

How can regional economic development and entrepreneurship be triggered and fostered through effective forest management?

Master Thesis submitted in fulfilment of the Degree

Master of Science

in Sustainable Development, Management and Policy

Submitted to Dr. Sabine Sedlacek

Veronika Feheregyhazy

1443002

Gerasdorf, 03.06.2016

AFFIDAVIT

I hereby affirm that this Master's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

Date

Signature

ABSTRACT

Tackling climate change is the most important environmental and social issue of the 21st century. Cutting down forests faster than it can regenerate takes away one of the world's major sinks for CO₂ and thus accelerates climate change by increasing the latent CO₂ concentration in the atmosphere. Therefore, this thesis aims to answer the question how regional economic development and entrepreneurship are triggered and fostered through effective forest management. The literature presents many possibilities concerning how governments can tackle the problem of rainforest degradation and the lack of rural development. The research aim is to show award-winning initiatives and develop a best practice model for the Amazon region recommending how this issue can be solved locally. A comparative case study analysis was conducted to assess the impact of 10 initiatives from Brazil, Peru, Bolivia and Ecuador. In the following steps common success factors and threats were identified. The common factors were used in the final step to develop a best practice model. The model shows the most important factors to consider which are: a participatory governance model, the development of alternative livelihoods, partnerships and education and awareness.

TABLE OF CONTENTS

Affidavit.....	I
Abstract.....	III
List of Figures	X
List of Abbreviations	XI
1 Introduction	1
1.1 Problem Identification	1
1.2 Research Question	2
1.3 Hypothesis	3
1.4 Purpose and Contribution.....	3
1.5 Methodology	3
1.5.1 Sampling Design.....	4
1.5.2 Case Study Pre-Analysis	5
1.5.3 Case Study Analysis Grid	6
1.5.4 Validity Threats	6
1.6 Limitations	7
2 Literature Review-	8
2.1 Key Concepts.....	8
2.1.1 The Amazon Rainforest.....	8
2.1.2 The Tragedy of the Commons.....	10
2.1.3 Sustainable Forest Management	11
2.2 Environmental Management Method and Approaches.....	12
2.2.1 Multi-Stakeholder Approach	12
2.2.2 Community-Based Approach	13
2.2.3 Eco-Tourism	13
2.3 National Forest Policies: country profiles.....	13
2.3.1 Brazil	14
2.3.2 Bolivia	14
2.3.3 Ecuador	14
2.3.4 Peru.....	15
2.4 Why governments keep failing in forest protection.....	16
2.5 Factors impacting forest conservation	17
3 The Case Study introductions	21
3.1 Association of Smallholder Agroforestry Producers Reca Project (ASAP) (Equator Initiative, 2012a).....	21
3.1.1 Introduction	Error! Bookmark not defined.
3.1.2 Threats	Error! Bookmark not defined.

3.1.3	Impacts.....	Error! Bookmark not defined.
3.1.4	Success Factors	Error! Bookmark not defined.
3.2	Capacity of the Upper and Lower Izozog (CABI) (Equator Initiative, 2012b).....	21
3.2.1	Introduction	24
3.2.2	Threats	Error! Bookmark not defined.
3.2.3	Impacts.....	Error! Bookmark not defined.
3.2.4	Success Factors	Error! Bookmark not defined.
3.3	Chalalán Eco-Lodge (Equator Initiative, 2012c)	27
3.3.1	Introduction	Error! Bookmark not defined.
3.3.2	Threats	Error! Bookmark not defined.
3.3.3	Impacts.....	Error! Bookmark not defined.
3.3.4	Success factors	Error! Bookmark not defined.
3.4	Consejo Regional Tsimané Mosekene (CRTM), Pilón Lajas (Equator Initiative, 2012d).....	27
3.4.1	Introduction	Error! Bookmark not defined.
3.4.2	Threats	Error! Bookmark not defined.
3.4.3	Impacts.....	Error! Bookmark not defined.
3.4.4	Success Factors	Error! Bookmark not defined.
3.5	Ese'ēja Native Community of Infierno / Posada Amazonas (Equator Initiative, 2012e) ..	29
3.5.1	Introduction	Error! Bookmark not defined.
3.5.2	Threats	Error! Bookmark not defined.
3.5.3	Impacts.....	Error! Bookmark not defined.
3.5.4	Success Factors	Error! Bookmark not defined.
3.6	Green Life Association of Amazonia (AVIVE) (Equator Initiative, 2012f).....	32
3.6.1	Introduction	Error! Bookmark not defined.
3.6.2	Threats	Error! Bookmark not defined.
3.6.3	Impacts.....	Error! Bookmark not defined.
3.6.4	Success Factors	Error! Bookmark not defined.
3.7	Kapawi Eco-Lodge & Reserve (Equator Initiative, 2012g).....	Error! Bookmark not defined.
3.7.1	Introduction	Error! Bookmark not defined.
3.7.2	Threats	Error! Bookmark not defined.
3.7.3	Impacts.....	Error! Bookmark not defined.
3.7.4	Success Factors	Error! Bookmark not defined.
3.8	Poloprobio (Equator Initiative, 2012h)	Error! Bookmark not defined.
3.8.1	Introduction	Error! Bookmark not defined.
3.8.2	Threats	Error! Bookmark not defined.
3.8.3	Impacts.....	Error! Bookmark not defined.
3.8.4	Success Factors	Error! Bookmark not defined.
3.9	Sociocultural Association of Yawanawá (SCAY) (Equator Initiative, 2012i)	Error! Bookmark not defined.
3.9.1	Introduction	Error! Bookmark not defined.
3.9.2	Threats	Error! Bookmark not defined.
3.9.3	Impact	Error! Bookmark not defined.
3.9.4	Success Factors	Error! Bookmark not defined.
3.10	Tres Islas Native Community (Che, Deza, & Hodgdon, 2015)	Error! Bookmark not defined.
3.10.1	Introduction	Error! Bookmark not defined.
3.10.2	Threats	Error! Bookmark not defined.
3.10.3	Impacts.....	Error! Bookmark not defined.
3.10.4	Success Factors	Error! Bookmark not defined.

4	Pre-Analysis using decision trees.....	35
4.1	Case Study Impact Indicators.....	49
4.1.1	Financials	51
4.1.2	Sources of income	51
4.1.3	Household Income.....	52
4.1.4	Infrastructure.....	53
4.1.5	Capacity Building	53
4.1.6	Awareness Raising	54
4.1.7	Land Use and Zoning.....	55
4.1.8	Rainforest Conservation	55
4.1.9	Flora and Fauna	56
4.1.10	Data Availability on Flora and Fauna	56
4.2	Impact Assessment.....	57
5	Case Study Assessment.....	60
5.1	Impact Rating Grid.....	60
5.2	What are the variations in impacts?.....	65
5.3	Success factors and threats	66
5.3.1	Success factor analysis grid.....	67
5.3.2	Common success factors	68
5.3.3	Common Threats Analysis Grid.....	71
5.3.4	Common threats.....	72
6	Discussion:	75
6.1.1	Subgroup eco-tourism projects	75
6.1.2	Which role does the local political system play in rainforest management?	75
6.1.3	What is the role of stakeholder management in these programs?	77
7	Developing a best practise model	80
7.1	Can there be a single best practise model?.....	80
7.2	What are the most important factors to consider for a best practise model?	80
7.2.1	The governance structure.....	80
7.2.2	Alternative Livelihood Development	81
7.2.3	Education and Awareness.....	82
7.2.4	Partnerships.....	82
7.2.5	Community cohesion and strong social structures.....	83
7.3	Are there differences between countries or regions?.....	83
7.3.1	Example of a best practise case study	84
8	Conclusion.....	86
8.1	Summary.....	86
8.2	Contribution to knowledge.....	88
8.3	Future research.....	88
9	Bibliography.....	90

LIST OF TABLES

Table 1: Impact Assessment Part 1	58
Table 2: Impact Assessment part 2	59
Table 3: Impact Rating Grid.....	60
Table 4 Success Factors:.....	67
Table 5: Threats.....	71

LIST OF FIGURES

Figure 1: The Amazon Biome and the Amazon Basin (WWF, 2015) 8

Figure 2: Deforestation in Non-Brazilian Amazon Countries, 2004-2012 (Nepstad, 2013) 9

Figure 3: Causes of Deforestation in the Amazon, 2000-2005 (Fox, 2008)..... 10

Figure 4 Decision Tree: Financials 51

Figure 5 Sources of Income 52

Figure 6 Household Income..... 52

Figure 7: Infrastructure 53

Figure 8: Capacity building 54

Figure 9: Awareness Raising 54

Figure 10: Land Use and Zoning 55

Figure 11: Rainforest Conservation..... 56

Figure 12: Flora and Fauna 56

Figure 13: Data Availability on Flora and Fauna 57

LIST OF ABBREVIATIONS

ASAP	Association of Smallholder Agroforestry Producers Reca Project
AVIVE	Green Life Association of Amazonia
CABI	Capacity of the Upper and Lower Izozog
CO₂	Carbon dioxide
CRTM	Consejo Regional Tsimané Mosekene /Tsimané Mosekene Regional Council
EIA	Environmental Impact Analysis
FAO	Food and Agriculture Organization of the United Nations
INCRA	National Institute of Agrarian Settlements
MSI	Multi-Stakeholder Initiatives
NAE	Achuar Nation of Ecuador
NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Products
RB	Biosphere reserve
RDS	Sustainable Development Reserve
RECA	Projeto Reflorestamento Econômico Consorciado e Adensafo
REDD	Reduced Emissions from Deforestation and forest Degradation in Developing countries
SCAY	Sociocultural Association of Yawanawá
SERNAP	National Service of Protected Areas
TCO	Tierra Comunitaria de Origen /Original Community-Based Territory
WCS	Wildlife Conservation Society

1 INTRODUCTION

1.1 Problem Identification

In December 2015 at the United Nations Climate Change Conference in Paris, 195 nations committed themselves to a new accord that aims to “To hold the increase in the global average temperature to well below 2°C above pre-industrial levels [and to [rapidly] scale up global efforts to limit temperature increase to below 1.5 °C] [, while recognizing that in some regions and vulnerable ecosystems high risks are projected even for warming above 1.5 °C],” (UNFCCC, 9 December 2015). To reach this goal, it is clear that green house gases, such as carbon dioxide (CO₂) need to be reduced (COP 21, 2015).

Plants, in their ability to transform CO₂ into O₂ through photosynthesis play a key role in stabilising the climate. Cutting down forests at the speed at which it is done today takes away one of the world’s major sinks for CO₂ and thus accelerates climate change by increasing the CO₂ concentration in the atmosphere (Laurance, 1999). It is proven that this rapid deforestation of rainforests significantly increased the concentration of CO₂ in the atmosphere (Parker, 2015).

The Amazon rainforest, therefore, not only plays a vital role in the stabilisation of the climate as we know it, but it also is one of the world’s most bio-diverse regions, known as the largest expanse of natural forests in the world (Food and Agriculture Organization of the United Nations, 2010). Even though less than half of 1% of the Amazon’s flowering plant species have been studied in detail for their medical potential, many plants have been discovered and used for a large number of different pharmaceutical products. Nevertheless, one can extract more than just commercial value from the forest products of the Amazon rainforest, such as cultural value from the communities living within the area, which makes it necessary to protect the forest (Parker, 2015).

In a report for the Food and Agriculture Organization of the United Nations (FAO), Kaeslin and Williamson (2010) established that on a worldwide level the main threats to forests and forest wildlife were:

1. “Conversion of forests to agriculture;

2. Overgrazing of woodlands;
3. Unsustainable harvesting or collection of wood, fuelwood and non-wood forest products;
4. Excessive hunting;
5. Illegal wildlife trade;
6. Encroachment of human settlements;
7. Tourism and recreational pressure;
8. Mining and fossil fuel extraction;
9. Forest fires”

Analysing the case studies concerning local sustainable development initiatives in Chapter 3, it can be seen that many of those above-mentioned threats are directly applicable to the Amazon, especially points 1., 3., 6., and 8. Therefore, it is vital that a sustainable method of protecting and regenerating the Amazon is implemented.

1.2 Research Question

One method to control unsustainable logging of primary forests is sustainable forest management initiatives that not only aim to protect the forests but also to give the local population alternative means of sustaining their livelihoods. However, there are many different initiatives that exist using a wide range of approaches differing in objectives as well as methodology. To find out which methods perform well from an environmental as well as a socio-economic perspective, the research question for this paper was defined as follows:

How can regional economic development and entrepreneurship be triggered and fostered through effective forest management in the Amazon region?

In order to answer this research question, the author has developed this thesis as a comparative case study to find common success factors and best practise models to fight deforestation and improve rural development and entrepreneurship simultaneously.

1.3 Hypothesis

Considering the wide variation of approaches used in the case studies that are analysed the author has developed the following hypothesis:

There are common success factors and common threats that apply to the majority of the case studies that were analysed, which would make it possible to recommend one or several best practise model.

1.4 Purpose and Contribution

The purpose of this thesis is to analyse different approaches to sustainable forest management and economic development in the region in order to evaluate the approaches, which were used and to recommend a best practise model.

The contribution the author seeks to make is to develop a deeper insight into small-scale, local initiatives in forest management. This can then be used as a guideline for the development of a methodology for similar initiatives by considering the most common success factors and threats and therefore increasing the chances of succeeding in its mission.

1.5 Methodology

Research for this paper was conducted exclusively through the use of secondary data due to constraints in time. Moreover, as this paper analyses case studies from projects set in South America obtaining primary data is neither feasible nor affordable.

Thus, the research for the introductory part and the general background was done by the means of collecting relevant scientific articles and publications from reputable organizations such as the FAO. In this part, the relevant definitions and key concepts are elaborated.

In the second part of the thesis, 10 case studies are analysed. In order to have a diversified sample, the case studies were taken from Peru, Ecuador, Bolivia and Brazil, which have major shares of the Amazon basin relative to their total territory are represented. As Brazil is the largest country within this area, approximately one third of the case studies are from there. On one hand, it can be argued that this is an unequal distribution of cases by region. However, looking at the total area of expansion of the Amazon it is apparent that Brazil also has the largest potential influence due to their share of the Amazon basin. Therefore, it is deemed

ideal that the amount of the case studies per country, more or less, reflects their share of the forest area relative to their total territory.

First, the author has tried to select cases based on the following categories: multi-stakeholder approach, community-based approach and eco-tourism. However, during the initial research phase it became apparent that the lines between the approaches are blurred and often a case study may be identified as belonging to two or even to all three categories. Therefore, the author has decided to analyse all case studies in the same manner and only tries to group the case studies after the analysis is done, if common factors such as purpose or approach emerge.

The majority of the case studies were sourced from the Equator Initiative Case Study Database (Equator Initiative, 2015), which improves comparability as all case studies are structured similarly. This initiative “brings together the United Nations, governments, civil society, businesses and grassroots organizations to recognize and advance local sustainable development solutions for people, nature and resilient communities”. Thus, it is deemed a reputable and objective source. Due to the fact that the case studies they present in their database are those that won the Equator Prize, they can be deemed successful initiatives that can function as role models for future projects. Moreover, the advantage of using this source is that the case study analyses are setup in a very similar way, which makes a comparison easier and more reliable.

However, due to the fact that the emphasis in the Equator Initiative Case Study Data Base is on the success factors of the cases, the author has decided not to use it as an exclusive source. Therefore, one of the case studies is taken from a different source, namely the Non-Governmental Organization (NGO) Rainforest Alliance (2015). Two other case studies which were initially taken from the Equator Initiative Database, were supplemented with case studies from other sources.

1.5.1 Sampling Design

The study population for the case study analysis are forest management initiatives based in the Amazon rainforest. As already elaborated in the introduction this forest is the world’s largest primary forest and thus has a very high cultural and ecological value. Moreover, the deforestation in this area happens at a rapid and unsustainable pace, which is a threat not only for the local population and wildlife but also for the planet as a whole, due to the Amazon’s role as major CO₂ sink and climate stabilizer.

The sampling frame, which has been used to select the case studies, was based on five criteria:

- Initiatives operate within the Amazon River Basin
- Initiatives focus on environmental management and development of the local area
- Initiatives show medium to high success (which is measured based on their impacts and their evaluation by third parties)
- There is enough data available on those initiatives

Therefore the sample population is defined as the 10 specific case studies, which have been selected from the study population by using the sampling frame. For each case study there is one main document, which is used to evaluate them.

1.5.2 Case Study Pre-Analysis

In order to be able to rank the case studies, a pre-analysis is done evaluating each case study using decision trees. There is one decision tree for each of the 10 categories that are analysed.

Indicators for the environmental dimension that can be found in the literature are for instance: the number and populations of rare, endangered and typical species; incidents of illegal logging or poaching; and existence of environmental education and awareness raising workshops or projects (Li, 2004).

From an economic perspective, one may measure the impact on annual income of the local population, on the number of people engaging in environmental-friendly livelihoods or businesses or on the number of new enterprises founded by locals (ibid).

However, as the case studies do not provide such detailed quantified data, the categories chosen by the author in both the environmental and the economic dimension had to be adapted to the information available.

To see all the information from the 10 decision trees at a glance, the information is subsequently put into a 10x10 table (split into two 10x5 tables because of the limitations in page size).

1.5.3 Case Study Analysis Grid

In order to measure the different impacts of the case studies from a qualitative perspective a case study analysis grid is developed, which permits a comparison between the cases, similar to a Balanced Scorecard. In the end, the case studies can be ranked based on how successful they meet the objectives set by the author. This last part is important, as initiatives may have different objectives and thus regard different outcomes as successful. However, for the purpose of this thesis “success” is seen as an approach where regional economic development and entrepreneurship are fostered through effective forest management. Thus, the indicators measured are of economic and environmental nature. Other indicators, such as education levels, migration or health, are only considered indirectly as they have an impact on economic development and the environment.

The grid encompasses 10 indicators, half of them for assessing the environmental impacts and the other half for assessing the socio-economic dimension of rural economic development and entrepreneurship. However, due to the descriptive nature of the case studies quantitative assessments such as concrete change in poverty rates within the community are not available. Therefore, all indicators will be assessed in four categories: high, medium, low impact, no impact/not mentioned.

Thus, the final assessment grid will be a 10x10 grid where each case can gain a score from 0-3 in each category. Each indicator will have a defined weight and thus the case studies can be ranked in order of their overall success in regards to the author’s objectives.

1.5.4 Validity Threats

As the case studies only offer verbal descriptions of the situation and impacts of the initiatives, there may be room for different interpretations. However, concrete data, such as changes in income of the local populations during the duration of the project are often unavailable. Therefore, there is the threat of subjectivity in the analysis. In order to improve objectivity the author uses a qualitative assessment grid where each case study is analysed based on their performance in various categories. For example, in the category of rainforest protection the case studies are rated based on their actions. First, each case is separated by whether the program has actively tried to impact forest conservation or if it had an indirect impact as a result of other activities, such as the use of non-timber forest products (NTFP), which needed a sound ecosystem. Those case studies that have developed a direct initiative are then

subcategorized into groups; for example, those that “just” managed to decrease the rate of deforestation and others that engaged in active reforestation projects.

In terms of external validity, the thesis is limited to data from the Amazon Basin. For this paper, 10 specific case studies have been analysed, hence the findings only apply for those. However, similar geographical regions face similar problems and threats (see Food and Agriculture Organization of the United Nations, 2010 and Kaeslin & Williamson, 2010). Thus, the common success factors and threats found in this paper as well as the recommendations for a best practise model made based on them by the author may be taken as guidelines for what needs to be considered in similar projects, especially within the context of South American forests.

1.6 Limitations

As already mentioned in 1.6.2 **Error! Reference source not found.** there is little external validity of the findings from this comparative case study analysis. However, this issue cannot be avoided due to the methodology used, since for every case study there are different objectives, stakeholders, legal and political, social, economic and environmental factors that need to be considered in order to make a decision on how to best set up an environmental management initiative in this area. Therefore, the outcomes are meant not as absolute best practise models and recommendations but as guidelines and indicators as to what needs to be considered and what worked in similar regions.

Linked to the issue elaborated above, there is also the fact that in the comparison of cases there may be confounding factors that stem from the fact that not all cases are from the same country, and therefore there are different legal and political backgrounds. This may influence, among others, the structure and objectives of the case studies as well as their legal status and their ability to gain financial support from governmental agencies. However, due to the sampling frame used there are not enough suitable case studies from a single country within the region. Still, it may become apparent in the later stage of the analysis that national differences play a role in success, which is why this variation in nationalities of the case studies can be seen as an advantage.

2 LITERATURE REVIEW-

2.1 Key Concepts

2.1.1 The Amazon Rainforest

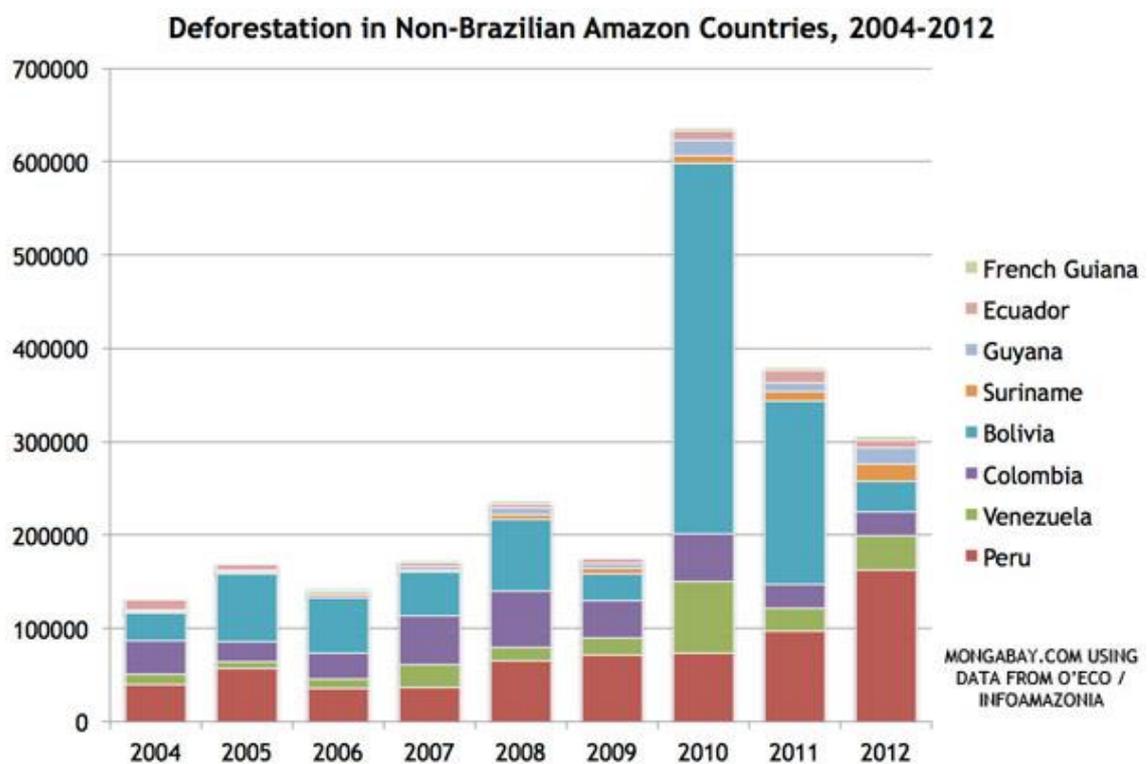
There are two methods to define the territory of the Amazon rainforest as seen in Figure 1: The Amazon Biome and the Amazon Basin (WWF, 2015). The area can be defined either as the Amazon Biome or the Amazon Basin. The Amazon Biome “encompasses 6.7 million km² and is shared by eight countries: Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana and Suriname, and the overseas territory of French Guiana” (WWF Living Amazon Initiative, 2014). This means that the area is approximately twice the size of India.

