

## **Submission on Non-Carbon Benefits as an Imperative for the Sustainability of REDD+**

Submission by:

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### **Methodological guidance for activities relating to reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries**

This submission seeks to provide input to the methodological discussion on Non-Carbon Benefits, as referred to in Decision 1/CP.18, paragraph 40 and which has been discussed under SBSTA 38 and 39 and will be an important agenda item for SBSTA 40.

The submission focuses on the crucial role of indigenous peoples and forest dependent communities in nurturing forests and maintaining forest cover. There is increasing and widespread recognition that, in order to make greenhouse gas emissions reductions/removals possible and enduring in the forest sector, REDD+ must broaden its scope from a highly carbon-focused to a more holistic approach. Hence, initiatives to achieve Non-Carbon Benefits (NCBs), in association with a robust safeguards regime, are as important as carbon-related measures and must be designed in an integrated and synergetic manner. Recognition of rights to land, territories and natural resources are crucial preconditions for achieving a number of NCBs for indigenous peoples and local communities and an important incentive for their active participation in REDD+, in all decision-making process and implementation. Integrating these rights in REDD+ mechanisms ultimately secures their livelihoods, provides for environmental services and is the key for the sustainability of REDD+. Community-based monitoring of natural resources and other NCBs is cost-effective and accurate, and further incentivises the achievement of NCBs.

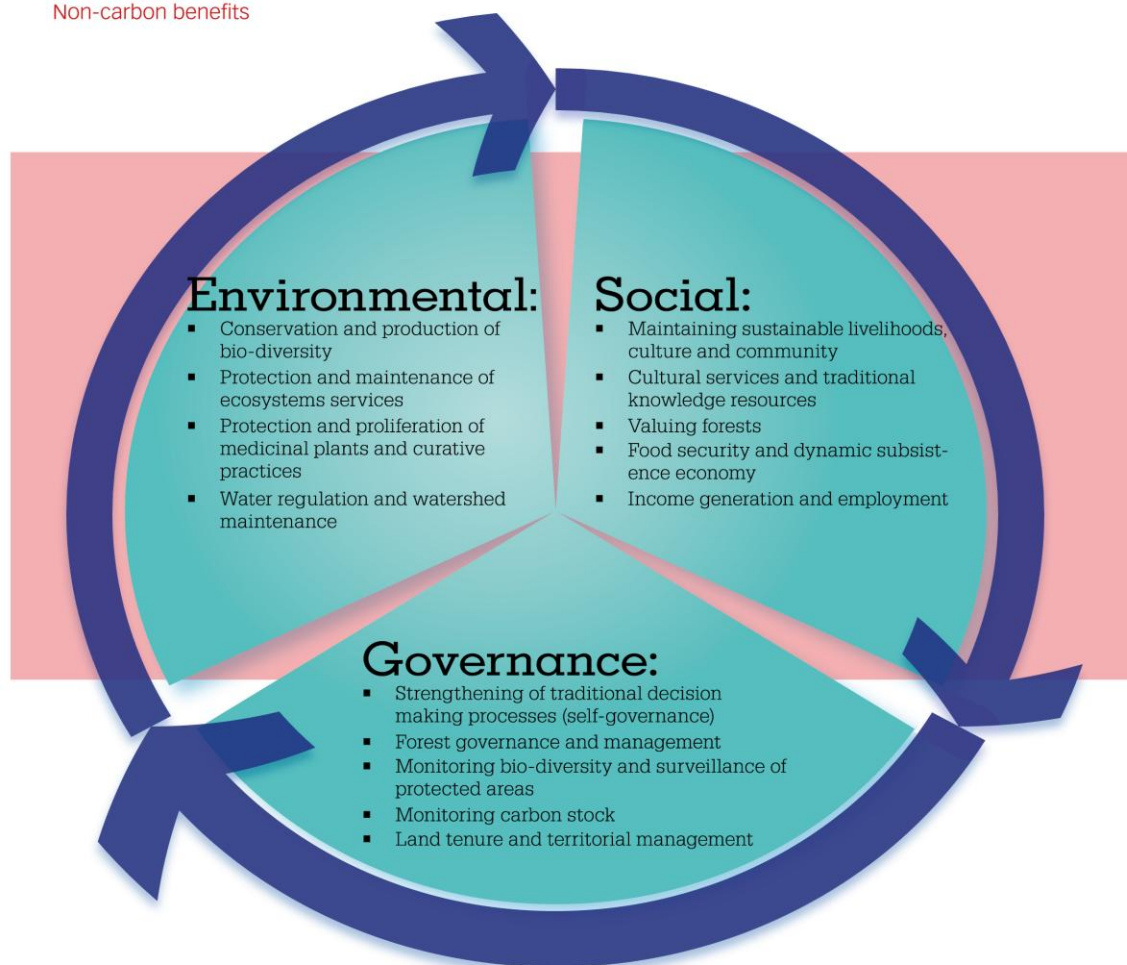
Whatever form REDD+ implementation and related financial mechanisms may take, the tropical forest habitats of the world are not isolated biotic environments, but integrated social and ecological systems, inhabited for millennia by a variety of human populations that in a dynamic and synergetic interplay have been part of the creation of these forests and their biodiversity. Indigenous peoples and forest-dependent communities generate numerous and invaluable NCBs, which contribute to the maintenance of these forest systems. They constitute vibrant and dynamic communities that are determined to maintain their identities and livelihood practices, and are increasingly taking an active part in the international processes to establish workable climate change policies. Without high priority to NCBs in the institutionalization of REDD+ and its safeguards system sustaining REDD+ is not possible. Fortunately the major institutional operators behind REDD+ are increasingly recognizing that NCBs are the *sine qua non* for REDD+ and that indigenous peoples and local communities are not the problem but the solution.

