

Defining Non Carbon Benefits



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Key messages:

Non carbon benefits are prerequisites to the legitimacy, effectiveness and sustainability of carbon sequestration initiatives, rather than mere safeguards to, or co-benefits from, such initiatives.

Local spiritual, relational or livelihood concerns and the control over land and resources provide carbon rich ecosystem protection.

Governance is an integral part of our non carbon benefit's operational model, from which a MRV-system will be developed; this must involve downward accountability and a fairer dialogue between knowledge systems.

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1. Introduction

1.1 Purpose of the study

Increasing recognition of the importance of non carbon benefits (NCBs) for the sustainability of climate change mitigation and adaptation efforts is the background and reason for this study. IPCC (2019), in their Summary for Policymakers on Climate Change and Land, conclude that conservation of high-carbon ecosystems, such as forests, is among the few response options with immediate impacts on climate change adaptation and mitigation. The successful implementation of response options depends on consideration of local environmental and socio-economic conditions, it further states, and recommends the involvement of local stakeholders for the effectiveness of decision-making and governance, as well as the inclusion of indigenous and local knowledge to overcome challenges. These are all elements in what is known as non-carbon benefits.

Article 5 of the Paris Agreement invites countries to take action to conserve and enhance sinks and reservoirs of greenhouse gases, including forests. It also encourages actions to implement and support, including through results-based payments, the existing Warsaw Framework for REDD+ adopted in COP 19, and alternative policy approaches such as joint mitigation and adaptation approaches for the integral and sustainable management of forests, while reaffirming the importance of incentivizing, as appropriate, non-carbon benefits associated with such approaches. However, results-based finance must also consider incentives for intermediate outputs, such as policy-performance, in order to effectively reduce deforestation and forest degradation (Wong et al. 2016). The design of NCB criteria and a corresponding tool for monitoring, reporting and verifying (MRV) them, is needed to secure proper implementation, to document and learn from activities, outputs and desired effect.

‘Non carbon benefits’ is a broad and still sparsely operationalized concept, especially in the context of local communities and indigenous territories, despite the fact that in developing countries, this is where most of the benefits exist. As a logical consequence, there are only few experiences with monitoring, reporting and verifying activities that create or maintain NCBs at the local level, recognizing collective action and being socially and culturally appropriate. From our bibliographical survey we find that these most often focus on parts of possible NCB elements such as ecosystem services, and a unifying concept is not developed. There is a need for a comprehensive analysis of broader aspects of NCBs that can form the basis for their recognition and local prioritization. Elements beyond the bio-physical, such as new understandings of property and governance or human-nature relations, must be recognized and included in the strategies to protect or restore ecosystems.

First of all there is a need to define the concept of ‘non carbon benefits’, and how it relates to carbon co-benefits and safeguards. Further, it must allow for operationalization in the field, i.e. serve to identify existing benefits and possibilities to create new, as well as identify challenges and focus areas for action. Hopefully, the model of the concept can also help developing a tool for MRV.

The second objective of the study is to collect, analyze and systematize knowledge about NCBs, and related activities that create or maintain them. This will result in a NCB list, and constitute the main body of the study. As an analytical exercise, the framework and the list will be applied to empirical cases. Finally, a review of key principles for an MRV tool may serve in the development of MRV indicators for NCB activities, which will be the focus of the next phase of the project.

The study has a Latin American focus and begins with an introduction to the region. The introductory part then presents the methods applied, before it enters the establishment of the concept and the analytical framework.

1.2 Latin America

Introduction

Although hopefully broadly applicable, this report has a conscious, pervasive focus on Latin America. This is expressed by a regional bias in literature search, and reflected in the choice of interviewees and empirical material. This section serves to give an initial, general overview of the region with regards to socio-economic, environmental and cultural matters of importance to our topic.

In Latin America, two thirds of carbon emissions relate to land-use change and deforestation. The region has the largest forest loss in the world, most of which occurs in the Amazon basin (Aguilar-Støen et al. 2016). Political pressure to reduce emissions related to land-use change has come from the international arena in many forms, and several countries have turned to climate policies as an opportunity to improve environmental governance.

There has, however, been a political opposition towards carbon offsets among various actors and entire countries. Indigenous peoples have articulated their disbelief in carbon offsets as a solution to eliminate emissions, and have criticized carbon projects for their over-simplified portrayal of ecosystems and forests, and for ignoring socio-economic, political and institutional implications. The Bolivian government, among other countries, stresses the historical responsibility of developed countries, and the risk that the mechanisms will benefit those responsible for the deforestation in the first place the most. The different oppositions launched a broadening of the focus towards multiple aspects of forests and their environmental, cultural and livelihood services (Aguilar-Støen et al. 2016) in parallel to the focus on forest carbon, providing a good basis for this study.

The indigenous populations inhabit the predominant part of the natural forests in the region and have been protagonists in the demand of a non-carbon comprehension of the forests. However, if indigenous peoples play a key role in the *maintenance* of NCBs, non-indigenous populations have an equally important role in *creating* NCBs that contribute to climate change mitigation and adaptation. For both groups, national land and resource policies have a crucial role in establishing clear tenure arrangements, and in prioritizing sustainable rural development over development with adverse effects on climate, environment and livelihoods. They also need to account for the different valuation of forest and related biodiversity by indigenous peoples who have intricate and interdependent relations with the forest, including spiritual, cultural and economic aspects.

Climate change impacts on Latin American biomes

Three major eco-geographical sub-regions constitute our region of interest: The Amazon basin, the Andean highland, and Central America (Kronik and Verner 2010). Panama and the tropical dry forest in the southern periphery of the Amazon are focus areas of this study.

The Amazon is the sub-region with the highest natural and cultural diversity. One in ten known species in the world lives in the Amazon rainforest (Da Silva et al. 2005). Generally, temperatures are hot, and precipitations and humidity high; that said the variability in biotopes is enormous; the descent from the

Andes form biodiversity-hotspots, while towards the east, flooded forests, natural grasslands and large rivers dominate the ever changing landscapes. In the periphery of the basin, rare forest types are found, such as the Chiquitano dry tropical forest in eastern Bolivia. Climate change in the tropical lowland forest biomes is felt by higher temperatures and unpredictability in formerly well-defined seasons (Kronik and Verner 2010). The tropical dry forest experience widespread forest-fires as a result of human activities combined with extremely dry conditions. Before extreme drought would happen every 10-20 years, but since the 1980s, this has occurred every two or three years. The increase in forest fires is adding to the dryness of the environment, apart from causing soil erosion, human diseases and pests. In the rainy season, the area gets torrential rains that cause floods affecting the roads. These phenomena are characteristic manifestations of climate change as identified by the Chiquitano indigenous population (Machicao et al. 2016). Throughout the Amazon, local perceptions of climate change correlate with meteorological findings, and there are already impacts on horticulture (less diversity; more working hours) and health, and indirect effects through negative impacts on wildlife and forest products, on which local people depend (Kronik and Verner 2010). Severe flooding and droughts have also displaced communities and driven rural-to-urban migration (Nakashima et al. 2012; Christoffersen 2018a).

High levels of cultural and natural diversity also characterize Central America and Panama. Closeness to both the Pacific and the Atlantic Ocean influence the region, and climate variability has a different characteristic here. Seasonal hurricanes have become more frequent and extreme, threatening numerous islands because of the simultaneous sea-level rise. The Guna people, living on the islands of the Panamanian Caribbean coast, thus prepare for relocation to the mainland. Equally severe are the extended drought periods and intense precipitation (Kronik and Verner 2010), with impacts similar to those suffered in the Amazon.

The Andes sub-region profoundly differs from the tropical lowlands. It does not form part of the study area, although experiences from the biome are used as examples throughout the report. Effects of climate change in the Andes are manifest in the rapid retreat of glaciers. Temperature increase has proven to be extra high in tropical highlands. This significantly affects water availability for consumption, agriculture and energy generation. It causes mountain pastures to dry out and affect the cultivation of traditional crops, forcing cultivation to higher altitudes (Potato Park 2019). An increase in the frequency of the El Niño phenomenon is another result of climate change, but water shortage is currently by far the most serious consequence.

Political economy and climate politics

In Latin-America, the 'commodity consensus' and the Initiative to Integrate South-American Infrastructures Regionally (IIRSA) both consolidate the extractive development strategy adopted by leftist and liberal states alike. In the Amazon, extraction of hydrocarbons, mega-infrastructures and export crops, especially the gene-modified soy production, constitute the contemporary commodifying frontiers as a result of this economic strategy. Extraction and agro-industry are capital, not labor, intensive and require only limited, specialized staff, producing an increasingly redundant local population (Christoffersen 2018a).

The State is not one, however; it is multifaceted, and governments internally reflect different and often contradictory interests. The different sectors develop their policies according to own concerns without necessarily seeking integrality and coherence with the policies of other sectors. In Bolivia, for example, the environmental sector promote rights for nature and the 'Living Well' as a leading life philosophy and the

basis for state building, while e.g. the mining, energy and agricultural sectors prioritize economic growth (Christoffersen 2018a). Ministries do not hold equal powers, but can sometimes find international support for their causes.

The Paris Agreement, with its opportunity to focus on NCBs, helps environmental ministries raise funding, awareness and technical advice to advance their purposes. Fulfilment of the agreement includes the development and implementation of Nationally Determined Contributions (NDC) with the participation of civil society. The Ministry of Environment in Panama and the Plurinational Authority of Mother Earth in Bolivia thus constitute important stakeholders for our purpose to integrate indigenous peoples and local communities in the process, and to institutionalize NCBs in national strategies. Panama could be an important first mover; all parties are committed to the development of activities that can maintain and create NCBs. Their experiences can provide important knowledge for other countries that wish to embark on NCB initiatives.

Land-use and distribution

States and larger market players are the ones that influence rural landscapes and developments the most. As an example, ten companies own more than 60 % of the world's agricultural seed supply, focusing on four staple crops (Ensor and Berger 2009). Remembering that, we proceed with indigenous peoples and small scale farmers' influence on, and interests in, land and resources.

When economic activities in the 1980s and 1990s reentered the tropical lowlands, they also enabled an influential movement, backed by NGOs and foreign donors, who became successful in negotiating the establishment of indigenous territories that often overlap with protected areas. Environmentally, this has secured large tracts of biodiverse, forested landscapes, shaped by the diverse needs to secure peoples' livelihoods. With increasing pressures on forested lands, they proactively took charge of the protected areas, and thus strategically appropriated the social and political space of these areas. The four decades long alignment with the transnational environmentalist agenda now permeates tropical forest peoples' identity; it is easily compatible with a diversified livelihood strategy, and close to some of the practices considered distinctively indigenous. Taking care of nature has become a consistent articulation of the territorial peoples that today oppose the extractivist agenda of the developmentalist governments (Anthias and Radcliffe 2015; Christoffersen 2018a). In Central America some of the same mechanisms take place.

Today's extractive frontiers in the Amazon push the 'older frontiers', cattle-ranches and small-scale farmers, into forested areas inhabited by indigenous peoples (Christoffersen 2018b). The ethnic groups are numerous, but mostly small in numbers. They may own large forest tracts collectively, but enforcement of their exclusive land-rights is difficult, sometimes further complicated by national politics encouraging migration and agricultural expansion into the sparsely populated regions. Neither states nor migrants or ranchers seem to show understanding of the territorial peoples' need for whole landscapes to form the basis for their diversified livelihood strategies, or their positive effect on conservation of landscapes of national and international importance, especially with regards to global climate change mitigation.

Conflicts between indigenous peoples and non-indigenous peasants are common in tropical lowland forests. Although peasant communities are far more heterogeneous than indigenous communities, there are similarities: culturally, economically and politically, the peasants diverge from the indigenous peoples, bringing with them the private-property logic of the peasant family. For the indigenous peoples, land is a

‘casa grande’ supporting extended families’ subsistence, while for the peasants, land belong to those who use it productively as proprietors (Christoffersen 2014); difficulties to recognize the land-use of one another result in even deeper conflicts.

Peasants are often in a better position regarding use of technologies, physical infrastructures and markets. Culturally adapted to intensive agriculture or cattle ranching, they pursue those strategies. They are, however, often in a quite vulnerable position regarding rights and legal access to land and natural resources, and depend on relatively small parcels. Applying unsustainable production methods results in erosion of the resources and the undermining of their places for livelihoods in the longer term (Hvalkof 2006). Including peasant families in activities to create NCBs are thus crucial.

Existing vulnerabilities and climate change

When asking indigenous peoples, climate change is not always perceived as an anomaly. The Chiquitanos in Bolivia even believe in the repetitive destruction and renewal of our planet (Machicao et al. 2016). Extreme weather conditions have always occurred, the reason they become hazards are due to other circumstances. The Movima in Bolivia experience annual flooding, sometimes extreme; they then become hazards because the Movima no longer have access to higher land, they claim. Cattle-ranches occupy the natural grasslands, while the Movima must cluster in the forests along the rivers (Christoffersen 2018b). Clearing forests here weakens the resilience of the ecosystem towards extreme weather conditions, and hinders its services (mitigating impacts of climate variability, and sequestering carbon).

Vulnerability to climate change is linked to the ability to access and control resources, and to the skills and opportunity to influence decisions that affect livelihoods (Ensor and Berger 2009; Ribot 2010, 2014). Limited access to markets, social services, infrastructure and political representation, along with economic pressures caused by agri-business and mining, places indigenous peoples and rural poor people among the most vulnerable groups to the negative effects of climate change (Nakashima et al. 2012; Kronik and Verner 2010; Ribot 2010). There is a clear link between social and ecological resilience, particularly for social groups that directly depend on natural resources for their livelihoods (Adger 2000). Attention to climate change must not occlude social causes of vulnerability, produced in and by society.

With local communities being essential caretakers of forests and ecosystems, such negative outcomes seriously jeopardize climate change mitigation efforts. Communities can respond successfully to climate change only to a certain point if they do not have access to influence other factors important for their welfare. Enhancing the adaptive capacity of forest-dwelling communities through the promotion of NCBs is thus a logical approach to climate change mitigation and adaptation.

1.3 Methods

Systematization and validation of non carbon benefits

The study is primarily a desk study (see appendix 6 for literature search procedure) complemented with field visits in two pilot areas in Panamá, and interviews with knowledgeable practitioners and researchers (appendix 1). Since the NCB-concept is only little explored and defined, related issues were examined, all with positive contributions to climate change mitigation and adaptation as a common reference.

The resulting list of non carbon benefits revealed three major groups of benefits: bio-cultural, socio-economic and environmental, apart from the ever present requirement of appropriate governance of the activities creating or maintaining those benefits. This helped to define the NCB-concept for this report.

The preliminary list of benefits was evaluated by a gathering of young people and traditional leaders in the Emberá Ejua So indigenous territory, and by adults from four peasant communities in the upper Mamoni valley. Apart from validating the list, the two groups contributed to it with their ideas and experiences. The field work in Panama (see appendix 2 for the program) was organized as a combination of investigation and empowerment of local stakeholders. Appendix 3 describes the workshops and the data-collection methods. Appendix 4 lists its participants.

Target groups, beneficiaries and stakeholders of relevance to the study

1. Territorial authorities (traditional y representative)
2. Indigenous and peasant communities
3. Young climate activists from the target countries
4. Non carbon benefits users
5. Partners: Apoyo Para el Campesino-Indígena del Oriente Boliviano (APCOB), Fundación Geoversity in Panama and the Forest Stewardship Council® (FSC)
6. Other local, national and international actors, such as organizations of youth, female producers, timber and non-timber producers, national governments/environmental ministries, and platforms and networks of NGOs involved with this or related topics

The pilot countries and pilot areas

In *Bolivia*, the government, despite a radical environmentalist discourse, bases its economy on continued and scaled-up extractivism. High growth rates in the past decades explain why the government has not challenged this structural development model. Nevertheless, Bolivia has attempted to take leadership on climate on the international scene, promoting a different, holistic relationship with nature.

The neoliberal era in the 1980s and 1990s seriously opened for foreign investments in the Andean-Amazonian countries. In Bolivia the economic power shifted to the lowlands where global economies of soy, oil and gas entered the scene. This significantly affected indigenous peoples and occasioned deforestation and other damages to ecosystems, but also led to the organization of the lowland peoples, and the reservation of areas for both indigenous peoples and nature conservation (Anthias and Radcliffe 2015). Today the national government and the indigenous organizations represent fundamentally different visions for the Plurinational State: the wish for national level strengthening on one side versus the striving for self-governed collective entities on the other (Christoffersen 2018a).

Meanwhile, large private landowners own 90% of the productive land. In general terms, this group can be placed geographically in Santa Cruz, Bolivia's economic center in the south-east. This is also the department in which the pilot Chiquitano communities, part of this project, are placed. In 2012, zones made available for oil operations increased by 50% on the previous year. In 2011, oil concessions had doubled since 2010 and the industry extended to 22 indigenous territories and 10 protected areas (Christoffersen 2018a). Holding collective land is not enough to safeguard livelihoods and forests; activities to increase NCBs are central for their upkeep.

The Chiquitano people in Monte Verde and Lomerío territories, like most indigenous peoples in Latin America (Nakashima et al. 2012), diversify their livelihoods. Besides agriculture adapted to the tropical dry forest (Machicao et al. 2016), they engage with a range of income generating activities that they control within their land, including collecting and processing non timber forest products (NTFP), handicrafts and coffee production in agroforestry systems. The latter has a huge potential and interest at the moment. They also engage with timber production with high income potential. For a while this strengthened organizations and land control, but low prices and decreasing demand combined with new laws being abused to whitewash illegal activities, has turned the seemingly prosperous activity into loss of control and division within the territories.

The Chiquitano pilot communities have been severely affected by this year's forest fires and have not been able to initiate field activities yet, but the group of young people that, like in Panama, will investigate and prioritize NCBs in the communities is well-established. It has experience from a former climate project; it then collected data and knowledge about traditional methods of climate variability adaptation. The findings (Machicao et al. 2016) are included in this study and the methods they used form the basis for the field work of the Euroclima+ NCB initiative.

Two other EUROCLIMA+ projects are being implemented in Bolivia. Coordinators from the three implementing NGOs met with the Plurinational Authority of Mother Earth (APT) to explore coinciding interests. With regards to NCBs, there is an excellent proximity to the philosophy that the environmental sector seeks to promote, more specifically to the 'Joint Mitigation and Adaptation Mechanism for the integral and sustainable management of forests' – an alternative to REDD+ that is perceived as synonymous with the 'commodification' of nature. There is a good basis for future collaboration to secure good results in the pilot areas as well as in the integration of NCBs in the environmental strategies.

An unexpected regime shift in Bolivia has happened during the conclusion of the writing of this report. Conditions may change in the country in the coming years.

Panama has experienced a loss of forest cover from 70 % in 1947 to 45 % in 2000 (UN-REDD 2013). Far the most remaining forest is found in the indigenous territories and *comarcas*, a special geographical territory and political jurisdiction under indigenous peoples' collective ownership. Gunayala was the first of its kind, established in 1938. Panamanian law thereby recognizes indigenous peoples' right to self-governance. The territories cannot be leased or alienated to other people (Martínez and Herrera 2016).

Securing indigenous peoples' collective land rights have proven to be an effective method to protect forest and natural resources (Dooley et al. 2018). However, the former Ministry of Environment in Panama did not permit collective ownership to land corresponding to protected areas. The indigenous territory Emberá Ejua So and the Mamóní valley constitute our pilot areas in Panama (see appendix 3, fig. 1). Emberá Ejua So corresponds to the major part of the Chagres National Park, and is moreover a key provider of water to the Panama Canal, which implies that The Panama Canal Authority (ACP) is in charge of the management of its watersheds. The territory is also an 'urban forest' - supplier of fresh water to Panama City. Protecting its headwaters is thus of utmost importance.

Pressure on the Emberá land and accompanying deforestation pose a serious threat to water protection on top of an increasingly dry climate. ACP and the Ministry of Environment have not prevented the entrance of

mestizo farmers in the territory; as a consequence approximately 15 % of the area has been deforested since 1984, when the area became National Park. To counter this, five Emberá communities are pursuing legal title to the area based on an alternative administrative procedure to the individual comarca laws.

In the Mamóní valley, the Geoversity Foundation promotes forest conservation and global climate action through educational 'Life Changer' research and learning expeditions, and the development of environment friendly bamboo reforestation and constructions¹. Along with four peasant communities in the valley they are involved with the NCB-project, and will meet with their Emberá neighbors in search of synergy.

The last stakeholder to mention here is the Ministry of Environment in Panama, 'MiAmbiente'. They have in the past had unfortunate experiences with the implementation of REDD+ activities related to a long dispute with the indigenous peoples who managed to halt all activities. The ministry, in their Nationally Determined Contributions (NDC) strategy that embodies efforts to reduce national emissions and adapt to the impacts of climate change, has promised participatory committees; that have yet to be established. However, MiAmbiente has warmly welcomed the opportunity to embark on NCBs and cooperate with local communities, indigenous peoples and NGOs for a successful outcome (appendix 3).

1.4 Definitions

Non-carbon benefits

The first major task of this study is to establish an operational definition of the concept. In literature, it has been difficult to discern non-carbon benefits (NCBs) from *safeguards* or *co-benefits*, so it is important to clarify how to distinguish between the concepts. The following definition could be applied in urban contexts as well, but this study is limited to rural area activities, primarily those related to forest regions.

