been involved since?
- Who have been key partners in your organization's involvement with XXX and what were their roles?
- How is your arrangement with the organization implementing the project in-country and project participants structured?
- What are some of the primary challenges your organization has experienced in your involvement with XXX project and how have you overcome them?
- What have been some of the primary benefits to your organization to being involved in XXX project?

- [skip if not for-profit company] Has this project generated financial returns for your company?

- o If not, why not and do you expect it to generate returns in the future?

### **Interview Guide: Carbon Offsets Specialists**

#### Experience with Carbon Offsetting to Finance Conservation

- What is your current position within XXX organization?
- In what ways have you been or are you currently involved in projects or initiatives that employ carbon offsets to finance conservation?
  - What do you feel motivates for-profit entities to invest in these projects?
    - o Do these projects generally generate profits for these entities? Why or why not?
      - o What are some of the other benefits for-profit organizations receive from being involved in these projects?
        - o What are some of the primary risks involved for for-profit organizations involved in these projects?
          - It seems that there are often a number of other, non-profit organizations that are also involved in these projects. In your experience:
            - o Why is this the case?

- o Is this combination of for-profit and nonprofit funding also the norm for carbon offsetting projects generally, or just those being specifically employed to generate conservation funding?
- o What would you say is the “value” these projects generate for nonprofit organizations?
  - In terms of the potential environmental benefits of these projects:
    - o What set of conditions need to be present or put in place in order for these projects to mitigate greenhouse gas emissions?
    - o What set of conditions need to be present or put in place in order for these projects to truly support conservation goals more broadly?
  - In terms of the potential social benefits of these projects:
    - o What set of conditions need to be present or put in place in order for these projects to support poverty alleviation or other aspects of sustainable development in the sites of implementation?

## Appendix II: Coding Guide

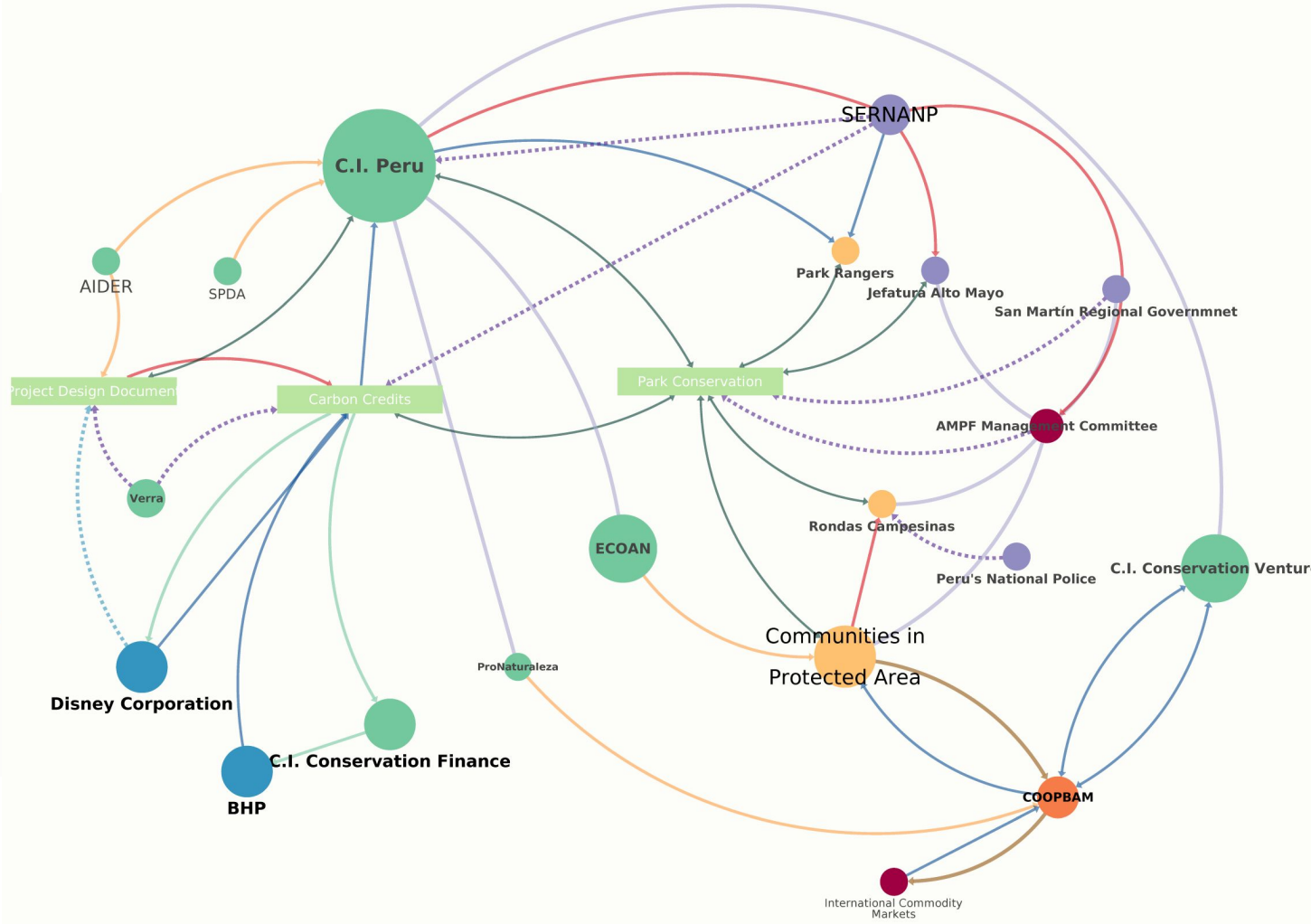
Node Type	Main Node	Node Name	Description	Research Question
Main Node	Roles and Actors	Roles and Actors		<b>Roles and Actors required for conservation through carbon offsets</b>
Sub Node	Roles and Actors	Roles	Main functions that needed to be executed (financing, implementing)	Roles and Actors required for conservation through carbon offsets