## 1. What are Non-Carbon Benefits?

Non-Carbon Benefits are generally understood as positive *social, environmental and governance outcomes* from REDD+ activities. They go beyond the minimum requirements for safeguards that ensure that REDD+ does no harm to livelihoods and biodiversity, by taking a more proactive and positive approach. NCBs are contributions that ensure that the results of REDD+ will endure over time and are, as such, a crucial prerequisite for the success of REDD+ in general.

NCBs have multiple forms and expressions dependent on the national, regional and local context. To specify some of the multiple forms of NCBs, the three main classes of NCBs can be identified and further subdivided into a number of *ad hoc* sub-categories of benefits and outcomes:

Figure 1:  
Non-carbon benefits



## 2. Synergetic relationship between carbon, land rights and non-carbon benefits

Indigenous peoples and forest-dependent communities play a critical role in nurturing, adapting and developing the forests and forest-related resources, and are thus essential for certain NCBs. Indigenous peoples living in diverse forests around the world not only depend on the forest for their livelihoods but also contribute to its protection, conservation and reproduction, through their traditional natural resources management and sustainable practices.

International peer-reviewed research has documented that land security through demarcation and titling of indigenous territories protects and increases tropical forest cover. A study that measured land use over a 50-year period in the Peruvian Amazon shows, for example, how demarcation and

titling of indigenous territories has led to increased forest cover due to the sustainability of the indigenous production system. This was compared with non-indigenous cattle raisers' production in the same location over the same time span. The study demonstrates positive synergy between land tenure rights, forest governance, carbon and economic co-benefits (see case 1 in the Annex).

The anthropogenic factor in maintaining tropical forest habitats and biodiversity is also well documented in other contexts. Hence, NCBs are not add-ons to REDD+, nor a residual category created to satisfy civil society organizations, but a precondition for the long-term success of REDD+; for achieving the desired carbon benefits and emissions reductions, and curbing the drivers of deforestation. Indigenous peoples, through the International Indigenous Peoples Forum on Climate Change (IIPFCC), have consistently pushed for the explicit recognition and prioritization of NCBs and corresponding mechanisms, emphasizing the importance of a rights-based approach.

### **3. Indigenous Peoples and REDD+**

Indigenous peoples have been and remain critical towards the REDD+ scheme; particularly in REDD+ piloting initiatives, where carbon trading on capital markets was seen as the financial driver. Their main fear has been that REDD+ would lead to speculators and entrepreneurs taking control of resources and lands, with indigenous peoples *de facto* losing their right to self-determination. The commoditization of the forest, which is an embodiment of entire cosmologies, cultural heritage and sustainable livelihoods, is a general concern.