FIGURE 1: THE AMAZON BIOME AND THE AMAZON BASIN (WWF, 2015)



Even though deforestation rates in the Amazon have shown signs of slowing in Brazil since 2005, the trend is not reflected in the other countries in the area. In Brazil the annual deforestation was at approximately 27,000sq km per year, but this number fell to below 5000 sq km in 2012. This decrease was mostly due to strict governmental policies implemented because of international pressure for better protection of the Amazon. Since then, though, this number has been slowly rising. In the other Amazon countries, the trend looks very different as illustrated in *Figure 2 Deforestation in Non-Brazilian Amazon Countries, 2004-2012*. This graphic shows that apart from Brazil it is mostly Bolivia and Peru, which are responsible for the majority of the deforestation, despite large annual variation (Nepstad, 2013).

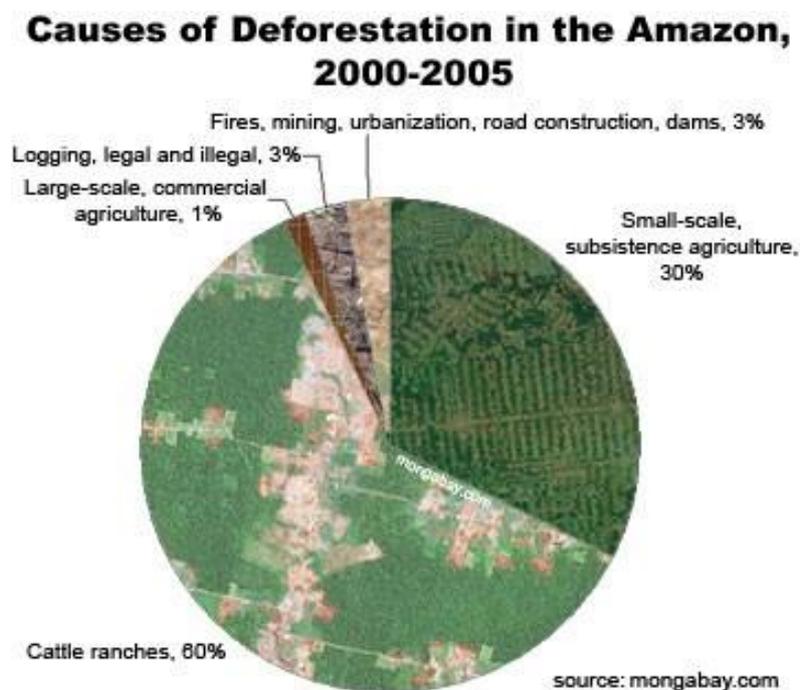
FIGURE 2: DEFORESTATION IN NON-BRAZILIAN AMAZON COUNTRIES, 2004-2012 (NEPSTAD, 2013)



As explained in the Introduction, the main causes for deforestation are easily explained but difficult to solved. As shown in *Figure 3: Causes of Deforestation in the Amazon, 2000-2005* (Fox, 2008), the main drivers are cattle ranches and small-scale, subsistence agriculture. If it were possible for the local population to make a living from forest products without destroying the forest itself, then the impacts of agriculture and cattle ranching would decrease significantly. This is why even small-scale initiatives for good environmental management can

play an important role in decreasing deforestation. This is not only due to its direct impacts but also because the more successful initiatives there are, the more likely other communities or NGO's join in with their own project, using previous projects as an example.

FIGURE 3: CAUSES OF DEFORESTATION IN THE AMAZON, 2000-2005 (Fox, 2008)



2.1.2 The Tragedy of the Commons

When considering the issues connected to the deforestation of the Amazon, the concept of the Tragedy of the Commons need to be considered.

If there is a common good such as a pasture, all surrounding farmers will let their cattle graze there. For them it is a free resource, i.e. food for cattle. This goes well as long as the number of cattle is kept low enough to give the pasture time and space to regenerate. However, if more people move into the area or the number of cattle increases due to large investments, the pasture is overgrazed and depletes faster than it can regenerate until there is no food left for the animals. Logically, each farmer wants to maximize their own gain by always adding one more animal to the herd without considering the negative impact on the food available for the herd to graze (Hardin, 1968).

“Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit--in a world that is limited. Ruin is the destination toward which all men rush,

each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all”(Ibid).

As Prof Hardin already described the Tragedy of the Commons in 1968, the same is true even today. Some issues where it is easily seen are overfishing of the oceans, pollution, logging and deforestation in general. There are several options that can be taken as solutions: the territory can be kept as public property, but the rights to enter are allocated based on wealth or agreed-upon standards or the land can be sold as private property through auctions or lotteries based on different criteria. Prof Hardin (ibid) called all of these solutions “reasonable possibilities. They are all objectionable. But we must choose--or acquiesce in the destruction of the commons that we call our National Parks.”

The same is true for the Amazon today. There are private and public territories that are protected through a wide range of initiatives, but there is also private and public territory that is destroyed rapidly. Thus, both approaches have their merits and their drawbacks, which have to be kept in mind when talking about the possibilities of environmental management.

2.1.3 Sustainable Forest Management

The main objective of sustainable forest management is to reduce deforestation and forest degradation while simultaneously increasing the benefits for the people and the environment. From a social perspective this method improves employment through the creation of environmentally friendly livelihood and from an environmental perspective it delivers important services such as water, soil and biodiversity conservation (Sabogal, 2015).

Therefore, “Managing forests sustainably means increasing their benefits, including timber and food, to meet society’s needs in a way that conserves and maintains forest ecosystems for the benefit of present and future generations” (ibid).

In order to ensure effective forest management, there need to be appropriate forest policies or legislations as well as incentives for the local population and private companies. Moreover, inadequate access to financial resources and lack of technical know-how can prevent sustainable behaviour in this context. Additionally, sustainable forest management plans have to consider not only sustainable timber and wood production but also the value of other goods and services the forests provide (ibid). It is crucial in the context of sustainable forest management projects to tailor each one well to the area as not only ecological and environmental as well as social, economic, political, cultural and spiritual dimensions play a

role (PEFC International, 2015). Standards need to be strict enough to control compliance to good forest management policies but flexible enough to permit adaptation to changing circumstances.

The International Tropical Timber Organization (2014) brings in another important task of sustainable forest management which is that it should “aim to balance the needs of different forest users so that its benefits and costs are shared equitably”.

Therefore, similar to the general definition of sustainability which includes a social, economic and environmental pillar, well-structured sustainable forest management projects also need to consider such a holistic approach.

2.2 Environmental Management Method and Approaches

In this category, the three approaches which were identified in the case studies are introduced. Some case studies belong mainly into one category; however the majority of case studies show elements of two or even all three categories.

2.2.1 Multi-Stakeholder Approach

Multi-Stakeholder Initiatives (MSI) have developed in order to solve complex sustainability problems which have emerged due to a lack of global governance and limited capacity and resources in all societal sectors (government, private companies and the civil society). This is due to the fact that businesses are pressured to externalize their costs as much as possible and governments are unable to impose suitable regulations on international markets. Moreover, the civil society lacks resources to pressure businesses that do not act in a responsible manner (Huijstee, 2012).

Therefore, MSI's are developed in order to combine the resources, capacities and knowledge of various stakeholders groups to respond to such challenges. MSI's are closely linked to multi-stakeholder governance which often exists in formally organized initiatives. In other cases an MSI can also only be a dialogue platform that represents the different stakeholders. Thus, the most common definition is that MSI's are 'interactive processes in which business, CSOs and possibly other stakeholder groups interact to make business processes more socially and/or environmentally sustainable' (ibid, p.14).

For the purpose of this thesis, multi-stakeholder approaches are distinct from community-based approaches. The objective of a multi-stakeholder approach, which is socially and environmentally sound business practises, is triggered from an outside party, whereas in a community-based approach the trigger comes from within the community and is the centre of the initiative. However, in both approaches there can be multiple stakeholders involved.

2.2.2 Community-Based Approach

“Community based forest management is the management, by communities or smallholders, of forests and agroforests they own, as well as the management of state-owned forests (some of which share customary tenure and rights under traditional laws and practice) by communities” (Molnar, France, Purdy, & Karver, 2011).

Community-based forest management (CBFM) steams from the idea of congruently reducing poverty and unsustainable resource depletion. This is done by strengthening the rights of the communities and improving their livelihoods and their ability to manage their resources. Ideally, this would lead to poverty reduction and sustainable forest management practises. In order to be really successful, it’s not only overall poverty that needs to be taken into account but also the living conditions of marginalized groups such as indigenous people and women. There is evidence that suggests that shifting the tenure for forests from the government to the communities significantly decreased the resource depletion within the area, as the community can directly benefit from the forest products without exploitation from outside investors or companies. Moreover, if a community “owns” their forest they are incentivised to manage it in a manner so that they can sustain their livelihoods over a long period of time (Mahanty, Gronow, Nurse, & Malla, 2006).

2.2.3 Eco-Tourism

The International Ecotourism Society (2015) defines ecotourism as “responsible travel to natural areas that conserves the environment and improves the well-being of local people”.

Therefore, similar to multi-stakeholder initiatives, eco-tourism approaches focus on the impact of tourism on both the environment and society. Sometimes terms such as community tourism, community ecotourism or responsible tourism are used depending if the emphasis is more on the environmental or the social component (Buckley, 2009). However, for the purpose of this thesis eco-tourism may be understood as including both dimensions.

Eco-tourism presents the opportunity of employment in destinations that are generally in rural areas where there are few other sources of employment. Moreover, eco-tourism may have a significant positive impact on conservation efforts in the area, as it raises awareness of the importance of the natural environment. Furthermore, ecotourism aims to design, construct and operate low-impact facilities, which help minimize the impact on the environment (The International Ecotourism Society, 2015).

2.3 National Forest Policies: country profiles

In this section, a short introduction of national issues in relation to the sustainable management of the Amazon rainforest is given. Moreover, national forest policies are introduced to give the reader an impression of the similarities and differences in problems and policy approaches.

2.3.1 Brazil

Forty-three percent of Brazil's territory is covered by the Amazon biome and is home to 197 indigenous groups that live within the forest. As in many other large forests, Brazil is under pressure, especially from the mining industry, agriculture and cattle ranching. Between 2011 and 2012 Brazil succeeded in reducing deforestation by 27%, which is just below 5000sqkm/year. Additionally, between 2004 and 2012 the annual deforestation rate even decreased by 76%. However, in 2013 the annual rate of deforestation rose again. In any case, it is still too high, causing numerous threats to the eco-system and the local population. Brazil's target for 2020 is to reduce the deforestation of the Amazon rainforest by 80% (World Resources Institute, 2015; Butler, 2012).

Before 2009, the government tried to decrease the deforestation rates by only using restrictions and bans, but those were hard to enforce. Since 2009, the national government has made the protection of the Amazon a priority, fostered conservation projects and strictly punished illegal clearances (The Economist, 2014).

The main problem in Brazil is the uncertain situation regarding formal land rights. Approximately half of the Legal Amazon territory has uncertain property rights and the NGO Imaton has concluded that over 76% of the annual deforestation in the state of Pará is done in areas where land rights are unclear (World Resources Institute, 2015).

2.3.2 Bolivia

The case of Bolivia is very similar to Brazil only on a smaller scale. Historically, the Amazon rainforest covered half of Bolivia, however, nowadays deforestation rates are very high. In the

Bolivian lowlands it is estimated that 80% of the forests are threatened by deforestation. Historically, the main part of the population lived in the Andean highlands leaving the Amazon sparsely populated. Only rubber tappers and Brazil nut collectors settled in the jungle. In the 1990s however, the rubber prices fell dramatically, so the government started to give away timber concessions. At the same time, they started to establish indigenous territories. The problem still is that in many cases the concessions overlap with the protected areas or indigenous lands leading to conflicts. The main economic driver for clearing forests nowadays is cattle ranching (Forest Legality Alliance, n.d.; Yale School of Forestry & Environmental Studies, 2016a).

Strategic forest policies focused on sustainable management thereof were introduced in Bolivia in 1996 reforming the forestry laws. This set off a number of forest management plans, forest inventories or seed tree retention, which was overseen by a professional forestry agency called Bolivian Forestry Superintended. Furthermore, the legality and traceability of timber production was improved through a system tracing all timber and wood products. Through the forest management reform's efforts have started to give land ownership rights back to indigenous groups even over concession-holders (Yale School of Forestry & Environmental Studies, 2016a).

In Bolivia, not only has the government partaken in protecting the forests but also outside parties have impacted it. Forest Stewardship Council (FSC) certification for example is very strong in Bolivia. Experts state that this development benefits from the strong governmental policies that require annual management and harvesting plans. Another example is Conservation International that purchased national debt from the Bolivian government in exchange for establishing the Beni Biosphere Reserve, which was the first debt for nature swap in 1987 (ibid).

2.3.3 Ecuador

Even though Ecuador is the smallest country analysed in this paper, they have put a lot of efforts in their forest policy. This is the first country in the world to recognize the "Rights of Nature" in their constitution in 2008, which was approved by the Ecuadorian population. It gives the eco-system the right to grow and flourish and the authorities have the obligation to protect those rights and provide remedies for violations. Moreover, the constitution states that people, communities and indigenous groups have the right to benefit from the environment and that "environmental services are not susceptible to appropriation; that their production, provision and use will be regulated by the National Government." Moreover, indigenous communities have to be specifically involved in any decision-making processes that address activities in their territory. Furthermore, there is a large number of laws based on these constitutional prerequisites that aim to organize the management of the national forests in a sustainable manner (Forest Legality Alliance, n.d.b).

Overall, the deforestation rate in Ecuador is relatively low compared to other countries in the area, at 0.66%/year in 2008 (TRAFFIC International, n.d.). Even though there are many laws regulating the timber trade, it still does not work as well as anticipated. One exemplary problem is the informal timber trade. Farmers or indigenous communities produce half of the timber from native forests and 80% of small-scale operations on their land, because they need the extra profits to be able to buy food and pay school fees. However, this is done mostly at an informal level, without logging permits, thus making it illegal. This is due to the fact that such permits are too expensive for small farmers and on average acquiring these permits decreases their profit margin by half. Therefore, such small farmers have no incentive to operate under the law, as it only lowers their income (Center for International Forestry Research, 2014).

2.3.4 Peru

Until the year 2000, annual deforestation was very low in Peru, only at 0.2-0.4%. The reason for this was mostly due to the lack of infrastructure and the difficulty to access large parts of the Amazon. Most forestland was either property of the government or inhabited by native communities. In 2000/01 the government reformed its forest governance system granting long-term logging concessions to foster sustainable forest management. While those laws should have favoured local landholders, it did not work as planned and deforestation increased significantly. Large logging corporations saw their opportunities to make profits. The government tried to correct this development through amendments to their policies in 2008-2010 but failed again. Even a multi-stakeholder dialogue running from 2009-2011 could not help improve the situation and was concluded without results. The NGO Environmental Intelligence Agency estimates that 80% of the timber exported by Peru is illegal (Yale School of Forestry & Environmental Studies, 2016b).

There is also another reason deforestation has increased strongly in Peru especially in recent years. This increase is caused by the increase in governmental restrictions and lower deforestation rates in Brazil, where the leakages lead to an increase in Peru, as companies try to compensate their lower production from Brazil through Peruvian timber. Moreover, the weakness of the Peruvian government and the continuously strong demand for palm oil has resulted in large-scale land conversion to agricultural land in recent years (ibid).

Additionally, a raise in gold mining is seen in Peru, mostly done by small artisans by local rivers. The consequence is river contamination with mercury and other environmental hazards. Deforestation is especially high if such gold mining areas are easily accessible via roads. Especially the construction of the Inter-Oceanic highway has had a large impact on the forests, as now these areas can be much easier accessed, making it more interesting for logging, mining and farming (ibid).

2.4 Why governments keep failing in forest protection

The article by Alston & Andersson (2009) indicates that one reason governmental policies are often unsuccessful in decreasing deforestation is the hidden transaction costs that are not considered. They argue that to decrease those costs and implement a REDD intervention three requirements have to be met: “negotiation of agreements with landowners; the monitoring and verification of outcomes; and the enforcement of agreements if the parties do not fulfill their obligations”.

Another governmental strategy to foster forest conservation is decentralization. In their working paper published in 2010, Andersson, Evans, Gobson & Wrights (2010) argue that even though de jure decentralization has no significant effect, de facto decentralization has a measurable positive effect on forest cover. The authors interpret this as local governments that have the ability to raise public revenue are more successful in protecting their forests.

However, the question of land ownership still remains difficult to solve for governments. In a case study about the Yuracaré in Bolivia, the authors illustrated a case in which the government has reformed the land tenure laws to grant legal access to ancestral land to the indigenous communities and even 14 years after those reforms of the land tenures, problems remained. First, the process of legally obtaining those rights are very bureaucratic and slow, taking a lot of time. Second, even though the reforms were meant to benefit the indigenous communities, the local institutional context was largely neglected and assumptions about the management were made that were very different from the actual situation. Moreover, the government tried to implement formal monitoring systems under the responsibility of professional foresters. This created conflicts, as the indigenous institutions were not only not included in those monitoring systems but also weakened in their capabilities. This example shows that, even though governments have good intention, they need to consider a wide range of factors. To be successful they could have introduced a stakeholder dialogue to get a better understanding of the actual situation in the communities (Andersson, León, Uberhuaga, & Benavides, 2010).

In a different article, Andersson finds that the municipal governments remain the best suited partner for community forest self-governance in Bolivia. Her main finding was that “local users’ relationship with local government representatives increases the likelihood of a community developing their own forest governance institutions”. She suggests that the government is the most important partner, because in the context of small forest communities, the municipal government is often the only formal organization that is readily accessible for the locals. Municipal governments are not only universally present around Bolivia but also hold an all-inclusive mandate, which gives them a significant advantage over NGOs, which are constrained in these factors. However, it has to be stated that this situation is

closely linked to the Bolivian governance structure and cannot be transferred to other countries without considering their national institutional context (Andersson, 2010).

2.5 Factors impacting forest conservation

The literature on sustainable forest management focuses mainly on possible governmental intervention and legal frameworks such as for example Alston & Andersson, 2009; Andersson, Evans, Gobson, & Wrights, 2010; Andersson, León, Uberhuaga, & Benavides, 2010; Angelsen, 2009; Cattaneo, 2001; or Paavola, Gouldson, & Kluvánková-Oravská, 2009. Therefore, general conclusions from the literature are only made for governmental policies. For solutions on a smaller scale the case study analysis in the following chapters of this paper will be used.

In her article from 2001, Andrea Cattaneo examines a range of factors on their impact on deforestation in Brazil. She came to several conclusions that give a first impression about the most important factors.

The first factor is transportation. Decreasing costs of transportation and infrastructure developments in rural areas facilitate access to previously pristine areas. This encourages people to settle in these areas and cut down the forest as it is an attractive business opportunity for them. This leads to the second factor which is the high demand for timber. Due to the decreasing costs of transportation, more timber can be absorbed by a larger market (Cattaneo, 2001).

As a solution Cattaneo suggests policies aimed to address the unclear tenure situation in Brazilian forests. She concludes that the majority of deforestation is done by untenured loggers. However, she admits that such policies are difficult to implement and enforce which can also be seen in the previous two chapters 0 and 0 which already introduced the challenges governments face when trying to implement stricter land ownership regimes (ibid).

However, her results indicate that buffer zones created through an integrated participatory management initiative that establish clear land rights and conservation zones are to be encouraged.

As elaborated in the first chapter, the biggest driving factor for deforestation is agriculture and cattle ranching. On the first glance one may conclude that improvements in technical efficiency would increase the yields produced and thus decrease deforestation pressures because farmers can have a higher return on their existing land without needing to convert more land. However, Cattaneo (2001) as well as Angelsen (2009) suggest does not always hold true, at least for cattle ranching. She suggests that livestock technology improvements have the highest return for agricultural producers but still in the long run total deforestation increases for all livestock technology improvements. This is due to the fact that through the new technology cattle ranching becomes more profitable so more farmers engage in it.

Many studies such as Barbier and Burgess (2001) and Deacon(1995) conclude that it is the government and its public policies and property rights systems is the most important factor influencing land use decision. In their paper “Interplay of Actors, Scales, Frameworks and Regimes in the Governance of Biodiversity” (Paavola, Gouldson, & Kluvánková-Oravská, 2009) the authors find that the governance framework for biodiversity and its horizontal and vertical integration with the broader institutional setting can both foster and complicate the governance of biodiversity. This is shown also by Mandemaker, Bakker and Stoorvogel (2011) who examine the impact of governance on agricultural expansion and intensification. They find that in areas where the quality of governance is low, agricultural increases are produced through expansion whereas in countries where the governance has a high quality, increases are brought through intensification of agricultural land use. Thus, they conclude that governance issues have to be solved in order to keep land conversion for agriculture low without decreasing the output from agriculture.

Arild Angelsen (2009) shows how such governance policy improvements can be realized. In her article she distinguished between three sets of policies. The first set is meant to decrease the rent from extensive agriculture. The second set aims to increase the rent of extractive or protective forest rent, creating institutions or markets. Those institutions are for example community-managed forests where the community members as the collective land owners would be the primary beneficiaries of this higher rent. The third sets of policies are those aimed towards strict protections of forests through the establishment of national parks. Nevertheless, Anderson cautions against the creation of win-lose situation where forest conservation comes at the cost of agricultural production.