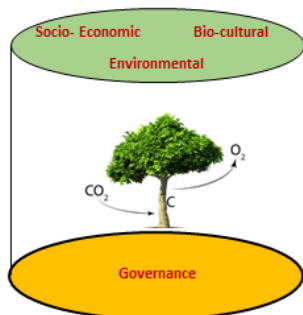
Non-carbon benefits, in this study, include three important principles/ideas in its definition. Our interest is to *maintain or create* NCBs, the definition is thus

- the positive socio-economic, environmental or bio-cultural effects of well-governed activities
- that also contribute to climate change mitigation or adaptation
- without necessarily being related to carbon sequestration

¹ The Mamóní Valley Preserve established by the Geoversity Foundation is currently a 5,000 hectares land conservancy aspiring to geographically include the entire upper Mamóní watershed (11,710 Has.) The vision for the reserve is that plants, people and animals co-exist harmoniously in a thriving rainforest environment, for global impact.

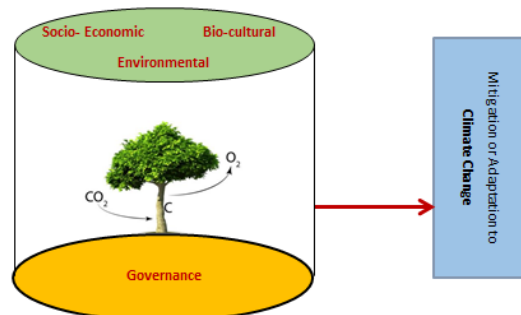
Non Carbon Benefits

1) the positive socio-economic, environmental and bio-cultural effects of activities...



..that

2) also contribute to mitigation or adaptation of climate change



3) without necessarily relating to carbon sequestration initiatives

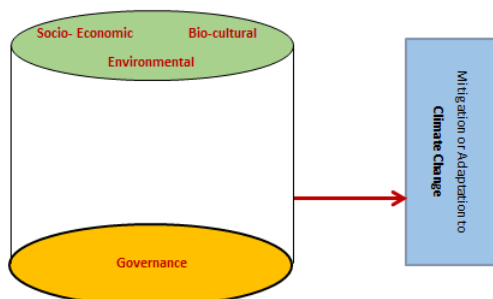


Figure 1: Model of the non carbon benefits concept

The last point is what distinguishes non carbon benefits from safeguards and co-benefits; NCB's can be promoted outside of the purpose of *carbon sequestration*. Even when an activity includes the purpose of carbon sequestration, the logic is reversed in that it is recognized that the NCBs are critical to both the legitimacy and effectiveness of carbon initiatives. NCBs are therefore better viewed as prerequisites than as benefits to be safeguarded (Visseren-Hamakers et al. 2012). Moreover, governance is included as an inseparable part of the concept.

NCBs can still be regarded as closely related to safeguards and co-benefits. The elements they concern, and their substance, are largely identical. It is thus appropriate to briefly survey safeguards and co-benefits too.

Safeguards and co-benefits

Forests are much more than climate relevant biological assets. Some peoples read them as 'social landscapes' and see forests as their biographies and community histories (Plantinga and Wu 2003). Standardization attempts, like mechanisms to organize compensation payments for conserving or restoring tropical forest, may run counter to the diversity of tropical forests and the specific and diverse socio-economic, cultural and political situations and conditions of their use (Aicher 2014). *Safeguards*, defensive measures in form of standards for good practice, were introduced to prevent a too reductionist approach to both development and conservation.

Safeguards, in the World Bank definition, refer to measures to prevent or mitigate harm from investment or development activities. Safeguards, in the context of reducing emissions from deforestation and forest

degradation, can be defined as policies, measures or procedures to protect communities and environment against damages or harm. Obviously, this broad notion leaves space for negotiations as to what is considered damage or harm, and how and by whom this is defined. Importantly, however, safeguards brought into the debate the idiom of legitimacy, fairness and rights, distinguishing the debates from the capitalist discourse of efficiency, markets and transaction costs, and enabling negotiation.

The rights-based safeguards often refer to legal norms on international scope like the Human Rights Declaration or the United Nations Declaration on the Rights of Indigenous Peoples; the Cancun agreement safeguards included the respect for the knowledge and rights of indigenous peoples and members of local communities (Aicher 2014; UNFCCC 2011). These standards include aspects like the demand for rights for traditional land tenure, customary access and use of natural resources, self-determination, benefit-sharing, and free, prior and informed consent (FPIC).

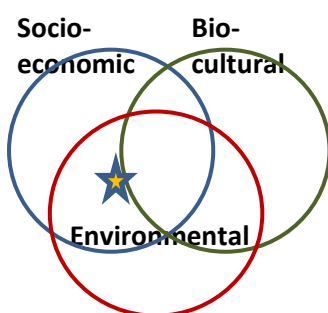
Co-benefits, more than values per se, are portrayed as parts of win-win solutions, as added values to the main purpose of carbon sequestration, something that can be obtained by the same means and money. While commonly left undefined in literature, carbon co-benefits are mostly equaled to ecosystem services such as clean air and water, reduced soil erosion (Plantinga and Wu 2003) or biodiversity conservation (Gilroy et al. 2014; Phelps et al. 2012; Brown et al. 2008; Díaz et al. 2009). A few reports and articles include social co-benefits associated with ‘pro-poor development’, human rights, governance, tenure security and participation (Brown et al. 2008; Visseren-Hamakers et al. 2012; Chhatre et al. 2012), explicitly linking co-benefits with safeguards.

Other concepts

Vulnerability, in the IPCC definition, is the degree to which a system is susceptible to and unable to cope with adverse effects (of climate change). A key parameter is *adaptive capacity*. *Adaptive capacity*, in this paper, refers to the ability or potential of (an ecosystem) or a community or household to respond successfully to climate variability, either by alleviating adverse impacts or capturing new opportunities. Climate change is but one among multiple causal factors that contribute to a negative outcome, such as loss of livelihoods, dislocation or the breakdown of social institutions (Ribot 2010).

1.5 Using the conceptual framework

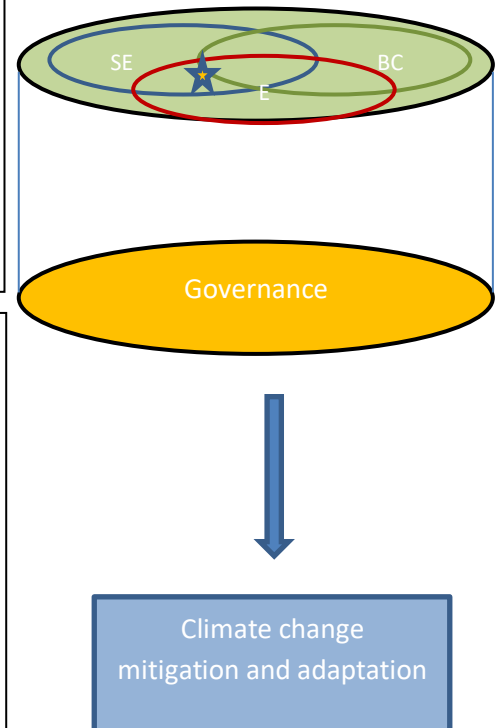
This is an example of how the framework can be used to identify, analyze and plan activities that maintain, enhance or create NCBs. The example of a non timber forest product (NTFP) is based on an interview with Luis Arteaga (appendix 1); section 3 (analysis) will provide more examples, and also return to this.



Identification: In the Bolivian Amazon Departments, Pando and La Paz, indigenous as well as non-indigenous communities base their main income on the collection and sale of Brazil nut (*Bertholletia excelsa*). The activity creates a *socio-economic benefit*. The Brazil nut thrives only in natural forest. It can be planted, but needs pollinators that are dependent on other species. It does not bear fruit until the age of at least 35 years. The activity thus also maintains *environmental benefits* – the protection of natural, diverse old-growth forests. On the figure this NCB is placed near the bio-cultural, in that it may also be argued that for the indigenous people, spending time in the forest is among activities considered distinctively indigenous.

The Governance benefit: In this case, it is the resource that defines the organization. Brazil nut is a valuable NTFP that intermediaries purchase in locally based centers. They also set the price (discussed below). However, more than an income generating activity and value chain, the management system provides a certain level of control over the land. It has also provided a basis for negotiations with petrol companies, thus strengthening the position of the local people.

Activities that lead to the benefit: To maintain and enhance positive effects for climate change mitigation and adaptation, an analysis of limiting factors is needed. Currently, the nut is not a limited resource, although the system *is* vulnerable to climate variability. A drought in 2016 caused a nut decrease of 40 %, which the collectors were not aware of until the harvest. An adaptation activity could be a way to estimate harvest based on forecasting. Prices fluctuate, but the intermediaries pay very little, even in years of high demand. In order for the activity to remain advantageous, the local people must strengthen their bargaining skills through better organization. The NTFP thus becomes the means to boost themes of governance and control, and include adaptation activities. How can the model be recreated for the benefit of local people and the long term sustainability?



2. Non Carbon Benefits List

Participation in climate change adaptation and mitigation programs and projects is unlikely to be motivated by the potential to 'farm carbon', but rather by benefits such as improved livelihoods, clean water, secure tenure rights or a better and more secure local economy, food security or new skills and technologies.

The following list, a-w, includes descriptions of NCBs and the activities that maintain or create them. Where concrete examples are given, they are at their best with regards to contributing to both community and ecosystem well-being and resilience, as well as to climate change mitigation and adaptation. Appendix 7 presents a summary list.

2.1 Socio-economic benefits

Socio-economic benefits maintain sustainable livelihoods; they are essential for people to remain in their communities and thus guard their immediate environment. Socio-economic benefits are basic for forest populations' security, welfare and social resilience (Hailemariam et al. 2015). For people living in or adjacent to forests, the economy derived from the forest can be primary or function as a safety-net in times of low income or extraordinary expenses. It can also provide a 'buffer' that keeps families from absolute poverty through supplemental services and incomes (Lund and Treue 2008). Forests contribute to

livelihoods for more than half a billion users (Chhatre and Agrawal 2009). Income generating products are often surplus of subsistence crops or collected goods, but can also be specifically destined for the market.

Access to health and educational services are often included when evaluating socio-economic conditions. The lack of access to these services locally can be the main cause of community depopulation, and thus the loss of valuable knowledge connected to the land, as well as control of and with degrading activities.

a. Cultivation systems: Food security, agrobiodiversity and dietary choices

For millennia, agriculturalists have developed and ingeniously managed diverse and locally adapted cultivation systems, resulting in both community *food security* and the conservation of *agrobiodiversity*. Agrobiodiversity provides a varied diet and improved nutrition and decrease pest-risks. This strategy of minimizing risk stabilizes yields and maximizes returns using low levels of technology and limited resources. These patches of agricultural heritage cover no less than 10 million ha worldwide (Altieri 2004), providing ecological services to rural inhabitants as well as to mankind generally, including the preservation and development of farming knowledge, local crop and animal varieties, and diverse forms of social organization. Local supply of food reduce energy use, post-harvest losses and waste in food systems, major sources of emissions and pressure on land (IPCC 2019). Moreover, increased protection, supply and proliferation of medical plants' and food crops' genetic resources are of local and global importance. By supporting and studying these systems, we can expand our knowledge of the dynamics of complex systems, especially the relationship between biodiversity and ecosystem function, and practical principles for the design of more sustainable agro-ecosystems appropriate to small farmers. Assisting smallholders and indigenous peoples to adapt to climate change is the most urgent priority that addresses both food security and leads to a transformative pathway for agriculture (Dooley et al. 2018). Improving cultivation systems with new techniques and crops help local people maintain their land and resources sustainably. See also *food sovereignty* ('benefit o').

In the tropical rainforests of Central America and the Amazon, *swidden-fallow systems* prevail among indigenous peoples. In the small plot, ½-1 ha, various crops imitate the natural forest succession. Trees and palms are intercropped with food crops, yielding fruits, fibers and timber in the fallow period. The trees contribute to maintaining soil fertility through nutrient cycling, and legume tree species further enrich the soil (Feliciano et al. 2018). Yuca (cassava) is the dominant crop during the first couple of years; the resilient system has a large yuca variety and plenty of other crops. Along the large Amazon-rivers, *flooded forest agricultural systems* allow for continuous production on the same land, given the annual nutrient supply from the flooding. The limited cultivation period requires crops with short rotation, and the variety is lower here.

In elevated areas, the climate allows for shadow systems such as coffee-based *agroforestry*. The best cultivation system practices outside of the larger indigenous territories are found among *agroecology-based production systems*, notably agroforestry in our context. 'Agroecology' is used here in its sense as an alternative to industrial farming, and defined as being biodiverse, resilient, energetically efficient and socially just. Agroforestry systems can include valuable species for both subsistence and commerce, and its introduction can also lead to large per-acre increases in carbon stocks (Dooley et al. 2018). A study from Panama shows that agroforestry systems offer an alternative to production of valuable timber, and even have the potential to sequester almost as much carbon while providing benefits for biodiversity and food security, that timber does not. Reforestations with tree and palm species that are both threatened and

provide non timber forest products (NTFP) have improved the livelihoods of Emberá communities in Panamá (Holmes et al. 2017).

Agroforestry systems can be grouped into the ‘agri-silvicultural’; the ‘silvo-pastoral’; ‘boundary planting’; ‘improved fallows’; ‘shadow systems’; ‘homegardens’ and ‘rotational woodlots’ (Feliciano et al. 2018). Improved fallows, and e.g. grassland conversion to silvo-pastoral systems, increase both carbon sequestration above ground and carbon in soil. Besides, cultivation of valuable species may compensate for declining wild resources (Widianingsih et al. 2019). The agroforestry system categories inspire improvements of cultivation systems to provide benefits for livelihoods, wild and agro-biodiversity, carbon sequestration and climate change adaptation alike.

Motivations to convert or improve cultivation systems are various. High incomes and the possibility to incorporate annual food crops into agroforests are good incentives (Holmes et al. 2017; Widianingsih et al. 2019). Apart from revenues from valuable species, receiving seedlings can encourage the participation in agro-forestry projects. Also tree species of medicinal importance are associated with recurring benefits to the growers, and are being grown for longer periods for the benefit of carbon sequestration (Chauhan and Gera 2010). Financial commitments for climate change adaptation are crucial for conversion, including access to credits and technical assistance at the local level. Finally, whether local cultivation practices can be considered sustainable and contributing to the stability of the eco-system depend on a range of tenure and governance conditions (see benefit w).

The ‘Potato Park’² (2019), including seven communities in the high Peruvian Andes, manages more than one thousand tree hundred potato varieties, including wild species, and performs research at different altitudes and soils to adapt to rising temperatures, changing precipitation patterns and new pests. They enjoy a high level of food security and a healthy diet, as well as a good economy through access to niche markets.

b. Income generating forest activities

There is a general need and desire for local communities to generate income and find their entrance to the market (IPCC 2019), also by indigenous peoples like the Embará in Panama (Holmes et al. 2017). Environmentally sustainable income options are essential to avoid depopulation and depletion of resources. Depopulation increases the risk of land grab (Sluyter 2003; Christoffersen 2018b) and environmentally degrading activities, apart from the uncertainty that rural people face when they migrate.

Competition with conventional produced agricultural products on the free market is often no viable option for small scale farmers or indigenous peoples (Altman 2007), but the promotion of *niche products* offers opportunities for many local communities. This can be organic production of mainstream products, or the production or collection of site-specific *NTFPs*. Niche organic markets are generally growing at a 10 % rate annually (Ensor and Berger 2009). An example of niche production is the mentioned cultivation of rare potato-species by collective land owners in high Andes. Along with receipts connected to them, these potatoes are purchased by top chefs in the Cusco area (Potato Park 2019). Medicinal products are sold at local markets, in cases global niche markets. Cocoa from Beni in Bolivia has found its niche in Europe. Other

² <https://ourworld.unu.edu/en/the-thriving-biodiversity-of-peru-potato-park>

examples of organic/niche products are coffee, resins, brazil nut, leaves roofing mats, arts, crafts and dyes (Hailemariam et al. 2015; Altman 2007; Reyes-García 2001; Dyrmoose et al. 2017; Turreira et al. 2017).

Wood-based building materials and other products that can substitute emissions-intensive materials represent a huge potential for climate change mitigation (Buchanan and Levine 1999). Geoversity in Panama explores constructions in Bamboo³, aiming to scale-up a production in the upper valley of Mamoni that includes small-holders to introduce new environmental sources of income. The idea is that all steps of the process, from cultivation and maintaining, to curing, designing, building and trading complete constructions, will happen from the valley.

Tourism is a growing market and an opportunity for forest dwelling people to share knowledge of their environment, explain their livelihoods, traditions and rituals, use local ingredients and recipes to serve food, or guide tourists through scenic landscapes. Like any discussion about indigenous peoples' involvement with modernity, eco-tourism has been questioned as the possible destroyer of culture and tradition (Johnston 2006). The degree of control over activities and businesses is important for the integrity of communities. Eco, community and farm tourism that provide insights in natural, cultural and agricultural values and systems, exist on a continuum from externally defined and managed towards community-controlled activities. The Potato Park (2019) is an example of how communities control their own tourism concept that serves to disseminate information about their production-systems, trade, research, spirituality and pressures relating to external factors while generating income from interested tourists. In the Mamoni valley in Panamá, Geoversity organize life changer and learning experiences through low-carbon footprint expeditions⁴. Through a network of trails and cottages, the organization seeks to expand the activities to involve peasant families and introduce new sources of income that combine well with forest conservation.

Well-developed *infrastructure* is important for income generating activities, while also always carrying with it the risk of environmental degradation (Barbera et al. 2014; Foley et al. 2007; Hindery 2013). Roads are the tangible prerequisites to transport, products and tourists, like communication is essential to plan and coordinate activities. However, a road may move away production-process activities from the local, and promote new types of externally controlled businesses, like large-scale aquacultures and chicken-farms. It can cause health personal and teachers to settle away from the community, but on the other hand establish the link to better health and education services. New infrastructures change livelihoods for better and for worse. Electricity may change fishing and consumption patterns because of refrigerators, and a road may change settlements, leaving backlands unattended. In the Amazonia, larger infrastructure projects have often been met with resistance from indigenous peoples (Canessa 2014; Simmons 2004); however, studies show that once they have secure tenure, control with the land and a marketable production, indigenous peoples can themselves encourage the construction of new roads (Hvalkof 2006).

c. Sustainable management of forests

By providing long-term livelihoods for communities, *sustainable management of forests* (SMF) can reduce the extent of forest conversion to non-forest uses, lower greenhouse gas emissions and contribute to adaptation (IPCC 2019). The application of SMF to degraded natural production forests can also provide greater diversity and abundance of vertebrate species as well as increasing carbon storage in the tropical

³ <https://www.youtube.com/watch?v=maUuBp2N3wE>

⁴ <https://www.youtube.com/watch?v=1kCGNjXTY6E>

rain forest ecosystems (Imai et al. 2019). SMF is an essential tool for reducing the vulnerability of forests to environmental change (Hossein 2013; Innes 2013). It is judged against globally agreed criteria such as biodiversity, forest health and vitality, productive and protective functions of forests, socioeconomic benefits and needs, and legal, policy and institutional frameworks (Castañeda 2000). Community forest management is treated in ‘benefit t’.

d. Payments for ecosystem and research services

Payments for ecosystem services (PES), including *carbon payments*, are promoted to sustain local livelihoods while preserving ecosystem services. There have been hopes about the possibility of engaging local and indigenous peoples in the provision of ecosystem services to generate local, regional and national benefits (Altman 2007). Results have so far been modest with regards to jobs and income. Neither have these payments stopped the conversion to mono-crop plantations, where these constitute an alternative to forest conservation (Warren-Thomas et al. 2018). For local communities, carbon payments have not had a significant impact on household income and only limited impacts on poverty reduction.

Other benefits related to the schemes have been more significant (Lawlor et al. 2013). They can be *in-kind contributions* to local educational systems or infrastructure. Projects are also helping populations gain *tenure rights*. When tenure is already clear, communities have experienced that projects obtain the populations’ free, prior, and informed consent. Meaningful local *participation* leads to greater opportunity and security of benefits.

Projects in Brazil and Kenya reveal a different design: Focused on protecting existing forests, they extend *cash transfers* to households in order to build political support for conservation, rather than make payment conditional on carbon services (Lawlor et al. 2013). Government support and improved *access to credit* can help overcome barriers to adoption of sustainable practices, especially those faced by poor smallholder farmers.

Co-operation exists between local communities and researchers regarding area conservation and exchange of knowledge. In the Peruvian Amazon, local people are paid directly for their services to researchers, and receive additional income from educational tourism; importantly, they gain exclusive hunting rights when establishing a private conservation area in these kinds of conservation regimes (Richard Bodmer 2019; Maijuna community 2019).

Wage labor may include working as loggers for timber companies (Reyes-García 2001; Roca 2001), livestock herding and plantation work, but also environmental ministries and agencies, NGOs and researchers hire local people. Wage-labor takes time from own economic activities, but it helps maintaining populations in their communities instead of migrating for work. Of course, working relations must be non-exploitative and non-discriminatory.

e. Empowerment

In addition to good, basic *health and educational systems*, *empowerment* of individuals and communities to participate in climate change adaptation and mitigation activities, and contribute more effectively with own and new knowledge, are benefits locally as well as globally. Awareness-raising can build capacity in communities to minimize risks related to extreme events, and to seek support in adaptation to climate change (Ensor and Berger 2009). International and regional *coordination and exchange of experience* links local

experience horizontally and with global, political negotiations. Empowerment is also linked to the effective *governance* and control by indigenous and local communities over their forest and related resources.

Forests of the World and its partners in Bolivia, Nicaragua and Panama had good results with training young indigenous peoples to carry out community investigations on their own. They bridged the technical and strategic 'climate change regime' on the one side, and the environmental and traditional knowledge in the rural population on the other. Later, they exchanged experience horizontally and at international levels (Machicao 2016; Martínez and Herrera 2016).