Indigenous peoples' territories have been subject to various forms of resource extraction and alienation of their lands for centuries. Extractivism, including legal and illegal logging, has historically been the main driver of colonization of the tropical forests. REDD+ and carbon financing adds an abstract element to this experience, which the people living in the forests have limited knowledge and influence over and which is subject to international and national systems. The worry is obvious and understandable, particularly among peoples who are struggling for recognition of their rights to land and territory. The ingrained lack of confidence in and distrust of the State, its authorities and its foreign allies is also part of the picture.

The way to overcome this and develop positive opportunities in the REDD+ scheme is by giving high priority to the implementation of rights of indigenous peoples and forest dependent communities. This requires the stringent implementation of the safeguards stipulated in the COP16 Cancún Agreement but also incentivization of NCBs, particularly those that are related to rights to lands, territories and natural resources. This ultimately implies application of the provisions of ILO Convention No. 169 and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), and adherence to the principles of Free, Prior and Informed Consent (FPIC).

Popular resistance to REDD+ projects at the local level may jeopardize REDD+ activities and threaten REDD+ sustainability in the long run. Without consistent implementation of safeguards and without high priority given to NCBs as requirement for results-based financing, financing and investments may be at risk due to contradicting interests and related social conflicts.

### **4. Safeguards, Safeguards Information Systems and Non-Carbon Benefits**

Although the term NCBs was not explicitly used, the Cancún Safeguards Agreement (Decision 1/CP.16, Appendix I) determined that *REDD+ activities should enhance social and environmental benefits, incentivize the conservation of natural forests and their ecosystem services, and promote effective forest governance mechanisms.*

The Cancún Agreement also recognizes that the UNFCCC Parties are obliged to fully respect

human rights and, particularly, the rights of indigenous peoples in all climate-change related decisions and actions.

Indigenous peoples have always argued that safeguards and compliance systems had to be in place in all phases of REDD+, including in the preparatory phases (Phase 1+2). This must be supplemented with the planning for and incentivization of NCBs.

Public access to information on how safeguards are addressed and respected during the implementation of REDD+ activities have been envisaged to happen at country level. This is the basis of the so-called *Safeguards Information System* (SIS). The agreement on the type of information that will go into the SIS is very critical for indigenous peoples, particularly the issue of rights to land, territories and natural resources, as argued above. Furthermore, the establishment of the SIS on the basis of community-based monitoring is an indispensable prerequisite for a cost-effective and participatory implementation of REDD+, which contributes to building trust and to strengthening forest governance.

The REDD+ safeguards are indispensable for achieving results. Without effectual safeguards, REDD+ will fail to “slow, halt and reverse forest cover and carbon loss” and also fail to deliver NCBs. The safeguards, if implemented properly, can enhance forest governance, promote the full and effective participation of indigenous peoples and local communities and respect for their rights, and protect biodiversity in order to ensure ecosystem resilience and the permanence of emissions reductions. Moreover, specific planning for integration of NCBs in the SIS is needed. However, as pointed out earlier, NCBs go beyond the “do no harm” requirement of safeguards and the decision to find ways to incentivise non-carbon benefits has therefore been an important achievement.

## **5. Incentivizing Non-Carbon Benefits**

Incentivizing NCBs is crucial for REDD+ sustainability, which implies that NCBs should be fully integrated into REDD+ planning and implementation. UNFCCC and other sources should provide ex-ante financing, for example to address the crucial issue of land tenure rights, and to allow countries, indigenous peoples and communities to pursue an integrated holistic approach.

Approaches for incentivizing NCBs are being developed by funds and agencies, and UNFCCC should provide guidance to facilitate an understanding how NCBs can be incentivized appropriately. Importantly, performance in social, environmental and governance aspects should be fully integrated into results-based payments and monitored based on indicators, which among others should reflect the implementation of rights to land, territories and resources and to consultation, participation and consent. In general, recognition of rights to lands, territories and resources, in line with the provisions of UNDRIP, constitutes a fundamental basis for the achievement of other NCBs.