2.6 Increasing forest rent

To conclude, the main responsibility the governments in the Amazon rainforest regions have is to establish clear land ownership rights and avoid granting conflicting concessions to outside parties on indigenous community land. As already established, the majority of unsustainable logging happens in areas where such land rights are unclear or disputed (Cattaneo, 2001).

Moreover, the issue of extensive and unsuitable agriculture has to be resolved. Intensification of agriculture can have positive impacts, creating higher yields for farmers, but the area where such activities are permitted has to be clearly limited, so that the rebound effect do not offset the gains. If the higher yields per hectare attract more people to engage in agriculture than the effect on deforestation may very well be the opposite (Angelsen, 2009; Cattaneo, 2001).

As Angelsen (2009) argues, the extractive forest rent for timber and non-timber forest products (NTFP) and the protective forest rent, which is the gains of protecting forests such as water catchments, pollination services, or carbon sequestration, have to be increased through policy to stimulate forest cover stabilization and regrowth. Increasing the forest rent through

policies can be done for example by the distribution of new technologies that increase efficiency in an environmentally harmless manner, or the provision of marketing assistance to increase demand for sustainably harvested timber and NTFPs. If coupled with clear ownership rights, such increased rent for forests will motivate the land owners to manage their forests in a sustainable manner, resolving the tragedy of the commons.

3 THE CASE STUDY INTRODUCTIONS¹

In order to develop an answer to the research question 10 case studies are analysed based on their impacts, success factors and threats. Moreover, a short introduction of the setup and purpose of each program is given.

3.1 Association of Smallholder Agroforestry Producers Reca Project (ASAP) (Equator Initiative, 2012a)

3.1.1 Introduction

The Abuna region in the northwest of Brazil has long been seen as undeveloped land without any economic opportunities. In an effort to change this, the National Institute of Agrarian Settlements (INCRA) has created a strategy in the 1980s to encourage landless peasants to move into the region and develop it. To facilitate the new settlements, the government also pursued a deforestation policy to clear land for agricultural purposes. However, the infrastructure was poorly developed, leaving the new settlers without access to electricity, roads or social services. Thus, the settlers started to engage in traditional agriculture of foreign crops, which proved unsuitable for the local soil and climate conditions. Thus, both the farmers and the environment were in poor condition. Moreover, disputes with the indigenous rubber tappers, the seringueiros, started as a result of resource limitations.

In an effort to resolve the disputes and use their new land in a productive manner, a group of settlers met with seringueiros to ask for guidance on how to adapt their agricultural practises to local conditions. This marked the beginning of the Association of Smallholder Agroforestry Producers. The aim was to “develop livelihood options based on the forest ecosystem”. By pooling their resources, the initial group of farmers was able to purchase cows and bulls but were required to give one calf back to the association, which then went to other members.

¹ Unless indicated otherwise, all information used in the section 3 *Case Study Introduction* is taken from the source provided in the chapter headings 3.1 – 3.10

After proving to be successful initially, the association had a long way to go to get to where they are today. They managed to do this through cooperation with many partners that provided financial resources, knowledge or technical guidance to the group. In 1989 the Projeto Reflorestamento Econômico Consorciado e Adensafo (RECA) was founded as the flagship program of the association. In this first phase, the main goal was to “develop a system of productive forest that would generate income streams for the local population without degrading the land”. The strategy to reach this goal was to invest in replanting forests with local and indigenous plant species, providing diverse ecosystems and new sources of income in NTFPs. Due to the realization that the demand for the products was insufficient, the association decided to invest into storing and processing businesses. This resulted in higher profits for the community and more employment opportunities.

As the association grew quickly involving over 300 families directly and 500 indirectly, they decided to divide into 12 groups. This facilitates the exchange and implementation, as the region where the association operates is very extensive.

3.1.2 Threats

The main threats to the region have been deforestation and forest degradation and commercial logging for the purpose of land transformation for cattle farming and the planting of non-native plants. Socially, the communities have faced social marginalization, lack of basic social and infrastructure services and very limited livelihood possibilities. All of these threats have been eased through the RECA project.

3.1.3 Impacts

The RECA project has a strong focus on the recovery of degraded land and has had large impacts in this area. Family farm plots and local farmers have been crucial for the reforestation initiatives that RECA started. To determine which areas are in need of restoration, RECA has documented all family farms and has planted over 640,000 seeds of local fruit tree species, such as acai, dragon’s blood or bacaba since the project started. To rejuvenate the local environment RECA also put in efforts to conserve and protect riparian buffer zones, such as watersheds or springs. The sustainable agroforestry system that ASAP promotes has had very strong impacts on the biodiversity of the region. Deforestation and degradation of forests has decreased in addition to illegal poaching and fishing. Farmers that are part of the ASAP have to fulfil strict requirements concerning the environmental impact of their production process. The

impact has to be kept as low as possible and all resource extraction has to be done in a sustainable manner.

To increase awareness for the environment among the local population in the Abunda region, the ASAP has developed environmental education programs for local students. The association organizes classroom and field-based training to show students the threats to their environment and the value standing forests have for the soil and the ecosystem. Moreover, students are educated about viable sustainable livelihood options in the field of agroforestry and can join in planting native trees.

Socially, the RECA project targeted mainly immigrants that came to the region searching for work but found themselves marginalized, with little access to social services and very limited livelihood options. Through the RECA project, people realized how much more viable it is to cultivate local fruit and timber trees, which are adapted to the ecosystem of the region. Previously, the products from this region were sold unprocessed, but the processing facility RECA offers increased the profit of the farmers by over 30%. This increase is also partly due to the fact that all products are sold to RECA, which then re-sells them further. Due to its size, RECA has a larger bargaining power than the small farmers would have alone and can get a higher price for their products. Via RECA, the farmers can also build partnerships and develop capacities through interactions with each other. Moreover, joining together in such a collection increases political visibility and legitimacy.

Between 2007 and 2009, RECA has created more than USD 1,000,000 revenues for their local producers. This does not only benefit the farmers themselves but also leads to significant spillover effects, spreading the benefits over the wider communities, for example through the increased demand in day labourers and temporary labour for the harvesting seasons. Part of the revenue from RECA is invested into local enterprises such as pharmacies or bakeries and slowly transforms the local economy. Additionally, RECA supported 40 families working in beekeeping, by assisting the families with the packaging and marketing of their honey. Focusing on planting native fruit and timber species does not only positively impact the environmental health but also restores previously degraded land making it more productive in a sustainable manner. It ensures, therefore, higher economic stability and food security for the communities. The latter is especially due to the promotion of organic agricultural practises and the promotion of crop diversification, which make the food supply more resilient.

RECA also has a strong focus on social cohesion. It serves as a platform to help small farmers cooperate, for example passing on old tractors to others when purchasing a new model. To foster equity and integration, RECA targets women and children with their programs too. Children are educated in the Family Farm School where they can participate in workshops and trainings. Each producer group has one representative, which is elected to represent the concerns of female farmers and meant to empower women and involve them in the decision-making process.

In the area of policy, RECA has had a strong impact. The region where the ASAP is established is very distant from urban areas and lacks basic infrastructure and social services. RECA has filled this gap and provided the local population with those essential services, which has made them a valuable partner for the local government. In return, RECA has a strong position to lobby for the needs of the farmers with the governments, helping them to obtain environmental and organic certifications and securing their land tenures. Thus, RECA serves as a link between the people and the local and national government.

3.1.4 Success Factors

RECA sees their success based on their participatory approach. The organization was founded as a collection of small farmers and has grown from there. This means that they are the main decision-makers and can have their voices heard. Each producer group has several representatives, which come together to discuss the needs of their members. A women representative, for example, was established for each producer group because the female producers demanded it. Moreover, RECA ensures cross-generational cohesion through education, which ensures the continuation of the success in the future.

3.2 Capacity of the Upper and Lower Izozog (CABI) (Equator Initiative, 2012b)

3.2.1 Introduction

The Capacity of the Upper and Lower Izozog (CABI) is an organization representing over 10,000 indigenous Izoceño-Guaraní people in Bolivia. CABI's initial role was to advocate and protect the land rights of this group. The dry tropical forests in the region were the territory of those communities, but these areas are threatened due to large-scale cattle ranching and commercial soybean, sunflower and cotton farming. That has caused deforestation and soil

degradation that threaten the indigenous territories. However, because of a lack of land rights, the indigenous communities had little power to stop this. In the 1990s, CABI started negotiations with the Bolivian government, resulting in two landmark agreements. The first was to establish the Kaa-Lya del Gran Chaco National Park, one of the largest national parks on the continent. The second was the negotiation of land ownership rights for the Izoceño-Guaraní people in the form of a Tierra Comunitaria de Origen (TCO). The national park is co-managed by the government and CABI. The TCO is managed by CABI only, as it represents the local indigenous communities.

In order to decrease conflicts, CABI engaged in a participatory land use zoning approach, including both indigenous people and ranchers that own land in the region. Besides cooperating with the Wildlife Conservation Society (WCS), CABI also worked closely with Gas TransBolivia, the local energy company. Gas TransBolivia own a pipeline that crosses the national park as well as the TCO. The pipeline was built before the national park was established and therefore they remain owners of oil and gas exploitation concessions within the area. However, due to the close cooperation, Gas TransBolivia has been convinced to actively engage in environmental and social impact mitigation of their activities. Those impact mitigation and compensation programs are designed and implemented with the participation of the indigenous communities, making it beneficiary for both parties. Moreover, Gas TransBolivia financially aids the national park's administration through a substantially-sized trust fund.

3.2.2 Threats

As already elaborated above, the principle threats to the local communities and the environment are the mining industry, agriculture and conflicts regarding land rights and ownership. Agriculture is a problem, because often people are not aware of a sustainable perspective on the environment, which leads to conflicts due to overgrazing and generally an exploitation of natural resources. Moreover, the gas pipeline that crosses CABI's land shows that even though they are considered a TCO, they do not have unconditional rights on their land. However, this problem was mitigated with a landmark agreement obliging Gas TransBolivia to cooperate with CABI.

3.2.3 Impacts

The establishment of the national park and the active biodiversity-conservation policies have had a great impact on the many endemic species living in the region. Among the most well-known species is the largest observed population in the world of jaguars or the endangered Chacoan guanaco. In order for the indigenous communities to pursue their traditional way of life, CABI developed a system of selected hunting licenses, where landowners are only allowed to hunt only a few pre-defined species.

Moreover, CABI has invested in livelihood diversification programs, focusing mainly on the empowerment of women and value addition to local products. Finally, they also started pilot programs in Eco-Tourism with the aim of creating economic benefits while also raising awareness for the local environment.

In order to raise awareness for the environment, CABI together with the NGO Wildlife Conservation Society has implemented an environmental education program in 16 local schools in the region.

In the case study, there are no policy impacts mentioned. However, there is the landmark agreement requires the local energy company Gas TransBolivia to work with CABI to systematically decrease their negative social and environmental impacts and to pay compensation for the remaining ones. Part of the compensation scheme was a Development Plan for indigenous people designed by CABI to develop a range of productive activities. Moreover, they established a foundation together with the local community that manages the national park's funds that are used to make investments to get land titles for more territory for the protected area. However, the fund supplied over a third of the annual budget of the national park between 1998 and 2003. The efforts Gas TransBolivia underwent to mitigate the negative impacts of their infrastructure project were recognized for excellence by the International Association of Impact Assessment.

3.2.4 Success Factors

The success of CABI can be attributed partially to the strong partnerships they developed, with NGOs such as the Wildlife Conversation Society as well as with the government and even with Gas TransBolivia. Moreover, the co-management approach between the Izoceño-Guaraní and the government in the national park is important. Furthermore, CABI would not have been as

successful if they had not engaged in strong lobbying and advocacy efforts in order to defend their rights and obtain legal ownership over their lands.

3.3 Chalalán Eco-Lodge (Equator Initiative, 2012c)

3.3.1 Introduction

Founded in 1993, the Chalalán Eco-Lodge is located in the Madidi Protected Area in a remote region in Northern Bolivia. The Protected Area is split into the Madidi National Park and the Integrated Management Natural Area (IMNA). The Eco-Lodge is situated mainly in the latter. The indigenous communities living in this region had to fight hard to have their land declared a TCO, which nowadays overlaps with the Protected Area. The main issue the local communities still have are extreme economic marginalization and poor access to health services and education.

The Eco-lodge was founded in an attempt to create a new and sustainable source of income for the Quechuas-Tacana community that owns and operates it. The foundation of the project was only possible due to two large donations from the Inter-American Development Bank and the NGO Conservation International.

From 1998 to 2007, the number of visitors increased from 186 to 1,406. Moreover, National Geographic Traveller rated the eco-lodge as one of the top twenty most important tourist destinations. The project proved to be very successful in creating high positive conservation and development impacts through responsible ecotourism. The eco-lodge is build from locally and sustainably harvested materials in the traditional style of the community. They offer room for up to 30 persons at a time and different trails and guided tours through the forests. The guides are specialized on different topics, such as medical plants, community culture, bird or wildlife watching.

3.3.2 Threats

Initially the largest issue was the extreme poverty of the community and the systematic marginalization of the indigenous people. However, this improved significantly due to the eco-lodge. However, the tourism industry is volatile and as it is the main source of income for the entire community, they face high exposure to outside shocks that may decrease the number of tourists coming to the region. Environmentally, the region is threatened as the local government has decided to grant petroleum exploitation concessions to private enterprises on the

community land, which puts additional pressure not only on the natural environment but possibly also on the community.

3.3.3 Impacts

The attractiveness of Chalalán Eco-Lodge is dependent on their environment. Thus, to remain a desirable tourist destination Chalalán took measures to conserve the local environment and keep the impact of the tourist activities as low as possible. Ten thousand hectares of community land have been set aside for ecotourism activities only, which gives endemic species space to recover their populations. The community and the park guards of the Madidi National Park cooperate closely to monitor the health of the local wildlife and combat poaching and illegal logging. Moreover, every person that visits the national park has to pay an entrance fee that is put into a conservation fund.

Socially and economically, the project has benefitted all 116 families of the local community. The eco-lodge has generated 60 direct jobs, but due to the need for materials and supply and the new market for handicrafts the other members of the community profit too. The revenue that is generated from the tourist activities at the lodge is invested into social and infrastructure projects, such as portable water, health clinics, health loans and the construction of schools. Moreover, through this project the community has succeeded in having their land legally recognized as Tierra Comunitaria de Origen (TCO).

In the field of policy, Chalalán has had considerable impacts. Chalalán is part of the management committee of the Madidi National Park, which is important for stakeholder engagement efforts and coordination. Moreover, the Chalalán initiative founded the tourism network INTI-RUNA that is meant to serve as a platform for indigenous community-based eco-tourism programs in Latin America.

3.3.4 Success factors

The case study attributes the success of the eco-lodge to three factors. The first was the availability of funds for the start-up without which the entire project could not have been realized. Second, the strong group cohesion and solidarity among the community members was important to develop a shared vision and implement it. Last but not least, the natural environment with its wide variety of flora and fauna is a strong force that attracts tourists. This gives the community an additional incentive to be aware about their environment and engage in concrete actions to keep it in tact.

3.4 Consejo Regional Tsimané Mosekene (CRTM), Pilón Lajas (Equator Initiative, 2012d)

3.4.1 Introduction

Declared as a UNESCO Biosphere Reserve, Pilón Lajas was already proposed as a national park as early as 1975, as it is internationally recognized as important for biodiversity conservation (UNESCO, 2015). However, the Bolivian government failed to establish Pilón Lajas as a protected area. In fact, they took contrary actions by promoting the colonization of the region. This led to large problems in the region due to the influx of people and the increased demand for land and natural resources, especially timber. This development not only threatened the rainforest but also the local indigenous communities (Pauquet, 2005, p. 18).

The indigenous communities did not want these developments to continue and undertook protests that became known as the March for the Dignity and Territory of the Indigenous Lowland Villages in La Paz in 1990. This march triggered negotiations on a national level, which led to the transfer of ownership of the area Pilón Lajas, establishing it as an Original Community-based territory (TCO) in 1992. Simultaneously, the area was also declared a Biosphere Reserve (RB). This dual identity is a central point for how Pilón Lajas has been managed and continues to be managed.

3.4.1.1 The Biosphere Reserve

Pilón Lajas is part of a trans-boundary protected area compound that is situated in Bolivia and Peru. The area of approximately 4,000,000ha can be separated into 2 major sub-regions, which are the Yungas Montane Forest and Madeira Humid Forest. However, within both forests there is a wide variety of geologic and climate conditions, which allow many different eco-systems to flourish and are the reason for the large biodiversity in this region. Even though the areas which are situated close to the colonization areas and major roads suffer from deforestation, there are still some mountainous areas which are very hard to access and therefore remain pristine without major human impact (Peredo-Videa, 2008; Pauquet, 2005). Due to the lack of concrete data, the number of species within the RB is still unclear. However, scientists suspect that it has one of the highest biodiversity indices in Bolivia. There are for example 162 known timber species and several rare hardwood and palm species that can be found in Pilón Lajas. As of 2005, there were 755 registered animal species that lived in the region. Among these species is a number of threatened species, such as the spectacled bear or the lowland tapir. There

are also six types of large felines endemic to the regions, but the most variation is in the genus of birds, which counts over 700 unique species (Peredo-Videa, 2008).

3.4.1.2 The Indigenous Communal Lands

Approximately 80% of the population of Pílon Lajas belongs to one of three indigenous tribes, namely the Chimán, Tacana and Mosekene. Since the 1980s when a new road was constructed and the national government put in efforts to colonize the area, there has been an influx of settlers from other areas of Bolivia. The majority of the local indigenous population has traditionally lead a semi-nomadic lifestyle but started to settle in villages during the last decades. Traditionally, they engaged in subsistence agriculture, hunting and fishing. However, with the new settlers, new opportunities arose and many decided that it was more profitable to work for them, for example in the logging and mining industries as well as in large-scale agriculture (Peredo-Videa, 2008; Pauquet, 2005).

3.4.1.3 The Consejo Regional Tsimané Mosekene

In order to represent the communities living in Pílon Lajas and conserve the local eco-system the Tsimané Mosekene Regional Council (CRTM - Spanish: Consejo Regional Tsimané Mosekene) was founded. Their mission is to: “become a valid and legitimate negotiator for the inhabitants of RB-TCO Pílon Lajas at local, regional and national levels; to defend and strengthen the constitutional rights of the communities; to manage public and private technical and economic support based on integrated land management and human development in the indigenous population that it represents; and to preserve the natural and cultural heritage of the territory” (Equator Initiative, 2012d).

Every activity that takes place in Pílon Lajas has to first be proposed to the council where it is discussed and approved with the participation of the community. Thus, the communities have an influence on all decisions, which are made concerning the TCO. For projects regarding the biosphere reserve, CRTM cooperates with the National Service of Protected Area (SERNAP), which co-manages the RB. Before 2001 there have been many issues with mismanagement of CRTM, which is why serious restructuring took place. Since then, CRTM meets in fixed intervals and has developed, for example, Management Plans, which include zoning of the area and permitted activities (ibid).

3.4.2 Threats

The main threat for the TCO and RB in Pilón Lajas is the increased number of settlers due to the immigration of landless peasants into the region, amplifying the already relatively strong population growth. This leads to land invasion, illegal hunting and logging. The reason for this is the remaining poverty not only of the settlers but also the indigenous communities. As in many other case studies, Pilón Lajas conservation policies are put under pressure due to land conservation for cattle ranching and agriculture, which is magnified by the increasing population. Combined with the uncertainty in funding for the RB, people are hesitant to give up a stable income in logging for an uncertain alternative. Furthermore, mining and oil extraction within the region threaten the eco-system and the livelihood of the communities.

3.4.3 Impacts

In the field of biodiversity conservation CRTM has been successful on several levels. First, through the collaborative zoning of the TCO and the RB, strict protection areas were established and illegal hunting and logging were decreased. Moreover, there are also areas that can be used for the gathering of NTFPs or low-impact tourism, which creates a buffer zone between the non-protected areas and the conservation zones. In those protected zones, many species had the opportunity to recover their populations. This is also thanks to the management plan, which sets clear guidelines for how conservation and utilization of the environment shall be done. In order to assess the impact, the conservation efforts have had a biodiversity dataset and a monitoring system is planned to be set up. Through CRTM the awareness of the local population for their natural environment has increased

CRTM benefits the indigenous communities that live in Pilón Lajas directly. Through the expulsion of the logging companies and the new focus on NTFP production, CRTM estimates an increase in household income by 30% between 2005 and 2012. This is also partly a result of the collective bargaining of the small farmers and harvesters; they are able to sell their products at higher prices than before. CRTM engages in many different projects and thus additional jobs have been created, for example in education or technical support activities.

CRTM's lobbying and advocacy efforts in two main areas has impacted local and national policy. First, CRTM succeeded in institutionalizing the participatory governance approach they had used and second, the informed consent of the indigenous communities has become a requirement for environmental projects that take place or have an impact on Pilón Lajas.

3.4.4 Success Factors

The most important factor for success in this case was the strong will and the continuing efforts of the leaders of the indigenous community to defend their rights. The establishment of CRTM and the development of the Management Plan and Life Plan gave them a set of strategic goals and ways to achieve them. As CRTM emerged from the community itself, there is a strong sense of ownership and identification with the organization among the indigenous people, which makes it socially sustainable. Moreover, the participatory governance approach between CRTM and the relevant governmental agencies has been a crucial factor that has helped achieve their conservation goals.

3.5 Ese'ejá Native Community of Infierno / Posada Amazonas (Equator Initiative, 2012e)

3.5.1 Introduction

The Ese'ejá Native Community of Infierno was founded in 1974 when the Peruvian government implemented a law that gave indigenous groups the rights to form communities and get legal recognition for their land. The province Madre de Dios was the first community recognized under this law. In the 1990s, parts of their land were mistakenly added to the Tambopata Natural Reserve, which was founded to protect important watersheds in the region. After disputing this, the community got the land back but were obliged to set aside nearly 30% of their territory for conservation.

In order to still be able to get some use out of this land, the community decided to engage in low-impact tourism. Their expectation was to benefit from the influx in tourist without harming their environment. Originally, the Eco-lodge was build and operated by the "Rainforest Expeditions", a private company, with a contract promising to transfer management to the community after 20 years. While the community owned the lodge, Rainforest Expedition retains a 40% profit share until 2016. Until 2016 the lodge was run under a co-management model involving both the community and the tour operator. The overall aim of the Eco-lodge, called Posada Amazonas is "protecting biodiversity through low-impact, educational tourist activities."