Sub Node	Roles and Actors	Role Overlap	Instances were different roles are combined	Roles and Actors required for conservation through carbon offsets
Sub Node	Roles and Actors	Actors	Actors mentioned in project and their function	Roles and Actors required for conservation through carbon offsets
Sub Node	Roles and Actors	Overlapping Acotors	Actors that take on overlaping roles	Roles and Actors required for conservation through carbon offsets
Sub Node	Roles and Actors	Value Proposition by Actor	What is the added value for each actor involved	Value propositions by actor
<b>Main Node</b>	<b>Added Value Created</b>	<b>Added Value Created</b>		<b>Carbon Offsets added value</b>
Sub Node	Added Value Created	Financial Value	Examples, \$/credit, loans, grants, investments, added product value	Carbon Offsets added value
Sub Sub Node	Financial Value	Financial Value Narratives	Narratives used to describe financial value creation	Narratives and Mechanisms of value creation
Sub Sub Node	Financial Value	Financial Value Mechanisms	Mechanisms through which land is monetized	Narratives and Mechanisms of value creation
Sub Node	Added Value Created	Social Value	Reputational, social welfare,	Carbon Offsets added value
Sub Sub Node	Social Value	Social Value Narratives	Narratives used to describe social value creation	Narratives and Mechanisms of value creation
Sub Sub Node	Social Value	Socail Value Mechanisms	Project activites that create social value	Narratives and Mechanisms of value creation
Sub Node	Added Value Created	Environmnetal Value	Example: Carbon sequestration, biodiversity protection	Carbon Offsets added value
Sub Sub Node	Environmnetal Value	Environmental Value Narratives	Narratives used to describe environmental value creation	Narratives and Mechanisms of value creation
Sub Sub Node	Environmnetal Value	Environmental Value Mechanisms	Project activites that contribute to environmental value	Narratives and Mechanisms of value creation
Sub Node	Added Value Created	Political Value	Example: legitimacy, political leverage,	Carbon Offsets added value
Sub Sub Node	Political Value	Political Value Narratives	Narratives used to describe political value creation	Narratives and Mechanisms of value creation

Sub Sub Node	Political Value	Political Value Mechanisms	Activities through which political value is generated	Narratives and Mechanisms of value creation
Main Node	Costs and Risks	Costs and Risks		Cost and risk
Sub Node	Costs and Risks	Cost	Cost associated with project	Cost and risk
Sub Sub Node	Costs	Actor Costs	Cost associated with specific actors or roles	Cost and risk
Sub Node	Costs and Risks	Risks	Risks associated with project	Cost and risk
Sub Sub Node	Risks	Actor Risks	Risks associated with specific actors or roles	Cost and risk