The UNFCCC shall ensure an effective participatory process including indigenous peoples and forest dependent communities in developing definitions, guidance and requirements, that can be further tailored to nationally and locally appropriate approaches for incentivization and planning for NCBs.

What constitute the most important combination of NCBs and how they should be planned for and incentivized depends on the national and local situation as well as on the aspirations of indigenous peoples and forest dependent communities beyond monetary form. To make results-based payments of NCBs operational, monitoring of NCBs will need to be an integrated element of the Safeguards Information System (SIS) and national forest monitoring system, which must be in place for each country.

A systematic and participatory gathering and sampling of experiences from different REDD+ or REDD-like programmes that incentivize NCBs and target indigenous peoples and local communities is called for in order to inform the next phases of REDD+. Elements in this could be the establishment of an indigenous peoples' database and information system at national and regional levels, where the experiences and lessons learned from participation in REDD+ NCB schemes may be accumulated and accessed as well as more systematic network of REDD+ and NCB pilot projects.

## **6. MRV and Non-Carbon Benefits**

As pointed out by several observers MRV systems have historically been a very costly affair in tropical forest environments, which implies a challenge for the financial sustainability of REDD+. The reason for the high costs of monitoring is that it has largely been carried out by academic experts and consultants, with limited support from locals. The operational costs are far too high to be practicable, and alternative MRV systems must be designed to keep costs down. The inflated costs have wrongly been used as argument for not including the provision and monitoring of NCBs in the REDD+ framework. However, positive experiences generated with community-based monitoring of natural resources can be applied to monitor other aspects of NCBs, at the same time as lower costs.

A study team led by Danish ecologist Finn Danielsen has made a controlled comparison of expert monitoring and locally-based community monitoring of the status and trends in species and natural resources, looking at accuracy and variability, cost and sustainability as well as cultural relevance. This study provides for an example of monitoring of some aspects of NCBs. Case 2 in the Annex to this submission illustrates the results of this internationally renowned study, arguing that results from local community monitoring only differ slightly from results carried out by scientists. The study concludes that: "community members with limited education and armed with the simplest of techniques and equipment can accurately monitor forest biomass, previously thought to be the exclusive domain of highly trained professionals". Importantly, community-based monitoring is done at significant lower cost.

Several other studies of locally-based monitoring have been carried out in different regions of the world, reaching similar conclusions. Hence, monitoring of NCBs cannot be discarded on the grounds of costs or for fear of inaccuracy. NCBs are diverse and multifaceted and require a set of diverse and complementary monitoring approaches. However, the studies show that they need to be designed and implemented with the full and effective participation of indigenous peoples and the deliberate integration of community-based monitoring in REDD+ MRV framework with clear indicators relating to NCBs.

## 7. Recommendations

1. Indigenous peoples have always perceived forests and their resources as an integral part of their life and livelihood systems. Maintaining the multiple functions of forests is of primary importance for indigenous peoples and it requires the recognition of rights to land, territories and resources and other individual and collective human rights. Indigenous peoples have proven to be crucial for the conservation of forests and enhancement of forest cover, which entail that recognition of their rights and livelihood is a fundamental ‘factor of success’ in any REDD+ scheme. Therefore, we request SBSTA to urge Parties to undergo proper legal and policy reforms for the recognition and respect of indigenous peoples’ rights in accordance with international obligations and instruments such as the UNDRIP and ILO Convention No. 169 and develop guidance for effective implementation of related safeguards.
2. There is no internationally accepted definition of Non-Carbon Benefits, but the term generally refers to the social, environmental and governance co-benefits, which are crucial to take into account in order to secure the multiple functions of forests. We call on SBSTA to provide guidance on how to incentivize NCBs, particularly recognition of rights to lands, territories and resources, so that these are integrated fully into any system for result-based payments. Incentivization of NCBs should be a requirement and integrated fully in all REDD+ financing.
3. We believe that indigenous peoples and forest dependent communities’ traditional knowledge relating to forests, their livelihoods, and the cultural, spiritual, environmental and economic values that they attach to forests should be in focus while defining and discussing non-carbon benefits in REDD+. We call on SBSTA to strengthen its dialogue with indigenous peoples during the process of developing methodological guidance on non-carbon benefits.
4. There is still a prevailing perception among parties that it is challenging to monitor the non-carbon benefits. Internationally renowned research has demonstrated that community-based monitoring of carbon and non-carbon benefits is as accurate and reliable as the costly monitoring provided by professional and consultants. Therefore, we call on SBSTA to recognize and integrate community monitoring into the methodological guidance for REDD+ and incentivization of NCBs.
5. The Safeguards Information System (SIS) that will be developed by the parties should have a separate section on non-carbon benefits and related indicators. The processes to develop and implement methodological guidance on NCBs and SIS should ensure the full and effective participation of indigenous peoples and forest dependent communities, in line with the provision of international human rights standards.