The materials needed for Posada Amazonas such as food or construction material is sourced locally as long as the prices and quality of the products are not significantly worse than market

prices. This is meant to spread the benefits of the eco-lodge over the entire community. The two essential innovations brought by Posada Amazonas are the concepts of benefit-sharing and joint decision-making. In order to make these two innovations possible, capacity building initiatives have been carried out, mainly in the areas of management skills and business development.

3.5.2 Threats

One problem that is created by the Posada Amazonas is that even with the profit sharing system, some profit more than others. Especially tour guides, who are renowned for their expertise, get substantial tips from the tourists, which are significantly higher than what other community members make.

3.5.3 Impacts

In the field of biodiversity management, the Ese'ejá native Community of Infierno has had considerable impacts. They created partnerships with universities and research facilities to structurally assess the flora and fauna and create targeted programs to conserve the species that need it. Those efforts have had significant impacts in increasing several animal populations. One noteworthy project is the Harpy Eagle Project. Every community member that finds a nest of those birds on their land gets a premium from the eco-lodge. The amount of money they receive is based on how many tourists can have the opportunity to see the nest. This fee is paid until the chicks fledge, which can be up to nine months.

The socio-economic impacts of Posada Amazonas were significant too. Within the Madre de Dios region, 20% of tourist activity is attributed to the Posada Amazonas. This has a direct impact on the community. The wage labour needed for the lodge is filled by community member as much as possible and 60% of the profits go directly to the community. Additionally, other people profit too, such as local farmers and small-scale producers of materials, which are needed at the Eco-lodge.

The 60% of profit created by the eco-lodge is reinvested in community development projects, such as an emergency health care fund, elderly care services or loans and scholarships. What remains from this is divided equally among the families of the communities, providing each family with an additional income of USD 805 in 2007. This is more than five times what they received in 2001, because the total profits from the lodge increase steeply since then.

In order to not become over-dependant on tourism, the community has formed committees with the goal to develop strategic plans to foster other economic sectors as well, such as agriculture or healthcare. These efforts, together with investments in the education systems, have the overall goal to maximize the spillover effect from the increased money supply that Posada Amazonas created for the Ese'ejá native community. This is especially important because the community believes that the eco-lodge is approaching its maximum potential and will not continue to grow as much in the future. Furthermore, they have established a two-year community leadership program in cooperation with a Bolivian university that builds local management and entrepreneurship capacities of community leaders.

Financially, the Posada Amazonia provides a very attractive rate of return on investments of 35%, which benefits the community. Moreover, every employment at the Eco-lodge can be held for a maximum of two years, which ensures that the benefits from this facility are spread over as many community members as possible.

From a policy perspective, the Ese'ejá community has engaged in strong lobbying efforts to secure their land tenure and keep the eco-system of the Madre de Dios region intact. They intent to join forces with all other native communities in the region in order to “secure the rainforest corridor that connects them and create a functional buffer zone to the Interoceanic Highway”.

3.5.4 Success Factors

As for success factors, the case study mentions principally the partnership between the community and the private company. The investments from Rainforest Expeditions made it possible to construct the eco-lodge and their knowledge made it profitable. As the local community was highly involved from the beginning, knowledge transfer and capacity building were ensured, giving the community the necessary skills to take over the management in 2016. Thus, the communal measures to build local capacity were the second factor, which was crucial for the success.

3.6 Green Life Association of Amazonia (AVIVE) (Equator Initiative, 2012f)

3.6.1 Introduction

Following a course by a professor at the Federal University of Amazonas on native aromatic and medical plants in 1999, the participating group of 20 women from the island of Silvas decided to found the Green Live Association of Amazonia (AVIVE). Silvas is a small island located deep in the Amazon forest where women have had very few employment opportunities. AVIVE has developed techniques permitting the sustainable extraction of oil from native medical and aromatic plants.

Rosewood, which was nearly extinct in the region due to intense and unsustainable harvesting practises, has been since used by the women of AVIVE in order to create soaps, perfumes, cosmetic products and natural medicines. Their natural products are sold to locals and tourists and are also exported internationally.

The aim of this initiative was to create economically viable employment opportunities for local women with sustainable harvesting techniques that do not require the felling of trees and use the traditional knowledge of medical proprieties of endemic plants. An additional goal was to lower the cost for medicine for the local population.

In the beginning, the initiative faced issues with Brazilian law and regulations regarding the sale of medical products, which were inflexible and would have required large investments. Therefore, AVIVE decided to focus on aromatic and medical oils as the main ingredients for cosmetic products, such as soaps and perfumes as well as candles, focusing mainly on rosewood.

Selling their products internationally also posed a challenge for the association. They needed marketing licenses and sales permissions, which AVIVE, as a non-profit organization, could not obtain. Therefore, they founded COPRONAT in 2003, which is a “for-profit organization” acting as the commercial arm of AVIVE. Through this company the participating extractors and producers can be paid. Financing is also facilitated because COPRONAT as a commercial firm can easily take out bank loans and credits.

AVIVE also had to overcome several legal challenges, as the legal framework for the processing of NFTP's was not well developed. Moreover, the acquisition of formal land titles on all the 26 production areas was tedious, taking seven years in total.

As of 2012, AVIVE has had 43 women participate in the cooperative and an additional 100 men and women that work in the extraction of the natural oils and the production of cosmetic products and handicrafts. However, AVIVE does not only offer employment opportunities but also workshops for computer skills, English or marketing and environmental education programs.

The main innovation from AVIVE was the secondary processing of natural oils and the direct sales that cut out the middlemen and yield higher profits for the producers. Moreover, the attainment of sanitary certificates and legal land titles decreases uncertainty for the local communities. In order to keep their impact on the environment low, AVIVE has established "good collection practises" as there was a lack of national guidelines in this field.

3.6.2 Threats

There are two main factors threatening AVIVE's success. One is the very complex political and regulatory framework, which makes it challenging and costly for AVIVE to obtain all necessary certifications and permissions in a timely manner. To give an example, obtaining the necessary land titles for the 26 production sites took seven years. The second one is the vulnerability of the regions for natural disasters such as floods and forest fires. In 2010, nearly all of AVIVE's Andrioba trees have been destroyed in such a fire.

3.6.3 Impacts

AVIVE has several initiatives, which had beneficial impacts on biodiversity. First, they engaged in environmental education and trainings for their employees. Those workshops and trainings teach local oil collectors how to harvest in an environmentally friendly way. For example, they use a technique where only small holes have to be made in the trunk of the copaiba tree instead of deep gashes or cutting down the entire tree. This helps the health of the ecosystem and keeps the tree alive for further harvesting after an extended regeneration period. Moreover, AVIVE engages in extensive environmental monitoring efforts with the help from the local population and research institutions. Together they developed plant protocols for 11 species including important data about the plants habitat and use. With the guidance of a

Brazilian university, AVIVE is dedicated to take animal inventories of the entire area and establish regeneration programs.

The socio-economic impact of AVIVE was considerable too. By selling NTFPs directly without any middlemen, the profits of local producers increased substantially. The value-added processing created more employment opportunity and together those two factors caused an average increase in salaries of project participants from USD 100 to USD 165 between 2005 and 2007. Secondly, the women that founded AVIVE were previously unemployed. Through the association they acquired important skills as well as financial independence, which empowered them and decreased the number of incidents of domestic abuse.

AVIVE's slow but steady success has made them well-known and respected. They are often invited to local decision-making processes and even to national discussions about legislations concerning NTFPs. Moreover, AVIVE was a principle force for the foundation of the Sustainable Development Reserve in the Silva district where the community may harvest NTFPs in a sustainable manner. Their governance approach is based on good governance and transparency, which is why AVIVE is committed to maintain close and long-term relationships with their partner organizations. Those organizations include private companies such as the petrol provider Petrobras, NGOs such as the ICCO Foundation / Netherlands and governmental agencies and banking institutions.

3.6.4 Success Factors

They claim that their success was due to two factors: one is their commitment to good governance practises and transparency and the other is their policy of building strong and long-term relationships with their partners, which provide them with knowledge and resources.

3.7 Kapawi Eco-Lodge & Reserve (Equator Initiative, 2012g)

3.7.1 Introduction

The Kapawi eco-lodge is located in close to the eastern border of Ecuador in a very remote and secluded part of the Amazon rainforest. The area can be reached by a canoe taking 3-days from the closest larger town or by small aircraft. Due to the difficulties to reach the area and the lack of roads, it has remained untouched by typical outside threats such as large-scale logging or mining activities.

The area around the eco-Lodge is inhabited by approximately 1,000 members of the Achuar communities, who have lived in the area for over 100 years. They are organized in smaller communities in which each elects a head. However, all important decisions are made with the participation of all community members.

The Kapawi eco-lodge was founded in 1995 when the Ecuadorian tour operator Canodros agreed with the local Achuar communities to set up an eco-Lodge in their territories. Canodros signed a leasing agreement for 15-years after which the local community would assume responsibility over the lodge. This agreement ended in 2008 and now the community has started to take over. Initially, though, there were significant problems with the management, as the Achuar communities had no previous experience managing this type of enterprise. The resulting administrative and commercial problems led to severe negative impacts on the lodge and the local communities. Therefore, the community decided to change their management approach completely and, having seen the consequences of mismanagement, assumed great responsibility over the project. This large amount of effort, which the local community put into the project, as well as the trainings and experiences they gained through this process ultimately have helped make the eco-Lodge a success story.

Their mission is to “provide quality tourism services in the Ecuadorian Amazon that promote responsible enjoyment of nature, environmental education and cultural dissemination of the Achuar people”. The lodge does not offer fixed schedules but rather individualized programs. The visitors are accompanied by a local guide, who offers them different experiences based on their interests and abilities. Examples are visits to the local communities to introduce them to the Achuar’s traditional lifestyle, hiking through the forests to spot plants and animals, kayaking or fishing. The rivers offer a wide variety of local species to observe, such as the pink dolphin, the alligator or the infamous piranhas.

Currently the eco-Lodge is already self-sustaining and able to remain environmental-friendly, but they are already taking steps towards guaranteeing the long-term sustainability of the project. To reach this goal two main actions are needed. First, even though the community already sources 60% of their electricity from solar panels, there is a need for further capacity building in the field of technological innovation, especially regarding the possibilities of renewable sources of energy. This would reduce their environmental impact even further. Second, the community is considering launching a publicity campaign in order to raise awareness for the Lodge as a cultural and natural destination. The aim is to attract more

visitors and also to reach other communities showing how sustainable tourism can be done successfully.

3.7.2 Threats

There are no significant threats from outside, because the eco-lodge is situated in a very remote area, accessible only via a three-day boat trip from the closest town.

3.7.3 Impacts

Since its establishment the Kapawi Eco-Lodge has received multiple environmental stewardship certifications by various international organizations, showing their dedication and ability to keep high conservation and sustainability standards in the Lodge. Moreover, they were awarded the Rainforest Alliance seal, showing their good practices in sustainable tourism and certified by Best ECO Lodges. Thus, the Kapawi Eco-Lodge is well suited to act as a showcase example for the socio-economic and environmental potential of sustainable tourism in forest regions.

The eco-Lodge employs 32 people, out of which the majority are Achuar people. This has a direct impact on many other small-entrepreneurs in the area that sell handicrafts and supply the Lodge with food and other important resources. It was calculated that 1,200 people benefit directly and another 7,000 indirectly from the Kapawi Lodge.

The employees of the Lodge have high-standard contracts earning more than the minimum wage of the state, receiving social security as well as accident and life insurance. Moreover, there is an inclusion policy in place aiming to hire more women and people with disabilities. In order to assure that employees can work well, there are ongoing trainings and regular performance evaluations. Computer trainings are especially important for the community members as it enables them to communicate with the outside world, for example to plan the arriving flights for their visitors. However, there are also numerous trainings for the Achuar communities in general aiming to raise awareness for the environment and teach them how to manage it in a sustainable manner.

In order to survey the environmental impact of the eco-Lodge an Environmental Impact Analysis (EIA) was conducted in 2008. The result of it was that “the area occupied by the tourism facility and its area of influence are in a good state of conservation and tourism activities appeared to have had little impact on biodiversity”. The community continues to

monitor the biodiversity within the area, although the main source of data is sightings of animal or plant species by guides and tourists. To optimize the knowledge transfer, a blog system was established to monitor the species, which were sighted. Even though this is not a very “scientific” approach, it is the best and most cost-efficient option, which is available to the community. However, the community is already trying to find a better and more reliable monitoring system for which it seeks a contributing partner (e.g. an NGO) that can assist them with the technical details and the implementation.

In 2010 the organization Achuar Nation of Ecuador (NAE), representing the interest of all Achuar communities, committed to the environmental protection of 681,218 hectares. Based on this commitment the communities around the Eco-Lodge drew up maps establishing territorial areas dedicated to specific activities, such as hunting or tourism.

The positive impact that the Achuar communities experienced from the Kapawi Lodge made them aware of their local responsibility and the value of both their environment and their culture.

3.7.4 Success Factors

One of the main success factors is the governance system, which represents a combination of traditional and modern governance approaches tailored to the needs of the region. Additionally, through the reinvestment of the profits into the community and the financial stability, the eco-lodge is valued among the community. As it is dependent on wildlife tourists, the indigenous people are very aware of the value of their ecosystem and the need to keep it as pristine as possible.

3.8 Poloprobio (Equator Initiative, 2012h)

3.8.1 Introduction

Founded in 1998, the Centre for Biodiversity Protection and Sustainable Use of Natural Resources (Poloprobio) is situated in Rio Branco, Brazil. The research institution is working on developing innovations that help marginalized communities have sustainable and low-impact livelihoods. Their most successful innovation was the development of a method for rubber processing called “Amazon Natural Rubber”.

Until the 1990s, many local communities were principally engaged in rubber tapping as their main source of income. With the withdrawal of governmental subsidies in the 1990s, the entire Amazon rubber industry was hit hard as capital and services disappeared and entire communities lost their main source of income. This had a major impact on entire communities. Therefore, much of the land that has previously been used for rubber tapping was converted into agricultural land and cattle farms. However, the local indigenous communities still suffered from extreme poverty with few livelihood options.

This new innovation of “Amazon Natural Rubber” has many advantages. First, it does not require smoke curing; instead the rubber can be processed locally with local resources. Before this innovation, the main obstacle was the need for industrial fibres for the processing of rubber. Poloprobio solved this issue by using sawdust, which is cheap and easily available. The rubber products can be sold as decoration for clothing and handicrafts and also as packaging material, rubber flooring, rugs or other industrial-quality products.

Another advantage is that this method of production can be easily transferred to marginalized communities with limited resources and is relatively cheap to setup. By producing finished goods, more jobs are created and the income of the participating family-units increases. By 2012, Poloprobio will oversee 300ha of sustainably managed rubber tree plots.

Poloprobio employs teachers, agronomists, economists, chemists, ecologists, anthropologists and foresters that all work together closely with the communities that take part for a minimum of two years. The institute itself does not manage the rubber productions centrally, but rather offers support for the initiation and offers their expertise, advice and promotion efforts.

With their new innovation, Poloprobio has provided an alternative to the over 600 producers that have implemented their technology. Even though felled trees can still be sold at a higher price, the local population recognizes the long-term and year-round benefits of a tree plot of standing rubber trees.

3.8.2 Threats

Except for the eco-lodge, there are very few sources of income, which means that poverty is the largest social threat. This magnifies the problem of deforestation. Logging itself is a profitable source of income, but also land clearing for agriculture and cattle ranching are common.

3.8.3 Impacts

The biodiversity impact of this initiative was considerable. The rubber production does not require cutting down the forests, which is the major environmental threat in the region. Moreover, this activity allows the area to be used less intensively for agroforestry. These protected plots of standing trees protect the sensible ecological balance, especially concerning soil fertility and allows for the cultivation of other endemic plants, such as banana and coffee between the trees. Poloprobio's rubber production approach has also raised awareness for the protection of other tree and animal species, as the local population has started to realize the ecological and economic value of their standing forests.

The socio-economic effects on the communities of Poloprobio's approach were enormous. With little input in time, the community members can once again make substantial profits with the rubber extraction and processing. However, as the rubber production needs little time, farmers can still engage in other activities at the same time, such as the cultivation of NTFPs. This has raised the income of the previously very poor families and built social cohesion. This is a secondary development caused by the fact that through the Amazon Natural Rubber production there are more jobs in the region and young adults no longer have to leave the community for distant cities to make a living.

Poloprobio has won many national and international awards for their easily replicated innovation that shows great potential. While not having impacted laws directly, Poloprobio's promotion of the local rubber-production has impacted federal laws such as minimum prices for NTFPs or pensions for rubber workers.

3.8.4 Success Factors

What made Poloprobio so successful was that their rubber production technologies could be tailored to every community, needing little pre-requisites and skills. It is cheap and easy for farmers to adopt and yields high returns with a low investment cost. It also uses local materials, which are well-suited to the surrounding eco-system. Moreover, Poloprobio supports their members and encourages continuous innovation and knowledge exchange to further develop their techniques.

3.9 Sociocultural Association of Yawanawá (SCAY) (Equator Initiative, 2012i)

3.9.1 Introduction

The Sociocultural Association of Yawanawá (SCAY) was founded in order to improve the socioeconomic status of the marginalized indigenous Yawanawá communities in the Brazilian State Acre, Tarauacá Municipality. The explicit aim of the cooperative organization is to “create income generating opportunities for its members through the conservation of the community’s indigenous territory and the promotion of Yawanawá culture”.

The Yawanawá communities traditionally worked as farmers and rubber extractors since the 16th century. However, due to the strong downturn in rubber prices in 1992 these communities lost their primary source of income. Approximately at the same time, the regional government of Acre conducted an environmental impact assessment for a new highway that should pass through several indigenous territories, belonging to Yawanawá people among others. Through this assessment the lack of clear borders of the indigenous territory became problematic. Even though the general area (approximately 92,000 hectares) was demarked as a preservation area in 1984, the borders were not clearly defined and did not include the important mangroves, river sources or sacred indigenous sites.

3.9.2 Threats

SCAY faces three main threats. Those threats consist of conflicting land rights and difficulties in obtaining legal ownership rights over indigenous community land as well as deforestation for the purpose of timber trade and land conversion to agricultural land. Additionally, the poverty of the local population gives them little alternatives than clearing the forests for timber or agriculture.

3.9.3 Impact

Since 2003 SCAY lobbied intensively for a revision of the boundaries of their lands, which was finally granted in 2006. The outcome was an additional 95,000 hectares given to the Yawanawá, which more than doubled their territory. This was first tribe that succeeded in their lobbying efforts for a revision of the boundaries of their lands.

Another important impact of SCAY was the establishment of a partnership with the North American cosmetics enterprise Aveda Corporation Inc. in 1993. Three contracts were signed between the two parties. The first one specified the sale of urucum seeds from the Yawanawá community to Aveda; the second one detailed the rights to the use of the Yawanawá image and the third one Aveda's responsibility to support social projects for the community. This cooperation was very valuable as it created jobs in the farming and processing of urucum plants but also because it brought funds for much needed social investments in the areas of education, health, food security and infrastructure. Those funds made it possible to construct an entire new village called Nova Esperança. In total as many as 750 people benefitted from the investments by Aveda. Even though the sales of the urucum seeds do not longer suffice to create enough employment for the entire community, the social impact from the cooperation is still very important.

Moreover, the Yawanawá have selected a range of products that uses its image in order to promote their cultural heritage. Among those is a CD with indigenous folk songs, a DVD about their history, which was translated in eight languages, and a fashion label called Kurã Kene.

The strong land rights lobbying by the Yawanawá has had a strong impact on the forest environment in the area as they succeeded in refuting several claims by investors that tried to purchase their land for the purpose of logging, grazing or agriculture. The most prominent of those claims was when a famous Brazilian television presenter purchased 200,000 hectares of land intending to fell the entire area. ASCY successfully resisted the claim received the rights for 50,000 hectares of this land in 2007 and could delete the company's claim to the remaining 150,000 hectares on the grounds of a missing environmental impact assessment by the logging company. The efforts of ASCY to defend their land and conserve their natural environment were strengthened by a close cooperation with the provincial government of Acre, which is renowned for their forest-friendly policies.

In order to reduce their impact on the biological diversity of the region the previously nomadic Yawanawá commenced to engage in controlled animal breeding projects of alligators, fresh water turtles, wild boar and fish. Out of the specimens bred in this project, some are reintroduced into the wild and some are kept for consumption by the locals.

Socially, the SCAY has had considerable impacts on the local indigenous communities. Food security was improved through the breeding of animals but also through the cultivation of edible plant species. Sanitation facilities have been installed in a cooperation with Rainforest

Concern treating Malaria cases and but also to increase the general sanitation situation in the villages, especially for infants. In the field of education a lot of progress was made to keep the indigenous culture alive. Yawanawá language and history is now taught in the four local schools to all pupils.

Additionally to the above-mentioned efforts to promote the Yawanawá culture through CD, DVD and clothing the community also organizes an annual Yawa festival to strengthen the visibility of their culture and to improve the sales of their local products.

Another concern to SCAY is the empowerment of women. Considerable progress in this area has been made in changing the social dynamics within the communities and enabling women to gain access to leading positions in the community. Moreover, several economic projects in the community, such as the award-winning fashion brand, are targeted to empower local women.

In order to improve employment, efforts were put in place to cultivate and process a non-endemic mahogany species. However, this was not met by success, mainly due to the geographic isolation of the community. Trying to decrease the considerable transportation costs that arise from the 9-hour boat trip to the closest town, the Yawanawá communities started to cultivate the jatropha plant, using its seeds as a source for biogas fuel production. This project won several international awards, among those was the 2009 IDEAS Energy Innovation Contest.

3.9.4 Success Factors

The survival and profitability of SCAY is attributed to two factors. The first factor is that SCAY is very skilled in their extensive policy advocacy, which is facilitated by the strong ties they keep with the local government of Acre, which is known for their forest-friendly policies. The second factor is that the partnership with the cosmetics firm Aveda has created an important source of income. The company not only buys urucum seeds directly from the community but also pays to use the Yawanawá image for their campaigns increasing awareness for this indigenous tribe. Moreover, Aveda supports several social projects, which spread the benefits of this co-operation across the community and leads to broader development.

3.10 Tres Islas Native Community (Che, Deza, & Hodgdon, 2015)

3.10.1 Introduction

Founded in the 1940s, the Tres Islas is inhabited by 1391 persons in 2015. They are mostly members of two groups: The Ese'Eja indigenous community and the Shipibo, descendants of immigrants that came to the area the 1800s rubber boom. Until 1975, the community was relatively isolated, until the construction of a road. The Madre de Dios part of the Inter-Oceanic Highway has brought an influx of people and the area became more developed (Che, Deza, & Hodgdon, 2015).