2.2 Environmental benefits

Forests are important providers of essential environmental benefits. While their crucial role in carbon storage and climate regulation is increasingly highlighted, other services they provide have similar global values, as sketched out in this section. Forest ecosystems are also vitally important to regions, nations and local communities. Besides providing multiple, simultaneous forest ecosystem benefits, retained forests may also have strong implications for other ecosystems (UNEP-WCMC 2007). Carbon sequestration is included despite being a *carbon benefit* because it depends on ecosystem integrity and other non-carbon preconditions.

f: Carbon sequestration

With regards to carbon sequestration, response options with immediate impacts include the conservation of high-carbon ecosystems such as forests. Examples that provide multiple ecosystem services and functions, but take more time to deliver, include afforestation and reforestation, restoration of carbon rich ecosystems, agroforestry and the reclamation of degraded soils (IPCC 2019).

Old primary forests are among the systems that hold the largest carbon pools, especially in the wet tropics that host stable forest systems with high resilience. The long-term ability of forest ecosystems to sequester and retain carbon depends on the maintenance of ecosystem integrity and biological diversity. Maintaining functional diversity by *eliminating the conversion of diverse natural forests* to mono- or reduced- species plantations or agriculture is a fast contribution to carbon sequestration and storage (Thompson et al 2009; Danielsen et al. 2009). *Divestment* is central in this regard. See also 'benefit d' (PES).

g. Biodiversity and natural forest production and conservation

The Convention on Biological Diversity defines 'biological diversity' as the variability among living organisms from all ecosystems; including diversity within and among species, and of ecosystems. Some researchers include landscapes and biomes. Biodiversity and natural forest production has a symbiotic relationship with climate. Biodiversity is at risk with change and extreme events, but also works to enhance resilience (Ojea et al. 2016; Díaz et al. 2009).

The regional impacts of climate change, especially interacting with other land use pressures, might be sufficient to overcome the resilience of even some large areas of primary forests, pushing them into a permanently changed state. If forest ecosystems are pushed past an ecological 'tipping point', they could be transformed into a different forest type, or even a new non-forest ecosystem state. In most cases, the new ecosystem state would be poorer in terms of both biological diversity and delivering ecosystem goods and services (Thompson et al 2009). The vast majority of losses are foreseen to occur in the tropics (Bastin et al. 2019).

The capacity of forests to resist change or recover depends on biodiversity at multiple scales. A resilient forest ecosystem is able to maintain its 'identity' in terms of taxonomic composition, ecological functions and structure (Thompson et al 2009; Visseren-Hamakers et al. 2012). Forest ecosystems with naturally low species diversity can still have a high degree of resilience; they are adapted to disturbances, and have a broad genetic variability that allows tolerance to a wide range of conditions. Along with isolated or 'at the margins' tree populations, such populations are likely to represent pre-adapted gene pools for responding to climate change and can form core populations as conditions change. Resilience is also influenced by *the size of forest ecosystems* - the larger and less fragmented, the better - and by the condition and character of the surrounding landscape (Thompson et al 2009).

Primary tropical forests are, due to their extremely high species and genetic diversity, in general more resilient, stable, resistant, and adaptive than modified natural forests or plantations. *Policies and measures* that promote *primary forest protection* yield both climate change mitigation benefits and biodiversity conservation, in addition to other ecosystem services (Thompson et al 2009). Stopping investments in forest degrading activities is an effective way to prevent forest and biodiversity degradation. Avoiding further loss and degradation of primary forests must be the first priority in combatting the climate and biodiversity crises.

Increasing the biodiversity in planted and semi-natural forests will have a positive effect on their resilience and adaptive capacity as well as biological productivity; natural forests and processes should be used as models. Also naturally regenerating secondary forests have proven to support biodiverse communities, including many endangered species (Gilroy et al. 2014). Genetic diversity in forests can be maintained by avoiding practices that select only certain trees for harvesting and by controlling invasive species. Housing and preserving endemic biodiversity is essential (Ojea et al. 2016). Rules for hunting prevent the indiscriminate hunting of large fauna species.

Findings indicate that despite the articulation of biodiversity importance, fauna is not treated as a functional ecosystem component of forests. Forest fauna perform many ecological functions, directly and indirectly influencing ecosystem processes including pollination, seed dispersal and affecting germination, plant regeneration and growth, and biogeochemical cycles (Krause and Reinhardt 2019). Maintaining populations of natural crop pest predators and of pollinators and dispersers, are also intermediate processes deriving into food or fiber and thus of huge socio-economic importance (Ojea et al. 2016; Thompson et al. 2009).

h. Water: systems, supply and retention

Forests, especially large tracts, are important for local and regional water regulation and quality. This includes the capacity of watersheds to purify and regulate water flow. Forests increase retention time and thus delay water run-off to water courses in the event of heavy down pours, mitigating effects of extreme climate events. *Retaining forests in mountain catchments and around headwaters* help ensuring consistent water yields of high quality, and contribute to the health of aquatic ecosystems, such as waterways, and wetlands and their abilities to provide ecosystem services in turn. Wetlands include many types of forests such as mangroves, riverine forests, bog and swamp forests. Intact forests play a key role in the health of these (UNEP-WCMC 2007), as well as ensuring the operation of hydro-infrastructure, such as waterways and turbines.

i. Combating land degradation and desertification

Soil conservation is a central forest NCB. Maintenance of forest cover by avoidance of deforestation, or by reforestation, protects, enhances and restores soil properties and conditions, and reduces soil erosion.

Agricultural land-conversion to forest promotes additional benefits besides soil conservation and climate change mitigation, such as reduction of nitrogen and atrazine pollution, and enhanced wildlife habitats (Plantinga and Wu 2003). In dry areas, '*green walls*' established with native, resilient tree-species, can reduce sand storms and avert wind-erosion while improving microclimates, soil nutrients and water retention (IPCC 2019).

j. Damage mitigation

Damage mitigation refers to a forest's regulation of extreme events such as floods, wildfires or erosion (Ojea et al. 2016), see 'benefit g'. Maintaining forest cover help maintaining moisture, micro climate and prevent extreme temperatures locally, thus facilitating locally adapted agricultural systems and increasing resilience to climate change. Extreme climate events can cause depopulation of forests and other vital ecosystems, with the risk of land- or resource grab as a result (Christoffersen 2018a). Development of *adaptation strategies* and *risk management* are important activities at local and national levels.

k. Recreation and landscape aesthetics.

These are benefits related with leisure and the enjoyment of forests: recreation, esthetic value and scenic beauty. These values increase human wellbeing and life quality, and may also promote tourism (see 'benefit b'). The sites may contain specific ecosystem types and biodiversity, or species of interest for nature based tourism. *Balancing protection and accessibility* to such habitats requires good governance.

2.3 Bio-cultural benefits

Biocultural benefits include correlations, relationships and interactions between human and non-human species (Verschuuren 2017). Environmental degradation diminish the availability of natural resources and threatens the biocultural survival of indigenous and local people world-wide, starting a negative spiral because biocultural knowledge and practice conserve natural sites and species (Kronik and Verner 2010; Reyes-García 2001; Turreira Garcia et al. 2017). Being a dynamic concept, however, bio-cultural benefits can also be created and promoted in the quest for a new relationship with nature. There is an emerging realization that protecting and restoring biodiversity, and maintaining and revitalizing cultural diversity are intimately interrelated (Maffi and Woodly 2010). If used well, biocultural approaches to conservation can be a powerful tool for reducing the global loss of both biological and cultural diversity (Gavin et al. 2015).

l. Relational and reciprocal nature perception

The way we view nature is culturally determined and reflects the spirit of the time we live in. Nature has now also become a set of 'ecosystem services', readily available to the market and the making of adequate policies. This reflects a perception of nature that separates it from the human society, which is regarded its master and protector (Descola 2013). This dichotomy allows for the commodification of nature, and it paved the way for conservation without people - a model that has largely proved inefficient and detrimental to both the targeted land and the affected communities (Bodmer 2019; Neumann 1998). Conservation and development approaches alike often ignore the basic principle of giving equal consideration to different worldviews (Verschuuren 2017). A focus on biocultural heritage stresses the recognition of worldviews that serve as the foundation for different sets of knowledge about the natural

world (Gavin et al. 2015). Looking to other cultures, for different relations to nature, to help finding new solutions to solve the multiple crises of climate change, land degradation and diversity loss, is logical.

‘Bio-cultural units’ or ‘cultural landscapes’ comprise symbiotic relationships between people and the land. Spiritual, relational or livelihood concerns determine practices that lead to conservation, versus an area set aside for conservation. Communities in bio-cultural units simultaneously manage, conserve, modify and enrich their environment (Borrini-Feyerabend 2003; Hvalkof 2006). Indigenous territories represent biocultural heritage, a complex biocultural system formed by interdependent parties. The terms focus particularly on the reciprocal relationship between people and their environment. The components include biological resources, ranging from the micro (genetic) to the macro (landscape) scales, as well as ancestral traditions and practices (Argumedo 2010).

To the Chiquitano people in Bolivia, the entire universe is anthropomorphous. Every species has its *Jichi*. *Jichis*, the masters of nature, appear in the form of humans, animals or a hybrid between the two (Machicao et al. 2016). In an anthropomorphic environment, humans are not above or separated from nature, but must enter relationships with relevant persons, human or non-human, in order to live well in this world (Hvalkof 2006; Descola 2013); disrespectful relations will backfire.

It is not sufficient to only *recognize and support indigenous and local peoples’ worldview* and nature-relations. *Changing mind-sets* in occidental tourists and researchers, and in decision makers at all levels and of all sorts, are important activities with the aim to induce a more relational approach to nature, and inspire low-impact lifestyles and technological innovations. Geoversity in Panama has ‘biocultural renewal’ as their vision: A popular shift in worldview, moving away from values and practices that set humankind apart from nature, toward a fully evolved oneness with nature. They conduct educational nature expeditions with this aim. Like the before mentioned Potato Park in Peru (see b), Geoversity thus promotes purposes beyond tourism, in that they aim to inform and induce changes in their audiences.

m. Sacred natural sites and species

These are specific places or species, recognized by people as having spiritual or religious significance, or recognized by institutionalized religions or faiths as places or species of worship and remembrance. They are central to human spiritual life and well-being, and play an integral role in natural resource management and governance because they form informal networks managed and governed by local people. Sacred natural sites offer opportunities for bridging local knowledge and science when addressing conservation challenges. Recognition of these sites and species gives voice, rights and action to local people. They often overlap with valuable ecosystems, species habitats and scenic views, and thus help protect biodiversity. They *constitute the world’s oldest conservation sites and species*, protected for generations by social-spiritual conservation networks: *‘Forests are better protected by spirits than by REDD+’* (Verschuuren 2017).

Privatization of land has led to loss of protection of sacred sites, e.g. because of the belonging to other religions, or simply a wish to develop constructions at these places, often placed with scenic views. In efforts to protect sacred natural sites, spiritual leaders in Ghana and Guatemala engage in rights-based approaches, such as developing law proposals and biocultural community protocols to gain legal recognition and protection for their sacred places (Verschuuren 2017).

In Panamá, the Emberá identified various sacred sites and tree-species, among them the *nuci*, which are places with abundance of fish, guarded by an enormous fish, for which they have a lot of respect.

n. Knowledge and practices

Agricultural practices and natural resource management that include indigenous and local knowledge can contribute to overcoming the combined challenges of climate change, food security, biodiversity conservation and land degradation (IPCC 2019), and studies on use of local knowledge in adaptation to climate change strategies are several (Ensor and Berger 2009; Kronik and Verner 2010; Potato Park 2019). Traditional knowledge should not be understood as stagnant, it is continuously developed through acquirements of new skills and technologies.

Knowledge and management systems can be *functional*, adapted to specific physical conditions. Because of dependence on natural resources there are strong incentives for managing them sustainably, which is reflected in local systems of knowledge. Forecasting by reading clouds, plants or animal behavior, or rituals and natural calendars that guide cultivation are examples of handed down agricultural knowledge (Nakashima et al. 2012; Potato Park 2019).

Indigenous knowledge can be an *intellectual* pursuit as well (Nakashima et al. 2012). Environmental knowledge is embedded in folk taxonomies (Reyes-García 2001; Turreira Garcia et al. 2017), widely accepted as systematic and valuable. It includes an enormous knowledge of plant species, also species unknown to science, as well as knowledge of uses of species. Gender and age are influential factors regarding knowledge of plants and their uses. Knowledge of uses of natural materials can help us replace emissions-intensive materials (see benefit b), and enhance food and medicine security. Knowledge relating to traditional medicines is also critical in relation to health and wellbeing of indigenous peoples in coping with impacts of climate change, such as rise of diseases or health impacts of disasters.

Practices of importance to climate change adaptation are the different forms of *collective or reciprocal working relations* found among various peoples. They exist along family lines, or are organized by local authorities. Whichever, reciprocal and collective systems gather knowledge, labor and capabilities to secure successful outcomes. Food, seeds, services and goods travel along family lines within and between communities and reaching urban areas, safeguarding livelihoods (Christoffersen 2018b; Ensor and Berger 2009). A study on yuca cultivation among the Aguaruna of Peru found that closely related women seem to share more knowledge of yuca varieties than that accounted for by general cultural sharing (Reyes-García 2001).

o. Intergenerational knowledge transfer

The deficiency of elementary schools with regards to inclusion of territorial and traditional knowledge is a widespread challenge among indigenous peoples. Another is that the young people must leave their land to follow secondary or higher education. '*Our knowledge has no landing strip*', I was told by an elder of the Movima people in Bolivia. The image is meaningful in an area where distances are huge and often require air travel, and it reflects an enormous frustration of his people. They have become aware of the loss of valuable knowledge and skills happening as a result of the lack of capacity of the educational system to transfer knowledge and skills related to bio-culture and land (Christoffersen 2018a).

Knowledge is connected to language (Reyes-García 2001). Including the use of mother tongue language in education is a step in the right direction, but does not sufficiently combine language with land and practices – *‘the language dies in the school’*, the same elder said. Like among other indigenous peoples, elders have become involved in the primary school, fixed on the schedule, and taking the children out of the classroom. In the Peruvian Amazon, a group of Kukama people have initiated various activities to revive the language. One is radio-broadcasting in Kukama, another is visits to community elementary schools in order to debate the problem and inspire ways to redirect education towards the land, traditions and specific challenges faced by the Kukama. They have also made music videos in Kukama, combining tradition and modernity to target young people and draw attention to their livelihoods and cultural challenges⁵ (Radio Ucamara 2019).

Another approach to revive knowledge and practices was the mentioned ‘bridge-building’ between elders and young indigenous investigators (Machicao et al. 2016; Martínez and Herrera 2016). The young learned about their own culture and background, and the elders highly appreciated the interest. Training the young to perform investigations on their own, and make the link between communities and organizations at various levels, was so successful that this project will repeat the method to identify and prioritize NCBs in the pilot communities.

Similar good experiences with participatory research combining science and local knowledge was found in the Andes with regards to pasture improvement, animal health, water conservation, and agro-biodiversity. Farmer field schools trained indigenous technicians who then reached out in their own language (Ensor and Berger 2009).

Besides oral traditions and everyday practices, myths and performing arts serve to transfer knowledge. Festivals, dance, games and rituals can disseminate knowledge related to food and practices, and theatre can treat challenges with changing environments. Arts and crafts for own use and sale are also examples of transfer of skills (Verschuuren 2017). Sale to tourists is not new; historical descriptions from expeditions bear witness of Amazonian women’s exhibitions and sale of their artwork to visitors (Bodmer 2019; Roca 2001).

Women have a central position regarding intergenerational knowledge transfer since they are mainly the ones that spend time with the children during everyday activities in agriculture and collection of e.g. medicinal plants.

p. Bio-cultural institutions

Bio- cultural institutions, like working relations and distributional systems, are strongly connected to the cycle of seasons that orders the timing of agricultural and ritual practices. In the Amazon, festive communal events and huge, yearly regional festivals are essential to social life, strengthening solidarity, cooperation and cohesion, and they are profoundly connected to the land. Food production and ornaments for the events influence choice of crops and collection of forest products, and ceremonial dances share the purpose of maintaining and healing society and nature. Upholding the ritual calendar is essential for maintaining and reviving nature-society relations, and the festivals are popular far beyond the usual boundaries between indigenous and non-indigenous spaces. The institutions are thus important for presenting and promoting bio-cultures to a broader audience.

⁵ Radio Ucamara: <http://radioucamara.net/category/pueblo-kukama-kukamiria/>

Bio-cultural institutions hold *high legitimacy*; they are generally more trusted than the formal political indigenous organizations and constitute a source for cohesion among communities (Christoffersen 2018a; Kronik and Verner 2010). In Beni, Bolivia, the indigenous church ‘el Cabildo indígenal’ is an old institution that holds high legitimacy among the lowland indigenous peoples. The large annual festivals are planned and hosted by this urban based institution. The Cabildo indígenal also provides adult education and hosts political meetings. Indigenous activism and organization springs from here and is still rooted in this institution that, contrary to the political indigenous organizations, have been able to remain united and maintain broader popular support.

Cultural institutions are dynamic; they exist because of their adaptive capacity and ability to incorporate new knowledge. Changing livelihoods, however, may undermine certain aspects of adaptive capacity and result in vulnerabilities, including breakdown of knowledge transfer, learning of skills, and weakening of social networks (Ford et al 2006). Unpredictable season variability and more frequent extreme events disrupt the agricultural calendar, cause crop losses and affect the availability of goods from forests (Kronik and Verner 2010). Elders and traditional leaders then sometimes lose credibility, and people search solutions to their problems elsewhere, often through migration. This is disastrous since the cultural institutions, developed over time, may still hold the main contribution of knowledge on how to respond to uncertainty and variability. Addressing the *intergenerational transfer of knowledge and skills* (benefit o) is thus of huge importance.

Coproduction of livelihoods, knowledge and institutions (Bebbington 2000; Christoffersen 2018b; Borrini-Feyerabend et al. 2010) with organizations and markets are important dynamics, essential for the conservation and continuation of biocultural knowledge that provide communities with greater adaptive capacity (Gavin et al. 2015). An example is the bridging of science and experiential knowledge to find common ground in the conservation of biodiversity and natural sites of importance for both local people and conservation organizations (Verschuuren 2017; Bodmer 2019), enabling local and indigenous peoples to guide conservation efforts. Or the incorporation of local knowledge into science and agro-ecological systems (Reyes-García 2001; Maijuna community 2019), and vice versa: local peoples combine market opportunities, science and new technologies with their intimate knowledge of ecological systems and species behavior to optimize livelihood conditions (Christofersen 2018b; Nakashima et al. 2012).

New institutions that could be regarded ‘bio-cultural’ emerge at the global level, foremost in the occidental world, in response to the climate and biodiversity crises. Among those are *Fridays for Future* and Earth Day’s campaigns for climate action, such as *Earth Rise*, *Great Global Clean-up* and *Foodprints for the future*.

q. Food sovereignty

Food sovereignty is a rights-based approach to food security. It defends the right of people to produce, distribute and consume healthy food in or near their land in an ecologically sustainable way. It includes the right to define own food and agricultural systems, thus placing the people who produce and consume food at the heart of food systems and policies, rather than the demands of markets and corporations (Altieri and Toledo 2011). This is in compliance with the IPCC (2019) call for radical changes in agro-food systems.

Rural social movements embrace the concept of food sovereignty as an alternative to the inequitable international trade to solve the world’s food problem. They *focus on local autonomy, markets, production-consumption cycles, and farmer-to-farmer networks*. Food sovereignty is proving to empower local, regional

and national peasant organizations and movements (Altieri and Toledo 2011). The 'Potato Park' (2019) in Peru is an example of conscious food sovereignty practice. Seven communities protect and develop the over 1300 potato varieties they have been guarding for centuries. Contrary to the good examples are those cases where indigenous peoples have been restrained from subsistence production on their lands due to nature conservation, like has been the case of the Embará in Ejua So for decades. Until recently they depended entirely on tourism, and bought food – even to serve to the tourists – from colonists.

2.4 Governance of NCBs

Adopting a definition of environmental governance (Aguilar-Støen et al. 2016), we can unravel the governance concept: *a set of formal and informal institutions, mechanisms and practices, by way of which social order is produced by controlling what is related to the non carbon benefit.*

Multiple actors, including national, subnational, territorial and local governments, multilateral institutions, scientists, business, NGOs and trade certification bodies have roles to play in ensuring successful outcomes and constitute governance arrangements (Dunlop and Corbera 2016; Aguilar-Støen et al. 2016). Regional and global exchange of experiences can also be included as important governance actions. IPCC (2019) emphasizes that appropriate design of policies, institutions and governance systems at all scales contribute to land related adaptation and mitigation.

More than design, however, governance is about power, relationships and accountability (Borrini-Feyerabend 2003; Larson and Soto 2008). Who has the influence, who makes decisions and how are decision-makers held accountable? All too often, local development is still referred to as a technological issue, and about getting policies right.

Local decision-making can offer benefits in terms of resilience and adaptive capacity by being responsive to local knowledge of risks and opportunities. It includes an active role for informed communities, enabling them to act on a basis of their self-defined best interests (Ensor and Berger 2009; Borrini-Feyerabend et al. 2010). It is locally that benefits are identified and prioritized, maintained and developed. Our focus is local, but the local is determined by its context.

The objective of the larger project is to institutionalize the local NCBs in national climate strategies. It is important to also investigate national plans, priorities, legislation and enforcement, as well as other agreements or processes that could 1) support new local initiatives 2) be supported through the provision of tools to integrate NCBs and 3) already have a frame for MRV.