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## ANNEX 1: CASE STUDIES

### Non-Carbon Benefits and indigenous- and local community practices

The following two case studies show how NCBs are crucial for the mere existence of the forests we want to protect, and thus for REDD+. The two cases speak to different aspects of the NCB debate.

#### Case 1: Titling of indigenous territories protects and increases tropical forest cover<sup>1</sup>

*Summary: Case 1 presents evidence from a study measuring land use over a 50-year period in the Peruvian Amazon and shows how demarcation and titling of indigenous community territories has led to increased forest cover, due to the sustainability of the indigenous production system. This is compared with non-indigenous cattle raisers' production in the same location over the same time span, which has led to high deforestation rates and a self-destructive and stagnating economy. The study illustrates the importance of NCBs to REDD+, and particularly the effects of land demarcation and titling of indigenous communities, its impact on governance and democracy, on social structures and livelihoods, and on environment and forest cover. The case shows that NCBs are both land tenure rights as well as subsistence and coffee production, illustrating the synergy between rights, carbon and economic benefits for the indigenous population.*

#### The area

The area called Gran Pajonal is a high lying interfluvial plateau<sup>2</sup> of approximately 380,000 hectares (3,800 km<sup>2</sup>) situated in the eastern part of the central Peruvian Amazon. The area is covered with lush forest vegetation<sup>3</sup> combining primary forest with secondary forest growth, most predominant around the community settlements. However, the most distinctive feature in this landscape is the *pajonales* - the hill savannahs - open, grass-covered areas that are scattered all over the inner zone of the Gran Pajonal and numbering hundreds of patches of grasslands of varying size, ranging from small glades to large savannahs covering hundreds of hectares.

#### The population

Two different populations inhabit the Gran Pajonal: the Ashéninka Indians and a group of mestizo settlers - *colonos* - with mixed backgrounds in the Andean peasant society.

The Gran Pajonal Ashéninka number around 8,000 persons today (2013); distributed across some 40 Native Communities (Comunidades Nativas). The community territories are all demarcated and collectively titled in the name of each community, all with their own elected authorities and with relative autonomy, guaranteed in Peruvian legislation and the national constitution. Most of the communities have their own bilingual primary school, a small health post and several have their own multichannel shortwave radio for communication with neighbouring indigenous communities and organizations. All the communities together make up the Ashéninka Organization of Gran Pajonal, the OAGP, a well-functioning indigenous organization with a strong and consistent

<sup>1</sup> This case is based on a research project conducted by the Danish anthropologist Søren Hvalkof, supported by the Danish Council for Development Research and carried out at the University of Massachusetts, Amherst, USA, 1994-1997. (10, 11 and 12)

<sup>2</sup> It rises like a rocky block to an elevation that varies between 3,000 to 5,000 feet but, inside, one finds a much more friendly tableland characterized by a combination of rolling hills and steep slopes, criss-crossed by numerous streams cutting deep ravines.

<sup>3</sup> Classified according to ecoclimatic parameters as Humid and Very Humid Montane subtropical forest (ONERN 1968:72-73).



leadership. The communities are all located adjacent to each other, forming one large continuous territory.