The main problems of Tres Islas are gold mining and illegal logging. Those often stem from a more structural issue, which is that "87% of Peruvian Indigenous lands in parts of Madre de Dios overlap with private concessions like mining and other conflicting land uses" (Scullion, Vogt, Sienkoewicz, Gmur, & Trujillo, 2014). Both mining and illegal logging increased forest loss, pollution and social tension (Che, Deza, & Hodgdon, 2015).

Traditionally, the families in Tres Islas engaged in farming NTFP harvesting and logging. However, they had little power in setting prices for their products and gains of the use of communal forests went to few individuals, so the community was in need for a new strategy (ibid).

Through cooperation with Rainforest Alliance starting in 2013, the situation of Tres Islas improved significantly (ibid).

3.10.2 Threats

The main threat to the conservation of the eco-system in Madre de Dios is the proximity to large roads and the construction of the Inter-Oceanic Highway crossing Madre de Dios. This already has lead to an influx of settlers, putting more pressure on natural resources leading to over-exploitation of those. Moreover, the Tres Islas community has a long-standing border conflict not only with the settlers but also with the neighbouring native community. As in nearly all other case studies, illegal logging is hard to combat. In Tres Islas this problem is increased by the mining industry, which is seen as an additional source of income by many.

3.10.3 Impacts

In the beginning basis research had been conducted to gather baseline data. Then an integrated management plan was created on a participatory manner involving the community. Furthermore, the traditional organizations of the community were strengthened increasing participation, accountability and transparency.

Timber harvesting was regulated strongly limiting the area and the volume of annual harvestings as well as prohibiting the harvest of cedar and mahogany and the usage of heavy machinery. Through this management plan, the community took control over the harvesting operations and the gains were shared across it.

Simultaneously, there have been large investments in the area of NTFP in order to diversify the local economy. Brazil Nuts harvesting was expanded, increasing the number of families that could work in it and also the price per unit increased by 18%. Through cooperation with other organizations, the access to financing needed for Brazil nuts harvesting rose by 230%. Another NTFP in which they invested were two sorts of palm fruits, which created a source of income for 29 community members. For the Aguaje palm fruit, management plans were developed and those were adopted by Ministry of Agriculture thus legitimizing local management practices. This has not only an effect on Tres Islas but also on other palm fruit harvester across the country.

Another strategy to increase the income of local families was the introduction of three value-added products: timber floorboards, Brazil nut oil and Brazil nut snacks (from cracked or sub-standard nuts). These products could be sold more expensively than the unprocessed resource and thus created both jobs and income.

In order to make the local community aware of and take advantage of their opportunities, 44 workshops and other training activities were conducted by rainforest Alliance.

An analysis by Rainforest Alliance comparing Tres Islas' performance in 2013 and 2015 showed significant increases in the categories participation, administrative capacities, financing and solvency. Deforestation slowed significantly during the period; however, it is difficult to attribute this to a single action.

3.10.4 Success Factors

Attributing the success of the Tres Islas case to one factor is impossible. In the beginning, the collaborative territorial planning and management was the most crucial aspect of maximizing the acceptance and the effectiveness of the program. However, developing local capacities, enhancing the social organization and investing into transparency and participation within the enterprise became more important as the project went on. Moreover, the coordination between the different partners was essential as was the value-added production of forest products. Finally, the case study also mentions the access to credit and financing to be necessary in order to be able to build up their project.

4 PRE-ANALYSIS USING DECISION TREES

In order to rank the success of the case studies to foster economic development in the region through sustainable forest management initiatives, the author has developed a pre-analysis.

4.1 Case Study Impact Indicators

When analysing the case studies, the author has identified 10 categories that can be used to measure the environmental and economic performance of the initiatives. Those indicators are financials, sources of income, impact on household income, infrastructure, capacity building, awareness raising, land use and zoning, rainforest conservation, flora and fauna, and data availability on flora and fauna.

This is a limitation as some data, such as unemployment rates, years of schooling or industry/employment sector structure is simply not available for the micro-regions, which is considered by the case studies. Using data from other sources would be meaningless as community-specific economic indicators are not available.

To illustrate and compare the performance of the initiatives within each category, the author has decided to use decision trees. On those “trees” every indicator is split into various subcategories to permit a specific placement of every single case on each tree. Some decision trees have more subcategories on one level, some have more levels. This depends on the specific indicator as the categories are developed as a direct result of the analysis of the case studies. Due to the fact that 9 out of 10 case studies were taken from the same source, they are structured similarly and use the very similar criteria to assess their performance. However, the Tres Islas case study published by Rainforest Alliance does not use the same structure and emphasises different criteria for the project’s performance. Therefore, there are some missing values, mainly concerning environmental indicators. This does not mean that they have performed poorly in these areas, but they did not report it in the case study detailed enough to be assessed.

All projects are different in scale and mission so it is not simple to compare their impact. Therefore, the impacts should be regarded relative to the project size, not in absolute values.

As already established in the introduction, the purpose of the case studies often differs depending on the initial challenges the community or organization that founded the project encountered. The decision tree in this category is meant to illustrate those different purposes. All case studies that are used for this thesis have been successful in fulfilling their initial purpose, and thus were awarded the Equator Prize. However, it must not be forgotten that the goal of this thesis is to find an ideal case study or approach aiming to realize sustainable forest management that triggers and fosters local economic development and entrepreneurship.

Next to each category on the decision trees there is a number, which indicates how many case studies fall in this category. As an example the decision tree for the first category can be seen below in **Error! Reference source not found.**. The different boxes indicate the possible categories in which a case study can be placed and the numbers within the boxes show how many case studies fall in this category. All decision trees have a different number of categories depending on the nature of the dimension assessed. In some decision trees, multiple categories can be selected for a single case, for example to assess their impact on local infrastructure.

In order to retain a good graphic overview to facilitate the comparison of the different cases, the information given in the trees is as condensed as possible. To avoid compromising the reader's understanding of the content of the following decision trees, a short introduction to each indicator is given. The numbers next to the text in the cells of the decision trees indicate how many case studies fall into this particular subcategory.

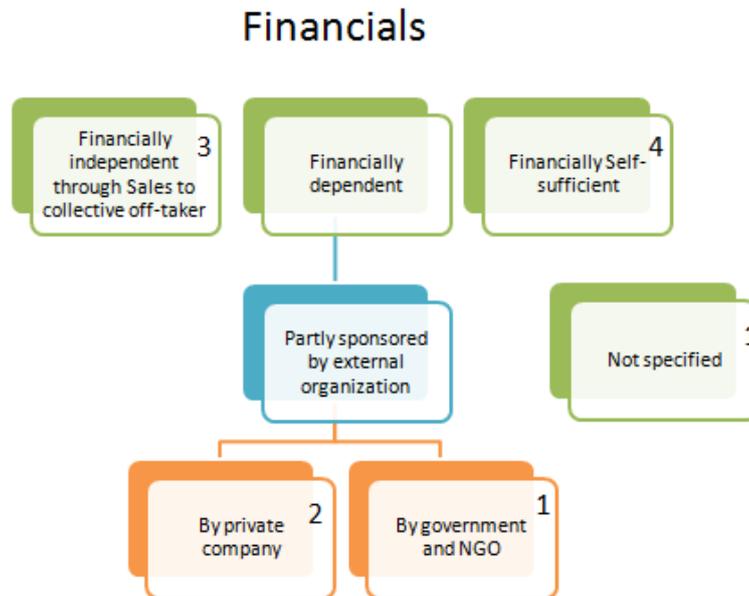
All case studies that did not indicate any information in a specific category are listed as "Not specified" in the corresponding cell on the tree.

The following 10 decision trees are developed by the author based on the case study analysis.

4.1.1 Financials

For a project to survive in the long-term their financial situation should be stable. Therefore, this category assesses whether or not a project is financially self-sufficient. Thus, there are four categories: financially self-sufficient; financially independent through sales; financially dependent - partly sponsored by private company; and financially dependent - partly sponsored

FIGURE 4 DECISION TREE: FINANCIALS

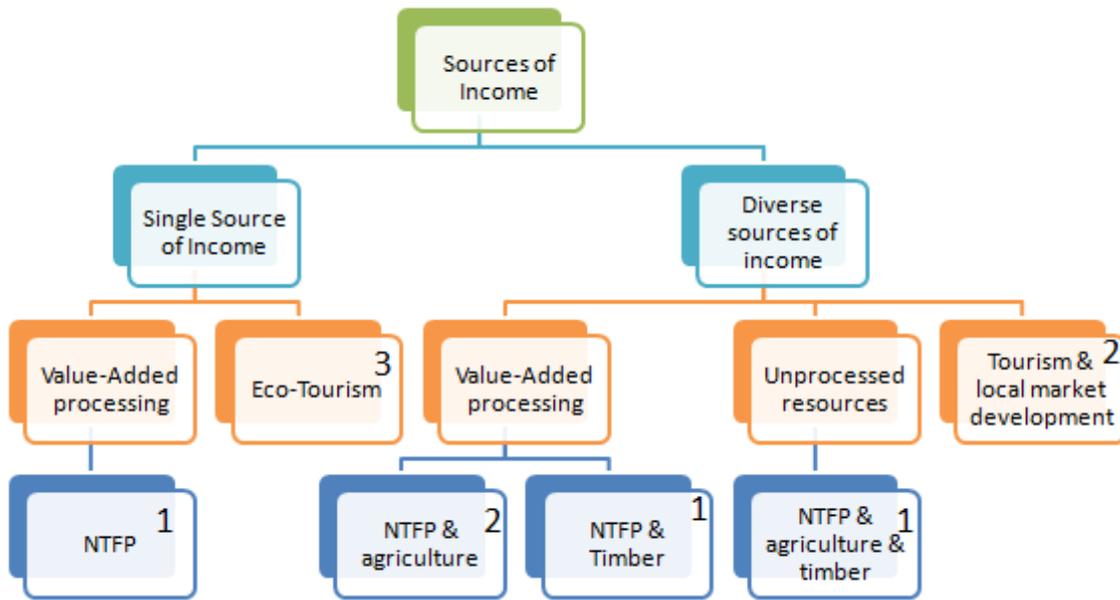


by NGO's and government. The first two indicate projects that are not dependent on sponsoring from outside parties the last two indicate those that are.

4.1.2 Sources of income

In this category the new sources of income that developed through the initiative are assessed. To facilitate the comparison, the sources of income are grouped into four broad categories: Eco-tourism (all eco-tourism projects in the case studies are Eco-lodges) and surrounding activities; agriculture, NTFP (non-timber forest products) production and processing; and timber harvesting. Moreover it is indicated if cases depend on one main source of income (single source) or if they have many (diverse sources) of income.

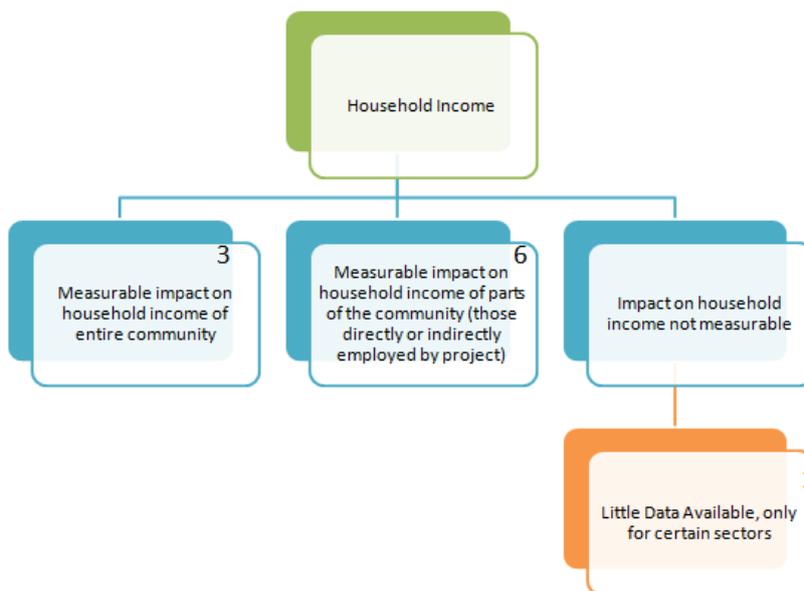
FIGURE 5 SOURCES OF INCOME



4.1.3 Household Income

This category describes the effects of the new sources of income on all households in the community. There is a differentiation if there is a measurable impact on the household income of the entire community or of selected community members. In one case there is only data available on certain sectors so the overall effects are not measurable.

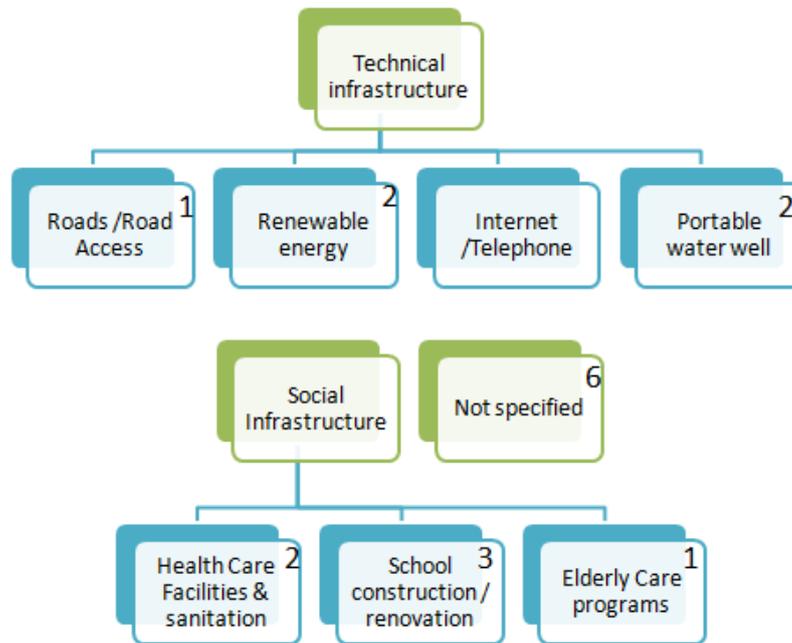
FIGURE 6: HOUSEHOLD INCOME



4.1.4 Infrastructure

This category provides a list of all infrastructure developments within the communities that were realized due to the initiative that is assessed. They include portable water systems, road construction or school renovations and teacher trainings. All infrastructural developments aim to make the life of people better and facilitate the economic development of the area.

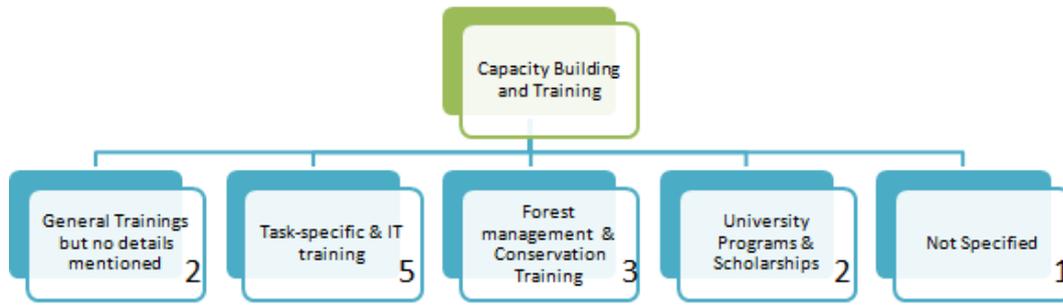
FIGURE 7: INFRASTRUCTURE



4.1.5 Capacity Building

In the category capacity building all efforts by the project team to foster the development of knowledge and skills for the local community, to ensure the long term sustainability of the project are indicated. Those efforts include, but are not limited to, general forest management trainings, task specific trainings (for example for the administration of an eco-lodge), university programs and scholarships or workshops. If specified in the sources it is also mentioned if the capacity building efforts were provided by community members for each other or if they were provided by external parties such as NGO's.

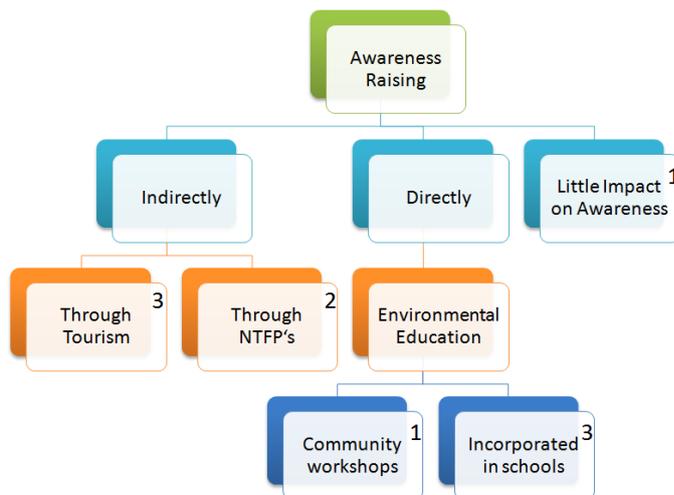
FIGURE 8: CAPACITY BUILDING



4.1.6 Awareness Raising

In this category all direct and indirect activities that raise awareness for the natural environment are introduced. Direct awareness raising efforts are environmental education projects provided to community members, for instance in schools. Indirect measures include for example tourism. Through the construction of an eco-lodge in a region there is an influx of tourists that want to experience a pristine natural environment and a traditional culture which are the main attractions in the tourism-based approaches which are assessed. As the community's goal is to draw in as many tourists as possible, they become aware of how to keep their environment in a good condition and will not destroy it. As an example, please refer to 3.3.3 Chala-lán Eco-Lodge For the development of NFTP's the indirect effect is similar: people that make money out of the harvesting and processing of NFTP's need the forest to grow their plants. Thus, they become aware that it needs to be conserved as shown for example in **Error! Reference source not found. Error! Reference source not found.**

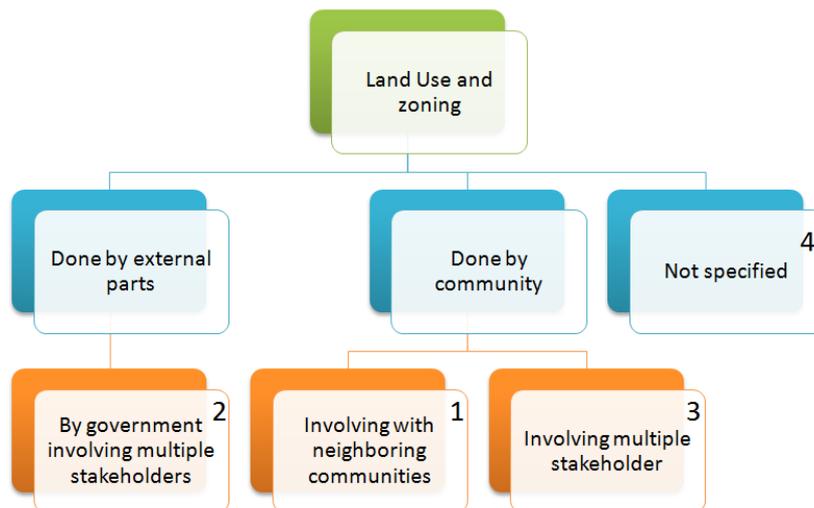
FIGURE 9: AWARENESS RAISING



4.1.7 Land Use and Zoning

Land use and zoning describes if and by whom it was decided which parts of the communal land or national parks are to be used for what. Some areas may be set aside for complete conservation whereas in others sustainable harvesting or controlled hunting is permitted. The parties involved are the community, the government, NGO's, private companies (e.g. oil extracting companies) or surrounding communities. Thus, the text in the cells indicates which of those parties were actively involved. This is important because if one party that has a strong interest in the area is excluded from the process the potential for conflict increases.

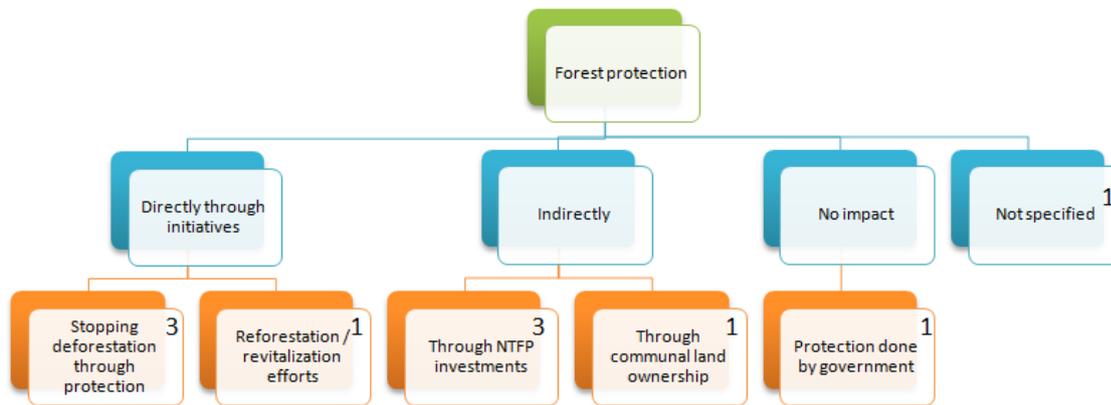
FIGURE 10: LAND USE AND ZONING



4.1.8 Rainforest Conservation

The category rainforest conservation indicates any direct and indirect activities triggered by the initiative that result in the conservation of the local forests. Direct efforts are protected areas where deforestation is not permitted and reforestation and revitalization of forests. Indirect effects are, similarly to the category *Awareness Raising*, that deforestation decreases because through the investments into the development of NFTP's as alternative sources of income that only prosper if the forest cover is retained. Moreover, communal land ownership also fosters forest protection because they can decide what to permit on their land.