We begin at the local level and gradually expand the 'jurisdiction'. Whereas 'governance' with relation to indigenous peoples most often is well-defined, governance in non-indigenous communities will often shape around the resource in question and be more experimental. Therefore, they are treated separately.

r. Indigenous peoples' land and resource governance

Territorial Governance can be considered the exercise of the indigenous peoples' right to self-determination guaranteed in the declaration of the United Nations and American States on the Rights of Indigenous Peoples. Here it is clarified that, as collective subjects, indigenous peoples and nations are free to establish their own norms, govern themselves and develop in their traditional territories according to their own customs and priorities, as long as they recognize their integration into the nation-state. Governance in this context refers to different forms of governance (different from being governed), in a

jurisdiction defined by a people according to its relationship with a particular territory and based on structures and processes developed by its population according to context and specific needs. These territories may or may not correspond to other jurisdictional spaces, like e.g. the municipals (Kjaerby 2011).

While often well-defined, indigenous peoples' land and resource governance is thus not necessarily easily identified. Among forest peoples in Latin America there are, however, a number of similarities that are worth highlighting. Of specific importance are *concepts of property and democracy*.

Collectively owned land is subjected to the control of communal and territorial institutions. Land cannot be sold, and benefits from commons must not lead to individual enrichment. Distribution of land and common resource use and maintenance is directly controlled by the families at the community meeting (Christoffersen 2014). While collectively owned, land for cultivation and hunting is connected to families by complex systems, invisible to the observer (Maijuna community 2019). Livestock can be managed collectively for communal sale or consumption (Christoffersen 2018a).

The community constitutes a basic organizational unit. Its members are the resident families who enjoy high levels of autonomy. They meet frequently to make decisions about matters concerning the community (Christoffersen 2014). A legal representative is appointed for a few years; his role is mediating, coordinating and guaranteeing consent from its all-encompassing constituency with no linkage to party politics, more than actual governing. There are other authorities, as well as boards and commissions on e.g. school and health. Large parts of the adults are thus directly involved with local governance. Decisions are made at the community-meeting; the authorities are merely responsible of presenting issues and carrying out decisions. The leader can be a woman, but not often a young person.

Indigenous territorial jurisdictions normally include several communities. In legalization of the land, the regional or territorial government may adopt a structure that reflects the organization of the society in which it is embedded (McDaniel 2002). A general assembly with representatives from all communities makes the highest level of authority (Machicao et al. 2016; Martínez and Herrera 2016; Christoffersen 2014). Decisions that affect the commons, like sale of timber on a larger scale, agreements with external organizations, companies or government institutions, are taken here. The system has a built-in downward accountability, and a built-in inertia.

An executive, daily leadership of the territory is often appointed by the general assembly. While apparently mirroring occidental institutions, internally, they tend to be more fluid, with authority dispersed across the organization (McDaniel 2002). Indigenous leaders can experience high levels of stress because they sometimes are forced to make decisions without the opportunity to consult with 'the base', and sometimes fail to make decisions because of the inertia of the traditional decision-making system. There are often accusations against these individuals about corruption and 'own gain', sometimes for a reason, at other times not. The *deviants from the known procedures* may alone cause the suspicion (Christoffersen 2014). On top of this, they often have to work under high levels of insecurity regarding budgets since they rarely receive government support and must rely on support from their base and from NGOs. Offers from national governments to pay the salary of indigenous leaders have caused internal division in indigenous organizations because of insecurity with regards to (upwards) accountability, and such offers are likely to be turned down by the organizations.

Increasingly, younger indigenous people are trained to manage projects, business or resources in the interface with external organizations or governments, while authority still rests with the traditional system. This should always be recognized in the cooperation with indigenous peoples. Interventions require the free, prior and informed consent (FPIC) of the indigenous communities; this is not a new idea, but an example of a traditional procedure being institutionalized.

Apart from the socio-political organizations, there are bio-cultural institutions (benefit p) that influence NCB governance just as much.

s. Non-indigenous local people's resource governance

Rural communities can vary notably with regards to citizen composition, income levels, land ownership and occupations. Findings indicate that significant inequality has an impact on local environmental governance. When segments of a population feel disenfranchised or inferior to local elite, perhaps their employer, they will be reluctant to assert their influence, leaving power and control in the hands of a few. In this case, clear management goals and guidelines set by an outside authority may be an advantage (Ravnborg and Gómez 2015).

When situated in a Protected Area (PA), the outside authority may be a private organization since the environmental ministry tends to delegate management. That organization can be a local, a national or a big international NGO (see u), engaging local communities to different extents. Management can also be handled by the municipality. In both cases, the responsible environmental engineer can help countering inequalities by keeping up *checks and balances*, e.g. through joint inspections with the local co-management or user group. Examples of 'elite capture' are plenty; NGOs need to *thoroughly map local demographics* to ensure representation of all segments. Municipal delegates may also experience elite-capture, but contrary to NGOs they can be held accountable by citizens through elections.

Outside of PAs, the administrative structure of the responsible ministry is the authority. Decentralization of powers and duties within the lines of ministries can lead to an even stronger central concentration of power, which can have adverse effects on local forest users because the power and control move closer (Larson and Soto 2008; Ribot 2002). When well managed, the authority can gather interested parties and local representatives to council meetings where the parties can address issues of common interest/resources, thus making room for *joint decision-making and grievance opportunity*.

Non-indigenous peoples, however heterogeneous, are generally oriented towards the market and profess to the logic of private property. Governance may regard common resources, conservation or management and sale of products. Local common resource management *does* result in the conservation of ecosystems when meaningful powers follow (devolution), for a number of reasons: A direct say is more important to resource users than a democratic vote for a national level politician, and local resource management offers an opportunity to observe economic and biological cause-effect relations of management decisions, putting rural people in a better position to hold leaders accountable (Lund and Treue 2008). Further, concerns for the long term sustainability of the resources induce practices that lead to conservation (Borrini-Feyerabend 2003). An example is the concern for freshwater. Water supply arrangements are often multiscale, including ministry, private enterprises and local water committees; when the state fails to deliver, or prices and conditions become intolerable, local communities have proven that they can effectuate local freshwater management (Fabricant and Hicks 2013).

Some *basic principles* thus appear to be important for efficient, local governance: Institutions must adopt the principle of *downward accountability*, which means demanded, appointed and controlled from below (Ensor and Berger 2009). *Transparency*, such as auditing and access to accounts is mandatory, and the local community preferably holds the *formal management rights* (Lund and Treue 2008). At least, the development of local rules must be participatory; this has proven to promote stronger and more equitable land governance, by *clarifying processes at local level* and ensuring *broad involvement in decision-making* on land and resource issues (Richard et al. 2019). *Tenure security* will improve local adaptive capacity (Chhatre et al. 2012).

Social networks, understood as different stakeholders coming together to deal with natural resource problems and dilemmas, can be as important and in cases even more efficient than the existence of formal institutions for environmental governance (Bodina and Crona 2009). Creation of community committees for prevention and recovery from extreme events can start like this. Such *risk management* can include informing and preparing families, integrating with civil defense systems, and coordinating with regional and local governments and other communities to mobilize aid (Ensor and Berger 2009).

In the Mamoni valley (Panama), members of peasant communities identifying possible projects across the valley, quickly, perhaps from former experience, found that solid organization and good governance are crucial factors for success. They were also pointing to the importance of government support for enabling policies and environmental restrictions, the latter with the large cattle-ranches in mind (appendix 3).

A lot of research and experience with local resource governance derive from decentralized or community forest management, why this specific subject will have its own section below.

t. Community based forestry

Most forests in Latin America are owned by the states and forest concessions given to international corporations. Concessionaries tend to maximize short-term profit to reinvest outside of the country. The forests thus become sources of revenue for the national governments, with little local control over the impacts of this extractive model, which often leads to high environmental impacts and the marginalization of local people (Merino 2016; see also w).

This trend can change, and it is changing to some extent (Rights and Resources 2018). Empirical research demonstrates how local forest governance can be as, if not more, effective than centralized state-based regimes, and at lower costs. Successful experiences of community forestry have revealed positive synergies among forest management, livelihoods and conservation; also *maintenance and development of 'commonality'* based on social capital and local institutions has been found. These are key factors for protection of forest commons; *human resources and collective action are critical for resilience* (Sandbrook et al. 2010; Porter-Bolland et al. 2012; Bodina and Crona 2009). In Chiquitanía (Bolivia), the elaboration of forest management plans not only decreased deforestation, it also contributed to the improved organization of the communities (Machicao et al. 2016), for a while at least (see 'pilot area' p. 8).

Many national governments have implicitly recognized these findings in their pursuit of decentralized forest governance and in strengthening local rights and capacities to use and manage forests. However, such reforms can be politically resisted, particularly where the value of forest resources is high and central government bodies are able to capture the majority of benefits (Sandbrook et al. 2010).

In the Amazon region, examples of low or no payments, even debt-labor (ORPIO 2019), risky working conditions and environmental degradation have spurred projects of local forest management. Community forestry or co-management of forests has been promoted world-wide for similar reasons, and are well studied. *Decentralized forest management works when meaningful powers are devolved* to local communities (Lund and Treue 2008). This includes technical and administrative capacity building, as well as the downward accountability of local leaders, without which responsible management can fail.

Larger forest size, incorporation of local knowledge and greater rule-making autonomy at the local level are associated with both avoided degradation and livelihood benefits. When local communities own or otherwise get *exclusive rights*, they restrict their consumption of forest products (Chhatre and Agrawal 2009; Schlager and Ostrom 1992). A main concern in having a community forest is to secure the land for the coming generations, an opportunity that different schemes of local forest management and control have given to oust non-owners from illegally using the land (Nuesiri 2015). Moreover, decentralized forest taxation can finance public services (Lund and Treue 2008). A basic recommendation is thus that social objectives be put on equal footing with environmental requirements in decentralized forest management.

u. Protected Area governance

Protected Areas (PAs) can be governed by government, private actors, communities, or co-governed in any combination thereof (Canessa 2014; Borrini-Feyerabend et al. 2010). In Latin America, 80 % of PAs are indigenous owned and/or inhabited (Kronik and Verner; see also 1.2: 'Land-use...'). There is a strong association between indigenous peoples and nature conservation; the efficiency of their protection is increasingly recognized (Daniels 2003).

Co-management of PAs is on the increase. In the Peruvian Amazon, indigenous peoples rarely get exclusive rights to larger land tracts; on the contrary, they have experienced dislocations to clear large areas for conservation. Lessons from such conservation strategies have been critical: loss of control with illegal activities, near-extinction of specific fish and mammals, loss of livelihoods, violence and killings (Bodmer 2019). Today the strategy is abandoned in favor of co-management. Agreements exist between government agencies or private institutions and indigenous communities, *acknowledging common interests and negotiating and accepting trade-offs* in order to control the areas (Premauer and Berkes 2015). Among private actors are researchers and NGOs that have managed to create private forest and wild-life conservation areas in agreement with indigenous communities. The trade-off for the community is typically restrictions on specific agricultural activities and developments in return for exclusive hunting rights or employment, or benefits from tourism (Bodmer 2019; Maijuna community 2019). In addition to protecting environment and landscapes, these agreements are protecting livelihoods, and can sometimes empower weaker segments of the population. In Nicaragua, small-scale farmers struggled to have their area declared protected; they benefited from the formulation of the management plan which became the subject for negotiations between different segments of land users and owners (Ravnborg 2008).

International conservationist organizations often both finance and manage huge parks, with differences in the extent to which they engage local communities. Especially the large NGOs have been accused of neglecting indigenous peoples, whose land they are in the business to protect for big government and corporate money (Chapin 2004). Sometimes reforms financed by donors with their eagerness for quick results are pushed to hard (Hansen et al. 2009). Also smaller, foreign institutions manage land. In the Peruvian Andes, an American research NGO had the delegated responsibility to manage a buffer-zone to

the Manu national park and decided to fence the area to prevent the free roaming cattle from the neighboring community to enter. Not only did they fail to enter into dialog with the local people, they also failed to recognize that the biodiverse forest existed despite, or perhaps even because of, the cattle. The results have been discontent and unwanted overgrowths, yet they maintain their decision because cattle are ‘unnatural’ to the location (Waycecha 2019). Predominant occidental nature perceptions (see 2.3) and unequal power relations allow for exclusions.

v. Intergovernmental and international governance

Proximate causes of deforestation and forest degradation are mostly related to agricultural expansion and intensification, wood extraction or infrastructure extension. Stepping back and considering the *underlying causes* remind us of factors relating to the larger world-system, such as investments, taxation policies, technological and demographic factors, and production and consumption patterns. *Divestment* in sectors with adverse effects on climate change mitigation and adaptation is perhaps the single most effective way to limit emissions and vulnerabilities of people and nature. Finally, national governance defines the setting, application and enforcement of regime rules (Hansen et al. 2009). Ministries are not equally powerful; environmental ministries, when existing, usually have less power than the agricultural or finance ministries - just as the fact that a climate agreement does not have the same weight as a trade agreement.

Ratified conventions regarding natural and cultural protection are legal instruments that help law-makers adopt and implement national policies. Opportunities for governments to pursue synergies between NCBs and other national commitments to international agreements in the implementation and verification of activities exist; mapping out these can help develop national tools for identification and evaluation of NCBs (Kapos et al. 2007; Bastos et al. 2017). Such agreements are also instruments for local communities in their efforts to improve their conditions, and can enable counseling or provide grievance mechanisms in case of violations and conflicts. Indigenous peoples’ regional organisations, like the Coordinator of Indigenous Organizations of the Amazon River Basin (COICA) and the Consejo Indígena de Centro América (CICA), are established to strengthen and promote the rights, interests and wellbeing of indigenous peoples at international levels. Some conventions that are relevant to the promotion of forest NCBs, and which in turn can be supported through the provision of tools and strategies to integrate NCBs, are listed in appendix 5.

This project is an example of how the Article 2 of the Paris agreement of the UNFCCC inspire multiple governance actors to cooperate, and hopefully lifts the capacity of ministries to serve their purpose, while also giving local communities juridical leverage. They can, for example, call for the obligation of national governments to include civil society in the elaboration of Nationally Determined Contributions (see 1.2).

w. National level governance

National governments are key actors in the promotion of NBCs, and play a crucial role in this Euroclima+ project. Their responsibility includes the adoption, implementation and enforcement of supportive policies, inclusion of civil society, risk management, and compliance with and promotion of international conventions relevant for forest non carbon benefits.

Mutually supportive climate and land policies, and their implementation, have the potential to save resources, amplify social resilience, support ecological restoration, reduce exposure of human and natural systems to climate change, and foster engagement and collaboration between stakeholders (IPCC 2019).

Land policies include recognition of customary tenure, redistribution, decentralization/devolution, co-management, sustainable forest management, regulation of rental markets etc., and can provide both security and flexible response to climate change. Land policies that encourage the conversion of agricultural land to forest may generate additional environmental benefits besides climate change mitigation, such as reductions in agricultural externalities (Plantinga and Wu 2003). Land restoration and rehabilitation efforts can be more effective when policies *support local management of natural resources, while strengthening cooperation between actors and institutions* (see s, t, u, v), including at the international level (IPCC 2019).

Secure land tenure and land rights may be the single most important factor for sustainable management of forests and ecosystem protection (Dooley 2018), and thus the most important effort for national governments to perform. In the Americas, however, land subject to land titling and credits has been the clean land without trees, the ‘developed land’ (Wulf 2019; Postero 2007); historically, forests have been perceived as a hindrance for development, which was noted already by Humboldt during his American expedition around the year 1800. The understanding of forests as a socio-economic development opportunity is recent and still not widespread.

To prevent depletion of resources, collective and exclusive property rights to a well-defined group of people is an effective strategy that is well-documented (Schlager and Ostrom 1992; Chhatre and Agrawal 2009). It can reduce illegal logging and other illegal activities, especially when the government supports the enforcement. Contrary to this, unclear property rights can lead to overharvesting and unregulated land speculation (e.g. Parry et al. 2010).

Policies that enable and incentivize sustainable land management *for climate change adaptation and mitigation* include improved access to markets and financial services, enhancing local and community collective action, reforming subsidies and promoting an enabling trade system (IPCC 2019); *Citizen inclusion* is key in the identification of focus areas, the setting of goals, and implementation and monitoring of actions and policy instruments for climate change mitigation and adaptation. Obtaining local populations’ FPIC in activities or policies that will affect them is indispensable, and not a one-off activity, but a continuous, inclusive dialog between parties (Christoffersen 2014; Colchester 2010).

Other enabling policies include *dispute-resolution mechanisms* that span local, subnational and national levels, and have in place an institutional and legal framework to handle complaints and potential conflicts (Dunlop and Corbera 2016). *Access to basic state services* such as health, education and infrastructure is always vital for the sustainable and effective local community and thus its possible contribution to environmental protection (Rainey et al. 2003).

Policies to *manage risk* related to climate change may include weather and health insurance, social protection and adaptive safety-nets, contingent finance and reserve funds, access to early warning systems combined with contingency plans (IPCC 2019).

It remains to be emphasized that reforms may run against the interests of elites and powerful interest groups. Challenges are generally underestimated; there is an assumption of sufficient political will to guarantee the success of new projects, while identified policy failures of decades of reform attempts are ignored (Hansen et al. 2009). Also counter-acting development policies will complicate progress, e.g. the

support of 'conventional' rural development, such as extractive industry or large scale, mono-cultivation of crops, dependent on scarce water resources and fertilizer (Ensor and Berger 2009).

3. Analyzing empirical findings

Non carbon benefits are dynamic, and inherently context and site-specific; every place and stakeholder must make the identification and analysis. NCBs must strengthen the resilience of local communities and environments to face climate change, because adaptation takes place here. This takes strong institutions and control with land and resources, as well as the important relation between authorities, organizations and local governance systems: coproduction of benefits can offer development paths that differ from those otherwise offered to indigenous and other rural communities (Christoffersen 2018a; Williams 2004). Two empirical examples illustrate different challenges or approaches to meeting these ends, applying the framework like in the case of Brazil nut in Bolivia (section 1.5).

The NCB framework is useful for two different exercises: 1) to identify and analyze current benefits from activities, and how they may be optimized or amended, and 2) to identify and develop new activities.

Remembering the Brazil-nut example, indigenous and non-indigenous stakeholders, in cooperation with external organizations, take the point of departure in the business of Brazil nut to strengthen the relation to markets, but even more important, to improve local governance by increasing local control, resilience and adaptation activities. This includes communal and associative organization.

3.1 Must the Emberá people keep dancing?

Identification: In Emberá Ejua So, four out of five indigenous communities depend entirely on tourism, placing the activity thoroughly in the socio-economic circle. In performing traditional dances and rituals, and serving traditional food, the activity could overlap with the bio-cultural circle as well, this is discussed below. Tourism supposedly helps maintaining environmental benefits, and in this case it has, so far. The activity can thus be placed in the middle of the figure, within all three circles; but is it a sustainable model?

Governance: The organization of activities in the communities when tourists arrive is undertaken by committees consisting of the members of the community in question. However, tourism agencies based in Panama City have the required license to manage the business; this takes certain administrative, infrastructural and linguistic skills. The agencies decide which audience to target. They also tell the Emberá people how they should present themselves and their communities. As it is, the Emberá tend to represent themselves as historical objects, with a narrow focus on art performances. Dimitrios Theodossopoulos (2013) has written about the 'exotization' of the Emberá, and the wish of both tourists and Emberá to know/show the modern indigenous people instead of the reenactments of a past. Meanwhile, colonists enter and deforest the southwestern part of the territory, and the Emberá in their current livelihood strategy have so far had no means to efficiently stop this.

Activities: To maintain and enhance positive environmental effects, the Emberá have started several processes. First of all they seek legal, collective title to protect the land which also includes important headwaters for the Panama Canal and freshwater for the city. If they succeed, they have made a suggestion for peaceful coexistence with the colonists, by which they can stay and continue their own organizational system as long as they acknowledge the indigenous ownership and territorial authority and collaborate on

environmental restoration*. Pursuing the title and negotiating with the colonists, has already strengthened their governance structures. Secondly, they have realized that they are not obliged to live entirely from tourism, which they have been led to believe. They have thus started the identification of other ways that will enhance their control with the area while creating good livelihoods (see appendix 3). Finally, they have started the debate on how to change the prevailing tourism-concept; the business is good and they don't mind showing how they live. Performance of tradition is part of Embará life, but the complexities and challenges of modern indigenous life could easily be embraced in the model, disseminating the challenges they face, including with external pressures. They have a well-established scene to do that.

As in the Brazil nut case, the point of departure in an existing activity may be the first step in increasing local control. Expanding and diversifying activities would add to that. Bringing 'life changers' on educational expeditions along with Geoversity, communities from the Mamoni valley and the Guna people, would directly increase control with the land by patrolling remote areas when trekking, maintaining trails and monitoring the territories.

* Another example of negotiations between indigenous peoples and colonists: In Nicaragua, 70 % of the Indio-Maiz Biological Reserve is part of the territory administered by the autonomous Rama-Kriol Territorial Government, and home to indigenous Rama and Africa descendent Kriol people. Apart from the rights-holding group, there are a number of colonists who have lived in the territory for a long time. Instead of expelling them, an agreement to protect the land from new settlers or illegal activities through patrols has been negotiated. That way, usually conflicting parties have been 'nudged' into positive cooperation by common interests.

3.2 Female producers in Chiquitanía

Identification: The extraction of Copaiba oil and water is an income generating activity for Chiquitano women in three communities in the Monte Verde territory, and one in Lomerio. The oil has medicinal uses, processed and sold pure or as pomade, while the water has cosmetic values for hair and skin and is processed and sold as soap and shampoo. The activity is generating *socio-economic benefits*. It is also a product that has been used traditionally and knowledge about its potential and extraction technologies keep developing as the women experiment with the material; it is thus also maintaining and creating *bio-cultural values*. Finally, the copaiba is a timber species, and was formerly felled while the oil was mainly a bi-product. Extraction and processing its oil and water thus additionally has *environmental benefits*.