The *colono* population is concentrated in the center of the area in and around the old mission and settler colony of *Oventeni*. Today, there are around 650 settlers representing some 120 families. Most of these settlers migrated to the area in the 1960s, and a second generation of settlers born in Oventeni is gradually taking over. These *colonos* are mostly of Andean descent, with their roots in the Quechua-speaking peasant culture of the Central Andes. They self-identify as mestizo highlanders, and colonist pioneers. They are not organized in any common association. The colonist community includes many poor peasants and a few dominating and relatively wealthy cattle ranchers. (10, 11, 12)

### Economy and production

The core of the Ashéninka production system is a traditional Amazonian shifting horticulture, sometimes characterized as "native agroforestry" (12, 13, 14, 15). The system is based on small swidden plots averaging 1-2 hectares, with a variety of edible, commercial and utilitarian plant species in an advanced intercropping system. The structure and composition of such a garden plot varies over time as the plot gradually regenerates as forest. Every season thus has its specific composition of harvestable crops, ending with perennial tree crops such as avocado trees, peach palms and nuts. An average fallow period spans some 25 years, but the fallow cycle varies depending on the soil, location and use, before the plot can be cut and used again for a new garden plot. A relatively new tendency in market-oriented production is the cultivation of high-quality coffee for export. The Ashéninka have adopted coffee as a favourite cash crop and have succeeded in adapting it to their integrated rotational cultivation system. As an integral part of their subsistence cultivation system, their coffee production costs are quite low compared to those of neighbouring mestizo coffee producers, making the Ashéninka quite competitive and far less vulnerable to market fluctuations. The income from coffee production is growing, and organic certification is in process. The key to the coffee success of the Ashéninka is the diverse and healthy subsistence production, which keeps the cost of social reproduction low. The indigenous economy is geared towards self-sufficiency, with several "institutionalized" buffer mechanisms in times of crisis. The study shows that the key parameter for success is demarcation and collective titling of indigenous territories. The indigenous population did not have any lands or territories demarcated and titled until they succeeded, though massive pressure and organizational effort, in starting the demarcation and titling process of their community territories with support from a World Bank-financed regional development scheme in the late 1980s. The land titling restrained the aggressively expanding cattle economy at the time, and gave room for the development of sustainable high-quality coffee production, another important NCB in combination with the land titling.

The fact that their land and territory is demarcated and communally-titled is an indispensable prerequisite, as it otherwise would have been appropriated by colonist cattle ranchers.

The settler economy of Oventeni is primarily based on cattle-raising. Tropical forest is cleared and pasture suited to cattle grazing is instead planted. Most of the heavy work of clearing forest, planting pasture and maintaining it to avoid re-growth into shrub savannah forest has been done by cheap Ashéninka labour. The indigenous labour was up to the 1990s secured through feudal exploitation systems, in patron-peon relationships. The productivity of the cattle-rearing is very low. The settler economy is vulnerable to market fluctuations and access to cheap external labour. With the growth of the combined indigenous coffee export and subsistence economy, it has been increasingly difficult for the cattle raisers to secure indigenous labour, and cattle production is gradually proving unviable and unsustainable.

### The impacts on the forest habitat

A study of land-use patterns and changes in forest growth over a 50-year period documents the impact of these two different production systems,<sup>4</sup> and shows that the indigenous population has maintained almost the same ratio of forested land to land in production, albeit with a falling tendency in extension of grassland.<sup>5</sup>

<b>Land use 1950s</b>		
	<b>Indigenous areas</b>	<b>Settler area</b>
Forest	87%	87%
Grassland/pasture	7%	7%
Gardens and fallow	6%	6%
Settlements	-	<1%

<b>Land use 1980s</b>		
	<b>Indigenous areas</b>	<b>Settler area</b>
Forest	92%	72%
Grassland/pasture	6%	20%
Gardens and fallow	2%	7%
Settlements	<1%	<1%

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<sup>4</sup> See note 7 above.