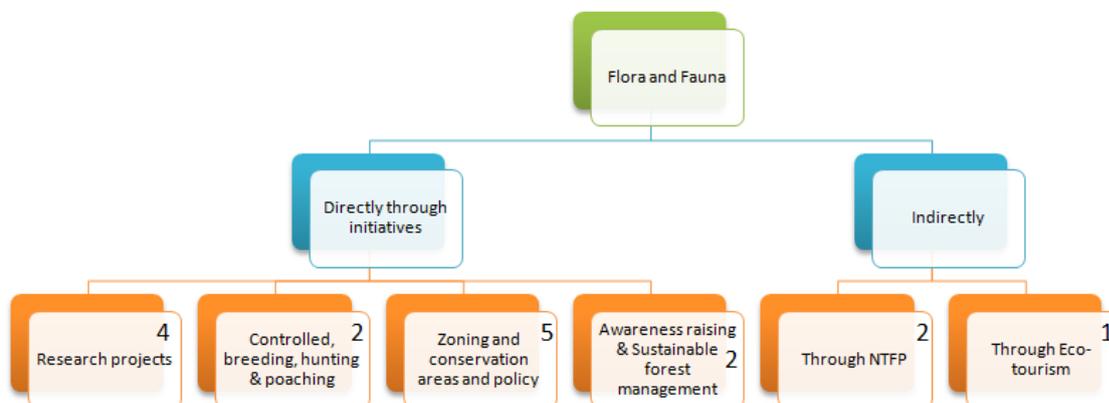
FIGURE 11: RAINFOREST CONSERVATION



4.1.9 Flora and Fauna

In this category, efforts to conserve the biodiversity of the local flora and fauna are described. Similar to the previous category *Rainforest Conservation*, there is a differentiation between direct and indirect efforts. Direct efforts include the establishment of conservation areas, research projects, or conservation policies. Indirect efforts as in the previous category are eco-tourism and NTFPs production and harvesting which need a biodiverse natural environment for better economic success.

FIGURE 12: FLORA AND FAUNA

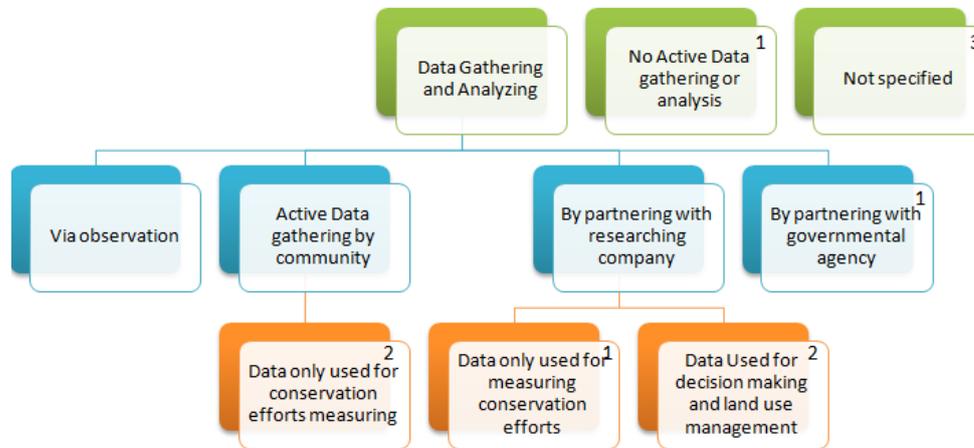


4.1.10 Data Availability on Flora and Fauna

For the conservation of an area it is important to measure what the real impact of a project on the natural environment and its biodiversity was. Therefore, data gathering and analyzing is important. In this category it is assessed how well data was gathered and if it was used for specific decision-making purposes. Many initiatives cooperate with research institutions or governmental agencies that have better capacities to gather data on the local flora and fauna. Others rely on the community which is encouraged to share their observations. If the infor-

mation is used for specific purposes such as management plans or to facilitate decision-making processes, this is also indicated.

FIGURE 13: DATA AVAILABILITY ON FLORA AND FAUNA



4.2 Impact Assessment

In the following tables *Table 1: Impact Assessment Part 1* and *Table 2: Impact Assessment part 2* show the assessment of each case study in each category established in the decision trees. As the purpose of this paper is to find ideal projects that foster economic development and forest conservation simultaneously, the categories are put in two groups. The blue ones are economic indicators and the green ones the environmental indicators.

Based on where an initiative is placed in each category they will be ranked in the following section 5 *Case Study Assessment*. In this section there will also be a closer introduction to all categories that are assessed in this table and the reason the cases were ranked in this specific order.

TABLE 1: IMPACT ASSESSMENT PART 1

Categories/cases	ASAP	CABI	Chalalán	CRTM	Ese'ija Community
Financials	Financially independent through sales	Financially dependent, partly sponsored by private company	Financially self-sufficient	Financially dependent, partly sponsored by NGO's and government	Financially self-sufficient
Sources of Income	Diverse, value added processing: NTFP & Agriculture	Single-source: Eco-tourism & surrounding activities	Single-source: Eco-tourism & surrounding activities	Diverse: Eco-tourism & income diversification	Single-source: Eco-tourism & surrounding activities
Household income	Measurable impact on household income of selected community members	Measurable impact on household income of selected community members	Measurable impact on household income of entire community	not measurable - little data availability - only in certain sectors	Measurable impact on household income of selected community members
Infrastructure	Not specified	Not specified	Potable water systems, Health clinics, health loans, construction of schools	Not specified	Portable water well & tank, road access, school construction
Capacity Building	General forest management, conservation training, task-specific trainings	Not specified	Trainings but no details mentioned	Trainings but no details mentioned	By NGO: task specific, business development & management, 2-year university leadership program
Awareness Raising	Directly: environmental education in specific school and trainings	Directly: environmental education incorporated in local schools	Indirectly: through tourism	Little impact on awareness	Indirectly: through tourism
Land Use and Zoning	Not specified	Done by community together with companies, governments and private land owners	Done by external party - government+community - protection area & sustainable use area	Done by community + external party	Done by government, involving multiple stakeholder
Rainforest Conservation	Directly: Reforestation / revitalization efforts	Directly: Stopping deforestation through protection	Directly: Stopping deforestation through protection	Directly: Stopping deforestation through protection	No impact (Protection done by government)
Flora and Fauna	Directly: conservation areas, research and conservation policies	Directly: zoning and conservation area, research projects	Directly: strict protection, indirectly: through ecotourism	Directly: zoning and conservation area, research projects	Directly: conservation areas, research and conservation policies, awareness raising, indirectly through eco-tourism
Data Availability on Flora and Fauna	In cooperation with researching institution	Not specified	Through observation by community	In cooperation with governmental agency	In cooperation with researching institution, used for decision making

TABLE 2: IMPACT ASSESSMENT PART 2

Categories/cases	AVIVE	Kapawi Eco-Lodge	Poloprobio	SCAY	Tres Islas
Financials	Financially independent through sales	Financially self-sufficient	Financially self-sufficient	Financially independent through sales by community	Not specified
Sources of Income	Single Source: Value-added processing of NFTP	Diverse: Tourism & Local market development	Single source: processed NFTP	Diverse: unprocessed - NFTP, Agriculture & timber	Diverse: NFTP & Timber
Household income	Measurable impact on household income of selected community members	Measurable impact on household income of entire community	Measurable impact on household income of selected community members	Measurable impact on household income of selected community members	Measurable impact on household income of entire community
Infrastructure	Not specified	Solar panels, internet access	Not specified	Health care facilities and sanitation, schools: teacher trainings * construction & renovation; sustainable energy use (fuel)	Not specified
Capacity Building	General forest management training	By community: IT Training, Task-specific Trainings, ongoing	By NGO: task-specific, scholarships for higher education	By community: teacher trainings, by company: not mentioned	General forest management training - ongoing workshops
Awareness Raising	Directly: environmental education for 15 communities	Indirectly: through tourism	Indirectly: through NFTP's	Directly: Environmental education incorporated in local schools	Indirectly: through NFTP's and workshops
Land Use and Zoning	Not specified	Done by communities with neighbouring communities	Not specified	Not specified	By community establishing zones for example for timber harvesting and NFTP's production
Rainforest Conservation	Indirectly: Through NFTP	Not specified	Indirectly: NFTP	Indirectly: communal Land	Indirectly: investments in NFTP
Flora and Fauna	Directly: research & sustainable forest management	Directly: controlled hunting & poaching, through eco-tourism	Indirectly: NFTP	Directly: controlled breeding programs	Indirectly: investments in NFTP
Data Availability on Flora and Fauna	In cooperation with researching institution used as basis for management plan	Active data gathering by community: for conservation measures	No active data gathering, only observations by community	Not specified	Not specified

5 CASE STUDY ASSESSMENT

5.1 Impact Rating Grid

TABLE 3: IMPACT RATING GRID

Categories/cases	ASAP	CABI	Chalalán	CRTM	Ese'eja Community	AVIVE	Kapawi Eco-Lodge	Poloprobio	SCAY	Tres Islas
Financials	3	2	3	2	3	3	3	3	3	0
Sources of Income	3	3	2	2	2	3	3	2	3	3
Household income	3	0	3	1	2	2	3	2	2	3
Infrastructure	0	0	3	0	3	0	2	0	3	0
Capacity Building	3	0	1	1	3	3	1	2	2	3
Awareness Raising	3	3	2	1	2	3	2	2	3	2
Land Use and Zoning	0	3	3	2	1	0	3	0	0	3
Rainforest Conservation	3	2	2	2	0	3	0	2	2	2
Flora and Fauna	3	3	2	2	3	3	1	1	1	1
Data Availability on Flora and Fauna	3	0	2	1	3	3	2	1	0	0
Total Score	24	16	23	14	22	23	20	15	19	17
Total Weighted Score	2.4	1.6	2.3	1.4	2.2	2.3	2	1.5	1.9	1.7
Total Weighted Score (without 0)	3.00	2.67	2.30	1.56	2.44	2.88	2.22	1.88	2.38	2.43

The impact rating grid has the purpose of comparing the impacts the case studies had in 10 distinct categories in the areas of environmental sustainability and economic development. Similarly to the pre-analysis, the categories highlighted in blue are economic indicators and those in green are environmental ones. Depending on their performance in each category the case studies are rated as follows: 3 – high impact, 2- medium impact, 1-low impact and 0- not mentioned. The ratings directly correspond to Table 1: Impact Assessment Part 1 and Table 2: Impact Assessment part 2 which verbally describe what the impact of the case study was in each category. This is translated into “grades” in this analysis. In the following part it is explained what was considered a good performance and why.

For example, in the category “forest conservation” a project that “only” decreased the rate of deforestation would have a lower rating than one that actively engages in reforestation measures.

The total score is the sum of points from each category, which is translated in “grades” in the Total Weight Score. As nearly every case has some categories where no information is given in the case studies, the last category “Total Weight Score (without 0)” shows the score only for the number of categories in which information was available. The table is coloured based on the scoring from green (highest score) to red (lowest score).

5.1.1.1 Explaining the ratings of impacts

5.1.1.1.1 Financial Self-Sufficiency

The first question an investor or economist may ask about a project target economic development is about its financial situation. Is it valuable? Due to the fact that no traditional annual reports about the financial situation of the projects were available in the case studies, the financial health was assessed based on whether they were financially self-sufficient. The projects already have been running for multiple years and therefore at one point need to become financially stable. CRTM for example faces uncertainties concerning whether or not they will be able to secure enough funds from the government and NGOs for the future years. This is a threat to the success of a project, because the local community members may think twice to commit to and put efforts in a project that may decrease in size the following year.

5.1.1.1.2 Source of income

In the category, “Sources of income” the author has put an emphasis on the establishing of a set of diverse sources of income for a community to increase resilience.

All projects analysed have developed at least one additional source of income, which was not there before. Those sources of income are the harvesting and processing of different NFTP, improvement in agriculture, eco-tourism facilities and their surrounding activities (food sector, construction, transportation, guides, etc.) and sustainable harvesting of timber.

The highest scores are given for the development of a diverse set of income sources. The singular focus on one source of income may be dangerous, for examples if demand for this product deteriorates or additional legal prerequisites are introduced which makes it harder for local producers to compete against other regions. Focusing only on tourism, as seen in the case of the Chalalán eco-lodge, may be dangerous if there are outside factors which discourage tourists to travel to this area, such as earthquakes, safety issues or instances of political unrest.

SCAY for example, sells unprocessed urucum seeds to a cosmetic company, but also engages in sustainable agriculture and responsible timber harvesting. Thus, if they ever run into problems with one of those three main sources of income, they still make profit with the others increasing their resilience, especially due to the fact that they have a long-term contract with the cosmetic company which brings additional stability

5.1.1.1.3 Household Income

Assessing the impact a certain initiative or project had on the household income proved to be very hard considering the limited secondary data. Most case studies point out increases in the household income of community members in at least in one of the local industry sector over the years. It is clear that all projects had positive impacts on the household income of many people. Therefore, the differentiation between cases was made based only on if selected community members profited, or if the profits were spread over the entire community. The latter is seen as more desirable by the author because of the lower impact on income disparity.

In the case of the Ese'Eja community the profits from their eco-lodge are distributed over the entire community ensuring that everyone benefits. 60% of the profits are reinvested into community development programs such as an emergency health care fund, elderly care services or loans and scholarships. The remaining profit is divided equally among the families of the communities providing each family with an additional income of USD 805 in 2007. This is more than 5 times what they received in 2001 because the total profits from the lodge increase steeply.

5.1.1.1.4 Infrastructure

Infrastructure impacts were added as a broad category to assess if there were impacts that fostered community development. For instance, building schools or improving them increases the education and the abilities of the local youth. Health clinics and care centres for the elderly, such as established in the Ese'Eja community, improve the social situation of the community as a whole. Other measures such as transportation and roads construction or Internet access even have a more direct impact, because they improve overall access to those regions. This is very important considering that most of the case studies analyse projects that are set in very remote areas. People living in the surroundings of the Kapawi eco-lodge for example need to make a 3-days long boat trip to access the closest town.

5.1.1.1.5 Capacity Building

Capacity building is crucial, because it gives the locals the abilities and knowledge to continue working in those projects eventually without help from NGO's and outside experts. In other word, workshops and trainings positively impact the long-term economic and environmental sustainability of an initiative. In cooperation with an NGO, the Ese'Eja community does not only provide task-specific training for the employees of the eco-lodge but also business development workshops. They even developed a 2-year leadership program together with a local university tailored to the management of community-based sustainable forest management programs.

5.1.1.1.6 Awareness Raising

From the environmental perspective, raising awareness is very important. First, people need to realize that there is a problem if they cut down the rain forest and why it is necessary to protect the animals and plants that live within. Without the awareness of the local population any initiative coming from the outside trying to protect the rainforest will create friction. It is difficult for people with little means to change their lifestyle and develop alternative sources of income if logging remains more lucrative.

Therefore, one of the main purposes of sustainable forest management initiatives is to make people understand and accept that conservation of their natural environment is important. There are different possibilities how awareness can be raised. Some projects such as ASAP or CABI have developed specific environmental education programs where children and adults learn about the intrinsic and extrinsic value of their forests. Other project raise awareness indirectly only by developing sources of income that depend on keeping the local eco-system intact. Examples for this are the four projects that indicate tourism as their main source of income or Poloprobio which' success depends on the survival of their rubber trees. For the eco-lodges the maintenance of the eco-system is necessary primarily to draw in tourists as the regions are all relatively remote.

5.1.1.1.7 Land Use and Zoning

While done for every protected area and national park, land use rights and zoning are essential to the success of a conservation project. In this category it is not only assessed if zones for conservation are established but also if all necessary stakeholders have been involved. If important stakeholders such as the local community, are left out of such a process the probability of people ignoring what is permitted and what is not in a certain zone would increase. As the

Amazon rainforest is huge the protection against illegal hunting and logging becomes more difficult if less people accept the zones.

The community operating the Chalalán eco-lodge for example engaged in an integrated land use and zoning initiative and established protected zones where no commercial activities are permitted but also zones where people are allowed to sustainably harvest forest products. This is a well-balanced structure benefiting both the community and the eco-system.

5.1.1.1.8 Forest Conservation

In the category “forest conservation” a project is evaluated based on how successful it is in stopping deforestation. Due to the fact that no case study offers absolute numbers on how much deforestation has decreased and to what extent this can be attributed, this is measured qualitatively. The highest ratings are given for projects that developed concrete reforestation or rejuvenation measures, such as ASAP, that engage the entire community in their reforestation projects, while the lowest ratings are given for those that decrease logging only through NFTPs or controlled logging. Such measures make it more attractive for people to engage in other activities that are not as unsustainable, but do not directly protect the environment.

5.1.1.1.9 Flora and Fauna

The category flora and fauna is similar to the category above. Here any direct or indirect measures taken to protect the flora and fauna, especially species under threat of distinction are evaluated. Some projects have very well developed conservation policies and projects to protect specific species, whereas others do not. These projects simply rely on the development of alternative sources of income to give incentives to not engage in logging.

Some projects have very specific initiatives to protect a certain species such as the Harpy eagle project by the Ese'Eja community. Every community member that finds a harpy eagle nest on their premises receives a premium from the eco-lodge. The amount of money they are given is based on how many tourists can have the opportunity to see the nest. This fee is paid until the chicks fledge which can be up to nine month. This initiative encourages local land owners to protect the birds and not disturb their nests and at the same time it makes the area even more attractive for visitors.

5.1.1.1.10 Data Availability on Flora and Fauna

The category data availability on flora and fauna therefore assesses if data on the flora and fauna in the area has been gathered and more importantly also used for decision-making.

Some projects rely on observation, for examples by tour guides, which know that area well. This is a good start, but there is the danger of only observing “charismatic” animals, which are easy to spot. Therefore, data gathering and analysing in cooperation with research institutions is more valuable. The highest ratings are given to initiatives that use this data for decision-making, such as ASAP for instance.

5.2 What are the variations in impacts?

Among those cases, which were analysed and generally considered best-practice cases, the Association of Smallholder Agroforestry Producers (ASAP) and the Green Life Association of Amazonia (AVIVE) scored the highest. They both have a very similar approach, starting off as a community initiative rather than a nationally protected territory and investing in cultivation of NTFPs. ASAP is the most community-based among the case studies, as it is the family farmers that lead the entire project. Similarly, AVIVE is also managed by a group of indigenous women, which is also the group that benefits most from the initiative.

Poloprobio and Pilon Lajas (CRTM) had the lowest overall scores. That however does not mean that they did not fulfil their purpose. For example, Poloprobio is an Equator Prize winning project. However, it has a much more narrow focus than the other projects. It specializes solely on rubber production without much diversification. This means that all gains in other categories stem from indirect impacts. Certainly, deforestation will slow if people recognize the importance of standing forests for rubber harvesting, but other projects such as ASAP actively engage in reforestation. Therefore, it has to be made clear that the resulting rankings are based on the author’s goal of finding role model case studies that foster economic development, environmental conservation and health simultaneously.

There is a strong variation in data gathering and analysing in the field of environmental protection and conservation. This can be problematic; because without sufficient data it cannot be determined if a project is assessed as “low-impact” and keeps the natural habitat intact. Most projects simply rely on offering people alternative sources of income besides logging and unsustainable agriculture and state that this has a significant impact on the environment. While this may be true, one gets the impression from many case studies that this is not based on scientific data. The author, however argues that whether a project has an impact on the forest and its biodiversity needs to be based on some kind of data, even if it is just an initiative of continuous and organized observations by the local population.

The highest variations are seen in the categories forest conservation and flora and fauna conservation. Here there are basically two groups. One group has direct programs, initiatives, trainings and policies to conserve their natural environment; the other one relies solemnly on decreasing the attractiveness of logging, unsustainable agricultural practises and cattle ranching. Both categories may impact the environment; however they have a different focus.

5.3 Success factors and threats

In order to illustrate the success factors and threats of the case studies, the author has decided to use the same pre-analysis tool as for the case study impacts.

The success factors are taken directly from the case studies, thus they are impacted by the opinion of the case study author that can choose what to state as a success factor in the various cases. The same is true for the threats. The reader needs to be aware that this may lead to a bias because which factors are mentioned as success factors or threats are selected by the case study author and cannot be verified by the author as the projects are set in South America.

To facilitate the understanding the success factors are grouped into parent categories that group similar factors. For each case study it is indicated with an “x” which factors they specify as the main success factors for the projects. In the penultimate column the number of case studies per subcategory is indicated and in the ultimate column the number of cases per parent category. Note that is a case indicates two subcategories it still only counts once in the total of the parent category.

The four subcategories which most case studies indicate as their success factors are highlighted in bold in the penultimate column.

5.3.1 Success factor analysis grid

TABLE 4 SUCCESS FACTORS:

Parent Category	Subcategory	ASAP	CABI	Chalalán	CRTM	Ese'aja Community	AVIVE	Kapawi Eco- Lodge	Poloprobio	SCAY	Tres Islas	Total number of cases per subcategory	Total number of cases per parent category
Partnerships	...with government		x				x			x		3	5
	...with third sector (NGO's)		x				x				x	3	
	...with private organizations		x			x	x			x	x	5	
Alternative Livelihood development	...development of new products								x	x		2	3
	...cheap and easily tailored production methods								x			1	
	...value added processing of local products						x		x			2	
Financial perspective	Re-investment of profits into community projects							x		x		2	5
	Access to credit and financing / Financial Stability			x		x		x			x	4	
Governance	Co-Management		x		x	x						3	9
	Commitment to good governance and transparency						x				x	2	
	Combination of traditional and modern governance							x				1	
	Participatory governance approach, community- management, decision making and engagement	x		x	x		x	x	x		x	7	
Education & trainings	Training, Capacity building					x	x		x		x	4	5
	Education											0	
Dual identity: integration of environmental and social sustainability					x							1	1
Awareness Raising via tourism				x				x				2	2
Lobbying and Advocacy for indigenous (land) rights			x		x					x		3	3

SOURCE: TABLE DEVELOPED BY AUTHOR BASED ON THE ANALYSIS OF THE CASE STUDIES

5.3.2 Common success factors

5.3.2.1 Governance

The most commonly mentioned category within the success factors was the governance approach. Within governance there are various subcategories such as good governance and transparency, co-management or participatory community-based management. All subcategories describe something different but are relatively similar. For a best practise model it can however be concluded that in order to be successful a well-suited governance model is necessary. Whether this is a co-management or a community-managed model depends on the situation but participation and a commitment to good governance should be central in any model.

5.3.2.2 Partnerships

Partnerships are mentioned in many cases as a crucial factor for success. The case studies show that partnerships with the government may facilitate the legalization of the program and the advocacy of indigenous concerns.

Third sector partners such as NGO's mainly have the role of introducing new production methods, assisting the communities to access credits and build up local expertise.

Private partners are often involved to provide financing and expertise. Especially in two case studies, AVIVE and SCAY, the private party also acts as the main off-taker for the production output within the community (Equator Initiative, 2012f; Equator Initiative, 2012i).

5.3.2.3 Finances

Financing, in general is a crucial point for many in the case studies that were assessed. The initiatives need to resolve the questions of how to obtain funds and how to retain financial stability in the long run. As seen in the example of CRTM, uncertainty in middle-and long-term funding undermines the efforts put into such a project. Another issue that has come up is the equal distribution of profits among the community, especially via social projects (Equator Initiative, 2012d). While mentioned explicitly as success factor only in the case of the Kapawi eco-lodge and SCAY, it is also practised and valued in several other projects as seen in the introductory section of the case studies (Equator Initiative, 2012g; Equator Initiative, 2012i).