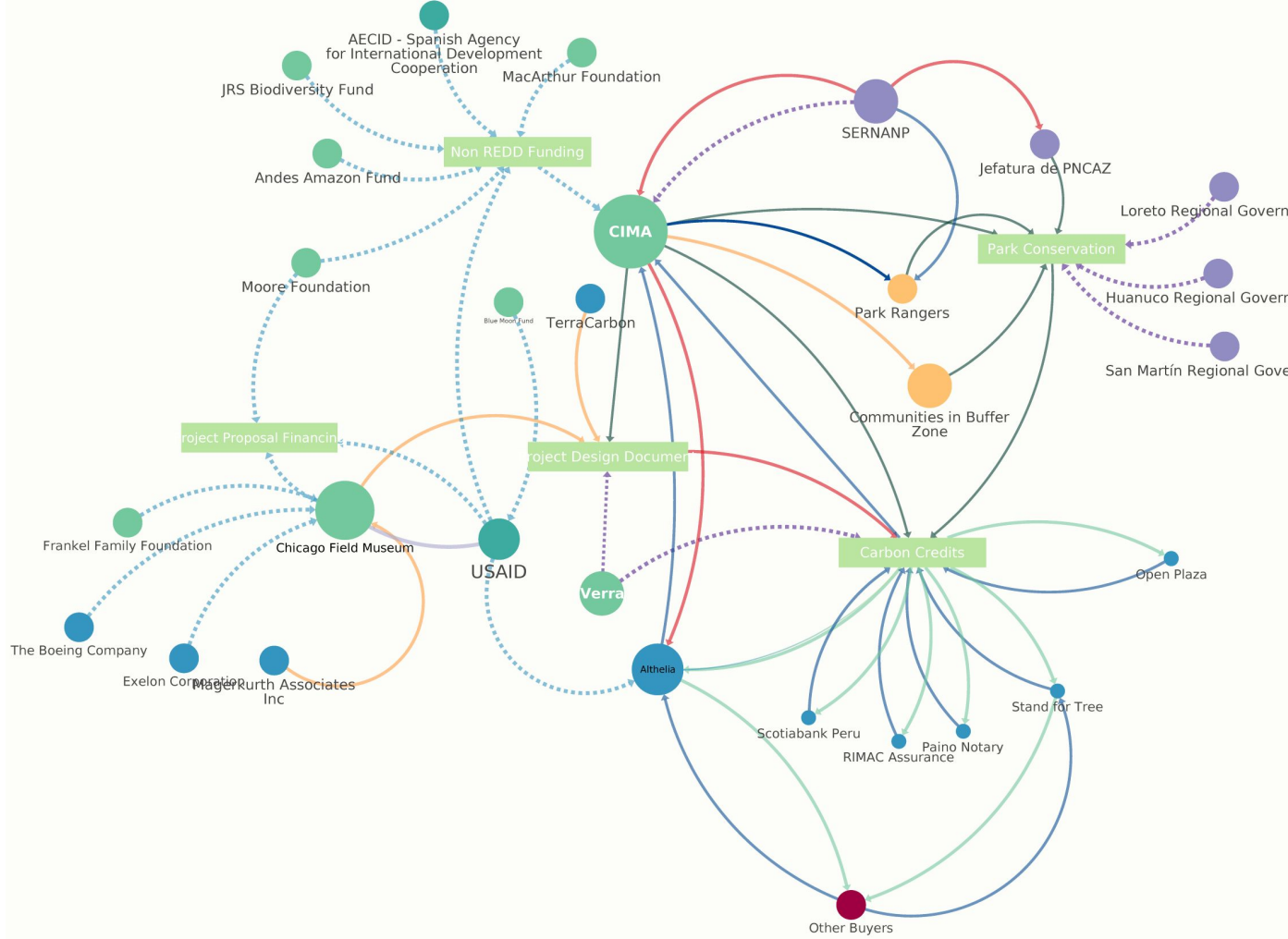
### Legend

- - - Non-profit Financial Transactions
- For-Profit Financial Transactions
- Knowledge Transfer
- Carbon Credit Transfers
- Activity
- - - Regulation
- Authority
- Partnership
- Commodity
- Unknown Relationship
- For-Profit
- Non-profit
- International Development Agency
- Government Agency
- Cooperative
- Participant
- Other



### Legend

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### Legend

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