Governance: Except for the harvesting, the copaiba business is the women's; they own the oil. The husbands hand in the harvest to the women's associations where the directives administer the sales of the products. Their composition and regulations vary from one community to another, like the management skills and leadership abilities of the members; however, they are all functioning relatively well. This is considered to be because of the concrete focus of their reunions and the very tangible tasks of developing and promoting new products for sale. They organize and attend workshops to exchange experience; for this the NGO APCOB facilitates infrastructures. With regards to markets, they experience the same obstacles as many other NTFP organizations, mainly due to unclear legislative frameworks and uncertainty regarding responsibilities and authorities of institutions (Torre et al. 2011). So far, they mostly sell their products at a reasonable price in the informal markets in the nearby larger town, Concepción.

Activities: To maintain and enhance positive effects for livelihoods and resilience, the women prefer to process the oil and water themselves, even if the raw material may have a higher value if sold to the cosmetic or medicinal industry. It has generated an exceptional interest and dynamic, and the women are empowered by their independent activities and income. They challenge positions within the family and in the community, which naturally require sacrifices since they still are responsible for children and households; the support or resistance from husbands varies. However, the process strengthens the adaptive capacity of families and communities in the longer term.

Like in the other examples, local marketing and control with a resource enhance governance capacities and negotiation positions for the group in charge, here the women. More than the economic values, which of course are central, the NCBs serve to maintain and secure local control with land and resources.

4. The importance of indigenous peoples' lands to ecosystem stability

Indigenous peoples in Latin America are well placed to contribute towards the crafting of effective and resilient responses to climate change. The allocation of land to indigenous groups has given them exceptional legal authority, albeit not necessarily the power, to prevent environmental degradation caused by internal as well as external parties. Indigenous peoples in collective territories manage landscapes, not patches of land like smallholders, or timber concessions like companies or community user-groups. The diversified strategies maintain diverse landscapes, reflecting the multiple uses of forest resources. There is evidence that forests and eco-systems inhabited by indigenous and other forest-dwelling peoples with clear tenure rights coincide with high levels of biodiversity and experience less deforestation and degradation than other areas, whether protected or not (Nakashima et al. 2012; Kronik and Verner 2010; Daniels 2003; Hvalkof 2006; Dooley 2018; Nolte et al. 2013). The management under collective control suits conservation objectives well and makes partnership with indigenous peoples in protection of biodiversity and large, coherent eco-systems interesting.

The young indigenous investigators in Panama found some basic reasons for forest and nature conservation in indigenous territories: 1) the ancestral land, origin of the people; 2) future generation heritage; 3) spirituality, communal conservation areas (Martínez and Herrera 2016). This verifies that the greatest concern of indigenous peoples is their social situation (Kronik and Verner 2010), which is tied to their lives in a specific territory. The land and its resources are the foundation upon which they intend to rebuild their economies and so improve the socioeconomic circumstance of individuals, families, communities, and peoples (Anderson et al. 2006). This is threatened, by climate change, advancing colonization, political unrest, forest destruction and excessive resource exploitation.

Activities that maintain or create NCB's will enhance resilience of indigenous peoples and the eco-systems they depend on. Governance and ability (means and power) to access political decision-making and markets are essential prerequisites for the stability of forest generated benefits. When well-functioning, the supra-communal construction, *the indigenous territory or region*, constitutes a robust unit with regards to sustainable land and resource governance. The collective management of common resources prevents their depletion by 'entrepreneurial' individuals through rules and social control, and prevents radical and rapid land-use changes due to lengthy decision-making procedures.

A common assumption, supported by studies, has been that indigenous people's relation with the environment becomes more destructive as they integrate to the market (Reyes-García 2001). Studies also show that indigenous peoples' integration with market economies reduces the nutritional variability of their diets (Godoy et al. 2005). The debate remains open, however, since other studies indicate that changes in livelihood, induced by integration into the market system, do not necessarily affect health or increase resource depletion in the long run (Reyes-García 2001; Schlager and Ostrom 1992; Godoy et al. 2005). It seems that indigenous peoples do not resist modernization efforts or development institutions (Vincent 2004), but rather turn them to their own purposes. Rather than defending something existing, they actually produce new places (Christoffersen 2018a). Indigenous practices have always been dynamic, adopting new crops, skills and techniques, adapting to changing environments and developing through interactions with external actors. The ability to continuously incorporate the new in existing traditions and practices has built resilience in the face of environmental change and variation, and of shocks and stresses to livelihoods imposed by externally imposed politics and systems. Trade and barter has always been part of indigenous livelihoods (Bebbington 2000; Christoffersen 2018b), destruction foremost relate to extractive activities and the far more recent inclusion of remote forests as large scale production sites (Cunha and Almeida 2000).

Paradoxically, indigenous peoples despite their vulnerable position vis-à-vis climate change, may thus be the most capable to respond to changing environments through the maintenance of variability and multiple livelihood options. This is a message to (keep on to) promote in global discussions and agreements.

5. Monitoring, report and verification (MRV) of NCBs.

MRV is an integral part of governance and thus of any non carbon benefit activity. MRV of NCBs therefore has the potential to combine all aspects of the framework. The development of a MRV methodology for NCBs is a subsequent objective of this Euroclima+ project; this section offers initial reflections on important requirements that will promote good MRV for NCBs. Upward accountability, quantitative methods, exclusion and disregard for local monitoring potential appear to be major concerns (see also Shkaruba et al. 2016); the reflections therefore revolve around these themes.

The section then presents some existing monitoring frameworks in this or related areas, with a specific focus on the Forest Stewardship Council® Ecosystem Services Procedure, which provide indicators for key attributes related to environmental benefits. Shared monitoring and harmonization of reporting to different international agreements (appendix 5) is a recommendation to reduce the costs of documentation, while increasing the profile of the NCBs (UNEP-WCMC 2007). More importantly, this will allow for a comparative matrix that illustrates how the NCB elements are linked to different international standard instruments, which will enable stakeholders, not least indigenous peoples and local communities, to back up initiatives for NCB activities or make claims of lack of implementation of such activities with legally binding instruments ratified by Nation States, or alternatively, incorporated in private certification or corporate social responsibility (CSR) frameworks. Such matrix could be part of the tool. Exiting MRV can also provide important inspiration for how to create a monitoring framework that spans different scales.

Useful and relevant criteria and indicators can be pieced together from the reviewed MRV frameworks; Appendix 8 gives examples of where to seek inspiration. What remains is the methodology by which to

collect and treat data. FAO and indigenous navigator present methods promoting different degrees of local participation or execution of the process at the local level (the former more top-down). As pointed to in the reflections below, the involvement and local control with MRV is central to governance of NCBs.

5.1 Important requirements for a NCB monitoring framework

Accountability: According to our framework, the activities and efforts to maintain, enhance or create NCBs, whether bio-cultural, socio-economic or environmental, must always consider governance and accountability mechanisms at all levels and contribute to climate change mitigation or adaptation. Working towards these ends is a process, not always easily verified. A main reason for measuring effects of efforts is accountability. There is a tendency, logical however, that the top-down planning and funding entail upward accountability. The increasing amount of donor requirements not only burden partners and beneficiaries in recipient countries, it influences the level of local participation and engagement with project purpose and design, and eats up most of the funding available because the upward accountability requires professionals and sometimes research for verification. This becomes decisive for the type projects engaged with (McDaniel 2002; Cornwall and Brock 2005). Outcomes must be directly measurable, which inevitably shape the project-designs, in this case the MRV, and the methods used in the field.

Local concern and control over land and resources, as it has been found, provide ecosystem protection. The section 2.4 provides a review of effective governance solutions; they all include considerable local influence. MRV can add to the efficient governance by directing accountability downwards, towards the impacted communities. This is at the heart of the NCB purpose, and it requires transfer of real power and responsibility. It also requires acceptance of indicators based more on process and performance (Wong et al. 2016) than on measurable outcomes, or the simple ticking off 'consultations conducted' or 'strategy approved' by 'x number of participants'. When embedded within international agreements, however, MRV must stay loyal to terms. This implies thorough explanation of every single term within the monitoring framework.

Community monitoring: It was found that robust organization, resilience and governance develops in parallel with inclusion, responsibility and local control with resources. The logical consequence of this is to integrate communities in MRV. Reviews find that community monitoring is cost-effective and meets the highest standards (Larrazábal et al. 2012; Torres 2014; Brofeldt et al. 2018; Tomasini and Theilade 2019; Hvalkof and Krøijer 2013). Communities can assess above ground biomass, as well as monitor management, social and environmental variables. They can collect large amounts of data, regardless of gender or age, and store and transmit the data. The use of smartphones for data collection has opened up new opportunities for communities wishing to engage in community-based monitoring. The findings suggest that local communities with little formal education are able to monitor both forest crimes and forest resources.

Monitoring crimes can be dangerous; governments must recognize the rights of their citizens and ensure that forest communities feel the benefits and protection of international agreements on human rights and sustainable resource management. Partnerships between communities and public bodies and authorities can find ways to use data collected and shared by communities to support law enforcement, while minimizing risks to local people. In this way, community rights and environmental stability can be safeguarded.

Community monitoring has an empowering effect in itself (Indigenous Navigator 2014). Data that strengthens the local knowledge base for resource protection and community development is as relevant

for the community to access, as it is for the state. Communities, who apply the tools to generate data on the NCB potential they possess, get better equipped to enter into dialogue with duty-bearers and external stakeholders about the promotion of them. They will develop a higher level of awareness of their opportunities and rights through the data generation process.

Initiatives of indigenous peoples and local communities to focus on Community Based Monitoring and Information Systems (CBMIS) have shown the relevance of local monitoring to track status and trends of biodiversity and community well-being, and to protect communities and the resources on which they depend from unwanted external pressures and potentially unsustainable activities. However, despite increasing interest and appreciation at national and international levels, there is still a gap between governments and research institutions developing and implementing plans and reporting frameworks, and the activities of communities (Ferrari et al. 2015). Bridging that gap is a main objective of this NCB project.

A fairer dialogue between different knowledge systems: The extent to which communities participate in MRV on a continuum from observing to autonomously implementing it depends on a wide range of conditions, such as citizen composition, community cohesion, culture, interest and abilities. In a stratified community with high levels of inequality, the joint inspections with an external authority and meaningful participation through representatives from all segments may be the best procedure, and clear outputs, indicators, and benefit sharing mechanism can help giving voice to the vulnerable in case of elite violations.

With culturally different, but more homogeneous communities, the approach must be more careful. The MRV provides the chance for including other knowledge systems and views on forests, which in itself is a goal. There is, however, a danger of co-opting local knowledge and experiences into the standards and monitoring systems merely strategically as an instrument for delivering robust results *without* understanding knowledge as a dynamic production system (Gavin et al. 2015). The rights and livelihoods of forest dependent groups are insufficiently reflected in most framing standards, as well as the acceptance of non-scientific validation schemes and specific indigenous ways of producing knowledge or practicing (Plantinga and Wu 2003).

The Indigenous Peoples' Partnership on Forests and Climate Change (IPPFCC) argue that the persistent use of indigenous knowledge and customary governance are the reasons that most remaining intact tropical forests are found in indigenous peoples' territories, which authorizes them to work on a community based monitoring and information system (Riamit and Tauli-Corpuz 2011). They must develop strategies and standards based on indigenous knowledge systems that are convincing to 'outsiders', not only to themselves (Plantinga and Wu 2003). They must be careful not to fall into the same trap, co-opting the MRV- lingo, and instead provide spaces for dialog between different knowledge systems where discourses can be challenged without running the risk of romanticizing traditional knowledge.

When asking indigenous persons directly about non-human or reciprocal nature relations, they may deny their existence, but through participant observation, when working in the field, fishing or hunting, behaviors will reveal how they constantly give attention to them anyway. Changes are perceived and registered by means that may be incomprehensible to the occidental observer. Although often present, autonomous local monitoring systems are frequently ignored by externally driven community-based or participatory conservation projects; indigenous peoples adopt a variety of socio-economic, management, ecological and environmental indicators to assess wild resources (Tomasini and Theilade 2019). Indigenous

based MRV, trusting the argument of the IPPFCC, must ask questions that do not necessarily require 'verifiable' data, as generally understood, for its answer. The use of indigenous investigators as knowledge holders, mentioned through-out this report, is a method to respectfully bridge knowledge systems. CBMIS or collective data collection as used in the Indigenous Navigator (below) is another way whereby local indicators can be developed and prioritized.

5.2 Existing MRV schemes

The UNFCCC Secretariat, in advance of SBSTA 40, published a compilation of ten submissions by parties on methodological issues related to non carbon benefits resulting from the implementation of REDD+ activities. None of the submissions propose a methodological framework in any detail; there appears to be an agreement that NCBs should be determined and incentivized nationally and that countries should develop their own MRVs. Existing MRV schemes provide inspiration for that, or could constitute part of a national NCB monitoring framework. This section presents some MRV tools and frameworks of potential interest in the subsequent development of a NCB MRV framework to be tested in the pilot areas.

The Indigenous Navigator (2014) is a rights-based framework and set of tools for indigenous peoples to monitor the level of recognition and implementation of their rights systematically. It provides various aspects of interest for the development of a NCB monitoring framework, and some of the indicators and data-collection methods could be readily used in the NCB context. Data gathering happens by use of two questionnaires, one for the national level looking at laws, policies and programs, and one for community level, designed for collective assessments on the ground. Like the coming NCB MRV tool, the indigenous navigator serves to assess performance on different scales and offers a platform for dialog between indigenous communities and organizations, other rural communities, duty bearers, NGOs, the private sector and other interested parties. The indicators framework comprises *structural indicators*, which assess the legal and policy framework of a given country; *process indicators*, measuring the states' ongoing implementation efforts through programs, budget allocations etc.; and *outcome indicators*, which capture the actual enjoyment of human rights by indigenous peoples. At the local level, data-collection is always collective, and pilot-tests found that community groups could fill out answers to the headline indicators in 20 minutes. The form is a mix of fixed responses and room for comments and indication of own indicators. <http://nav.indigenousnavigator.com/index.php/en/>

The Rainforest Standard (RST) (2012) is developed by Colombia University in New York in collaboration with private environmental funds from Latin America and was launched at Rio+20 in 2018. It offers mechanisms for carbon accounting, but also for *socio-cultural and socio-economic* impacts as well as *biodiversity* outcomes of project activities. These components are integrated in the standard with credits dependent on compliance, and frequent monitoring over the lifetime of a project. The standard organizes requirements and protocols into five subject sections: Initial conditions; socio-cultural and socio-economic requirements; biodiversity considerations; emission reduction considerations and administrative operations. *Socio-cultural and socio-economic requirements include* identification and relation to de facto rightsholders; disclosures, transparency and FPIC, and sustainable quality of life benefits referring to the maintenance or augment of the quality of socio-economic or socio-cultural domains of the rightsholders. It provides detailed measurement and monitoring requirements, methods and verification conditions for each subject. <https://cees.columbia.edu/the-rainforest-standard>

The UNESCO Culture for Development Indicators (2014) provides a number of interesting indicators for the NCB context, especially for bio-cultural MRV. It also includes a *governance* dimension that provides components for the construction of a civil society participation indicator. The Heritage dimension includes *Intangible Cultural Heritage* covering the domains of a) *oral traditions and expressions*, including language as a vehicle of the intangible cultural heritage, b) *performing arts*, c) *social practices, rituals and festive events*, d) *knowledge and practices concerning nature and the universe*, and e) *traditional craftsmanship*. It provides working definitions that help identify cultural and natural heritage as well as their combination, and inspire their heritage management plan. A weighted checklist for the Heritage dimension can inspire NCB indicators. https://en.unesco.org/creativity/sites/creativity/files/digital-library/CDIS%20Methodology%20Manual_0.pdf

The Food and Agriculture Organization of the UN (FAO) framework to assess the extent and effectiveness of community-based forestry (2019) developed criteria and indicators generic enough to allow for comparability among countries and regions, obtained largely from existing government sources, project databases or scientific and technical literature. Where the quantitative data required by the indicators must be replaced by qualitative data, literature review and expert analysis is suggested. This top-down approach, however, is somehow mitigated by the process for conducting the assessment, which includes field-level data collection with focus group discussions, and participatory and validating work-shops involving a broad representation of stakeholders. The framework, among other indicators relevant for NCBs, assesses the institutionalization of community-based forestry in both government and civil society, which is central to this Euroclima+ project. <http://www.fao.org/3/ca4987en/CA4987EN.pdf>

The Forest Carbon Partnership Facility (FCPF) Carbon Fund's Methodological Framework (2013) includes a set of criteria and indicators that guide countries to develop and implement Emission Reduction (ER) programs for the Carbon Fund. The ER programs are aimed to protect tropical forests and enhance the livelihoods of local communities. One aspect is *safeguards*; it is *required* that programs meet the World Bank (WB) operational policies and procedures, and *encouraged* that they support and promote the UNFCCC (Cancun) safeguards. WB policies and procedures relevant for NCBs cover environmental (esp. OPs 4.01, 4.04, 4.36, 4.11), social (OPs 4.10, 4.12) and legal (esp. OP 7.60) safeguards. The countries must undertake a Strategic Environmental and Social Assessment (SESA) and develop a corresponding Environmental and Social Management Framework (ESMF). The program must provide information on how the WB safeguards are complied with, or how the Cancun safeguards are addressed and respected. The Carbon Fund also requires that a Feedback and Grievance Redress Mechanism (FGRM) is in place. For countries implementing Carbon Fund programs, there is thus an established platform for identifying NCBs and review MRVs already in use. Moreover, the program design requires identification of drivers of deforestation, and a proposal to address them, as well as a benefit sharing plan. NCBs must also be identified, prioritized and generated or enhanced, but there is no prescribed methodology for measuring or reporting priority NCBs. https://www.forestcarbonpartnership.org/system/files/documents/FCPF%20Carbon%20Fund%20Methodological%20Framework%20revised%202016_1.pdf

The Green Climate Fund (GCF) is the largest dedicated fund to support the achievement of the Paris Agreement. The Fund needs to assess the actual mitigation and adaptation impact of its investments, but has been criticized for lacking sufficient MRV guidance for reporting during implementation (Echeverri et al.

2018). The GCFs *Mitigation and Adaptation Performance Measurement Frameworks (PMF)* include indicators by which context-specific environmental, social and economic co-benefits of carbon related activities can be identified on a project or program case-by-case basis. While many indicators are NCB relevant, the methodological approach is quantitative and technical, and requires specialist assistance. The GCF refers to eight Performance Standards: environmental and social safeguards with the aim to avoid harm. [https://www.greenclimate.fund/documents/20182/239759/5.3 -
Performance Measurement Frameworks PMF .pdf/60941cef-7c87-475f-809e-4ebf1acbb3f4](https://www.greenclimate.fund/documents/20182/239759/5.3_-_Performance_Measurement_Frameworks_PMF.pdf/60941cef-7c87-475f-809e-4ebf1acbb3f4)

The REDD+ Social and Environmental Standards (REDD+ SES 2012) initiative provide a framework of national level (or sub-national level) standards aiming to build support for a higher level of social and environmental performance in REDD+ programs. It includes NCB elements found in our list, especially related to governance and environment. International standards are meant to be adapted to the national context in order to give guidance for REDD+ program design and for monitoring and reporting on performance (Hvalkof and Krøijer 2013; REDD+SES 2012) https://www.redd-standards.org/index.php?option=com_content&view=article&id=96:guidelines-for-the-use-of-redd-ses-at-country-level&catid=25,55:documents&Itemid=161. The SES may constitute a platform for indigenous and local communities to articulate their NCB priorities. However, the indigenous peoples of the Amazon, represented by COICA, have built an *indigenous REDD+ mechanism* based on alternative approaches, principles and strategies, based on the integrity of ecosystem services of forests and indigenous territories. It embraces a number of NCBs of which indigenous land tenure and territorial rights are central (Hvalkof and Krøijer 2013), but mostly constitutes a political statement, and advice for communities facing REDD-activities, http://theredddesk.org/sites/default/files/resources/pdf/coica_indigenous_redd.pdf

Community-based monitoring and information systems (CBMIS) refer to initiatives by indigenous peoples and local communities to monitor their well-being and state of their land and natural resources, applying a bundle of traditional knowledge and innovative tools and approaches. In the context of the Convention on Biological Diversity (CBD), a network of indigenous and local communities have monitored the health of biodiversity, climate change impacts, effects of illegal and unsustainable activities and the implementation of international agreements at the national or local level in countries all over the world (Ferrari et al. 2015). Operational indicators include trends in land-use change and land tenure, the practice of traditional occupations, respect for traditional knowledge and practices, and linguistic diversity (Secretariat of the CBD 2016). <https://www.cbd.int/traditional/presentations/africa-cbmis-2016-js.pdf>

The Most Significant Change (MSC) technique is a bottom up participatory monitoring and evaluation approach that involves generating and analyzing personal accounts of change, which could be e.g. practice change or empowerment, then deciding which of these accounts is the most significant – and why. Rather than relying on an overly simplified picture, but based on a large number of subjective perceptions, MSC can deliver a rich picture of what is happening of most importance according to the point of view of the majority of social actors in terms of effects, which is paramount for continuous learning. By identifying processes and causal mechanisms, it is helpful in explaining how change comes about and in what situations and contexts. MSC can be used to link local levels with regional and national levels through the repeated selection of stories in a hierarchical system. MSC reduce the amount of data otherwise accumulated at mega level, like within national level climate change focal points, but may work best in combination with other scientifically acknowledged MRV approaches, creating thereby a comprehensive

monitoring, learning and evaluation framework (Davies and Dart 2005) <https://www.mande.co.uk/wp-content/uploads/2005/MSCGuide.pdf>

The UN Economic Commission for Africa, in a report on non-carbon benefits of REDD+ (Katerere et al. 2015), suggests a (very) wide range of potential indicators and monitoring and data-collection methods for NCBs, more specifically in the categories: Improved economic and livelihood conditions; Improved forest governance; Ecosystem services provision; and Climate change adaptation.