5.3.2.4 Capacity Building

Half of the case studies mention capacity building and training as well as education as a necessity to prosper. This category is presented as both an impact category and a success factor. The author is convinced that it is necessary to mention it in both parts. In terms of impact education and trainings provide people with a wider set of abilities and opportunities which fosters regional economic development.

In terms of success factors capacity building is needed for the long-term survival and continuation of a project. In the beginning most case studies relied of the expertise from outside parties, NGO's and private companies, but those mostly do not want to invest into a project forever. Thus, their project tenures are finite. For an initiative to be able to survive longer, people have to be trained on how to manage or how to use new production methods. Through education this knowledge is transferred to the next generation. Additionally, education serves to improve environmental awareness and teaches how to act in an environmentally friendly manner.

5.3.2.5 Alternative Livelihood Development

In all projects, new sources of income were developed. Each initiative used different approaches and products depending on the social and ecological conditions, but only three case studies mentioned the techniques or products as success factors. Poloprobio is the main example, because the entire project is focused on the innovative new method of rubber extraction and processing that was created. All of the other impacts this project had can be attributed to these economic activities, which makes this new technique the main factor for success.

For indigenous communities, having their voices heard by the governments can often be difficult. Especially, the question of land ownership rights is often a source of conflict, which is why lobbying and advocacy efforts are essential. Many of those projects set up a strong communal governance body, which acts as an organ to communicate the collective concerns of its members to the local government.

Out of the three initiatives, which are mainly based on their eco-tourism facilities, two state that the environmental awareness of the community significantly increased due to the fact that their exceptional natural environment was the main attraction for tourists. Thus, having a pristine natural surrounding makes such tourism projects successful and increases directly the awareness of the community.

Finally, CRTM states that the fact that the territory is both a RB and a TCO and therefore leads to social and environmental sustainable action at the same time was an important factor for how the entire project was setup. In many cases, either the social, the ecological or the economic perspective is central, but CRTM manages at least two out of three (Equator Initiative, 2012d).

When trying to draw a line between the two cases that scored the highest ranking in the impact analysis, no clear statement can be made concerning common their success factors. This shows that there is a wide range of methods which can be used in order to foster both effective forest management and economic development.

5.3.3 Common Threats Analysis Grid

TABLE 5: THREATS

Parent Category	Subcategory	ASAP	CABI	Chalalán	CRTM	Ese'aja Community	AVIVE	Kapawi Eco-Lodge	Poloprobio	SCAY	Tres Islas	Total number of cases per subcategory	Total number of cases per parent category
Deforestation	Illegal logging	x									x	2	6
	for agriculture & cattle ranching	x	x		x				x	x		5	
	over-exploitation of resources		x		x						x	3	
Industry	Mining		x		x						x	3	6
	Commercial Logging								x	x		2	
	Oil & gas		x	x	x							3	
Social issues	Poverty			x	x				x	x		4	6
	Marginalization & lack of income sources as alternatives to logging			x					x	x		3	
	Immigration & Population growth				x						x	2	
	Unequal distribution of profits					x						1	
Legal	Land ownership conflicts		x	x						x	x	4	5
	Complex regulatory framework						x					1	
Economic	Overdependence on one industry sector			x								1	2
	Uncertainty of funding				x							1	
Ecological	Illegal hunting				x							1	2
	Natural disasters (floods, draughts, fires)						x					1	

SOURCE: TABLE DEVELOPED BY AUTHOR BASED ON THE ANALYSIS OF THE CASE STUDIES

5.3.4 Common threats

In this section, the threats are grouped and analysed. However, the reader will quickly become aware that many of the factors and categories are interlinked, which makes it challenging to describe one without referring to others.

The most common threat for the Amazon rainforest and the case studies assessed is deforestation for similar purposes as indicated in the literature in section *1.1 Problem Identification* and *2.1.1 The Amazon Rainforest*. The main purpose of deforestation is land conversion for agriculture and cattle ranching. The reasons for this are, as already established in several case study introductions, the poverty of the local population and the lack of alternatives. However, as the soil of the Amazon rainforest is not very fertile, once all endemic plants are cut down, soil is degraded quickly so more and more forest area has to be cleared (Equator Initiative, 2012a).

Another threat resulting from social problems such as population growth and poverty, is over-exploitation of resources, such as overgrazing. This problem is referred to in *2.1.2 The Tragedy of the Commons*. Considering that four out of ten case studies are pressured by land ownership conflicts, the tragedy of the commons develops quickly. Every party wants to get as much as they can out of the land, be it precious metals, grazing land or agricultural products, without any consideration for the ecological limits.

However, not only social problems threaten the initiatives but also a high interest from several industries in the natural resources of the land. Oil, gas and precious metals can be found in many areas and their extraction is seldom without negative impacts on the environment. Even projects with secure land rights such as CABI or the Chalalán eco-lodge have to arrange themselves with commercial companies because the government grants concessions for the exploitation of oil and gas resources on their land (Equator Initiative, 2012b; Equator Initiative, 2012c).

The main social problem of poverty has already been touched upon. Poverty together with lack of income sources and a lack of social services can undermine any conservation effort because people have no choice but to exploit the common resources. Linking this with a growing local population through immigration and high birth rates, these problems are amplified. The unequal distribution of profits is mentioned as a factor only in the Ese'Eja community, where the profits some community members make from their eco-lodge are not shared among the entire

community. However, this category has to be considered especially for projects such as tourism facilities, where only one business sector is developed.

As already mentioned several times in this section, land ownership is a source of conflict. Many case studies state it as one of their primary impacts in the area of policy that they were able to obtain legal titles for their lands. This is not mentioned explicitly in the impact-section as it only specifies direct environmental and economic impacts. However, having legal ownership over one's land is crucial not only for the legitimization of an initiative but also to defend their environment against outside pressures. In some cases however, land ownership rights are granted on a limited basis, where the government retains the rights to certain resources, such as CABI where the water rights belong to the local municipal government (Equator Initiative, 2012b).

There are also economic problems that can become threats in certain cases. The overdependence on one industry sector, while mentioned directly only for the Chahalán eco-lodge, should be a concern for all projects, especially those that are based on tourism. Tourism is a volatile industry as there are many outside factors, such as political instability, that influence the number of tourists that come to a region. If entire communities make their livelihood from one eco-lodge then such fluctuations have the potential to cause serious issues.

As already mentioned in the analysis of the success factors, funding is important. CRTM is threatened by a lack thereof making it difficult to get more people on board and to realize much needed renovations and investments.

Finally, there are also ecological threats. One is illegal hunting which again can be linked back to poverty and can be mitigated only through patrols controlling the area or through the provision of alternative sources of income so people do not see the need to hunt endangered species. Additionally, natural disasters also fall into this section. This is mentioned only for in the AVIVE project. However, there a severe flood followed by a forest fire, has destroyed large parts of the trees which were the basis of their NFTP's production.

There is one project, the Kapawi eco-lodge, where no threats are mentioned. This is not a mistake, but based on the case study author's statement that due to the very remote localization of the community, there are little outside pressures that impact the community.

To summarize, some threats, such as deforestation for agriculture and cattle ranching as well as the poverty of the local indigenous populations, are factors that have to be considered for

nearly every program taking place in the Amazon rainforest. Others, such as the over-dependence on one sector may only be mentioned once here but does not mean that it should not be considered. The best possible approach for a best practise model is to look at all the threats analysed in this case study and assess which are the most relevant ones for the project at hand.

6 DISCUSSION:

6.1.1 Subgroup eco-tourism projects

As there is a large variation among the 10 case studies in terms of which approach they have used, the only grouping that is possible are eco-tourism cases as they all use a very similar approach.

The three projects which used eco-tourism as their main source of income showed that tourism has a large potential to raise awareness for the environment. Generally it can be observed that through the influx of tourist the local population starts to recognize the value of their culture and their flora and fauna. However, in some cases this only means trying to protect “charismatic” megafauna rather than well-rounded forest management initiatives. Still, such megafauna often needs an intact biosphere to survive therefore the indirect effects of such efforts on the entire environment of the area may still be considerable.

Analysing the case studies it is observed that the issue of income inequality in previously poor and very poor communities is more apparent in eco-tourism projects than in other projects that created new sources of income, for example through the harvesting and processing of NTFP. This is mainly due to the fact that those directly employed by the tourism industry (e.g. guides) profit a lot and those indirectly employed (such as food suppliers) profit too but to a lesser extent. However, the rest of the community may be left out because tourism can bring a lot of money but does not necessarily mean that this money is spread equally. This is especially the case when non-local people are employed primarily instead of the local indigenous community members. The case of the Chalalán Eco-Lodge is an example of how this problem can be tackled. In this project, 80% of the profits from the eco-lodge are directly given to households and the remaining 20% are invested in local infrastructure projects, such as the construction of school or the development of road access and portable water wells (Equator Initiative, 2012c)

6.1.2 Which role does the local political system play in rainforest management?

Revising the differences in the national forest policies, as detailed in chapter 0 *Therefore, similar to multi-stakeholder initiatives*, eco-tourism approaches focus on the impact of tourism on both the environment and society. Sometimes terms such as community tourism, community ecotourism or responsible tourism are used depending if the emphasis is more on the envi-

ronmental or the social component (Buckley, 2009). However, for the purpose of this thesis eco-tourism may be understood as including both dimensions.

Eco-tourism presents the opportunity of employment in destinations that are generally in rural areas where there are few other sources of employment. Moreover, eco-tourism may have a significant positive impact on conservation efforts in the area, as it raises awareness of the important of the natural environment. Furthermore, ecotourism aims to design, construct and operate low-impact facilities, which help minimize the impact on the environment (The International Ecotourism Society, 2015).

National Forest Policies: country profiles it is apparent that there are some national differences. From what can be seen in the case studies the most apparent difference is the degree of difficulty of obtaining legal land titles over indigenous and communal territory. Moreover, there are differences in specific regulations, how to obtain licenses and certificates for example, but the case studies do not specify those in detail.

The challenge of uncertainty in land ownership titles arises as a more or less important topic in nearly all case studies across countries. This illustrates that even if countries have different forest policies, this problem is not yet solved conclusively and equitable in any of the countries analysed.

Another area where there are large national differences are resource extraction concession for companies on indigenous lands. Such concessions are often the source of friction, because they are granted by different governments even if the land is considered a TCO, for instance in cases of the Chalachán eco-lodge or CABI. There are national differences concerning how such concessions are granted and national interest behind them. The main question is which kind of development goals a country has and how strong the pressure on the government from different industries is (see *O Therefore, similar to multi-stakeholder initiatives*, eco-tourism approaches focus on the impact of tourism on both the environment and society. Sometimes terms such as community tourism, community ecotourism or responsible tourism are used depending if the emphasis is more on the environmental or the social component (Buckley, 2009). However, for the purpose of this thesis eco-tourism may be understood as including both dimensions.

Eco-tourism presents the opportunity of employment in destinations that are generally in rural areas where there are few other sources of employment. Moreover, eco-tourism may have a significant positive impact on conservation efforts in the area, as it raises awareness of the important of the natural environment. Furthermore, ecotourism aims to design, construct and operate low-impact facilities, which help minimize the impact on the environment (The International Ecotourism Society, 2015).

National Forest Policies: country profiles).

6.1.3 What is the role of stakeholder management in these programs?

Ideally, rainforest conservation and development programs such as those analysed in this thesis should benefit all relevant stakeholders to maximize acceptance. Practically, this is often not possible, which is reflected, for example in the large number of cases that consider land ownership and border conflicts as a main threat to their initiative. However, a large number of case studies also points out the importance of partnerships. This is due to the fact that the local indigenous communities often live in poverty and do not have the financial means to set up such livelihood development and conservation initiatives on their own. They need governments, NGO's or private firms for financial support and to build up local management capacity and technical skills.

Government is one of the most crucial stakeholders for many of those projects as most communities had to obtain legal land ownership rights over their territories at the beginning of their project. This was often challenging, in the case of AVIVE the registration of land titles for all of their 26 production sites took seven years. This is why several of the projects that were assessed across all relevant countries indicate that their main policy impact was their strong lobbying and advocacy efforts with the local and national governments. Here not only land ownership but also the lack of a clear legal framework is often an issue as shown in the cases of AVIVE too (Equator Initiative, 2012f).

There are also positive examples of cooperation efforts with the government. Poloprobio's promotion of community-based rubber production has convinced the government to establish minimum prices for NFTP's as well as paid pension for rubber workers by the federal government (Equator Initiative, 2012h).

In many cases, rainforest initiatives were setup through cooperation with private firms, that either co-manage the projects such as in the case of the Chalalán eco-lodge or act as a main off-taker for the production as shown in the case studies of AVIVE or SCAY. Other private corporation, such as mining companies or oil and gas providers, threaten the conservation efforts by the communities analysed.

This is also because of the fact that governments retain the right to grant certain natural resource extraction concessions to those firms, even though the land is recognized as indigenous

community territory. This, as well as outside pressures, especially from farmers and cattle ranchers are the main sources of border conflicts as seen in nearly all of the cases analysed.

CABI is an exception in this area, because there the gas pipeline existed before the land was recognized as a national park and an indigenous territory. However, there has been an agreement between the community and Gas TransBolivia which obliged the company to mitigate their social and environmental impacts as much as possible and provide funds to the Kaa-lyá Foundation, which is a trust fund providing a large part of the national park's budget (Equator Initiative, 2012b).

The last group of stakeholders that needs to be analysed by a project team are the neighbouring communities. Cooperation with indigenous as well as newly-immigrated settler communities has to be considered. New settlers often have a stronger negative impact on the environment than indigenous people that engage in subsistence agro-forestry only. This can be seen in the case of CRTM where the influx of landless peasants put an increasing pressure on the natural resources. The RECA project however, shows how it is possible to include both the indigenous communities and the groups of recent settlers through cooperation which creates win-win situations for all parties (Equator Initiative, 2012d).

Therefore, when setting up a new project in this field a thorough stakeholder analysis is indispensable. Failing to recognize the potential impact, both positively and negatively, of a certain stakeholder group may threaten the entire project. As explained above with the example of CABI, even the seemingly most polluting stakeholder can be convinced to participate with the right incentives, if it is not possible to prevent them from operating in the area.

6.1.3.1 Which strategies can be used to convince community members of the importance of a sustainable forest management program?

The most powerful strategy that was used in nearly all case study was the development of new sources of income that are more sustainable than logging or cultivating foreign crops. The production of NFTPs needs an intact eco-system as a prerequisite for their products to grow. Therefore, people start to recognize the value of standing forests. The rubber production using the technology of Poloprobio does not provide immediate profits that match timber prices but they are sustainable in the long-run as rubber can be harvested from the same trees multiple times (Equator Initiative, 2012h).

Tourism projects have a very similar approach. The main attraction of an eco-lodge in the Amazon rainforest is the unique flora and fauna. This means that in order to remain attractive to tourists, the local population has to conserve their environment. This strategy is very powerful because it can even foster efforts to increase the populations of rare species on the verge of distinction, such as the incentive-based “Harpy Eagle nest project” established by the Ese’ija community (Equator Initiative, 2012e).

Education also plays a large role to convince people of the importance of environmental protection. In several of the projects analysed there are efforts to adapt the formal education in schools so that children learn the importance of standing forests and how to produce goods in a sustainable manner within them. Such classes have been established for example in the cases of CABI or SCAY. Through the RECA project by ASAP they even built a specific family farm school that teaches teenagers about sustainable agro-forestry, forest conservation and sustainable management. Those efforts are targeted to reach the next generation improving the long-term, cross-generational sustainability of a project.

However, environmental education does not have to be done only in schools but also in capacity building trainings and workshop targeted to adults teaching them about sustainable forest management and providing the relevant skills to produce and process goods in a low-impact manner.

7 DEVELOPING A BEST PRACTISE MODEL

7.1 Can there be a single best practise model?

The answer to this question is most likely yes and no. There are many factors such as a good and participatory governance approach which can foster success and have to be solved in a similar manner for any project. However it is crucial to tailor each forest management or sustainable development project to the local conditions.

7.2 What are the most important factors to consider for a best practise model?

For every project an initial analysis has to be conducted in order to determine strengths, weaknesses, opportunities and threats (SWOT analysis). Using the results from such an analysis, the best following points can be resolved in a tailored manner for each project.

7.2.1 The governance structure

What needs to be considered in a proper integrative governance approach?

To answer this question, the case studies have to be put into two groups. There is one group where the initial focus was to develop new products on private or communal land to decrease poverty without causing negative environmental impacts. Part of this group is for example Poloprobio, the Kapawi eco-lodge or SCAY where the community and a private partner wanted to develop an alternative source of income that gives people the possibility to make money without destroying the eco-system.

The second group are projects such as CABI, the Chalachán Eco-lodge or CRTM where some kind of protected territory was established by the government, often involving the community too, and people developed their sustainable sources of income around it.

The difference is that in the first group the main initial stakeholders that have to be involved are the community and the private partner only. Then they are often supplemented by NGOs or start to address their concerns and setting up communication channels to the government. Here, it is very easy to overlook some stakeholders, such as other community members not employed directly by the project or neighbouring community.

In the second case there is a protected area at the centre of the project. Thus, it is not the community alone anymore that wants to protect their way of living but there is also the gov-

ernment as a formal entity that takes part. Therefore, the process already starts in a more formal manner. With the aid of the government, projects do not have to put in as much effort to convince the authorities of their efforts but already have them as a partner. Moreover, it can increase visibility. At the beginning of a nationally protected area, a zoning and mapping process typically takes place where most stakeholders are already addressed and can give their input. Therefore, the danger of not integrating some parties may be decreased.

Apart from this, community involvement is crucial. Nearly all case studies state communal management or participation as one of their success factors which already gives an idea about the importance of this topic. Ideally such a local sustainable development solution is setup either as a co-management or as a community-managed organization. However, the first one is often easier, as it gives the community either a governmental agency or a private party as a partner, providing expertise, managerial skills and funds. Thus, it is often the only manner how communities can start up such large projects. In the case of the three eco-lodges that were analysed, the third party which is an outside tour operator has the obligation to transfer their parts back to the community after a fixed number of years. This gives the community the possibility to build up their capabilities to run such a facility and then more and more responsibilities until they do not need the outside party's support anymore and are fully self-sufficient.

The overall goal of establishing a governance structure is to establish an integrated and participatory body where all relevant stakeholders have a voice. Strong partnerships should be created especially in the beginning offering knowledge, equipment and financial support. However, the long-term goal for a sustainable forest management approach should be financial independence.

7.2.2 Alternative Livelihood Development

The most direct "incentive" to decrease or stop unsustainable and uncontrolled deforestation is to offer alternatives. This is why the development of alternatives is central to success. As shown in the case studies, most of the communities live in areas which are far from large cities and often hard to reach. Thus, the local population is limited in how they can make their living and logging or mining companies often pay best. However, if alternative production opportunities are created such as the cultivation of NTFP, people have a choice and can make an income without degrading their surrounding forests.

If possible, the best approach is to diversify. Tourism is a very suitable tool to increase local and international awareness for nature, but needs high initial investments and is prone to fluctuations. NTFPs are more stable. Still, to avoid the risk of crop failure due to pests or unsuitable weather conditions, different plants should be cultivated. Moreover, the processing and secondary production from the local raw materials can create further employment opportuni-

ties and higher margins for the people, as seen in most case studies that use NFTP as their main source of income.

Thus, ideally a project should take care to develop a well-balanced set of different sources of income to increase resilience against external shocks.

7.2.3 Education and Awareness

The best forest management project will not be effective if the local community and all other relevant stakeholders are not convinced of the necessity of the program. Therefore, people first need to be aware that there is a problem. They have to understand why it is their concern if forests are cleared and species disappear. Second, solutions have to be given and the relevant community members have to learn how to implement them and use the tools that are given.

Awareness can also be built indirectly through eco-tourism or NFTPs. Eco-tourists only come if the natural environment is in a pristine condition and want to see native animals or plants. Therefore, the local community will see their environment as their main attraction and will put in efforts to keep it in good condition. Similarly, NFTP can only grow in standing forests, such as the Brazil nut that cannot be cultivated in artificial plantations. The harvesting and processing of such products shows the local communities that their forests have a larger value than just serving as raw material for timber or as an obstacle for cattle ranching or farming.

In order to increase the long-term stability of a project and make sure the initial awareness and interest does not decrease, sustainable forest management should be integrated into local schools. The case studies show different methods of how this can be done. A good example is SCAY that provides in-class and field-based conservation trainings. In the first part students learn about different topics in environmental management and in the field excursions they can take part in the reforestation projects and can help planting new trees (Equator Initiative, 2012i).

To ensure that all community members are aware of why their eco-system needs protection the best approach is to include environmental education into the education system.

7.2.4 Partnerships

As already outlined, all of the communities which were analysed through the case studies are relatively small and often poor. Therefore, they need start-up capital as well as skills and technologies to get such a sustainable forest management project of the ground. It proved useful to involve a wide range of partners. Private companies are good partners for their financial resources and technologies whereas NGO's can help with experience and capacity building

efforts. Furthermore close links with local authorities should be developed to make sure all legal prerequisites are met and their concerns are heard. Lastly, research institutions and universities are very useful partners due to their experience in the fields of data collection and analysis but also to get access to new technologies, for example to process the locally-harvested raw material.

Thus, the overall goal is to integrate private, public and third sector stakeholders into the project to maximize the capacities and facilitate further development.

7.2.5 Community cohesion and strong social structures

Another factor is community cohesion and associations. The larger a group of people is that is trying to get their land claims recognized or protected, the more power they have to negotiate with the local government. There are also other advantages. Skills and knowledge can be shared as well as new technologies. The larger a group or association of communities is, the more impact their project may have and the more attractive they become for other individuals or communities to join in. As an example how a strong community cohesion impacts an initiative the ASAP can be used were networking and resource sharing has played a large role.

7.3 Are there differences between countries or regions?

From the 10 case studies that are analysed in this paper, the author could not establish a conclusive answer to this question about national differences in case studies. In order to make a conclusive connection between the projects and their national background, a larger number would have been needed, especially from Ecuador and Peru. As already mentioned in the introduction there is also the fact that within the Equator Initiative Case Study Database and also other sources, the majority of case studies that can be found as best practise or well-performing projects are from Brazil and Bolivia. For Brazil this is based upon the fact that the majority of the Amazon rainforest is located there. Ecuador is very small compared to the other three countries but why there is such a large difference between Bolivia and Peru which have a similar percentage of their country belonging to the Amazon Rainforest, cannot be answered with the underlying data.

However, there is exemplary evidence that the location of course plays a role. The SCAY had may have had an easier time advocating for their environmental and social concerns because the federal government of Acre, Brazil is renowned for their environmentally-friendly forest policies (Equator Initiative, 2012i). AVIVE, which is located in the neighbouring state of Amazo-

nas, states as one main threat their suffering under the complex regulatory system and the difficulties to obtain legal ownership titles for their lands (Equator Initiative, 2012f).

7.3.1 Example of a best practise case study

The case study analysis shows that as best practise cases ASAP and AVIVE can be taken as role models. Those two cases have very well developed structures and high scores in all categories. For tourism-based projects the Chalalán Eco-lodge can be taken.

For a new project firstly the potential of the area has to be analysed with a SWOT analysis. Based on this the most promising products or sectors that can be exploited in a sustainable manner can be defined. These will most likely be NFTP's or eco-tourism potential. In both cases, it would be best to find a partner from the industry and build a co-management project. This partner can offer financial assistance as well as transfer their skills and knowledge to the local population. An example for his would be SCAY that cooperated with a cosmetics firm which is also the collective off-taker for their NFTP's or the Kapawi eco-lodge which was established together with a local tour operator that assisted with the financing and management.

What has to be considered though is that commercial companies often have very different interests looking only for their own financial benefits. There will always be certain differences in objectives between a local indigenous community and their private partner company but those have to be clear from the beginning onwards to avoid conflicts. Unresolved differences in interests can endanger a project's success. Nevertheless, there are several cases such as SCAY that benefit from cooperating with a strong private partner.

Also, close links to the government have to be developed. If a commercial partner cannot easily be found, an NGO can also be taken as primary partner because they can assist with finding funding opportunities and building necessary skills.

At the same time, as the new opportunities are assessed, the community also has to find strategies to mitigate the relevant threats. Some, such as poverty and slash and burn agriculture can be mitigated through the project itself as it provides new sources of income for the people as can be seen in the case of the RECA project. Land ownership issues and pressures from mining or oil companies are more difficult to resolve. Here long-term indigenous rights advocacy strategies have to be developed to protect the territory as well as possible from those threats. This can be seen in the case of AVIVE that, even though the process of receiving ownership titles for all their harvesting sites took multiple years, were then able to defend their land.

If it is impossible to prevent the government from granting concessions to companies for resource extraction on the community territory one may be best advised to cooperate with those companies. How such a cooperation looks like can be seen in the case of CABI that has a close cooperation with Gas TransBolivia in chapter 3.2.1 *Introduction*. Through CABI's efforts

the gas provider is committed to mitigate their environmental impacts and provide funds for the conservation area. For each relevant threat a mitigation or adaptation method has to be found in order to decrease the project's vulnerability to those outside pressures. Nevertheless, it is clear that this is a constant process during the entire project period and not all threats can be influenced.

In the beginning the community may choose to focus on one product but as soon as these first production units are running further diversification needs to be prioritized. If funds can be secured, a processing facility for NFTP's has proven successful in many cases as the community can receive higher margins. This can be seen in the example of ASAP where the association decided to invest into storing and processing businesses. This resulted in higher profits for the community and more employment opportunities.

If tourism is used as the main source of income the community has to develop a concept concerning how to share the profits from this facility equitably over the entire community, through a development fund or a direct secondary income, both which can be seen in the case of the Kapawi eco-lodge. Otherwise, social inequalities increase which creates conflicts. Moreover, as already mentioned in the previous chapter, tourism should not be the one and only source of income but complemented by other economic activities so the community is more resilient against external shocks.

Except for indirect incentives to make the local population aware of the importance of forest conservation, education and trainings are crucial, especially when looking at the project from a long-term perspective. The best example of a good education and training approach can be found in the case of SCAY as described in detail in *7.2.3 Education and Awareness*.

Once enough funds are obtained to satisfy immediate needs, infrastructural improvements can be made. To improve equitable distribution of profits, some initiatives established a collective fund in which parts of the earnings are put. From this fund, infrastructure improvements such as school renovations, health care or sanitation improvements can be financed. The area where ASAP was founded for example was devoid of important infrastructure making it challenging for people to develop sustainably. However, through the ASAP and their RECA project a lot of infrastructure has been developed facilitating economic development and benefiting the people. This improves the living standards of the entire community.

8 CONCLUSION

The purpose of this thesis is to find a model showing how regional economic development and entrepreneurship be triggered and fostered through effective forest management in the Amazon region. Assessing 10 case studies based on their impacts, success factors and threats, a best practise model can be recommended. So the hypothesis: *“There are common success factors and common threats that apply for the majority of the case studies that were analysed that make it possible to recommend one or several best practise model”* proved to be correct. *Table 4 Success Factors:* and *Table 5: Threats* give a comprehensive overview about common factors from the case studies which are then used to establish a best practise model to resolve the research question.

The main factors that need to be considered in such a project are a well-suited participatory governance system, strong partnerships with a range of partners, and the development a diverse set of environmentally harmless sources of income which alleviates poverty and increases resilience through diversification. Furthermore, the profits of the project should be partly invested in the establishing of infrastructure and environmental education programs to foster the long-term stability and the cross-generational valuing of the project. Both factors increase equity as it is the entire community that benefits from them.

8.1 Summary

To summarize, it can be said that the case studies highlighted very similar issues as the literature review.

The issues that threaten the case studies that have been analysed can mostly be found in the literature already. Such issues are, for example, unclear land ownership rights leading to clear cases of the tragedy of the commons. This means everyone wants to exploit the common resource (i.e. the forest land) as much as possible without any regards of the result of everyone using these resources as intensively. This leads to over-exploitation and soil degradation which causes more forest to be cleared in order to have new land to exploit. Moreover, the classical forest threats of cattle ranching, agriculture, mining and commercial and illegal logging all appear in various case studies. This illustrates that those threats have a strong impact on the small as well as on the large scale.

The environmental management approaches of multi-stakeholder management, community-based management and eco-tourism all appeared in one form or another. All case studies

show cases that are managed by the community with private partners more or less involved depending on the case. There is not a single case which does not have multiple stakeholders involved; it is just the degree of power and involvement between the various parties that differ from case to case.

Regarding the forest policy both the literature and the case studies show that even though all countries that were involved already had some forest conservation policies and are interested in protecting the forests and aiding the indigenous communities but all systems are still flawed. Especially, legal ownership titles over community or indigenous lands are still a source of uncertainty for all countries leading to high shares of illegal logging and land clearing. No government has found a perfect solution yet. Even Brazil that showed a lowering of deforestation rates is not a perfect example, because this decrease in Brazil caused an increase in Peru as the logging industry still needs the raw materials.

Based on the impact analysis developed for this thesis, the case studies with the highest scores are the Association of Smallholder Agro-forestry Producers and the Green Life Association of Amazonia. This does not mean that lower scoring case studies, such as Poloprobio are not successful in developing sustainable solutions to local problems but that they do not fit to the dual objective of environmental sustainability and economic development as set by the author for this case study.

Concerning the success factors there is a large variety between cases making it impossible to group them. What can be said is that the governance structure of the initiatives was crucial for nearly all of them. Moreover, partnerships, financing and education and capacity building played a large role to foster prosperity. However, except for the governance system the success factors of the two highest scoring case studies did not overlap. This shows that there is no given "recipe" for how to build the perfect sustainable development solution but that there are multiple methods that have to fit to the local context.

The principal threats, as elaborated already in the beginning of the summery, are deforestation due to agriculture and cattle ranching, commercial and illegal logging, mining and oil extraction, social problems such as poverty and difficulties in obtaining legal land ownership titles.

The conclusion from the literature review that agricultural forest rent should be increased and land rights have to be established clearly proved true in the case study analysis. All case studies established new sources of income that depend on the maintenance of healthy forests. Through the initiatives, people had the opportunity to make their income from forest product extraction and processing or eco-tourism and increased their total profits. In all cases this directly or indirectly increased their environmental awareness and triggered sustainable forest management as well as socio-economic development.

To answer the research question a best practise model with the most important success factors needed to show how economic development can be fostered through sustainable forest management. Considering the large differences in local conditions it is difficult to establish one concrete model that can be replicated for any situation, even if they are in the same region. However, there are factors that need to be considered to increase the likelihood of succeeding. The principle factor is a well-suited governance system that fits to the local structures and gives community members the possibility to directly participate in decision-making. Moreover, strong partnerships are very helpful in building up local knowledge base and developing skills and securing financing. Furthermore, all possible threats have to be considered and mitigation or resilience strategies should be designed. Regardless of the products that are produced, it is in any case very beneficial to diversify the sources of income to be more resilient to external shocks. Finally, education and infrastructure should not be forgotten. Education is needed to foster the long-term survival of a project and infrastructure developments improve the overall development of a community and increase the value of such an initiative.

8.2 Contribution to knowledge

The contribution the author tries to make with this paper is to show the reader how proper forest management that promotes local economic development can look like. The most important outcomes of the analysis are the common success factors and threats as they can be taken as a guide of issues that have to be considered in other case studies. The assessment of the impacts is also important because it shows the differences between the single projects.

8.3 Future research

Further research should be conducted, with the purpose of analysing case studies that did not perform as well as those analysed here. This would help to identify the causes of failure and compare how the case studies from this paper have solved similar issues. Through such a comparison, an even better list of success factors and threats may be designed giving indications about their relevance and power to determine the success or failure of an initiative.

Furthermore, it would have been useful if this kind of analysis could have been done using primary data gathered by the author. The main advantage would have been that the same factors could have been analysed using the same methods. It is likely that economic or environmental indicators such as annual income can be assessed in more detail if conducting primary research with the sole purpose of assessing each project using the grids that were developed by the author for this paper. Using data nearly exclusively from one source, as done in this thesis, already streamlines the focuses of the assessments slightly but in some areas it was still challenging to compare the case studies. In several cases, it is not clear if the authors simply did not talk about a specific issue or if there was no impact or progress in that area. A quantitative or qualitative assessment tool that shows the progress made during the project period

would have been helpful. Assessing only the case studies makes it challenging to determine if a certain development, such as a decrease in deforestation rate, was only due to this single project or if external factors such as national laws or changes in commodity prices impacted this development more significantly. This would also help in solving the question if such small-scale projects can have a significant impact on stopping deforestation on a national scale.

Another issue linked to those sustainable forest management approaches is the problem of forest leakages. This term originally comes from emission policies but is used in the context of forest management too. If one region or country implements measures to regulate logging and decreases it, then most likely the logging activities will increase in the closest region that has fewer regulations. Therefore, strategies should be developed on a governmental and on a local level concerning how to best decrease deforestation rates while avoiding such negative feedback effects (Yale School of Forestry & Environmental Studies, 2016b; Baylis, Fullerton, & Shah, 2016).

9 BIBLIOGRAPHY

TRAFFIC International. (n.d.). *General characteristics of Ecuador's Forests*. Retrieved 2016 йил 4-May from Ecuador: <http://flegt.info/en/featured/ecuador/>

Alston, L. J., & Andersson, K. (2009). *Why governments often fail to protect forests: the hidden costs of intervention*.

Andersson, K. (2010). *Whose Support Matters Most? Self-Governance of Forests and External Actors*. Colorado: University of Colorado at Boulder.

Andersson, K., Evans, T., Gobson, C. C., & Wrights, G. (2010). *Decentralization and Deforestation: Comparing local forest governance regimes in Latin America*. Paper presented at the Workshop "Mapping the Politics of Ecology: Comparative Perspectives on Environmental Politics and Policies" in Stockholm, June 28, 2010.

Andersson, K., León, R., Uberhuaga, P., & Benavides, J. P. (2010). *Public Policy Reforms and Indigenous Forest Governance: The Case of the Yuracaré in Bolivia*. Bolivia: Center for the Study of Economic and Social Relativity (CERES).

Angelsen, A. (2009). *Policies for reduced deforestation and their impact on agricultural production*. Norway: Department of Economics and Resource Management, Norwegian University of Life Science.

Barbier, E., & Burgess, J. C. (2001). The Economics of Tropical Deforestation. *Journal of Economic Surveys*, pp. 413-433.

Baylis, K., Fullerton, D., & Shah, P. (2016 йил 17-January). *What Drives Forest Leakage?* Retrieved 2016 йил 10-May from The University of Arizona: https://econ.arizona.edu/sites/econ/files/fullertonseminar_fl-2016-01-17foraz-tucson.pdf

Black, R., & Crabtree, A. (2007). *Quality control and certification in ecotourism*. Wallingford: CAB International.

Buckley, R. (2009 йил November). Evaluating the net effects of ecotourism on the environment: a framework, first assessment and future research. *Journal of Sustainable Tourism Vol. 17, No. 6*, pp. 643-672.

Butler, R. (2012 йил 28-March). *Government policy contributes to huge drop in Amazon deforestation in Brazil*. Retrieved 2016 йил 3-May from Mongabay.com:

<https://news.mongabay.com/2012/03/government-policy-contributes-to-huge-drop-in-amazon-deforestation-in-brazil/>

Carpio, J. M. (2010). *The Project El Bala in the context of regional development*. Retrieved from Bolivian Forum on Environment and Development: <http://www.fobomade.org.bo/humedales/docs/balamolina.pdf>

Cattaneo, A. (2001, May). Deforestation in the Brazilian Amazon: Comparing the Impacts of Macroeconomic Shocks, Land tenure , and Technological Change. *Land Economics* , pp. 219-240.

Center for International Forestry Research. (2014). *FOREST GOVERNANCE IN ECUADOR*. Retrieved 2016 йил 5-May from <http://annualreport2013.cifor.org/forest-governance-in-ecuador/>

Che, H., Deza, P., & Hodgdon, B. H. (2015). *Towards Sustainable Landscapes: Strengthening Forest Management and Promoting Income Diversification In an Indigenous Community A Case Study of Work with Tres Islas Native Community (Madre de Dios, Peru)*. Inter-American Development Bank.

Conservation International. (2002). *News from the Front*. Retrieved from Conservation International: http://www.patrickj-online.com/images/uploads/NFF_spring_2002.pdf

COP 21. (2015). *United Nations conference on climate change*. From More details about the agreement: <http://www.cop21.gouv.fr/en/more-details-about-the-agreement/>

Deacon, R. T. (1995). Assessing the relationship between government policy and deforestation. *Journal of Environmental Economics and Management* , pp. 1-18.

Equator Initiative. (2012d). *Tsimané Mosekene Regional Council, Pilon Lajas, Bolivia*. New York: Equator Principles.

Equator Initiative. (2012a). *Association of Smallholder Agroforestry Producers RECA Project*. New York: Equator Initiative.

Equator Initiative. (2012b). *Capacity of the Upper and Lower Izozog (CABI)*. New York: Equator Initiative.

Equator Initiative. (2012c). *Chalalán Eco-Lodge*. New York: Equator Initiative.

Equator Initiative. (2015). *Equator Initiative Case Study Database*. From Equator Initiative: http://equatorinitiative.org/index.php?option=com_winners&view=casestudysearch&Itemid=685&lang=fr

Equator Initiative. (2012e). *Ese'ejá Native Community of Infierno*. New York: Equator Initiative.

Equator Initiative. (2012f). *Green Life Association of Amazonia (AVIVE)*. New York: Equator Initiative.

Equator Initiative. (2012g). *Kapawi Eco-Lodge and Reserve*. New York: Equator Initiative.

Equator Initiative. (2012h). *Poloprobio*. New York: Equator Initiative.

Equator Initiative. (2012i). *Sociocultural Association of Yawanawá*. New York: Equator Initiative.

Equator Initiative. (2015). *The Equator Initiative's online best practice database*. Retrieved from Equator Initiative Case Study Database: http://www.equatorinitiative.org/index.php?option=com_winners&view=casestudysearch&Itemid=685&lang=en

Food and Agriculture Organization of the United Nations. (2010). *Global Forest Resources Assessment 2010 Main report - FAO Forestry Paper 163*. Rome, Italy: Food and Agriculture Organization of the United Nations.

Forest Legality Alliance. (n.d.a). *Laws & Regulations*. Retrieved 2016 йил 5-May from Risk Tool: Bolivia: <http://www.forestlegality.org/risk-tool/country/bolivia>

Forest Legality Alliance. (n.d.b). *Laws & Regulations*. Retrieved 2016 йил 4-May from Risk Tool Ecuador: <http://www.forestlegality.org/risk-tool/country/ecuador>

Fox, J. (2008 йил 12-March). *Snakes on a Plain... and in the City*. From Treehugger: <http://www.treehugger.com/natural-sciences/snakes-on-a-plain-and-in-the-city.html>

Francescone, K. (2011, September 4). *Bolivia: Marching for Land Rights, Dignity and Social Change*. Retrieved from Global Research: Center for Research on Globalization: <http://www.globalresearch.ca/bolivia-marching-for-land-rights-dignity-and-social-change/26369>

Hardin, G. (1968, December 13). The Tragedy of the Commons. *Science* , pp. 1243-1248 .

Hill, D. (2015, June). *Bolivia opens up national parks to oil and gas firms*. Retrieved from The Guardian: <http://www.theguardian.com/environment/andes-to-the-amazon/2015/jun/05/bolivia-national-parks-oil-gas>

Huijstee, M. v. (2012). *Multi-stakeholder initiatives - A strategic guide for civil society organizations*. Amsterdam, NL: Stichting Onderzoek Multinationale Ondernemingen - Centre for Research on Multinational Corporations.

International Tropical Timber Organization. (2014). *Sustainable Forest Management*. From ITTO: http://www.itto.int/sustainable_forest_management/

Kaeslin, E., & Williamson, D. (2010). *Forests, People and Wildlife*. Rome, Italy: Unasylva.

Laurance, W. F. (1999 йил April). Gaia's lungs: Are rainforests inhaling Earth's excess carbon dioxide? *Natural History* , p. 96.

Li, W. (2004). Environmental management indicators for ecotourism in China's nature reserves: A case study in Tianmushan Nature Reserve. *Tourism Management* 25 , pp. 559-564.

Mahanty, S., Gronow, J., Nurse, M., & Malla, Y. (2006, February). Reducing Poverty through Community Based Forest Management in Asia. *Journal of Forest and Livelihood* 5(1) , pp. 78-89.

Mandemaker, M., Bakker, M., & Stoorvogel, J. (2011). The Role of Governance in Agricultural Expansion and Intensification: a Global Study of Arable Agriculture. *Ecology & Society* , p. 16(2):8.

Nepstad, D. (2013 йил 17-November). Why is Amazon deforestation climbing? *Mongabay.com*

Paavola, J., Gouldson, A., & Kluvánková-Oravská, T. (2009). Interplay of Actors, Scales, Frameworks and Regimes in the Governance of Biodiversity. *Environmental Policy and Governance* , pp. 148-158.

Parker, E. (2015). *WWF - Why is the Amazon rainforest important?* From The vital links between the Amazon rainforest, global warming and you: http://wwf.panda.org/what_we_do/where_we_work/amazon/about_the_amazon/why_amazon_important/

Pauquet, S. (2005). *Diagnosis of the Pilon Lajas Biosphere Reserve and Communal Lands*. La Paz, Bolivia: ParksWatch Bolivia.

PEFC International. (2015). *Sustainable Forest Management*. From <http://www.pefc.org/standards/sustainable-forest-management>

Peredo-Videa, B. (2008). *The Pilon Lajas Biosphere Reserve and Indigenous Territory, Beni, Bolivia*. Oxford: Green College, Oxford University.

Ruiz-Mallen, I., Shunko, C., Cobera, E., Ros, M., & Reyes-Garcia, V. (2015). Meanings, drivers, and motivations for community-based conservation in. *Ecology and Society* , 20 (3), 33-47.

Sabogal, C. (2015 йил 13-April). *Sustainable forest management*. From Food and Agriculture Organization of the United Nations: <http://www.fao.org/forestry/sfm/en/>

Scullion, J., Vogt, K. A., Sienkoewicz, A., Gmur, S. J., & Trujillo, C. (2014). Assessing the influence of landcover and conflicting land-use authorizations on eco-system conservation on the forest frontier of Madre de Dios, Peru. *Biological Conservation* (171), pp. 247-258.

The Economist. (2014 йил 7-June). *Cutting down on cutting down*. Retrieved 2016 йил 2-May from The Economist: <http://www.economist.com/news/science-and-technology/21603409-how-brazil-became-world-leader-reducing-environmental-degradation-cutting>

The International Ecotourism Society. (2015). *What is Ecotourism?* From TIES: <https://www.ecotourism.org/what-is-ecotourism>

The Rainforest Alliance . (2015). *Community Forest Enterprise Development: Case Studies from Latin America*. Retrieved from <http://www.rainforest-alliance.org/publications/community-forestry-case-studies>

UNESCO. (2015). *Biosphere Reserves – Learning Sites for Sustainable Development*. Retrieved from Ecological Sciences for Sustainable Development: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/>

UNFCCC. (9 December 2015). *DRAFT TEXT on COP 21 agenda item 4 (b) Durban Platform for Enhanced Action (decision 1/CP.17) Adoption of a protocol, another legal instrument, or an agreed outcome with legal force under the Convention applicable to all Parties* . Paris: UNFCCC.

United Nations Development Programme. (2012a). *Captaincy of the Upper and Lower Izozog (CABI), Bolivia*. New York, NY: Equator Initiative Case Study Series.

United Nations Development Programme. (2012b). *FrutaSã Industry, Trade and Export Ltd., Brazil*. New York, NY: Equator Initiatives Case Study Series.

United Nations Development Programme. (2012c). *Kapawi Eco-Lodge and Reserve, Ecuador*. New York, NY: Equator Initiative Case Study Series.

World Resources Institute. (2015). *The Governance of Forests Initiative*. Retrieved 2016 йил 3-May from Brazil: <http://www.wri.org/our-work/project/governance-forests-initiative/brazil>

WWF. (2015). *Inside the Amazon*. From http://wwf.panda.org/what_we_do/where_we_work/amazon/about_the_amazon/

Yale School of Forestry & Environmental Studies. (2016b). *Forest Governance - Peru*. Retrieved 2016 йил 4-May from Global Forest Atlas: <http://globalforestatlas.yale.edu/amazon/forest-governance/peru>

Yale School of Forestry & Environmnetal Studies. (2016a). *Forest Governance - Bolivia*. Retrieved 2016 йил 4-May from Global Forest Atlas: <http://globalforestatlas.yale.edu/amazon/forest-governance/bolivia>