<sup>5</sup> To be able to compare, relatively similar areas of intervention and of similar size were chosen: the colono zone around the Oventeni colony, and the Native Community of Shumahuani. Three situational time “transects” for land-use patterns were applied: The 1950s (1954 -1958), the 1980s (1983-1984) and the late 1990s (1996). The land use patterns were mapped, digitized and analyzed on the basis of aerial photo surveys from 1954 and 1958 in 1:10.000 and 1:15.000; and aerial photo surveys from 1983 and 1984 in 1:50.000. For the 1996 survey, the research project ordered a special take by the French SPOT satellite of the Gran Pajonal during the months of July-August 1996. (11)

<b>Land use 1996</b>		
	<b>Indigenous areas</b>	<b>Settler area</b>
Forest	91%	48%
Grassland/pasture	5%	28%
Gardens and fallow	4%	23%
Settlements	<1%	1%

The effectiveness of the indigenous production system in maintaining more than 91% forest cover is conspicuous. Moreover, the indigenous production system not merely permitted the maintenance and extension of forest. It has also allowed a sharp rise in population in the indigenous communities, where the population has tripled since the 1950s. The colonist population, on the other hand, has barely maintained the same population size as in the 1980s, but while they have increased deforestation of their production and living areas by almost 50% over the same period of time (48% with forest cover), there has been no noticeable changes in poverty level or income generation for the majority of settlers.

#### Conclusion:

The traditional indigenous production system and livelihood has shown remarkable resilience and adaptability to modern market conditions, entering into organic coffee production for the export market. Not only has the indigenous production system resulted in 5% more forest in 1996 compared to the 1950s, it has also supported a population increase of some 200-300% between the 1950s and 1996, generated income for extremely poor indigenous families, and made a more democratic governance system possible with active participation in national and civil society.

Contrary to this stands the settler production system based on small-scale cattle production. The *colono* population has barely been able to maintain its population size in Gran Pajonal, despite new road infrastructure and technical support. Moreover deforestation and degradation increased by 39% (from 13% in combined grass and gardens to 52% combined) between the 1950s and 1996, without notably increasing their relative living standards.

The conspicuous difference between the two production systems explains why NCBs are crucial and a prerequisite to generating long-term carbon benefits, and why indigenous knowledge and adaptability could also have a positive impact by restraining production systems that drive deforestation, such as the settler production of Gran Pajonal, if supported by the implementation of robust safeguards and the prioritization of NCBs.

The case of the coffee-producing Ashéninka in the Peruvian Amazon shows how social, cultural, environmental and governance aspects are interlinked and why it makes sense to give high priority

to NCBs in REDD. Although this study has been done on a regional level and could be suspected of being an exception, the general tendency towards forest protection by indigenous territorial usage and management systems is well documented by other large-scale studies in Peru. (17)

The high impact that indigenous areas have on reducing deforestation points to the fact that indigenous land rights, demarcation, titling and establishment of indigenous territories is a viable strategy for REDD+, in combination with multi-use areas of other forest-dependent communities, and substantiates why NCBs should be given high priority in all stages of REDD+ implementation.

## **Case 2: Introducing indigenous and community-based monitoring systems**

*Summary: This case study focuses on the capacity of local communities to monitor biodiversity and resources in Madagascar, Nicaragua, Philippines and Tanzania. It makes a controlled comparison between local community monitoring and trained scientists' monitoring and conclude that local and indigenous communities generate similar and equally good outputs as the trained scientists, and are much more cost efficient. The cases suggest that it is fully possible to build a cheap and effective MRV system based on community monitoring of NCBs.*

Case 2 is a comparative study from Latin America, Asia and Africa (2013) (23) evaluating the potential of locally-based monitoring of natural resources and biodiversity for informing conservation decision-making and intergovernmental mechanisms (such as REDD+), by comparing results of paired local and professional monitoring efforts in tropical forest habitats in four tropical countries: Madagascar, Nicaragua, the Philippines and Tanzania. The monitoring ran over 2.5 years and was conducted by 128 local people with only primary school education and 7 university-trained specialists.

The focus of the study was to compare measures of resource abundance by local community members and external scientists. It also focused on the most relevant information for informing natural resource management decisions such as the status of and trends in abundance indices. The working hypothesis was that measures of abundance in natural resources (biodiversity) would differ when assessed by community members compared to trained scientists. The study tested this hypothesis by comparing data from patrols by community members and line transect surveys by trained scientists along the same or adjacent survey routes in the same forest areas and over the same three-month period. The survey included numerous methodological considerations and parameters to make the comparison as reliable as possible. It is beyond this brief to summarize all these measures here; however some details seem warranted. (23).