The FSC Ecosystem Services Procedure: Impact Demonstration and Market Tools (FSC-PRO-30-006) *The Forest Stewardship Council (FSC) Forest Management Standards* (2015) require forest managers to maintain, enhance or restore ecosystem services and environmental values (Principle 6) and apply precautionary approaches to high conservation values (HCVs), through engagement with affected stakeholders (Principle 9). The HCVs include both environmental and cultural values, critical ecosystem services and community needs. The Standards also require the managers of FSC-certified forests to identify, produce, or enable the production of diversified benefits and/or products based on the range of resources and ecosystem services existing in the management unit (Principle 5). <https://ca.fsc.org/preview.fsc-std-60-004-international-generic-indicators.a-1011.pdf>

The FSC Ecosystem Services Procedure (ESP) (2018) can only be applied by FSC certified forest managers, who already comply with FSC Principles and Criteria. It offers a framework for verifying impacts and approving FSC ecosystem services claims with the objective to increase the value of a forest to the certificate holder e.g. by gaining access to ecosystem services markets. It sets out the requirements for FSC-certified forest managers to demonstrate the impact of their activities on the maintenance, conservation, restoration or enhancement of ecosystem services. <https://fsc.org/sites/fsc.org/files/2019-05/FSC-GUI-30-006.pdf>

The FSC ESP refers to five types of ecosystem services, aka *impacts*: 1) carbon sequestration and storage, 2) biodiversity conservation, 3) watershed services, 4) soil conservation, 5) recreational services. The five impacts *correspond well* with the environmental benefits in the NCB framework of this study, except that the NCB framework include an additional benefit (j), damage mitigation, which is not explicitly covered by the procedure, but included in the FSC Principles and Criteria.

The main concern about the procedure is that is based entirely on quantitative measures of outputs, with a strong belief in the objective and the replicable scientific measurement. This is both expensive, time consuming and excluding. While referring to the culturally appropriate engagement with indigenous peoples and local communities, the procedure does not incentivize local participation with its technical approach, leaving *governance* as a neglected effort, which is a major deficiency according to the NCB definition and operational framework of this study.

The ESP provides reference on how to identify and engage stakeholders of the ecosystem services, but not on how to identify rightsholders, although there are references to Principles 3 and 4, that set out the requirements for the relationship with indigenous peoples and local communities respectively. The FSC has developed a guideline on the implementation of Free, Prior and Informed Consent, specific to the implementation of FSC Forest Management Standards. This could be useful in the development of a more participatory approach.

As an effort of spreading the scheme and allow small-scale and community producers in the south to benefit from certification of their forest products, a thorough analysis has been made on *Alternatives to facilitate FSC certification for Community Forestry Operations* (Fraisie 2018). That report provides inspiration for a more inclusive approach, suggesting a community self-assessment system and the facilitation of useful technologies to apply at the local level. <https://ga2017.fsc.org/wp-content/uploads/2017/10/Alternatives-in-FSC-certification-for-Communities-23Dic16.pdf>

The FSC as a whole, with its development of National Standards, Principles and Criteria and its tools in form of procedures and guidelines, cover many NCBs. The challenge is the MRV methodology, which needs to address the important requirements for well-governed NCBs, more specifically questions of accountability and the inclusion of communities and possible different knowledge systems. The ESP itself has the potential to target more NCBs through the effective inclusion of local people in the choice, implementation, monitoring and verification of efforts. PES or training and hiring local people to MRV are socio-economic benefits that would simultaneously educate and empower local communities or individuals through knowledge exchange. Using qualitative methods would encourage the inclusion of local knowledge about social, cultural and biodiversity conditions, impacts and change, and thus also target bio-cultural benefits.

To sum up, while several of the mentioned existing MRV schemes contribute with indicators relevant for the development of a MRV tool, less of them seem sufficiently elaborate to apply, or even more important, they tend to be top down and quantitatively and technically based, and thus less appropriate in the context of NCBs. Since governance is an inherent part of the NCB model, and downward accountability and community involvement are decisive parts of sustainable NCB governance, the schemes that methodologically target that purpose could form the starting point. Based on the rapid review, these are the Indigenous Navigator, parts of the FAO CBF framework, CBMIS, Most Significant Change and the FSC community certification tool. To evaluate the national policy and performance level, the Indigenous Navigator again provides tools, as well as UNESCO, the FCPF Carbon Fund's Methodological Framework and REDD+ SES. Finally a Community Based REDD+ (CBR+) is being drafted and tested, which includes ideas for governance and dialogue platforms and knowledge streams; it has the objective that communities implement and monitor REDD+ activities, but offers no advanced methodological guidelines yet; it may still be worth browsing results from the pilot countries <https://www.unredd.net/documents.html?view=browse&customtags=180&startdate=&enddate=&dmlang>

6. Concluding remarks

Non carbon benefits have been defined as the positive effects of human activities that, although not necessarily coupled to carbon sequestration, contribute to climate change mitigation or adaptation. Governance is an inherent part of the framework, included in every activity. We have seen how NCBs can improve livelihoods, sustainable conservation management of forests and their biodiversity, and how organization and governance determine the extent to which benefits reach all segments of the community and return control to the local level. Good governance takes various shapes depending on demographics, culture and the benefits from local perspectives and valuation, and thus also the appropriate way to intervene as external organization or government. The connection to external institutions and the embedding of activities in society, supporting effective local governance, is determining the successful outcome of local NCB activities.

When interacting with homogeneous communities, that also have well established governance systems such as indigenous governance institutions, recognition, respect and collaboration rather than consensus should guide relations to reduce reproduction of power in exchange of ideas and decision-making. In stratified communities, however, joint or participatory development of management plans, and audits monitored by an external authority, can be the best way to strengthen security for poor or weaker segments, as well as for the robustness of the climate change mitigation and adaptation efforts. This requires capacity in government or private institutions.

The return of control to the local level does not happen without conflicts and tensions. It is vital to observe power relations, not only within the group of beneficiaries, but also in the larger context. The more valuable the resource, the more powerful internal and external actors will aim to control its development and use. Recognizing and protecting tenure rights of indigenous peoples and local communities is therefore vital. Challenging modes of unsustainable production, trade, fortress conservation, organization and ownership promote real changes and effective participation (Williams 2004), but are also inherently risky to the beneficiaries and their allies because of continuing vested interest of the more powerful groups.

It is critical to keep in mind the larger coloniality inherent in the commodity consensus and the fact that the spatial pressure on ecosystems is very much determined by the overconsumption in the global north and other growth regions. This must be stressed in international fora when presenting the NCB framework; without efforts to change those patterns, NCBs and other protective efforts in the global south will not succeed. Communicating correlations and causal effects to citizens and consumers is paramount.

Rights-based safeguards developed at international levels are still absolutely essential, and advocacy with references to international agreements is part of the efforts to institutionalize NCBs. NCBs offer the additional opportunity to focus on common interests, working with ministries and other environmental authorities. The participation of environmental ministries and community representatives facilitates the direct communication between community and government that hopefully results in a common vision of how to work in favor of the NCBs in practice, and how governments can incentivize NCB activities governed by local institutions of indigenous peoples and local communities. Increased clarity around tenure and resource rights, participation and transparency in land use decision making could become NCB activities' processes and outcomes.

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Appendices

Appendix 1. Consulted persons

Arteaga B, Luis. ACEAA - Conservación Amazónica. Director Técnico/Technical manager. Coordinator of BBE EUROCLIMA+, systematization of experience of economic initiatives based on forest products, Peru/ Bolivia

Barahona, Zulema. APCOB, Santa Cruz, Bolivia. Coordinador del proyecto EUROCLIMA+ en Bolivia.

Camacho, Edwin. APCOB, Santa Cruz, Bolivia. Coordinador general del proyecto EUROCLIMA+

Carling, Joan. Co-convener of the Indigenous Peoples Major Group (IPMG) for Sustainable Development

Corro, Dr. Victor. MiAmbiente. Environmental Ministry of Panama.

Dogirama, Brenio. Panama. Regional Fiscal Emberá.

Eke, Janja. FSC International Nicaragua, Project Coordinator Latin America

Feiring, Birgitte. Head of Department at The Danish Institute for Human Rights (DIHR)

Gervassi, Pina. FSC International, Perú. Climate Change Director.

Herrera, Heraclio. Panama. Coordinator of the project 'Clima y Juventud' in Panama.

Munk Ravnborg, Helle. Senior Researcher, Danish Institute for International Studies (DIIS)

Kanstrup, Jens Holm. Forests of the World, Copenhagen, Denmark. Technical Advisor.

Ketteler, Alison Von. FSC International, Bonn, Germany. Manager, Ecosystem Services Program.

Kjærby, Claus. Geoversity, City of knowledge, Panama City/ Mamoni Valley Preserve. Chief Operating Officer, Coordinator of the EUROCLIMA+ in Panama

Kronik, Jakob. Forests of the World, Copenhagen, Denmark. Director of International Cooperation

López, Heraclio. Geoversity, City of knowledge, Panama City. Philosopher, researcher, mediator, specialist in indigenous peoples' development and collective human rights.

Mecha Ruíz, Heliodoro. Panama. Former Regional Cacique Emberá (process of land titling of Ejua So)

Patiño, Patricia. APCOB, Santa Cruz, Bolivia. Administrator of the EUROCLIMA+ project

Rodríguez, Eric. Engineer. MiAmbiente, Environmental Ministry of Panama.

Tócamo, Neldo. Panama. Former Regional Cacique Emberá

Zarco, Antonio. Panama. Regional Cacique Embará

Appendix 2: Program in Panama

Fecha	Lugar, hora y participantes	Actividad
9/9	Geoversity , Ciudad del Saber, 13.00 – 16/17.00: Claus Kjaerby; Heraclio Lopez; Heraclio Herrera; Adolfo (coordinador Geoversity); Heliodoro Mecha Ruíz (titulo?)	Presentación del proyecto EUROCLIMA+ y el concepto BNRC. Aportes para el estudio y la para la metodología de trabajo de campo.
10/9	1. Geoversity , Ciudad del Saber, 10.00 – 11.30 Heraclio Lopez; Antonio Zarco (cacique regional Emberá); Neldo Tócamo (ex-cacique regional Emberá); Brenio Dogirama' (fiscal regional Emberá). 2. Geoversity , tarde Claus Kjaerby Tema: Preparación para reunión con MiAmbiente	1. FPIC de las autoridades regionales Emberá, planificación de la visita en el territorio Emberá Ejua So y presupuesto. 2. Agenda y preparación para la reunión en el Ministerio de Ambiente (MiAmbiente)
11/9	1. MiAmbiente , Albrook, 9.30-11.00 Claus Kjaerby, Dr. Victor Corro, Ingeniero Eric Rodríguez. 2. Geoversity , Ciudad del Saber 13.00-17.00 Heraclio Lopez.	1. Presentación del proyecto y la consultoría. Presentación del concepto BNRC con ejemplos. Aportes del ministerio al proyecto y el estudio. 2. Preparación del taller en La Bonga, territorio Emberá Ejua So.
12/9	Geoversity , Ciudad del Saber Heraclio Lopez	Preparación del taller en La Bonga, territorio Emberá Ejua So.
13/9	Viaje a La Bonga , Ejua So, 10.00 – 17.00 La Bonga , Ejua So, 19.30 – 21 Heraclio Lopez, jóvenes y autoridades Embará	Inicio del taller, véase apéndice x.
14/9	La Bonga , Ejua So, 8.00-12.00 y 13.00-16.00	Taller con jóvenes Embará. Véase apéndice x.
15/9	La Bonga , Ejua So, 8.00-11.30	Presentación de resultados para autoridades y comuneros. Elección de representante, véase apéndice x.
16/9	Geoversity , Ciudad del Saber Claus Kjaerby	Preparación del taller en Mamóní.
17/9	Viaje a Mamóní , 06.30 – 10.30 Centro de Mamóní , 13.00-17.30	Tour de la propiedad, viendo las construcciones de bambú y otros proyectos tipo BNRC. Taller con campesinos. Véase apéndice x.
18/9	Viaje a Ciudad del Saber, 10.00-13.00 1. Geoversity , Ciudad del Saber, 14.00-16.00 Claus Kjaerby 2. Ciudad de Panamá , 18.30-20.00 R Heraclio Herrera,	1. Reunión de clausura con el coordinador del proyecto en Panamá, Claus Kjaerby. 2. Reunión con el coordinador de proyecto anterior 'Clima y Juventud', Heraclio Herrera, sobre metodología de los jóvenes investigadores
19/9	18.55 Viaje a Dinamarca.	

Appendix 3: Workshops in Panama, September 9-19, 2019.

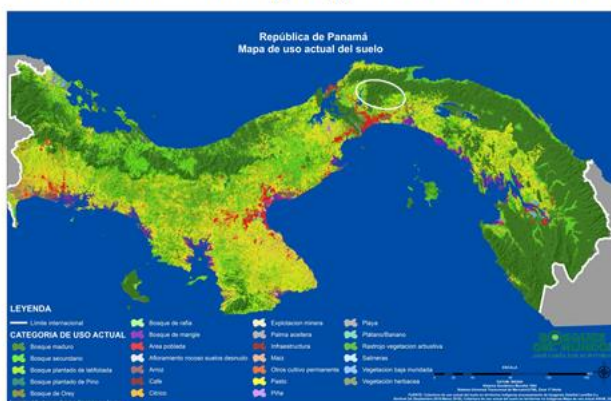
Introducción

Este informe describe tres talleres realizados durante mi trabajo de campo en Panamá: Uno con jóvenes del pueblo Emberá, otro con campesinos del valle Mamoní (fig. 1), y el tercero con el Ministerio de Ambiente. El informe da una visión general del contenido y el método utilizado en los talleres, tanto como los aportes que fueron el resultado de las reflexiones de los participantes. Las más importantes conclusiones derivado de estas se incluirán en el informe principal. Espero un borrador listo en inglés a mediados de octubre.

El objetivo de mi estudio es recopilar, analizar y sistematizar experiencias y prácticas tipo beneficios no relacionadas con el carbono (BNRC) y validar y priorizar los temas en una lista bruto con comunidades seleccionadas. La primera tarea ha sido definir el concepto, para ayudar la identificación de los BNRC y para establecer el marco del concepto. Este modelo es importante para su operacionalidad, y para asegurar que todos tengamos una referencia común. Este trabajo de campo ha sido de gran valor en la búsqueda de mejores prácticas, tanto como una evaluación práctica del modelo como herramienta para identificar valores BNRC ya existente, y nuevas actividades para promoverlos. Estando todavía en el proceso del desarrollo de una definición, había la posibilidad para los socios, puntos focales y beneficiarios de dar sus opiniones y sugerencias.

Tanto el proyecto como el marco fueron muy bien recibidos. Hubo un amplio acuerdo de que un nuevo enfoque en el bosque fuera de lo puramente técnico y productivo es oportuno e importante, y las comunidades tanto como el Ministerio están listas para seguir adelante con el proyecto. Especialmente los jóvenes tienen un fuerte deseo de progresar rápidamente con un curso de metodología para que puedan comenzar sus investigaciones de BNRC en sus comunidades, mientras que tienen el concepto en mente.

Panamá: Zona geográfica de acción



Panamá: 4 comunidades mestizas – 5 indígenas

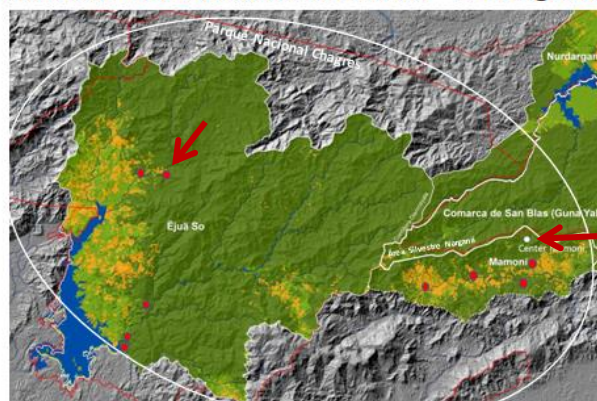


Figura 1: Área y comunidades de acción en Panamá. Los talleres tuvieron lugar en la comunidad La Bonga, Territorio Emberá Ejua So, y en el centro Mamoní (Geoversity) en el valle del Río Mamoní. Marcados con →

1. Taller en la Bonga, Emberá Ejua So. 13-15 de septiembre 2019.

Consultores: Lisbet Christoffersen y Heraclio Lopez.

Participantes: 13 jóvenes de las comunidades Parara Puru, La Bonga, Ella Drua, Tusípono y Puru Biakiru

Agenda general

Viernes 13, a noche:

- Presentación general del proyecto y la consultoría a la comunidad, a los/las jóvenes participantes del taller, y a las autoridades Emberá de todas las comunidades de Ejua So y del nivel organizativo regional (que estuvieron allí para asistir a otra reunión el sábado)
- Información sobre el nombramiento de un/a representante para el décimo reunión 'Foro Centroamérica Vulnerable Unida por la Vida' en Costa Rica, 5-6 de octubre (una 'pre-pre-COP' de organizaciones sociales que buscan incidir en las negociaciones climáticas en favor de los pueblos de la región)

Sábado 14, todo el día:

- Consulta con jóvenes Emberá sobre los Beneficios No Relacionados con el Carbono (BNRC)

Domingo 15, mañana:

- Presentación de los resultados por los jóvenes Emberá a los miembros de la comunidad interesados y el Cacique regional
- Consulta a Autoridades (Cacique regional)
- Nombramiento de representante para participar en el Foro en Costa Rica

Día uno

Sin posibilidad de mostrar nuestras diapositivas, introducimos el proyecto de manera general, después de la bienvenida por parte de las autoridades y la presentación de los presentes. Los jóvenes Emberá fueron invitados a participar en el taller/consulta sobre los BNRC el 14/9, y se invitó a las autoridades y miembros de la comunidad para escuchar los resultados del taller el día 15 por la mañana. Las autoridades y los jóvenes dieron su consentimiento para continuar con la consulta durante los próximos dos días.

Día dos

Presentación del concepto 'beneficios no relacionadas con el carbono' (BNRC) y los BNRC socio-económicos, ambientales y bio-culturales con más detalle:

El concepto BNRC: El cambio climático está ocurriendo como resultado de las emisiones y la acumulación de gases invernaderos en la atmósfera. Los gases invernaderos provienen del uso de gasolina, como combustibles, de la quema de bosques y del ganado, entre otras fuentes. El sol calienta la superficie de la tierra, lo cual es bueno; no habría vida sin ella. La capa de nubes impide que todos los rayos de calor regresen al universo, lo que también es bueno; nos moriríamos de frío esta capa. Sin embargo, los gases

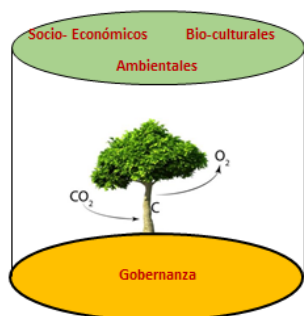
invernaderos espesan la capa y la superficie de la tierra se calienta como consecuencia. Los resultados se sienten como un clima cálido que causa sequías y/o lluvias extremas, con impactos en agricultura, plagas y enfermedades, y toda la vida en la tierra, tanto humana como no humana (biodiversidad).

En las COP de la CMNUCC (explicación general), las respuestas al cambio climático se relacionan con 1) mitigación o 2) adaptación. *Mitigación* significa reducir las emisiones y el carbono en el aire, *adaptación* refiere a la preparación en las personas, sociedades y la naturaleza para hacer frente al efecto y los daños del aumento de las temperaturas. Luego hablamos un poco sobre cómo adaptarse: ahorrar agua, proteger los cultivos, construir casas lejos del río, etc.

Los bosques, como un montón de árboles, han sido un punto de enfoque debido a su capacidad de absorber y almacenar carbono del aire. Y por buena razón, estos son beneficios relacionados con el carbono. Sin embargo, se ha dado cuenta de que los bosques no existen fuera de los contextos sociales y culturales, así surgió el concepto de 'beneficios no relacionados con el carbono'. El concepto de BNRC se definió y explicó a los jóvenes participantes de la siguiente manera (figura 2).

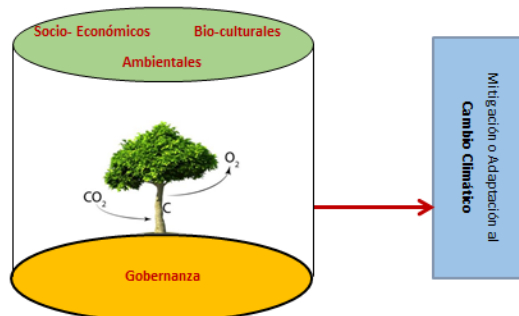
Concepto: Beneficios No Relacionados con Carbono

1) los efectos positivos socio-económicos, ambientales o bio-culturales de actividades ...



..que

2) a la vez contribuye a la mitigación o la adaptación al cambio climático...



3) ...sin necesariamente estar relacionado con las iniciativas de secuestro de carbono

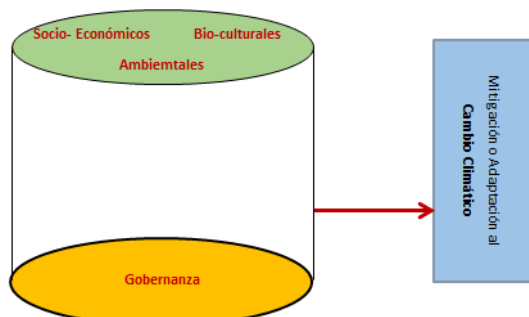


Figura 2: El concepto de beneficios no relacionados con el carbono, como explicado a los jóvenes Emberá

Las instituciones sólidas y la buena gobernanza son requisitos previos para los resultados exitosos de las actividades de los BNRC, pero antes de explorar el concepto de gobernanza, los participantes se separaron en grupos para avanzar con la identificación de los beneficios socioeconómicos, ambientales y bioculturales. Se explicaron de la siguiente manera:

Beneficios socio-económicos, ambientales y bio-culturales

Los beneficios socioeconómicos se relacionan con todo lo que sustenta los medios de vida. Por lo tanto incluyen sistemas de cultivo, actividades generadoras de ingresos, acceso a mercados y empoderamiento, que a la vez sirven para contribuir positivamente a la adaptación o mitigación al cambio climático.

Los beneficios ambientales se relacionan con la vida en todas sus formas - la biodiversidad - y los llamados 'servicios ecosistémicos', que pueden ser agua y aire limpio, o la conservación del suelo. Hermosos paisajes y valores recreativos también son beneficios ambientales. Todos contribuyen con efectos positivos a la mitigación o adaptación al cambio climático.

Los beneficios bio-culturales consideran nuestra relación con la naturaleza. Pueden incluir sitios y especies naturales sagradas, arquitectura y materiales, conocimientos y prácticas - transferidos de generación a generación, o eventos festivos y rituales relacionados con la tierra o los cultivos. Todo con contribuciones positivas a la adaptación o mitigación al cambio climático.

Identificación de beneficios no relacionados con el carbono en comunidades Emberá

Los participantes se dividieron en tres grupos, contando 1-2-3, y comenzaron la identificación de los BNRC existentes en sus comunidades. Cada grupo exploró uno de los tres conceptos descritos anteriormente y cada grupo recibió una lista de ejemplos para inspirarse. Después de la aclaración necesaria de que las listas no eran preguntas para responder, sino simplemente para inspirar, trabajaron durante aproximadamente 1 hora y media y presentaron su trabajo (foto 1). En una segunda ronda de trabajo en grupos elaboraron más dos temas de su lista para reflexionar sobre sus contribuciones a la mitigación o adaptación al cambio climático, y además sobre la gobernanza de ellos. Resultados de los ejercicios:

Beneficios socio-económicos:

Sistemas de cultivo: Plantación de plantas tradicionales y medicinales para uso beneficioso o económico. También es importante el momento de la siembra. Nuestros antepasados esperaron a la luna para sembrar y tener cosechas saludables. El tema fue elegido por el grupo para ser desarrollado en una segunda ronda. La segunda ronda de trabajo en grupos incluyó la reflexión sobre cómo estos beneficios y actividades para mantenerlos se relacionan con la mitigación y adaptación al cambio climático. Mitigación: al reducir las emisiones a través de la siembra que absorbe el aire contaminado; adaptación mediante la siembra en la estación óptima para cada cultivo: café y cacao en el verano; maíz, arroz y plátano en el invierno.

Acceso al mercado: La pesca; artesanía; bailes tradicionales y comida para turistas.

Silvi-cultura: Proyecto existente de reforestación de especies de palmeras en peligro de extinción, como guagara, cocabolo y chungo.

Pagos: Cooperación con el medio ambiente (MiAmbiente) y líderes tradicionales para conservar el parque nacional Chagres.

Empoderamiento: La educación y la formación ecológica para jóvenes y adultos, talleres y seminarios. El tema fue desarrollado en la segunda ronda. Mitigación: a través de proyectos sobre plantación sostenible

podemos reducir las emisiones. Adaptación: los mismos proyectos pueden ayudarnos a prepararnos para los cambios.

Beneficios ambientales:

Biodiversidad y bosques naturales: Bosque virgen y lugares sin uso humano; reforestación con especies nativas incluyendo frutas, fibras, medicina y especies en peligro de extinción, tal como cocabolo, cedro, wagara y gira; Flora y fauna – toda la vida del bosque; agua y aire; El tema fue elegido por el grupo para ser elaborado en una segunda ronda. Mitigación – cuidando el bosque y su fauna ayudamos al medio ambiente a absorber aires contaminados y controlar o regular el clima. Siendo responsables en salvaguardar y reducir en nuestras casas y comunidades los desechos que enferman la naturaleza. No quemar, no tirar basura en cualquier lugar, reciclar materiales: plástico, cartón y aluminio. Adaptación: Concienciar en las comunidades la importancia de la naturaleza. Gobernanza: No cazar indiscriminadamente animales, hacer crías y mantener las especies que nos rodean, tal como iguanas, tortugas y mariposas; no talar; ser amigable con los animales en peligro de extinción, como conejo pintado, aguililla arpía, negros iguanas; Cultivar solo en parcelas designados previamente escogidos.

Agua: sistemas, abastecimiento y retención: Este fue el segundo tema elegido para trabajar con más profundidad en una segunda ronda. Mantener y cuidar las fuentes de agua, no contaminar el agua; Reforestar en lugares devastados en orillas de fuentes de aguas, por ejemplo ríos, quebradas y nacientes de agua.

Combatir la degradación de la tierra: Hacer buen uso del suelo y no extraer material prima (como arena y tierra) indiscriminadamente.



Foto 1: Presentación de BNRC ambientales (grupo 2)

Beneficios bio-culturales:

Eventos festivos relacionados con la tierra: La danza – el canto de la montaña. Baile tradicional Emberá.

Sitios sagrados: 1) 'Nuci' es un sitio sagrado donde siempre hay peces en abundancia. Un enorme pez protege el lugar, por lo que también es un lugar peligroso. Los Emberá respetan y cuidan a los Nuci. Hay

varios de ellos. 2) Cuando nace un bebé, los padres deben buscar dos árboles cruzados y llevar el bebé debajo de ellos dos veces. 3) Un bebé recién nacido debe ser pintado con un tinte natural específico para asegurar su buena salud y belleza para toda la vida.

Artesanía: [de la] madera cocobolo

Arquitectura y materiales: Hacemos casas tradicionales con el árbol espavé.

Gobernanza

El mantenimiento y la creación de beneficios no relacionados con el carbono no pueden ocurrir sin gobernanza. Por lo tanto, la base de las actividades existentes y las nuevas iniciativas son instituciones y autoridades sólidas y responsables ante la comunidad. La buena gobernanza es un beneficio en sí mismo. La gobernanza de los beneficios no relacionados con el carbono ocurre en muchos niveles e incluye varios actores que todos tienen un papel en los resultados exitosos de las actividades e iniciativas. Ellos constan de gobiernos sub-nacionales y locales, organizaciones de la sociedad civil y empresas, aparte del gobierno nacional electo. A nivel global existen convenios intergubernamentales de los cuales Panamá ha ratificado varios relacionados con ciertos beneficios no relacionados con el carbono, por ejemplo el patrimonio cultural, incluyendo lo inmaterial que aborda el tipo de conocimiento que se transfiere a través de la práctica o los rituales. Panamá también ha ratificado el acuerdo de París que incluye la recomendación de implementar programas y proyectos de beneficios no relacionados con el carbono. Este proyecto EUROCLIMA+ tiene como objetivo que los BNRC se institucionalicen en las estrategias de mitigación y adaptación al cambio climático relacionadas con los bosques. MiAmbiente (Ministerio del medio ambiente) está muy interesado en el tema y es consciente de la participación de los jóvenes Emberá. Las convenciones internacionales son instrumentos legales que pueden servir para responsabilizar a los gobiernos nacionales.

Los participantes identificaron las autoridades e instituciones Emberá en grupos, y después hablamos sobre sus responsabilidades en relación con algunos de los BNRC que tenían en sus listas. A nivel comunitario, el Noko es la máxima autoridad. Su trabajo es resolver conflictos y velar por el mantenimiento de los bienes comunes. Los participantes pensaron que debería facilitar talleres y seminarios e implementar programas que beneficien a la naturaleza, y que las actividades deberían incluir a niños y adultos además de los jóvenes. El Fiscal y varios *Sarras* forman la 'policía' interna; son guardias y voluntarios tradicionales. El cacique regional y su junta directiva coordinan la toma de decisiones que se refieren a las siete comunidades de Chagres. Debe tener una visión general de las necesidades de todas las comunidades, como la necesidad de proyectos, educación y salud. Además del gobierno interno, el cacique regional establece el vínculo con otras instituciones y gobiernos. Existe otra capa de gobierno Emberá, el Congreso General de Tierras Colectivas de los Emberá y Wounaan, con un cacique regional general y su junta directiva. Representan a cinco organizaciones regionales.

Día 3

Presentación de resultados y elección de representante y coordinador del proyecto

A la mañana siguiente, los participantes presentaron sus resultados, limitados a los temas que cada grupo había elegido para desarrollar más. Como el cacique regional, Antonio Zarco, nombraría a uno de ellos para representar los jóvenes Emberá en el evento pre-pre-COP en Costa Rica, cada uno de los participantes

presentaron una parte de los resultados. Dos de ellos introdujeron el concepto. Todos habían entrenado sus presentaciones muchas veces, pero dos destacaron como especialmente buenos para explicar y elaborar los temas. Ellos fueron entrevistados por el cacique. Una joven, Dionilda Gil, fue nombrada para unirse al Foro Centroamericano en octubre en Costa Rica, el otro descalificó por provenir de una nueva comunidad, no reconocida por los demás; sin embargo, todavía puede participar en las próximas actividades. Se eligió a un hombre muy joven, Josef Zarco, de 18 años, para ser el coordinador de los jóvenes investigadores, calificando principalmente por su enorme entusiasmo por el proyecto.

El cacique está muy comprometido en el proyecto. Se quedó una noche extra para escuchar las presentaciones, habló mucho con los jóvenes sobre la importancia del proyecto, sobre ellos siendo responsables y sobre sus expectativas del representante cuando ella regrese de Costa Rica. Tenía sugerencias sobre cómo involucrar a más instituciones en el proyecto y buscar posibles cursos en por ejemplo la ACP (Autoridad del Canal de Panamá). Prometió a todos los participantes no elegidos que habría otras posibilidades siempre y cuando que trabajaron bien. Le gustaría que todos se convirtieran en especialistas. Los participantes nos instaron a que el próximo curso sobre metodología sería este año para que puedan comenzar las investigaciones.



Fotos 2,3 y 4. Izquierda arriba: Jóvenes Emberá subiendo el río Pequení para asistir al taller. Izquierda abajo: El Cacique Regional hablando con los jóvenes. Derecha: El coordinador del proyecto, el Cacique Regional, y la representante de los jóvenes yendo al Foro Centroamérica Vulnerable Unida por la Vida.

2. Taller en el Centro Mamoní (Geoversity), Septiembre 17, 2019, 13.00-17.30

Consultores: Claus Kjærby y Lisbet Christoffersen

Participantes: 25 hombres y mujeres campesinos y propietarios de tierras de las comunidades y fincas del valle arriba del Río Mamoní (La Zahina, San José, Mamoní arriba, Madroño), incluyendo también personal del Centro Mamoní de Geoversity.

Agenda

1. Quienes somos
2. Bienvenidos (Nathan Gray)
3. Presentación de Geoversity
4. Presentación del proyecto EUROCLIMA+, cambio climático y el concepto Beneficios No Relacionados con Carbono (BNRC)
5. Trabajo en grupos y presentaciones

Presentaciones y bienvenidos

Los participantes se presentaron, comenzando por el que vivía más alejado del Centro Mamoní en el valle. Después, Nathan Gray dio la bienvenida, tocado por la alta asistencia de la gente del valle por primera vez en el centro Mamoní. Su esperanza es una colectividad alrededor de un valle verde e innovador donde los residentes se unen para desarrollar habilidades nuevas y sostenibles para generar ingresos. Luego el Claus se hizo cargo con una presentación de Geoversity y el desarrollo del centro Mamoní, mostrando con fotos cómo el paisaje se ha cambiado de pastizales a bosque natural en solo 17 años (fotos 5 y 6).



Fotos 5 y 6 mostrando la reforestación de la propiedad del Centro Mamoní (Fotos: Nathan Gray)

Cambio Climático, el concepto BNRC y trabajo en grupos

La introducción al tema y la explicación del cambio climático y el nuevo concepto BNRC siguieron la misma forma descrita anteriormente en el taller con las comunidades Emberá. El proceso de trabajar en grupos fue un poco diferente dado que el tiempo del evento era más corto, y la composición de los participantes fue diferente. A diferencia del taller en Emberá Ejua So, se trataba de personas adultas con años de experiencias laborales. Además, mostraron una rápida comprensión e interés en el desarrollo de propuestas de iniciativas para promover beneficios no relacionados con el carbono. Por lo tanto, cuatro grupos trabajaron en propuestas de iniciativas dentro de todos los tipos de BNRC, considerando también la gobernanza en relación con estas (fotos 7 y 8). Los grupos fueron compuestos contando 1-2-3-4; trabajaron una hora antes de hacer sus presentaciones.



Fotos 7 y 8: Trabajo en grupos en el pabellón de bambú at Centro Mamoní

Resultados del trabajo en grupos

Por la inspiración para el trabajo mostramos una diapositiva (figura 3). Las propuestas se agrupaban en torno a cinco temas generales: 1) Reforestación y mejoramiento de suelos 2) Educación y empoderamiento 3) Agua 4) Turismo y 5) Gobernanza.

Ejemplos de iniciativas que generan “Beneficios no Relacionados con el Carbono”

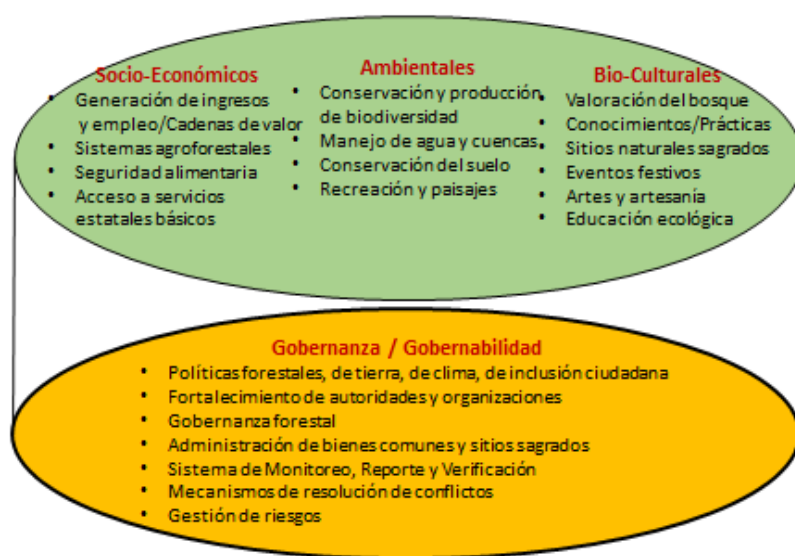


Figura 3: Inspiración para los grupos

1) Reforestación y mejoramiento de suelos

- Reforestación de áreas deforestadas con especies nativas, también maderas. *‘Sembrar árboles es invertir en el futuro – lo sabemos todos’*. *‘Ayuda a micro-regular el clima’*.
- Motivación a dueños de fincas grandes ganaderas para reforestar. *‘Nosotros pobres dejamos siempre ciertos árboles porque sirven para el ganado’*.
- Incentivo(\$) para conservar. *‘Hay que vivir’*. Un participante señaló que muchos propietarios de tierras ya protegen el bosque voluntariamente a un costo; podrían ser elegibles para recibir un pago por sus servicios eco-sistémicos.
- Sobre el rubro de ganadería y las porquerizas: sembrar árboles dentro de potreros y hacer cercas vivas; hacer biodigestores para producir gas metano; aprovechar los desechos para abono orgánico para los cultivos. *‘Usamos químicos, se puede preparar abono orgánico, pero cuesta’*. Una cooperativa nacional de venta de abono. Garantizado a los compradores. Apoyo técnica. Ingreso!
- Conservación del suelo por medio de reforestación con árboles frutales: mango; marañón (*anacardium occidentale*); pipa (estado de la fruta del coco con su cáscara verde); café; limón; nance; mamón (*Melicoccus bijugatus*); aguacate o guaba. Y árboles maderables: cedro amargo (*Cedrela odorata*); guayacan (*géneros Tabebuia, Caesalpinia, Guaiacum y Porlieria*); cedro espina; pabe; palo amarilla y roble.

2) Educación y empoderamiento

- Becas de estudios ecológicos del Valle de Mamoni
- Educación ambiental desde la escuela primarias
- El valle podría servir como centro de estudio e investigación para colegios y universidades, hay biodiversidad y varios tipos de animales como aves, felinos, insectos y reptiles

- Empoderamiento para generar ingresos a través de forestación
- Capacitar e implementar proyectos de forestación entre empresas, amigos y gobierno
- Educación ecológica de los ganaderos grandes. *‘Importante que el gobierno pone una ley’.*

3) Agua

- Tenemos fuentes de agua que nacen dentro del mismo valle de Mamoni, limpias, libre de contaminación
- Embotellar agua del valle
- Manejo de aguas y cuencas: jornada limpieza

4) Turismo

- El valle goza con balnearios, sitios para kayak y expediciones
- Mejoras de camino
- Recreación y paisajes: no talar bosques primarios
- Conservar la biodiversidad
- Valorar nuestra naturaleza. *‘Vemos la fauna en la finca de Oscar’.*
- Eco-turismo: presentación de tradiciones y artesanía – resaltando lo nuestro
- Puente campestre colgante (peso de caballo) – de bambú?

5) Gobernanza

- Organización para el desarrollo económico/social (sostenible)
- Las tenencias de tierras deben ser legales. Debemos formar un comité bien responsable para darle una buena respuesta a esta necesidad.
- Unificación es el punto de partida más importante
- Donde reforestar?
- Incluir el gobierno ha sido una lucha.

Quizás por experiencias de proyectos anteriores, los participantes estaban muy conscientes de la importancia del buen gobierno desde el principio. Otra reflexión importante fue sobre la ambivalencia del aumento del turismo; por un lado una fuente de ingresos y una oportunidad de difundir el conocimiento de la naturaleza única del valle y su manejo, por otro lado un riesgo de contaminación por grupos de turistas desinteresados en el ambiente. Por eso hay que manejar bien el turismo, siempre con conciencia de qué tipo de turistas los iniciativas atraerán.

Finalmente, Claus, en nombre de Geoversity, dio sus sugerencias sobre posibles iniciativas que conducirán a la mejora de beneficios no relacionadas con el carbono:

Socio-Económicos:

- Construcciones en bambú. El bambú se crea rápido, queremos promover su uso. Todo el proceso de la producción como especialidad del valle. Viviendas bellas y sanas.
- ‘Life Changer’ (expediciones/educación ecológica). Red en todo el valle, senderos, cabañas. Sirve para vigilancia al mismo tiempo.

- Producción de alimentos orgánicos. Un mercado local es un ahorro para todos.

Ambientales:

- Manejo de agua y la cuenca Mamóní
- Introducción de fertilizantes ecológicos

Bio-Culturales:

- Educación ecológica
- Intercambio de conocimientos y experiencias
- Celebraciones - cuando hemos alcanzado un hito importante

Gobernanza/Gobernabilidad:

- Creación de la Alianza del Río Mamóní – y poner un nombre unificado del valle
- Saneamiento, transferencia y delimitación de propiedades
- Apoyo a las organizaciones comunitarias
- Guardabosques comunitarios
- Geoversity pide reunión con el gobierno. Intentamos una buena relación con ellos.

3. Taller con el Ministerio de Ambiente (MiAmbiente). 11 de septiembre 2019.

Consultora: Lisbet Christoffersen

Representante de Geoversity: Claus Kjaerby

De MiAmbiente: Dr. Victor Corro, Ingeniero Eric Rodríguez

Agenda

1. Presentación del objetivo general del proyecto y de la consultoría
2. El concepto 'Beneficios No Relacionados con el Carbono' (BNRC)
3. Prioridades BNRC del MiAmbiente
4. Sistemas de monitoreo y verificación en MiAmbiente

Después de presentar el objetivo general del proyecto, y más específico de la consultoría, el marco del concepto fue introducido de la misma manera como descrito anteriormente en los otros talleres. Se enfatizó que existen sinergias - instrumentos legales internacionales – en la forma de convenios ratificados en Panamá. Las convenciones sobre protección natural y cultural son instrumentos legales que ayudan a los legisladores a adoptar e implementar políticas nacionales. En la figura 4 se enumeran algunas convenciones que son relevantes para la promoción de los BNRC forestales y que a su vez se pueden apoyar mediante la provisión de herramientas y estrategias para integrar los BNRC en Panamá.

Sinergias: Instrumentos legales internacionales Convenios ratificados (Panamá)

- Protección del Patrimonio Mundial Cultural y Natural (1978)
- Humedales de Importancia Internacional - Ramsar (1990)
- Diversidad Biológica (1995)
- Protección del Patrimonio Cultural Subacuático (2003)
- Salvaguardia del Patrimonio Cultural Inmaterial (2004)
- Protección y Promoción de la Diversidad de las Expresiones Culturales (2007)

Figura 4: Convenios ratificados por Panamá (con el año de ratificación)

Prioridades BNRC del MiAmbiente

Beneficios que quieren promover (o están promoviendo) incluye turismo, más específico el eco-turismo (uso de la naturaleza) y el agro-turismo (finca con producción orgánica o sistemas con ciclaje de nutrientes). También hay actividades con pueblos indígenas, ante todo artesanía y turismo; la artesanía también incluye la de los campesinos. Les gustaría desarrollar una idea de producción de carne con animales 'semi-capturadas' (de iguana, aves, lagarto etc.).

Sistemas de monitoreo y verificación

El ingeniero Eric Rodríguez recomienda métodos combinados. La entrevista sobre percepciones, y una combinación de drones/satélite y personas en la tierra para monitorear. Claus mencionaba *cambios más significados* como una metodología donde se puede rastrear los datos hasta el nivel individual. Victor Corro enfatizó que es importante mencionar género en el informe.

Geoversity están haciendo monitoreo de cambio de uso de tierra en la cuenca alta en micro-unidades. La metodología de micro-unidades podría replicarse hasta tener toda la cuenca.



Foto 9: Visita a MiAmbiente 9/11 2019.

MiAmbiente recibieron bien y con interés al concepto BNRC. Quieren participar en el COP 25 en Chile con el proyecto Euroclima+ si posible; van también al pre-COP en Costa Rica, promoviendo el concepto. Siguen el contacto con el coordinador del proyecto en Panamá, Claus Kjaerby, y van a visitar el centro Mamoni en el mes de octubre.



Figura 5: Ejecutores del proyecto EUROCLIMA+ en América Latina

Appendix 4: Participants in NCB workshops

Taller, 13-15 de septiembre 2019.

Lugar: Comunidad La Bonga, Territorio Emberá Ejua So

Nombre	Comunidad
1. Brenda Ortega	Tusípono Embera
2. Michel Ruiz	Puru biakiru
3. Alexis Guapidra (¿)	Tusípono Embera
4. Josef Zarco	Parara Puru
5. Asne Zarco	Parara Puru
6. Alber Mesua	
7. Roquelina Dumazá	Tusípono Embera
8. Dionilda Gil	Ella Drua
9. Josue Chami	La Bonga
10. Isac Hogiumd	Embera Puru Biakiru
11. Yazmin Dojirama	Tosípono
12. Aldo Dogirama	Parara Puru
13. Johana Felix	
Otros:	
Lisbet Christoffersen	Consultora, Dinamarca
Heraclio Lopez	Consultor, Panamá
Antonio Zarco (13 y 15)	Cacique regional

Talle, fecha: 17 de septiembre 2019.

Lugar: Centro Mamóní

Nombre	Comunidad
1. Antonio Carpintero	La Zahina
2. Policorbio Acosta	La Zahina
3. Miguel Castillo	San Jose
4. Marcelino Conespoo	El Valle
5. Maria Joyólez	Madroño
6. Enrique Rochigety	Madroño
7. Mariano Ortiz	Mamóní Arriba
8. Jozlien Sadayar	San José
9. Cecilia Rodriguez	San Jose
10. Jaime Vargas	La Zahina
11. Victor M Vasques R	La Zahina
12. Michael Medina	Madroño (El vivero)
13. Modesto Solis	Modroño
14. Merlis Carrillo	Centro Mamóní
15. Gabirel Salazar	Centro Mamóní
16. Eddy Vasquez	La Zahina
17. Angel Vasquez	La Zahina
18. Katia Montesal	Madroño

19. Daniel Gonzalez	La Zahina
20. Yolanda A de Monteza	La Zahina/Ciudad de Panamá
21. Oscar A Monteza	La Zahina/Ciudad de Panamá
22. Zeinielka Salazar	
23. Marixenia Murillo Bosquez Peducadora	
24. Nielka Valdes	
25. La hija Monteza	La Zahina/Ciudad de Panamá
Otros:	
Lisbet Christoffersen	Consultora, Dinamarca
Claus Kjaerby	Geoversity, Panamá
Nathan Gray	Geoversity, Panamá

Appendix 5. Conventions and other instruments of relevance to NCBs

- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar)
- Convention on Migratory Species (CMS)
- Convention concerning the protection of the World Cultural and Natural Heritage
- Indigenous and Tribal Peoples Convention (ILO 169)
- Convention on Biological Diversity (CBD)
- United Nations Convention to Combat Desertification (UNCCD)
- Convention for Safeguarding of the intangible cultural heritage
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions
- Convention on the Protection of the Underwater Cultural Heritage
- (UNFCCC Paris Agreement): Nationally Determined Contributions (NDCs)

Ratified by Bolivia (year of ratification)

- Convention on Wetlands of International Importance especially as Waterfowl Habitat - Ramsar (1971)
- Convention concerning the protection of the World Cultural and Natural Heritage (1976)
- Indigenous and Tribal Peoples Convention – ILO 169 (1991)
- Convention on Biological Diversity (1994)
- Convention for safeguarding of the intangible cultural heritage (2006)
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005)
- Convention on the Protection of the Underwater Cultural Heritage (2017)
- UNFCCC Paris Agreement (2016)

Ratified by Panama (year of ratification)

- Convention concerning the Protection of the World Cultural and Natural Heritage (1978)
- Convention on Wetlands of International Importance especially as Waterfowl Habitat - Ramsar (1990)
- Convention on Biological Diversity (1995)
- Convention on the Protection of the Underwater Cultural Heritage (2003)
- Convention for the Safeguarding of the Intangible Cultural Heritage (2004)
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2007)
- UNFCCC Paris Agreement (2016)

Appendix 6: Literature search

In order to get an idea of the broadness of themes and issues related to non carbon benefits (NCBs), an initial browsing of ‘grey literature’ regarding NCBs as well as co-benefits and safeguards in relation to carbon sequestration activities helped getting an overview, as did the simple Google Scholar search on ‘non carbon benefits’. This broad search enabled the initial systematization of themes, resulting in the table below which contains categories of benefits that both contribute to robust climate change mitigation and adaptation, and are their prerequisites for success/stability.

Economic	Social	Cultural	Environmental	Governance (enabling response options/premise)
Local economy, subsistence as well as commercial: maintain and protect sustainable livelihoods; Infrastructure; Employment; Payments; Food security. Dietary choices, reduced post-harvest losses, reduced food waste. Less competition for land. Improved energy use in food systems; Financial commitments for climate change adaptation; Increased supply of genetic resources for medical plants and food crops; Wood products that can substitute emissions-intensive materials.	Well-being; Good health; Maintaining community; Enhancing population security; Social resilience; Alleviating poverty; Empowerment of individuals and communities; Education, to participate more effectively; ‘Sustainable development’	Maintaining culture; <i>Food sovereignty</i> . Dietary choices, reduced post-harvest losses, reduced food waste. Less competition for land; Agro-biodiversity. (high score on mitigation, adaptation, land-degradation, desertification and food security, along with agro-forestry. Also reduced conversion to crop-land); Cultural and spiritual services; Traditional knowledge resources; Curative practices; UNESCO sites preservation; Science and knowledge (incl. traditional) promotion; Nature perception; Social organisation	Biodiversity and natural forest production and conservation; Increased resiliency of ecosystems; Improved ecosystem services through their protection and maintenance. Water (freshwater, water retention), food security; Protection and proliferation of medicinal plants; Scenic beauty preservation; Protected Area support; Adaptation of forest/ agricultural systems (incl increased soil organic carbon content); Combat desertification; Combat land degradation	Progress toward secure land tenure/access Territorial management; Reduce illegal logging ; Zoning, planning, regulation, incentives (eg. PES, FSC, access to markets, access to credits); Risk management (incl. natural hazards: fire, wind, flood, landslide; pollution); IP rights respected (incl. FPIC); Increased levels of transparency; More effective local and national institutions; Forest governance and management: Local participation in policies and systems that affect the management of forest resources. Local participation in local land-use and development; Strengthening of customary decision making processes; Monitoring bio-diversity and surveillance of protected areas; Monitoring carbon stock.

Using the table, I started an exhaustive literature search on each subject from the five lists, primarily by the use of REX and Google Scholar. From the results, as well as from literature already known to me, I also did continuous snowball sampling. The resulting list fills 22 pages, including short notes on main content and arguments, and colored coding which allowed effective and iterative consultation with the most relevant literature.

Appendix 7: List of non-carbon-benefits activities

Socio-economic benefits	Governance enablers or outcomes	Problematics and key issues
a. Cultivation systems: Food security, agrobiodiversity and dietary choices	<ul style="list-style-type: none"> - Financial commitments for climate change adaptation, including access to credits and technical assistance at the local level. - Secure land tenure (see w). - Downward accountability in land management and governance 	<ul style="list-style-type: none"> - Adapting to climate change is the most urgent priority that addresses both food security and leads to a transformative pathway for agriculture. - Concepts of property and local organization (see r and s).
b. Income generating forest activities	<ul style="list-style-type: none"> - Clear legislative frameworks and certainty regarding responsibilities and authorities of institutions - Local organization capacity - Secure land tenure and local control with resources 	<ul style="list-style-type: none"> - Access to markets. - Niche organic markets are growing. - Alternatives to emissions-intensive materials are in high demand - Environmentally sustainable income options are essential to avoid depopulation and depletion of resources.
c. Sustainable forest management	<ul style="list-style-type: none"> - Judged against globally agreed criteria - Certification 	<ul style="list-style-type: none"> - Reluctance to devolve real influence (see t)
d. Payments for ecosystem and research services	<ul style="list-style-type: none"> - Projects can help populations gain tenure rights - When tenure is already clear, communities have experienced that projects obtain the populations' FPIC, promoting participation - Government support and improved access to credit can help overcome barriers to adoption of sustainable practices 	<ul style="list-style-type: none"> - Modest results with regards to jobs and income - Payments do not stop conversion of forest
e. Empowerment	<ul style="list-style-type: none"> - Access to basic state services such as health and educational systems. - CC awareness-raising in communities for them to minimize risks and seek support. - International and regional coordination and exchange of experience to link local experience horizontally and with global, political negotiations. 	<ul style="list-style-type: none"> - Good results with training young indigenous peoples to carry out community investigations and bridge the technical and strategic on the one side, and the environmental and traditional on the other
Environmental benefits	Governance enablers or outcomes	Problematics and key issues
f. Carbon sequestration	<ul style="list-style-type: none"> - See d. - Divestment 	<ul style="list-style-type: none"> - Eliminating the conversion of diverse natural forests to mono- or reduced-species plantations or agriculture
g. Biodiversity and natural forest production and conservation	<ul style="list-style-type: none"> - Policies and measures that promote primary forest protection yield both climate change mitigation benefits and biodiversity conservation, in addition to other ecosystem services - Stop investments in forest degrading activities - Ecologically sustainable management of forests - Hunting rules 	<ul style="list-style-type: none"> - Vast majority of biodiversity losses will occur in the tropics - Impacts of climate change, interacting with other land use pressures, might overcome the resilience of ecosystems, pushing them over a tipping point
h. Water: systems, supply and retention	<ul style="list-style-type: none"> - Retain forests in mountain catchments and around headwaters through effective protection (see Emberá Ejua So, 'the pilot countries and pilot areas' in 1.3 and section 3, the Emberá case). 	<ul style="list-style-type: none"> - Deficient protection of watershed areas from deforestation, reinforced by insecure land tenure

i. Combating land degradation and desertification	<ul style="list-style-type: none"> - Retain forest cover and avoid conversion of forests to plantations or agriculture through effective protection - Agricultural land-conversion to forest 	<ul style="list-style-type: none"> - Counterproductive policies that seek to increase rural development through agriculture or plantations
j. Damage mitigation	<ul style="list-style-type: none"> - Development of adaptation strategies and risk management (local & national level) 	<ul style="list-style-type: none"> - Extreme climate events threaten to cause depopulation of forests and other vital eco-systems, with the risk of land- or resource grab as a result
k. Recreation and landscape aesthetics.	See m.	<ul style="list-style-type: none"> - Balancing protection and accessibility - See also m.
Bio-cultural benefits	Governance enablers or outcomes	Problematics and key issues
l. Relational and reciprocal nature perception	<ul style="list-style-type: none"> - Giving equal consideration to different worldviews in co-management/co-governance - Spiritual, relational or livelihood concerns can determine practices that lead to conservation, versus an area reserved for conservation. 	<ul style="list-style-type: none"> - Nature culturally determined as a set of 'eco-system services', readily available to the market and the making of adequate policies. - The nature/culture dichotomy that allows for commodification of nature
m. Sacred natural sites and species	<ul style="list-style-type: none"> - Form informal networks managed and governed by local people - May be recognized by institutionalized religions or faiths - Offer opportunities for bridging local knowledge and science when addressing conservation challenges. 	<ul style="list-style-type: none"> - Privatization of land has led to loss of protection of sacred sites - Spiritual leaders (Ghana; Guatemala) develop law proposals and bio-cultural community protocols to gain legal recognition and protection for their sacred places.
n. Knowledge and practices	<ul style="list-style-type: none"> - Gender and age are influential factors regarding knowledge of plants and their uses. Participation! - Collective or reciprocal working relations or systems gather knowledge, labor and capabilities to secure successful outcomes. 	<ul style="list-style-type: none"> - Important: Traditional knowledge should not be understood as stagnant, it is continuously developed through acquirements of new skills and technologies.
o. Intergenerational knowledge transfer	<ul style="list-style-type: none"> - Combining tradition, language and modernity in curriculum development - Participatory research combining science and local knowledge, elders and young 	<ul style="list-style-type: none"> - Deficiency of elementary schools with regards to inclusion of territorial and traditional knowledge. - Young people leave their land to follow secondary or higher education. - Arts and crafts, myths and performing arts serve to transfer knowledge.
p. Bio-cultural institutions	<ul style="list-style-type: none"> - Traditional working relations and distributional systems ensure local food security - Bio-cultural institutions generally hold high legitimacy among indigenous peoples - Coproduction of knowledge and institutions with organizations and markets (essential for the conservation and continuation of biocultural knowledge that provide adaptive capacity) 	<ul style="list-style-type: none"> - Cultural institutions are dynamic, existing because of their adaptive capacity and ability to incorporate new knowledge. Changing livelihoods may undermine aspects of this capacity and result in vulnerabilities, incl. breakdown of knowledge transfer, learning of skills, and weakening of social networks - New, global bio-cultural institutions emerge in response to global crises
q. Food sovereignty	<ul style="list-style-type: none"> - Proving to empower local, regional and national peasant organizations and movements due to focus on local markets, autonomy, production-consumption cycles, and farmer-to-farmer networks 	<ul style="list-style-type: none"> - Placing the people who produce and consume food at the heart of food systems and policies is severely challenged by the existing market dominated by mega food corporations

Governance of NCBs	Governance enablers or outcomes	Problematics and key issues
General comment	Appropriate design of policies, institutions and governance systems at all scales contribute to climate change related adaptation and mitigation	But governance is about power, relationships and accountability, more than design
r. Indigenous peoples' land and resource governance	<ul style="list-style-type: none"> - Collectively owned land is subjected to the control of communal and territorial institutions; it cannot be alienated - Community and territorial governance systems are mostly downward accountable - Large part of the adult indigenous population is involved with local governance - Bio-cultural institutions (see p) influence NCB governance as well as the socio-political organization - Built-in inertia and downward accountability in the governance systems prevent rapid land-use changes 	<ul style="list-style-type: none"> - The territorial government often adopts a structure that reflects the organization of the society in which it is embedded, or mirrors occidental NGOs. This may clash with authority that still rests with the traditional system. - Indigenous leaders can experience high levels of stress due to decision-making without the opportunity to consult with 'the base', the inertia of the traditional decision-making system, and due to insecurity regarding salaries and budgets - Interventions require FPIC
s. Non-indigenous local people's resource governance	<ul style="list-style-type: none"> - Significant inequalities between citizens may impact local environmental governance. In this case, clear management goals and guidelines set by an outside authority can be an advantage. Keeping up checks and balances help countering inequalities - Important: Enabling policies and environmental restrictions - Map local demographics to ensure representation of all community segments - The authority can gather interested parties and local representatives to council meetings, making room for joint decision-making - Devolution of power (as opposed to decentralization) mostly results in the conservation of ecosystems - Creation of community committees for prevention and recovery from extreme events - Basic principles for efficient, local governance: Downward accountability, transparency, formal management rights or at least participatory processes. 	<ul style="list-style-type: none"> - Examples of 'elite capture' are plenty - Decentralization within the lines of ministries often leads to stronger central concentration of power - Social networks can be as important, and in cases even more efficient, than the existence of formal institutions for environmental governance
t. Community based forestry	<ul style="list-style-type: none"> - Maintenance and development of 'commonality' based on social capital and local institutions has been found as results of community based forestry - Can contribute to improved organization of communities - Ownership and/or exclusive rights restrict local consumption of forest products - Decentralized forest taxation can finance public services 	<ul style="list-style-type: none"> - Reforms can be politically resisted where the values of resources are high. - Without technical and administrative capacity building and local control with leaders, responsible management can fail. - A main concern in having a community forest is to secure the land for the coming generations - Local forest governance can be as, if not more, effective than centralized state-based regimes, and at lower costs.

u. Protected Area governance	<ul style="list-style-type: none"> - Acknowledging common interests and negotiating and accepting trade-offs can promote efficient co-management of PAs - Negotiations about the formulation of a management plan can empower weaker segments of society, in general as well as among stratified resource users and owners 	<ul style="list-style-type: none"> - Dislocations and exclusions still happen - Unequal power-relations in co-management allows for the dominance of occidental conservation paradigms and regimes
v. Intergovernmental and international governance	<ul style="list-style-type: none"> - Divestment in sectors with adverse effects on climate change mitigation and adaptation may be the single most effective way to limit emissions and vulnerabilities of people and nature. - International agreements help law-makers adopt and implement national policies. - Opportunities to pursue synergies exist between NCBs and other national commitments to international agreements - International agreements can provide grievance mechanisms or counseling for local communities and citizens 	<ul style="list-style-type: none"> - Underlying causes of deforestation and forest degradation relate to the larger world-system and include investments, taxation policies, demographic factors, production and consumption patterns, as well as technological factors - National ministries and international agreements are not equally powerful
w. National level governance	<ul style="list-style-type: none"> - Land policies, i.e. customary tenure, redistribution, devolution, co-management, sustainable forest management, regulation of rental markets etc. can provide security and flexible response to climate change. - Land policies encouraging the conversion of agricultural land to forest can generate multiple environmental benefits - Secure land tenure and land rights are critical factors for sustainable management of forests and ecosystem protection - Collective and exclusive property rights to a well-defined group of people is effective to prevent resource depletion - Reforming subsidies and financial services, as well as enabling trade systems, can incentivize sustainable management of land - Citizen inclusion is key in the identification of focus areas, the setting of goals, and implementation and monitoring of actions and policy instruments for cc mitigation and adaptation - Obtaining local populations' FPIC in activities and policies is a continuous, inclusive dialog between parties - Dispute-resolution mechanisms spanning local, subnational and national levels, and having in place an institutional and legal framework to handle complaints/conflicts - Risk management policies 	<ul style="list-style-type: none"> - In Latin America, land subject to land titling and credits has been the deforested land - Unclear property rights can lead to overharvesting and unregulated land speculation - Access to basic state services such as health, education and infrastructure is vital for the sustainable and effective local community and thus its possible contribution to environmental protection - Reforms may run against the interests of elites and powerful interest groups - Counter-acting development policies complicate progress

Appendix 8: MRV Synergies

Non Carbon Benefits elements	Possible synergies with existing MRV tools and frameworks related to international/private agreements
Socio-economic benefits	Overall: MSC could be used in combination
a. Cultivation systems: Food security, agrobiodiversity and dietary choices	Indigenous Navigator; GCF PMF
b. Income generating forest activities	Indigenous Navigator; FAO assessment of CBF; GCF PMF
c. Sustainable forest management	FSC IGIs; RST; WB OP 4.36; REDD+SES
d. Payments for ecosystem and research services	REDD+SES P.2
e. Empowerment	REDD+SES P.6; Indigenous Navigator; FAO assessment of CBF
Environmental benefits	Overall: CBMIS
f. Carbon sequestration	FSC ES
g. Biodiversity and natural forest production and conservation	FSC ES; RST; WB OP 4.04; REDD+SES P.5; FAO assessment of CBF
h. Water: systems, supply and retention	FSC ES; FAO assessment of CBF
i. Combating land degradation and desertification	FSC ES; FAO assessment of CBF
j. Damage mitigation	WB OP 4.01; REDD+SES
k. Recreation and landscape aesthetics.	FSC ES; (UNESCO CDI)
Bio-cultural benefits	Overall: UNESCO CDI and Indigenous Navigator
l. Relational and reciprocal nature perception	
m. Sacred natural sites and species	WB OP 4.11
n. Knowledge and practices	
o. Intergenerational knowledge transfer	
p. Bio-cultural institutions	
q. Food sovereignty	
Governance of NCBs	Overall: MSC could be used in combination
r. Indigenous peoples' land and resource governance	Indigenous navigator; Joint UN-REDD/FCPF Guidelines on Stakeholder Engagements; CBMIS; WB OP 4.10; REDD+SES P. 1+6+7; UNREDD guidelines on FPIC
s. Non-indigenous local people's resource governance	CBMIS; FAO assessment of CBF
t. Community based forestry	FAO assessment of CBF
u. Protected Area governance	(IUCN-WCPA)
v. Intergovernmental and international governance	Indigenous Navigator; WB OP 4.12; REDD+SES P.7
w. National level governance	Indigenous Navigator; REDD+SES P.4+7; Joint UN-REDD/FCPF Guidelines on Stakeholder Engagements; FAO assessment of CBF; UNREDD guidelines on FPIC and Benefits and Risks Tool (BeRT); Safeguards Information systems (SIS); GCF PMF; FCPF Carbon Fund