The field data was collected between January 2007 and June 2009 across 34 sites in the four countries. The specific study sites were located on the basis of existing locally-based forest monitoring schemes, except in Nicaragua among the indigenous Mayagna population, where a local monitoring scheme had to be established for the purpose of the study. The study sites and boundaries were decided by the communities and scientists together and could vary in size from a few hundred hectares to several thousand hectares but all needed to be important in terms of both biodiversity and their value for local livelihoods (23). Local community representatives helped select the participants on the basis of their interest in and experience with forest resources, which included some very experienced collectors of forest products. Most of the community participants had very limited basic education and, accordingly, literacy limitations but at least one participant in each case was able to read and write. The participants received local training for 2-3 days on how to record the forest resources during already existing forest patrols. During the field study period, the training was followed up by an annual visit to each study site to assist the community participants and collect copies of completed field forms.

The trained scientists that conducted parallel monitoring at the same sites all had academic degrees at MSc level or equivalent in natural science. They all had a minimum of 10 years' field experience in tropical forest surveying. The scientists set up their own fixed monitoring routes at the same forest sites using a recognized line transect methodology. Length of transect routes was standardized (2000-2500 m) and walking speed was kept constant. The scientists also attempted to avoid double-counting the same individuals. The scientists were working alone. Both community surveyors and scientists recorded all their observations, independent of the distance of their survey routes. Both direct sightings and indirect evidence (calls, tracks, excrements etc.) were recorded, including moving animals and clusters. The community monitoring routes followed existing monitoring patrol routes (except in Nicaragua), and thus varied in shape and length between the countries. In the Philippines and Nicaragua, the community surveyors and the scientist followed the

same routes in the forest, but on different days. All these variables (and many more) were taken into account in the comparative study methodology.

Before the surveys started, the participants selected the natural resources and types of resource use events they wanted to monitor. The researchers proposed a minimum list with 5 categories: a species of large mammal, a species of small mammal, a species of bird, a type of resource use of animals and a type of resource use of plants. Based on this outline, community members decided on 68 targets to monitor, divided into three classes of taxon: 39 bird taxa, 24 mammals taxa and 5 types of resource use (e.g. cutting bamboo and hunting).

The result was that a total of 24,881 hours of monitoring by community members (19,183 hours) and trained scientists (5,698 hours) generated 5,804 paired records between community members and scientists measuring the same natural resource or resource use activity at the same sites over the same three-month period.

Summarizing the findings, it can be concluded that, in tropical forest habitats in developing countries, community members with little or no formal scientific education, who have decided which natural resources should be monitored, can generate results on abundance estimates, relative trends and temporal variation of natural resources and resource uses very similar to results generated by trained scientists.

The study found the greatest match in results between the two groups of observers when they surveyed the same route (Nicaragua, Philippines) with short time intervals between their surveys (Nicaragua). It found the lowest match in results where community members varied their survey routes among patrols (Tanzania). When there were only small differences in route, area and time of the surveys by community members and trained scientists, they produced closely similar estimates.

It can thus be concluded that, despite considerable differences between countries, cultures and the types of natural resources monitored, community members and trained scientists produced closely similar results on status and trends in species and natural resources. The study documents and highlights the potential value of locally-based natural resource monitoring for conservation decision-making across developing countries and thus for the REDD+ framework. (23)

#### Conclusions:

The study shows strikingly similar results between measures made by community members and professional foresters across countries and forest types. This corroborates a small but growing body of research, which suggests that community members with limited education and armed with the simplest of techniques and equipment can accurately monitor forest biomass, previously thought to be the exclusive domain of highly trained professionals.

The study also states that data gathered by communities meets the high standards of the United Nations Intergovernmental Panel on Climate Change (IPCC), and it argues that community-gathered data would strengthen current REDD+ projects. Local people would also be more likely to trust and participate in REDD+ activities if they were treated as equals in the process and ensured continued access to the forests they rely on for their livelihoods.

Finally, the study points to the need to develop simple standardized methods that can be used at scale and that can feed data into national information systems and the REDD+ Safeguards Information System - SIS. (25)

Submission by:

