Food and Agriculture Organization of the United Nations

FILAC

FUND FOR THE DEVELOPMENT OF THE INDIGENOUS PEOPLES OF LATIN AMERICA AND THE CARIBBEAN

Forest governance by indigenous and tribal peoples

An opportunity for **climate action** in Latin America and the Caribbean

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Food and Agriculture Organization of the United Nations (FAO)
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COVER PHOTOGRAPH ©FAO/ Mauricio Mireles
Indigenous woman from the Guna People, Púcuro Indigenous Territory, Darien Province, Panama (2019).

BACKCOVER PHOTOGRAPH ©ITINKUY.COM/ Miguel Arreátegui
Headdress (clothing) worn by a leader of the Harakbut People, Madre de Dios, Peru.

Last updated 13/05/2021

In memory of **Robinson López Descanse** (1984-2020), indigenous-amazonic leader of the Inga Peoples.

He served as governor of his community. Founder and president of the Association of Indigenous Councils of the Inga Peoples of the Municipality of Villagarzon, Commissioner of the National Human Rights Commission for Indigenous Peoples and Coordinator of the National Human Rights and for Peace Organization of Indigenous Peoples of the Colombian Amazon. Later, he was appointed Climate-change Coordinator of the Coordinating Body of the Indigenous Organizations of the Amazon Basin.

Robinson, of only 36 years of age, died on August 21st 2020 due to COVID-19.

We respectfully dedicate this report to Robinson, a man who devoted his life to his people.

Indigenous Territory in Talamanca, Limón Province, Costa Rica.

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PROLOGUE FAO

As I write this prologue, Latin America and the Caribbean due to COVID-19 faces one of the worst health, economic, and humanitarian crises of its history, due to COVID-19. Compared to that, the great climate change crisis may appear far off. Nevertheless, climate change threatens to be equally or even more dangerous than the pandemic. If the current situation has taught us anything, it is that we cannot afford to ignore scientists' warnings about imminent threats, and that the cost of overcoming this kind of catastrophe can be much greater than avoiding or mitigating it.

Even so, with such a strong economic crisis, no country in the region has the financial capability to redirect funds allocated to address the pandemic's devasting effects on health, welfare, and the economy, and channel them into efforts focusing exclusively on climate change. Collectively, we will have to be extremely creative and innovative to find the policies and investments that can help us to recover from the pandemic but also contribute to the inescapable tasks of mitigating and adapting to climate change.

Collaborating with the region's indigenous and tribal peoples to protect the forests in their territories fits the bill. These peoples are rich when it comes to culture, knowledge, and natural resources, but some of the poorest when it comes to incomes and access to services, and among the most affected by the pandemic, healthwise and economically. Supporting them to protect and manage their forests could help to create or recover hundreds of thousands of jobs in forestry, agroforestry, tourism, education, and cultural activities, and to avoid new pandemics, as well as providing other social, environmental, and cultural benefits. It also has the potential to attract hundreds of millions of USD dollars per year from international sources, since there is strong evidence that taking care of these forests is one of the

most cost-effective options for limiting carbon emissions, which is of vital interest to the entire planet.

Indigenous and tribal peoples and the forests in their ancestral territories play vital roles in global and regional climate action and in fighting poverty, hunger, and malnutrition on the continent. Their territories contain about one third of all the carbon stored in the forests of Latin America and the Caribbean and 14 percent of the carbon stored in tropical forests worldwide. Historically, these forests have suffered much less deforestation and degradation than other forests in the region, but that is changing rapidly, and there is an urgent need to take action to revert these new trends.

The report presented here, based on an exhaustive review of the recent scientific evidence, explains this situation, and presents a set of priority measures for governments and international agencies to implement, in close collaboration with the indigenous and tribal peoples. It shows how the cultural, geographic, economic, and political conditions and factors that have favored the preservation of the forests in the indigenous and tribal peoples' territories and the millenary cultures of their inhabitants are changing drastically; and the consequences could be disastrous, both environmentally and financially.

To respond to these challenges, the report proposes a set of investments and policies that have great potential to reactivate the economies of the indigenous and tribal territories, mitigate climate change, preserve biological and cultural diversity, and reduce social and environmental conflicts. This innovative proposal is based on five pillars:

i. Recognition of collective territorial rights.

ii. Compensation for environmental services.

iii. Community forest management.

iv. Revitalization of ancestral knowledge.

Entering the forests of Yurumanguí, Cauca Valley, Colombia.

v. Strengthening of grassroots organizations and mechanisms for territorial governance.

All within a framework of respect for indigenous and territorial peoples' right to Free, Prior and Informed Consent (FPIC).

For each of these pillars the report presents solid evidence, based on previous experience, that the proposed activities can achieve results. It also presents an econometric analysis and a preliminary indicative financial analysis, which show that the proposed measures can by highly profitable.

For the Food and Agriculture Organization (FAO), promoting social inclusion and reducing the inequalities that disproportionately affect the indigenous and tribal peoples of Latin America and the Caribbean is central to our mandate. We are especially concerned with the eradication of hunger and promotion of rural development, using a gender-sensitive and inter-generational approach, which recognizes collective

territorial rights. On behalf of FAO, and together with the Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean (FILAC), whose collaboration we are truly grateful for, we want to express our recognition for the indigenous and tribal peoples' many contributions to the preservation of natural and cultural assets and we hope that this research can make its own modest contribution to improving equitable access to climate finance and to rural economic recovery.

JULIO BERDEGUÉ
FAO Assistant Director General and Regional Representative for Latin America and the Caribbean

PROLOGUE FILAC

The present report shows how important and urgent it is to protect the forests and communities of indigenous and tribal peoples' territories. It demonstrates that the threats to these forests and their inhabitants are growing in a way that is disproportionate and unsustainable, even though indigenous and tribal peoples have been good guardians of nature. In response, it proposes a set of investments and policies for climate funders and government policymakers to, in coordination with indigenous and tribal peoples, help catalyze culturally sensitive sustainable development processes for this sector of the population.

For the Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean (FILAC), territorial rights are one key component for indigenous peoples to be able to define how they live. They provide a space where indigenous peoples can reproduce, practice, preserve, and revitalize their own political, economic, social, legal, and cultural system, in harmony with nature.

In that context, it is worth highlighting the emphasis this report gives to how important the indigenous and tribal territories are in terms of their:

- vast landmass;
- great capacity to capture and store carbon;
- enormous biodiversity;
- rich and diverse cultures; and
- potential contribution to culturally sensitive rural development and achievement of the Sustainable Development Goals (SDGs).

It is fundamental to compensate indigenous peoples for helping to revert the negative consequences of the current

Traditional clothing of the Guna Indigenous People Púcuro Indigenous Territory, Darién Province, Panama.

development model, which has been especially harmful for indigenous and tribal peoples. The indigenous and tribal peoples of Latin America and the Caribbean are increasingly worse off compared to other groups. This deficit began with the loss (dispossession) of many of their territories and servitude, enslavement, and forced labor. Some contemporary forms of enslavement persist to this day, and "should be eradicated immediately", as the Inter-American Commission on Human Rights (IACHR) noted in 2009 in relation to the indigenous Guaraní communities in the Chaco region.

Three quarters of the planet are covered with water. Barely two decades ago, it seemed like there would be enough of the vital liquid to meet every woman and man's needs. On average, Latin America and the Caribbean is the region with the most available water: 33 580 cubic meters of water per person per year, without even including the great subterranean Guarani aquifer, between Argentina and Uruguay. The region has four of the

most important rivers in the world (Amazon, Paraná, Orinoco, and Magdalena) and some of the largest lakes. Nevertheless, unrestrained forest destruction and waste, among other things, have made some nations, literally, die of thirst.

Based on their view of the good life (*buen vivir*) our indigenous peoples protect the water, the air, the earth, the forest, life, which interrelate with each other and form the basis for life.

Indigenous and tribal peoples' persistent demands for their rights and own forms of development, and their persistent defense of their territories and natural resources have become increasingly visible in recent years. This has also come with a resurgence of the criminalization of indigenous movements, and their leaders and authorities, and the propagation of undesirable practices of discrimination, persecution, racism, and assassinations.

A new relationship with indigenous peoples implies allocating resources to revitalize their intangible wealth of cultures and ancestral knowledge. That immaterial cultural patrimony provides a holistic foundation for the indigenous peoples' systems of communal living, including their forestry management practices, such as assisted forest regeneration, selective harvesting and reforesting, and assisted growth of trees within existed forests.

In recent years FILAC has learned various lessons, based on its experiences implementing community-designed sustainable development projects. Now that the world faces a global emergency and the effects of the COVID-19 pandemic, FILAC is more convinced than ever that specific strategies and approaches are need for indigenous and tribal peoples for three reasons:

i. The great majority of indigenous and tribal peoples live under **structurally vulnerable conditions** – many of them live far from urban areas and have extremely limited access to basic services, including healthcare and water.

ii. These are peoples with their **own cultures** and require an approach that integrates academic knowledge with their own contexts, knowledge, and ancestral practices, including their own languages and medical systems, among others.

iii. For indigenous communities, especially those that belong to peoples with small populations, **keeping the virus out of their territories is a matter of life and death**, not only for the individuals concerned but for their existence as a people. Given the immunological situation of many communities, the presence of COVID-19 can have dramatic consequences for these peoples, as happened in the past with other diseases.

Given all this, the time has come to create a more inclusive, resilient, and sustainable future. This requires new ways of conceptualizing and "doing" development, to achieve a "good co-existence" between peoples and between humans and other living beings, nature. That is the basis for really addressing the threats against and rapid destruction of the forests and habitats of indigenous and tribal peoples' territories.

MYRNA CUNNINGHAM KAIN
President of the Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean (FILAC)

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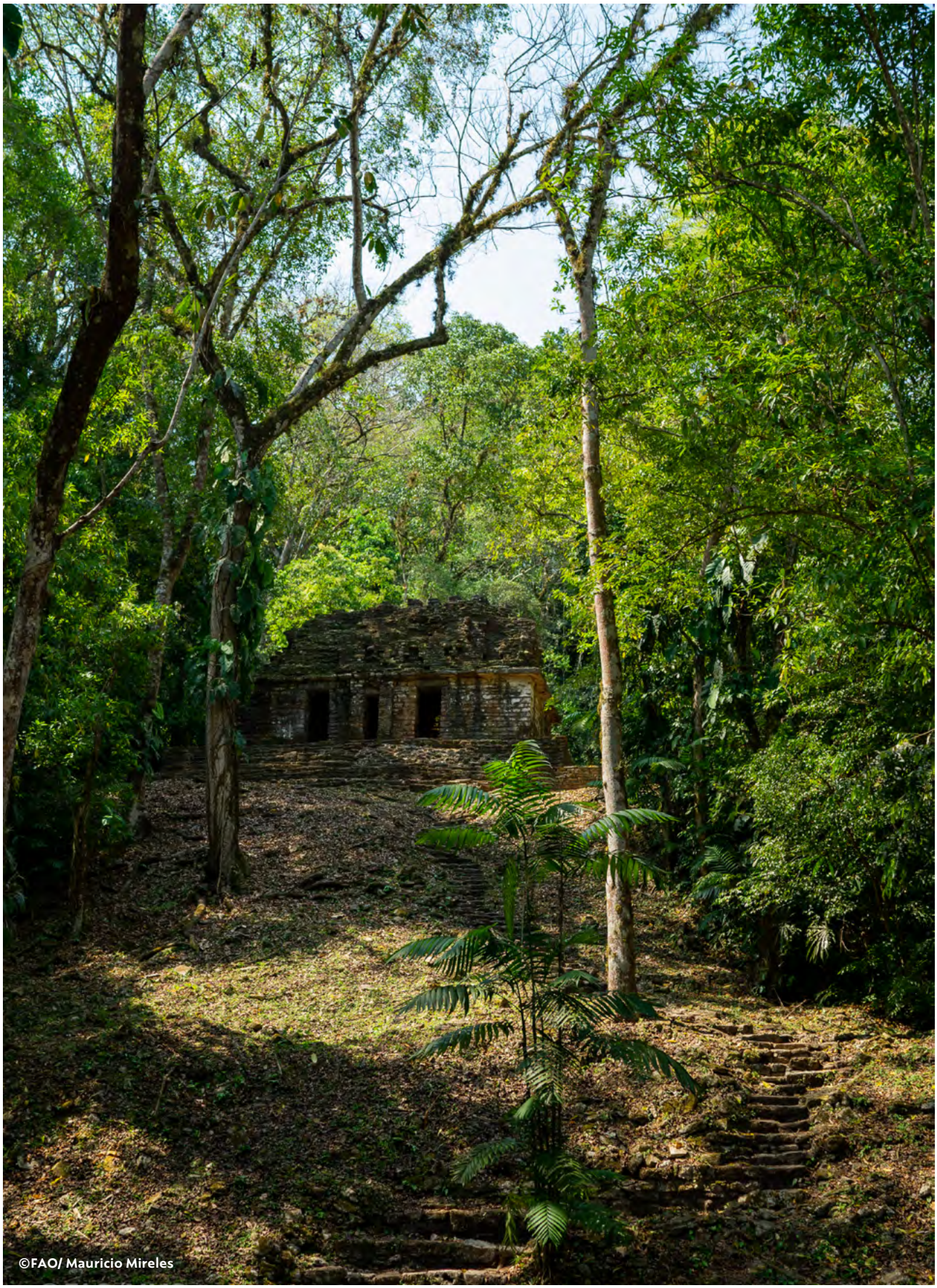


Archaeological zone of Yaxchilán, ancient city of the Mayan Culture, Municipality of Ocosingo, Chiapas, Mexico.

ABBREVIATIONS AND ACRONYMS

ACT	Amazon Conservation Team
CAOI	Andean Coordinator of Indigenous Organizations
COICA	Coordinating Body of the Indigenous Organizations of the Amazon Basin
CONAFOR	National Forestry Commission (Mexico)
ECLAC	Economic Commission for Latin America and the Caribbean
FAO	Food and Agricultural Organization of the United Nations
FAPI	Federation for the Autonomy of Indigenous Peoples (Paraguay)
FIAY	Indigenous Forum of Abya Yala
FILAC	Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean
FONAFIFO	National Forest Fund (Costa Rica)
FPIC	Free, Prior and Informed Consent
FSC	Forest Stewardship Council
IACHR	Inter-American Commission on Human Rights
IBC	Common Good Institute (Peru)
IEG	Independent Evaluation Group of the World Bank
ILO	International Labor Organization
IPBES	Inter-Governmental Panel on Biodiversity and Environmental Services
IPCC	Inter-Governmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
MINAM	Ministry of Environment (Peru)
MIQRO	Industrial woods of Quintana Roo
MtC	Million metric tonnes
NGOS	Non-governmental organizations
NTFPS	Non-timber forest products
PAS	Protected areas
PES	Payment for environmental services

PINPEP	Program of Forestry Incentives for Landholders for Small Areas Suitable for Forestry and Agroforestry (Guatemala)
PNCB	National Forest Conservation Program (Peru)
PREVFOGO	Program for Prevention and Combat of Forest Fires in Indigenous Territories (Brazil)
RAISG	Amazon Geo-Referenced Socio-Environmental Information Network
REDD+	Reduced emissions from deforestation and degradation
REM	REDD+ Early Movers
RRI	Rights and Resources Initiative
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNIPP	United Nations Indigenous Peoples Partnership

Woman of the Tikuna People, Leticia, Amazon, Colombia.

INTRODUCTION

This report highlights the importance and urgency for climate action initiatives of protecting the forests of the indigenous and tribal territories[1] and the communities that look after them.[2] Based on recent experience, it proposes a package of investments and policies for climate funders and government decision-makers to adopt, in coordination with the indigenous and tribal peoples.

The indigenous and tribal peoples that inhabit Latin America and the Caribbean's forest regions find themselves in a paradoxical situation. Despite being rich in natural and cultural resources, they are poor in monetary incomes and access to public services. This report addresses both aspects. It proposes measures that take advantage of indigenous and tribal peoples' natural and cultural riches to mitigate and adapt to climate change and protect wildlife and biological diversity, while reducing extreme poverty, food insecurity and social conflict. The COVID-19 pandemic makes such measures more urgent than ever. The indigenous and tribal peoples are among the groups most affected by the virus and its economic impacts, and the pandemic underscores how forest destruction and biodiversity loss can fuel zoonotic diseases that put human lives at risk.

Forests are extremely important for climate stability because it would be extremely difficult to limit the rise in average global temperatures to less than 2 degrees Celsius above pre-industrial levels without conserving and restoring the world's forests (Houghton *et al.,* 2017). Practically all scenarios for achieving this

[1] The term "indigenous and tribal territories" refers to areas that indigenous or tribal peoples manage collective or semi-collectively.

[2] This report focuses exclusively on indigenous and tribal peoples in forested regions and those regions themselves. However, much of its analysis and proposals apply to other traditional forest and riverbank communities. Those communities manage tens of millions of hectares of additional forests.

Maya Q'eqchi 'woman, community midwife (attends deliveries), also goes through the forests to fulfill her tasks, Guatemala.

goal include some combination of reducing deforestation and forest degradation, reforestation, and natural forest regeneration (IPCC, 2018), the main "climate actions" discussed in this report.

In this context, the forests of Latin America and the Caribbean's indigenous and tribal territories are key for global, regional, and local climate mitigation and resilience.[3] They contain almost 30 percent of the carbon of the region's forests and 14 percent of the carbon in tropical forests worldwide[4] (Saatchi *et al.,* 2011; Walker *et al.,* 2014; Frechette *et al.,* 2018). In fact, they store more carbon than all the forests in Indonesia or the Democratic

[3] Unless otherwise noted, this report uses the term "forest" to designate all land where the tree canopy covers more than 10 percent of the area, including primary, secondary, and planted forests, mangroves, and some agroforest systems.

[4] While this report covers all Latin American forests, it emphasizes the tropical forests, which contain the great majority of the region's forest area and carbon stored in its vegetation.

Republic of Congo, the two countries with the most tropical forest area after Brazil (Walker *et al.,* 2014).

Besides being great warehouses of carbon, forests also matter for the climate because they affect the temperature and rainfall patterns in other ways. Forests have higher evapotranspiration, greater surface roughness, and lower albedo than other land uses, and that has major effects on local temperatures and both local and distant rainfall patterns (Ellison *et al.,* 2017; Sheil, 2018; IPCC, 2019). Extensive forest cover can help to prevent extreme temperatures and changes in rainfall patterns, and thus maintain agricultural yields, avert heat stress, and prevent forest fires associated with droughts (Costa *et al.,* 2019; Suter *et al.,* 2019).

Historically, forests in indigenous and tribal territories have suffered much less destruction than the region's other forests. Nevertheless, several factors that protected these forests have weakened, and threats to these forests and their inhabitants are growing rapidly. To reverse these negative trends requires various measures, which can be grouped in five categories:

i. Strengthening communal territorial rights.
ii. Compensating indigenous and tribal communities for environmental services.
iii. Facilitating community forest management.
iv. Revitalizing traditional cultures and knowledge.
v. Strengthening territorial governance and indigenous and tribal organizations.

These measures offer an excellent opportunity to markedly reduce carbon dioxide in the atmosphere at a low cost per ton of avoided emissions, as well as generate other relevant environmental and social benefits. A holistic package of reforms and investments that incorporates these elements could contribute greatly to achieving many Sustainable

Development Goals (SDGs) and targets of the Paris Agreement, and the 2030 Agenda.

The report begins by analyzing the forests in the territories that indigenous and tribal peoples manage communally and their importance for climate action. Then, it tackles the reasons those forests have been better conserved than other forests in the region. Thirdly, it studies the new dynamics accelerating these forests' destruction threatening indigenous and tribal peoples. Finally, we propose a package of policies and reforms to reverse these trends, with emphasis on five types of interventions.

It is worth mentioning that this report centers on indigenous territories with significant forest cover. It also includes evidence about afro-descendants who could be considered "tribal" under international standards (Dulitzky, 2005).[5]

The report is based primarily on a review of over 300 studies published in the last two decades, including 73 studies published in the last two years (2019 and 2020). Hopefully, it will pique the interest of decision-makers and professionals who work in government agencies, grassroots organizations, international organizations, academic centers, and non-governmental organizations (NGOs) related to climate and forest policies and to land tenure and the rights of indigenous and tribal peoples.

[5] Tribal peoples are those "not indigenous to the region [they inhabit], but that share similar characteristics with indigenous peoples, such as having social, cultural and economic traditions different from other sections of the national community, identifying themselves with their ancestral territories" (Inter-American Court of Human Rights, 2007).

Indigenous woman leader from the Guna People, Púcuro Indigenous Territory, Darién Province, Panama.

WHO ARE THE INDIGENOUS AND TRIBAL PEOPLES OF LATIN AMERICA AND THE CARIBBEAN?

According to the United Nations (UN), more than 5 000 different peoples, with a population of over 370 million people, divided between 70 countries on five continents, fall under the category of "indigenous peoples" (UNIPP, 2012). These peoples are quite diverse. Each has their own culture, language, history, worldview, and productive, food, and medicinal systems. Nevertheless, they share a series of common characteristics and problems, which are the basis for their struggles and for the international policies that concern them.

While there are various meanings of the term "indigenous" or "indigenous peoples", the term has come to be used internationally in the context of global debates about the rights of ethnic minorities, tribal peoples, natives, aborigines, and indigenous populations. These are groups that have been, and continue to be, discriminated and marginalized, as the result of colonialism and postcolonial processes of building and developing modern nation states.

The International Labor Organization (ILO) was the main forum for international discussions about indigenous and tribal peoples between the 1920s and the approval of the United Nations Declaration on the Rights of Indigenous Peoples in 2007, and was responsible for the only international legal instruments focused exclusively on the rights of these people. In June 1989, the ILO approved Convention 169 on Indigenous and Tribal Peoples, which has been a key legal instrument references by organizations, agencies, and states that work on these issues ever since.

Article 1 of ILO Convention 169 establishes in broad terms the indigenous and tribal peoples to which the convention applies as follows:

a. "**tribal peoples in independent countries** whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;

b. **peoples in independent countries who are regarded as indigenous** on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions (ILO, 2014)."

The Convention's first article also establishes self-identification as indigenous or tribal as a fundamental criterion for determining which groups the Convention's provisions should apply to. Many other international instruments and many indigenous and tribal peoples have also adopted this criterion.

There are 826 different indigenous peoples in Latin America and the Caribbean, with an estimated population of 58 million people (ECLAC, 2014) (TABLE 1). These peoples share common concerns that form the basis of their global and regional agendas. These include various aspects of the right to self-determination:

- **Political**: right to autonomy and self-government.
- **Territorial**: territorial rights and natural resources.
- **Economical**: right to own development model.
- **Cultural**: right to own cultural identity.
- **Legal**: right to own legal system.
- **Participatory**: right to Free, Prior and Informed Consent (FPIC), and right to consultation.

These rights are fundamental for indigenous and tribal peoples' dignity and quality of life.

TABLE 1. Indigenous peoples in Latin America and the Caribbean, 2014.

Country	INDIGENOUS PEOPLES
Argentina	32
Bolivia (Plurinational State of)	39
Brazil	305
Chile	9
Colombia	102
Costa Rica	8
Ecuador	34
El Salvador	3
Guatemala*	3
Honduras	7
Mexico	78
Nicaragua	9
Panama	8
Paraguay	24
Peru	85
Uruguay	2
Venezuela (Bolivarian Republic of)	57
Total	**826**

* These three peoples speak 24 distinct languages.

SOURCE: ECLAC, 2014.

As mentioned previously, this report focuses on the indigenous peoples that live in territories with forest cover. Probably only between three and seven million of Latin America's 58 million indigenous inhabitants live in these territories (ECLAC and FILAC, 2020; Thiede and Gray, 2020). On average, the forest communities suffer from some of the highest levels of multidimensional poverty on the continent, even compared to other indigenous groups. At the turn of the 21st century, only about 43 percent of the indigenous population fifteen years of older in these areas had completed primary school, and only 56 percent had access to electricity (Thiede and Gray, 2020).

Young people from Yurumanguí learn about community forest management in the forests that surround them in the Cauca Valley, Colombia.

As far that the tribal peoples are concerned, the Brazilian Quilombolos, Surinam's Maroons, Garifuna Central American, and many Afro-Colombians and Afro-Ecuadorians, manage forest territories communally and relate to the forests in ways similar to indigenous peoples, and are concentrated in countries whose political constitutions recognize their collective territorial rights. Nevertheless, the area of forest these groups manage is less than 10 percent of what the indigenous peoples manage, and much less is known about these groups and their territories. There are no good statistics that show what portion of Latin America and the Caribbean's 27 million rural afro-descendants should be considered "tribal" under international standards, but it is probably only a few million of them (Freire *et al.*, 2018).

THE IMPORTANCE OF THE TERRITORIES WHERE INDIGENOUS AND TRIBAL PEOPLES ARE INVOLVED IN COMMUNAL FOREST GOVERNANCE

The territories where indigenous and tribal peoples engage in communal forest governance are critical due to:

- their huge size;
- the large amounts of carbon they capture and store;
- their great biodiversity;
- their great wealth and cultural diversity; and
- their potential for culturally appropriate forms of rural development and for meeting the Sustainable Development Goals (SDGs).

Indigenous Reserve of San Lorenzo de Caldono, Department of Cauca, Municipality of Caldono, Colombia.

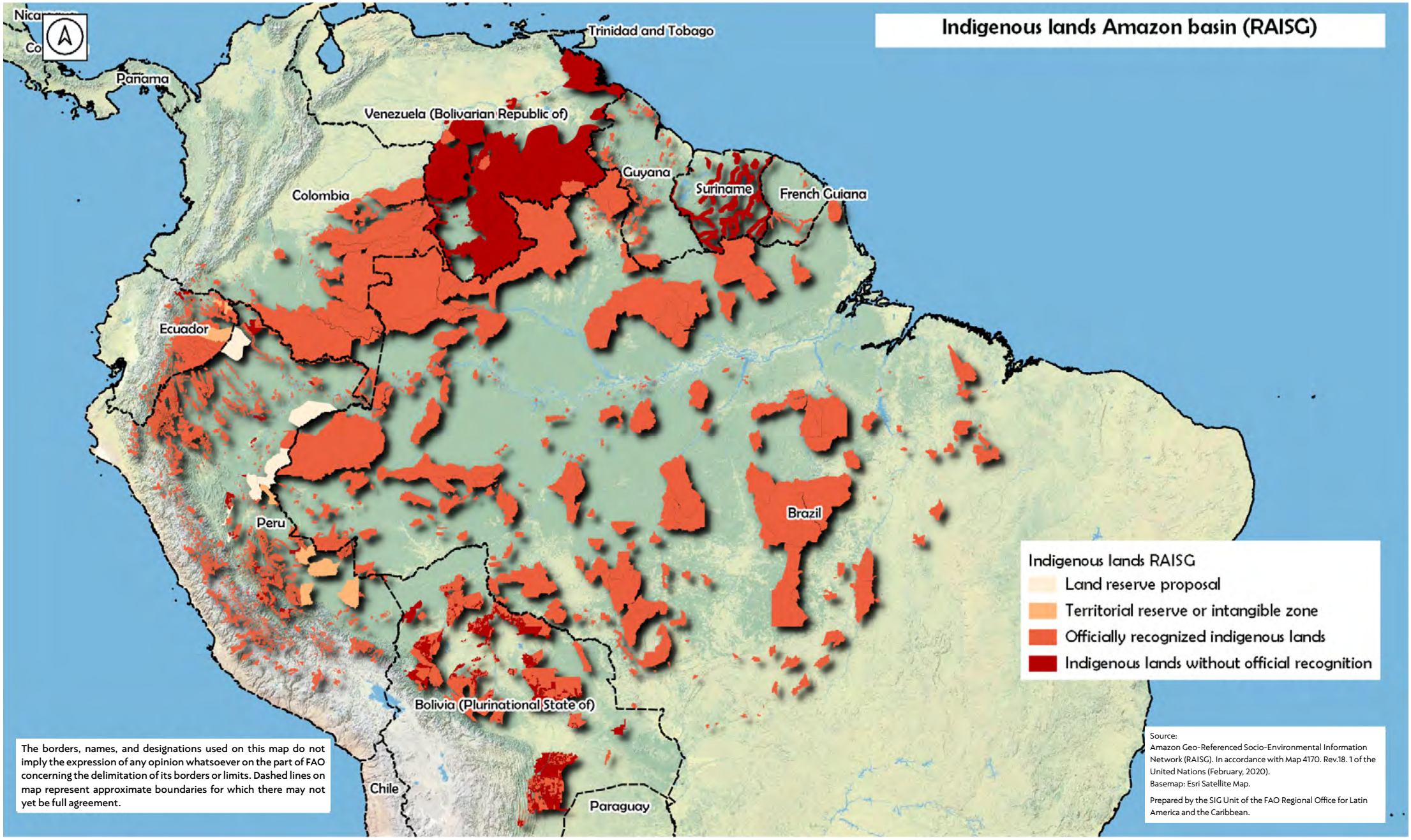
©FAO/ Mauricio Mireles

Fish producers of the Q'eqchi 'People, Peniel, Municipality of San Miguel de Tucurú, Alta Verapaz, Guatemala.

A holistic effort to reduce deforestation and forest degradation in indigenous and tribal territories **would significantly reduce extreme poverty and improve food security and human health**. It would also help to improve the rule of law, democratic participation, and conflict resolution.

a. The forests in the indigenous peoples' territories

Indigenous peoples physically occupy 404 million hectares in Latin America and the Caribbean, which is about one fifth of the region's total area (Garnett *et al.*, 2018) (TABLE 2). This includes all the places whose inhabitants self-identify as indigenous, not just those where they manage forests or territories collectively. Of these 404 million hectares, 237 million (almost 60 percent) are in the Amazon Basin (RAISG, 2019). That is an area larger than France, Great Britain, Germany, Italy, Norway, and Spain combined (MAP 1).



MAP 1. The indigenous territories of the Amazon Basin.

Forests cover more than 80 percent of the area indigenous peoples occupy (330 million hectares). Of that, 173 million hectares are "intact forests" (Garnett *et al.*, 2018; Fa *et al.*, 2020).[6] Almost half (45 percent) of the intact forests in the Amazon Basin are in indigenous territories (Fernández-Llamazares *et al.*, 2020). The remaining 153 million hectares of forests are more fragmented and/or disturbed.

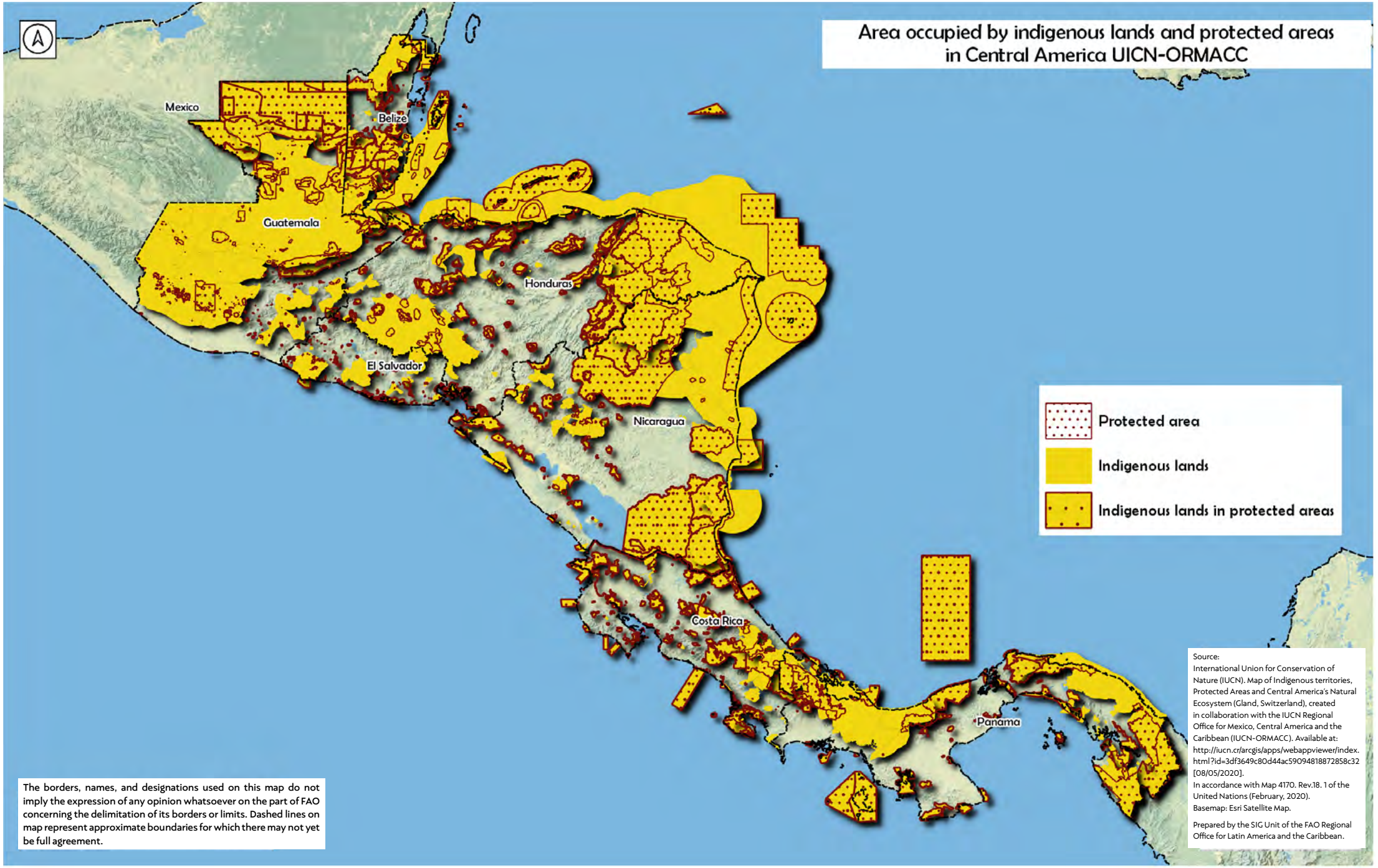
TABLE 2. Land and forest area occupied by indigenous peoples in Latin America and the Caribbean (millions of hectares).

	TOTAL AREA	AREA OCCUPIED BY INDIGENOUS PEOPLES	% OF TOTAL AREA OCCUPIED BY INDIGENOUS PEOPLES
Land	2 004	404	20
Forest	935	330	35

SOURCE: Prepared by the author on the basis of FAO, 2017; Garnett *et al.*, 2018; and Fa *et al.*, 2020.

Together, **about 35 percent of the region's forests are in areas occupied by indigenous groups** (Saatchi *et al.*, 2011; Fa *et al.*, 2020; Walker *et al.*, 2020). Most of that is in Argentina, Brazil, the Plurinational State of Bolivia, Colombia, Mexico, Peru and the Bolivarian Republic of Venezuela (TABLE 3). Indigenous peoples also occupy almost half (48 percent) of the forests of Central America (UICN, 2016) and a significant portion of those in Ecuador (30 percent), Guyana (15 percent), and Suriname (39 percent) (Fa *et al.*, 2020) (MAP 2).

[6] Potapov *et al.* (2020) define "intact forests" as forest ecosystems larger than 500 square kilometers that do not have large-scale human activity.



MAP 2. Area occupied by indigenous peoples and protected areas in Central America.

Cabo Pantoja, on the banks of the Napo River, Loreto, Peru, close to the border with Ecuador.

Of the 404 million hectares occupied by the indigenous peoples, **governments have formally recognized their collective property or usufruct rights over about 269 million hectares.**[7] (SEE TABLE 4). That recognition takes various forms, but it almost allows includes recognition of indigenous peoples' rights to remain in the territory and to use its resources to subsist. Once these rights are recognized, in most cases they cannot be lost. They are imprescriptible, inalienable, indivisible, and un-mortgageable.[8]

7 This figure should be considered a first approximation; since some countries do not have high-quality up-to-date statistics and, those statistics do not always distinguish between indigenous and non-indigenous territories.

8 In Mexico's *ejidos* the agricultural lands can be sub-divided and sold, but not the forest lands (Boege Schmidt 2008).

Governments have not recognized collective resource rights in the remaining 135 million hectares indigenous peoples manage. Some of that is owned by individual indigenous families that do not manage land collectively. The rest is largely land where governments could recognize indigenous peoples' collective resources rights but have yet to do so. Without such recognition, these lands are vulnerable to being occupied by external groups and having their forests destroyed.

Aerial view of the Pirititi Indigenous Territory, Roraima, Brazil.

©Felipe Werneck

TABLE 3. Area occupied by indigenous peoples (total, forest, and relatively undisturbed) and total national forest area in Latin America and the Caribbean (millions of hectares).*

COUNTRY	TOTAL AREA OCCUPIED BY INDIGENOUS PEOPLES	FOREST IN INDIGENOUS AREAS	TOTAL NATIONAL FOREST AREA	RELATIVELY UNDISTURBED AREAS OCCUPIED BY INDIGENOUS PEOPLES ("HUMAN FOOTPRINT" <4)
Argentina	62.1	23.4	27.1	33.5
Belize	0.7	0.7	1.4	0.4
Bolivia (Plurinational State of)	28.9	20.1	54.8	20.8
Brazil	118.3	118.1	493.5	111.8
Chile	8.9	2.1	17.7	6.1
Colombia	32.1	31.1	58.5	27.9
Costa Rica	0.6	0.6	2.8	0.1
Ecuador	7.5	7.4	12.5	5.4
El Salvador	0.5	0	0.3	0
Guatemala**	6.5	6.5	3.5	1.1
Guyana	3.2	3.2	16.5	2.8
French Guyana†	0.7	0.7	8.1	0.6
Honduras	3.6	3.6	4.6	1.4
Mexico	28.9	25.4	66.0	9.8
Nicaragua	4.2	4.2	3.1	1.9
Panama	3.1	3.1	4.6	1.5
Paraguay	5.4	5.4	15.3	3.8
Peru	37.2	23.7	74.0	23.6
Suriname	5.7	5.7	15.3	5.4
Uruguay	0	0		0
Venezuela (Bolivarian Republic of)	46.1	45.6	46.7	38.4
Total	**404.2**	**330.6**	**926.3‡**	**296.3**

* Strictly speaking, the estimates of "forests in indigenous areas" and "total national forest area" cannot be directly compared, since they were elaborated using distinct definitions and methodologies.

** Even though the source says indigenous peoples occupy 6.5 million hectares of forest in Guatemala, the correct figure is probably less than two million hectares (GPTC, 2009).

† French Guyana is part of France, not an independent country.

‡ This figure is a smaller than the total forest area in Table 1 (it does not include Uruguay or the Caribbean).

SOURCE: Prepared by the author on the basis of FAO, 2017; Garnett *et al.*, 2018; and Fa *et al.*, 2020.

Airo Pai Communal Reserve, protected area in the Loreto region, in the Maynas and Putumayo provinces, Peru.

Most countries don't have reliable estimates of the proportion of indigenous territories recognized by governments that have forest cover. Nonetheless, RRI (2018) estimates that **of the 269 million hectares in indigenous territories where the collective rights have been recognized, over 200 million have forests** —the majority of which is in Brazil, the Plurinational State of Bolivia, Colombia, Mexico, and Peru.[9]

[9] This is a conservative estimate. For example, for Mexico it considers less than half (16.6 million hectares of the 38.7 million hectares) of communally owned forest lands. That is the forest area Boege Schmidt (2008) identifies as part of the country's main indigenous territories. But Boege Schmidt himself recognizes that many Mexican communities outside these territories that own communal forestland self-identify as indigenous.

TABLE 4. Total area occupied by indigenous peoples and the area of indigenous territories formally recognized by governments (millions of hectares).

COUNTRY	TOTAL AREA OCCUPIED BY INDIGENOUS PEOPLES	AREA OF COMMUNAL INDIGENOUS TERRITORIES RECOGNIZED BY GOVERNMENTS	SOURCE OF THE ESTIMATE OF THE AREA OF INDIGENOUS TERRITORIES RECOGNIZED BY GOVERNMENTS
Argentina	62.1	8.0	RRI, 2015
Belize	0.7	0	Dubertret, 2017
Bolivia (Plurinational State of)	28.9	24.0	Estremadoiro, 2019
Brazil	118.3	117.1	FUNAI, 2020
Chile	8.9	2.3	Dubertret, 2017
Colombia	32.1	32.1	RRI, 2018
Costa Rica	0.6	0.3	RRI, 2015
Ecuador*	7.5	5.7	RAISG, 2019
El Salvador	0.5	0	Dubertret, 2017
Guatemala	6.5	1.4	RRI, 2015
Guyana	3.2	3.1	Cooperative Republic of Guyana, 2018
French Guyana**	0.7	0.7	RAISG, 2019
Honduras	3.6	1.4	RRI, 2015
Mexico	28.9	28.0	Boege Schmidt, 2008
Nicaragua†	4.2	3.8	De Camino Veloso, 2018
Panama	3.1	1.7	Vergara and Potvin, 2014
Paraguay	5.4	0.7	FAPI, (undated)
Peru	37.2	36.2	IBC, 2016
Suriname	5.7	0	Dubertret, 2017
Venezuela (Bolivarian Republic of)	46.1	2.8	Dubertret, 2017
Total	**404.2**	**269.3**	

* Includes only the Amazon region of Ecuador.

** French Guyana is part of France, not an independent country.

† Includes only the Caribbean Coast regions.

SOURCE: Prepared by the author on the basis of Garnett *et al.*, 2018.

Leticia, Amazon, Colombia.

An additional 11.5 million hectares have been recognized by the governments of the Plurinational State of Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, and the Bolivarian Republic of Venezuela as reserves for indigenous peoples in voluntary isolation and in initial contact, and another four million hectares have been formally proposed to as new reserves (IACHR, 2013; RAISG, 2019) (TABLE 5). These reserves seek to guarantee the cultural and physical integrity of these groups and to protect the forests that they depend on, by limiting the entrance of external groups.

TABLE 5. Existing, proposed, and total area in reserves for indigenous peoples in voluntary isolation and in initial contact (millions of hectares).

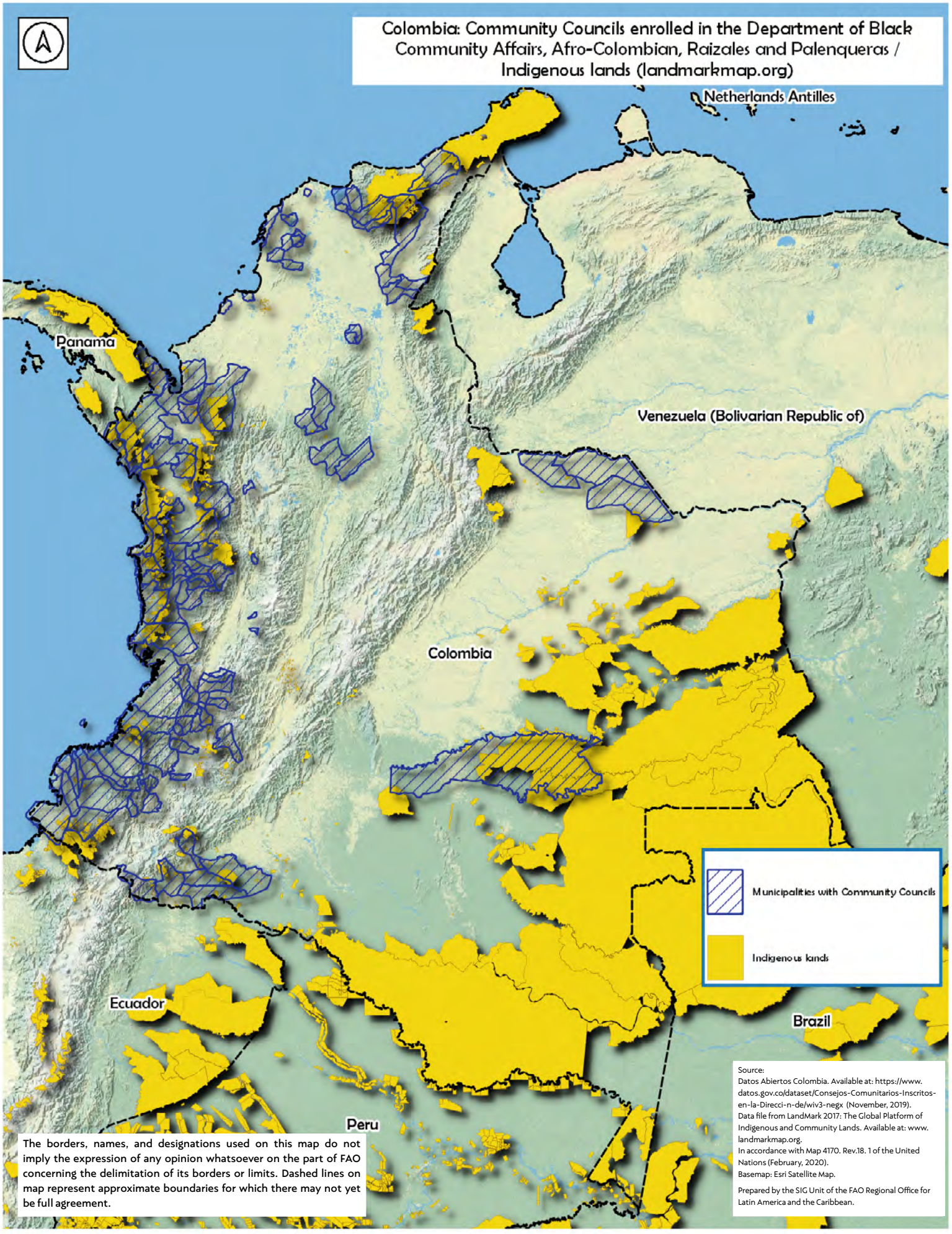
COUNTRY	EXISTING RESERVES	PROPOSED RESERVES	TOTAL RESERVE AREA	SOURCE
Bolivia (Plurinational State of)	2 437			IACHR, 2013
Brazil	2 402			IACHR, 2013
Colombia	1 945			IACHR, 2013
Ecuador	1 187			RAISG, 2019
Paraguay	550			IACHR, 2013
Peru	2 913	4 213	7 126	RAISG, 2019
Total	**11 434**	**4 213**	**15 647**	

SOURCE: Prepared by the author on the basis of IACHR, 2013 and RAISG, 2019.

b. The forests in the tribal peoples' territories

Much less is known about the forests of the tribal peoples than those of indigenous peoples. Brazil has the largest area of tribal territories (Quilombolos), but there is no reliable estimate about the size of that area, much less of its forest cover. Journalistic sources mention that Quilombolos cover twenty million hectares, but do not mention the source of that estimate or how it was calculated (Belmaker, 2018). Nor are there good estimates of the area occupied by Suriname's Maroons, which may be millions of hectares (Kambel, 2006).

In total, over the last thirty years, **governments have titled about eight million hectares of tribal peoples' collective territories,** including five million hectares in Colombia (MAP 3), two million hectares in Brazil, and one million hectares between Ecuador, Honduras, and Nicaragua (Rapoport Center, 2009; Herrera Arango, 2017; RRI, 2020). Most of that has forest cover. In addition to Brazil and Surinam, significant areas remain to be titled in Colombia (mostly outside the biogeographic Choco region), Ecuador's Pacific region, and the north coast of Honduras. However, the area that could be titled in those countries probably does not exceed four million hectares in total. In total there are probably between 320 and 380 million hectares of forests in indigenous and tribal territories, including areas governments have formally recognized and those they have yet to recognize.



MAP 3. Afro-Colombian and indigenous territories with collective land titles in Colombia.

c. The importance of the territories with forest cover that indigenous and tribal peoples manage communally

Given the **large quantity of carbon that they store, the water that they pump from their roots into the atmosphere, and their growing vulnerability**, the forests in the indigenous and tribal peoples' territories have a significant role in stabilizing the local, regional, and global climate. **The forests of the indigenous peoples' territories that have been well-mapped in the continent store about 34 000 million metric tons of carbon (MtC); that is almost 30 percent of all the forest stored in the forests in Latin America and 14 percent of all the carbon in the tropics worldwide** (Saatchi *et al.,* 2011; Walker *et al.,* 2014; Frechette *et al.,* 2018). Of that, 72 percent (24 651 MtC) is in the Amazon Basin (Frechette *et al.,* 2018).

The trees in these forests do not only store carbon; they constantly capture additional carbon from the atmosphere. Between 2003 and 2016 the carbon captured by the indigenous territories in the Amazon Basin was equal to 90 percent of all the carbon emitted from these territories due to deforestation or forest degradation (Walker *et al.,* 2020). In other words, these indigenous territories practically do not produce any net carbon emissions.

In the Amazon Basin, loss of a major part of the indigenous and tribal territories' forests could lead to a tipping point. The loss of the forests would reduce rainfall and increase local temperatures. The resulting droughts and forest fires would, in turn, destroy even more forests, creating a negative feedback loop. In a few decades, this process could convert the humid forest ecosystems in the south and east of the Amazon Basin into savannas — just like the *Cerrado* ecoregion. That would greatly affect Latin America's rainfall patterns, as well as local and global temperatures (Lovejoy and Nobre, 2019).

Frog Limoncocha Biological Reserve, Shushufindi Canton, Sucumbíos, Northern Amazon Region of Ecuador.

The indigenous and tribal peoples' territories also **house an enormous diversity of flora and fauna.** For example, there are more species of mammals, birds, reptiles, and amphibians in the indigenous territories in Brazil than in all the country's non-indigenous protected areas (Schuster *et al.,* 2019). Two thirds of the Plurinational State of Bolivia's vertebrates and 60 percent of its plants can be found in the Tacana and Leco de Apolo indigenous territories (Salinas *et al.,* 2017). Thus, avoiding deforestation and forest degradation in those territories would reduce habitat loss, one of the main threats to wildlife.

Maintaining the integrity of the territories' forests also helps to avoid, both known and unknown, zoonotic disease epidemics. Globally, most new diseases that caused epidemics in recent decades are of zoonotic origin, and many are linked to deforestation and forest degradation (Guégan *et al.,* 2020). Strong evidence links forest disturbance in the Amazon

with the prevalence of arboviruses, *candida auris*, Chagas disease, yellow fever, hantavirus, leishmaniasis, malaria, paracoccidioidomycosis, and rabies (Ellwanger *et al.,* 2020).

Although the forested territories that indigenous and tribal peoples manage communally probably have fewer than ten million inhabitants (Thiede and Gray 2020), those inhabitants possess an enormous wealth of culture and traditional knowledge, which is of incalculable value for them and humanity. The majority of the more than 800 distinct indigenous and tribal peoples in Latin America and the Caribbean can be found in these territories (ECLAC and FILAC, 2020).[10] That represents an enormous diversity of cultures, worldviews, customs, and knowledge, which can contribute to almost all facets of human life.

Despite that great cultural and natural wealth, the people that live in these territories have some of the lowest monetary incomes and most limited access to services and high rates of food and nutritional insecurity and diseases. Many areas where they live are plagued by high levels of illicit activity, violent conflict, and impunity (Global Witness 2018, 2019, 2020; McSweeney *et al.,* 2018; Clerici *et al.,* 2020). The COVID-19 pandemic has greatly aggravated these problems (Cowie 2020; FILAC and FIAY, 2020; Hernández, 2020). So, these territories also have great importance from a local and national governance and political stability perspective.

[10] The Amazon Basin alone has over 300 distinct indigenous peoples (Fernández-Llamazares *et al.*, 2020).

Afro-descendant family farmer, Darién Province, Panama.

DEFORESTATION AND FOREST DEGRADATION IN INDIGENOUS AND TRIBAL TERRITORIES

On average, the forests in the indigenous and tribal territories have been much better conserved than other forests in Latin America and the Caribbean, and their low carbon emissions reflect that.

In just about every country in the region indigenous and tribal territories have lower deforestation rates than other forest areas. Among the studies that confirm this are:

Plurinational State of Bolivia	Killeen *et al.*, 2008 Müller *et al.*, 2012 Paneque-Gálvez *et al.*, 2013 Salinas *et al.*, 2017 Blackman and Veit, 2018 van Dam, 2019 Painter *et al.*, 2020
Brazil	Nepstad *et al.*, 2006 Adeney, Christensen Jr. and Pimm, 2009 Ricketts *et al.*, 2010 de Espíndola *et al.*, 2012 Nolte *et al.*, 2013 Carranza *et al.*, 2014 Blackman and Veit, 2018 Jusys, 2018 Bayi, 2019 Baragwanath and Bayi, 2020 Begotti and Pérez, 2020 Paiva *et al.*, 2020
Colombia	Armenteras, Rodríguez y Retana, 2009 Blackman and Veit, 2018 Romero and Saavedra, 2019 Bonilla-Mejía and Higuera-Mendieta, 2019 van Dam, 2019 Vélez *et al.*, 2019 de los Ríos Rueda, 2020

Ecuador	Lu *et al.*, 2010 Blackman and Veit, 2018 van Dam, 2019
Guatemala	Montenegro and Castellanos, 2008
Honduras	Hayes, 2007
Mexico	Bonilla *et al.*, 2013 Bray *et al.*, 2008 Ellis *et al.*, 2017
Nicaragua	Stocks, McMahan and Taber, 2007
Panama	Nelson, Harris and Stone, 2001 Vergara-Asenjo and Potvin, 2014
Peru	Hvolfok, 2006 Oliveira *et al.*, 2007 Blackman *et al.*, 2017 Schleicher *et al.*, 2017
Bolivarian Republic of Venezuela	Flantua, Bilbao and Rosales, 2013

A regional study based on data from eleven countries reached a similar conclusion (Ceddia, Gunter and Corriveau-Bourque, 2015). No similar studies apparently exist for Costa Rica, Guyana, or Suriname, but the indigenous and/or tribal territories in those countries are known to have low deforestation rates.

In fact, lower deforestation and less forest fragmentation in indigenous areas also mean that large compact forests, the so-called "intact forests", have disappeared more slowly in those areas. While the area in intact forest blocks declined only by 4.9 percent between 2000 and 2016 in the region's indigenous areas, in the non-indigenous areas it fell 11.2 percent (Fa *et al.*, 2020).[11]

[11] The decline in intact forests is partly due to deforestation and partly to forest fragmentation.

Water lilies (*Victoria amazonica*), Leticia, Amazon, Colombia.

Many indigenous territories prevent deforestation as effectively as non-indigenous protected areas, and some even more effectively (Porter-Bolland *et al.,* 2012). For example, between 2006 and 2011, the indigenous territories in the Peruvian Amazon reduced deforestation twice as much as protected areas with similar ecological conditions and accessibility (Schleicher *et al.,* 2017). The situation in the Brazilian Amazon was similar between 2001 and 2009 (Nolte *et al.,* 2013; Jusys 2018).[12] The indigenous territories inside the Bosawas Biosphere Reserve in Nicaragua suffered much less deforestation than other parts of the Biosphere (Stocks, McMahan, and Taber, 2007) and indigenous community forest management areas in Mexico's Yucatan Peninsula have had lower deforestation rates than the protected areas (Bray *et al.* 2008).

[12] The Nolte *et al.*(2013) and Jusys (2018) studies compare deforestation rates in indigenous territories and strictly protected areas outside indigenous territories in Brazil. Both categories had much lower deforestation rates than the sustainable use protected areas during the time periods studied.

In other cases, protected areas without indigenous population avoided deforestation more effectively than the indigenous territories, including Brazil between 2009 and 2014 (Jusys, 2018), Colombia (Armenteras, Rodríguez and Retana, 2009; Bonilla-Mejía and Higuera-Mendieta, 2019), Ecuador (Holland *et al.,* 2014), and Panama[13] (Vergara-Asenjo and Potvin, 2014).[14] Even in these cases, however, both the indigenous territories and non-indigenous protected areas had lower deforestation than other forests.

Less information is available about forest degradation and it is less consistent.[15] On average, the indigenous territories of the Amazon Basin have higher carbon density per hectare, and that is partly because their vegetation is in better condition (Walker *et al.,* 2020). The previously mentioned Schleicher *et al.* (2017) study of the Peruvian Amazon also found that indigenous territories avoided forest degradation more effectively than protected areas. Studies of Brazil and Latin America as a region found fewer forest fires in indigenous areas (Nepstad *et al.,* 2006; Nelson and Chomitz, 2011). On the other hand, a recent study of the whole Amazon Basin found that indigenous territories avoid deforestation more effectively than forest degradation, and in some countries forest degradation in indigenous territories has reached worrisome levels (Walker *et al.,* 2020).

13 Although another study (Halvorson, 2018) found that titled indigenous territories in eastern Panama had lower deforestation rates than non-indigenous protected areas between 2000 and 2014.

14 No comparative study was identified that analyzes why indigenous territories limit deforestation more effectively than non-indigenous protected areas in some places, but not others.

15 This report uses the term "forest degradation" in a broad sense, to describe any loss of quality of a forest ecosystem, short of the forest's total disappearance. However, when referencing the Walker *et al.* (2020) study the term refers specifically to a decline in average carbon density in the forest vegetation.

Looking at the aggregate effects of all the processes that affect forest carbon gives a better sense of the whole picture. That includes deforestation, forest degradation, reforestation, forest regeneration, and tree growth in existing forests. If one does that for the entire Amazon Basin, where the majority of forests in indigenous territories are located, it is clear that forest destruction in the indigenous territories was much lower than in other areas, including non-indigenous protected areas, between 2003 and 2016. Even though indigenous territories cover 28 percent of the Amazon Basin, they only accounted for 2.6 percent of the carbon emissions (Walker *et al.*, 2020). While the indigenous territories in the Amazon Basin lost less than 0.3percent of the carbon in their forests between 2003 and 2016, non-indigenous protected areas lost 0.6 percent, and areas that were neither indigenous territories nor protected areas lost 3.6 percent (TABLE 6).

TABLE 6. Change in carbon stock in indigenous territories, protected areas, and other areas in the Amazon Basin between 2003 and 2016 (million metric tonnes and %).

	MILLION METRIC TONNES (MTC)	(%)
Indigenous territories (outside protected areas)	-23.6	-0.1
Protected areas (that overlap with indigenous territories)	-10.3	-0.3
Protected areas (without indigenous population)	-96.4	-0.6
Other areas	-1 159.6	-3.6
Total	**-1 289.9**	**-1.7**

SOURCE: Walker *et al.*, 2020.

Woman from the Yurumanguí community, leader in forest governance, Valle del Cauca, Colombia.

WHY FORESTS IN INDIGENOUS AND TRIBAL TERRITORIES HAVE BEEN BETTER CONSERVED

Six factors help to explain why the forests in communally managed indigenous and tribal territories have been better conserved than other forests:[16]

iii. Cultural factors and traditional knowledge;

iv. Recognition of collective territorial rights;

v. Forest incentive policies;

vi. Land use restrictions;

vii. Limited accessibility and low profitability of agriculture; and

viii. Limited access to capital and labor (Kaimowitz, 2015).

In the following pages we will discuss each of these factors' role in preserving the forests but not their relative weight. It is worth noting that no one has done a study examining the relative importance of all six factors, some of which are intimately related to each other. To assess their relative importance, any study would have to disentangle those complex interrelations.

Also, this section doesn't debate what to do with these factors in the future. That point is made in another section of this document.

[16] Including Afro-descendant territories in Colombia. In fact, Colombia is the only country where studies could identify deforestation rates in tribal territories.

Indigenous resident of the Amazon Awajun community. Loreto, Peru.

a. Cultural factors and traditional knowledge

Indigenous and tribal cultures and traditional knowledge have contributed to reduce forest destruction in various ways.

Many indigenous and tribal peoples have productive systems that are less harmful to forest ecosystems. This is an empirical finding, based on data, not a naïve ideological or romantic notion. It is well demonstrated that the continent's rural production systems are characterized by marked ethnic differences, both between indigenous peoples and mestizos and between distinct indigenous groups (Eden and Andrade, 1988; Godoy, Franks and Alvarado, 1998; Atran *et al.,* 1999; Sierra, 1999; Rudel, Bates and Machinguiashi, 2002; Frizzelle *et al.,* 2005; Hvolkof, 2006; Gray *et al.,* 2008; Killeen *et al.,* 2008; Stocks, McMahan and Taber, 2008; Lu *et al.,* 2010; Barsimantov

and Kendall, 2012; Müller *et al.,* 2012; Bonilla-Moheno *et al.,* 2013; Paneque-Gálvez *et al.,* 2013; Torres *et al.,* 2018; Vasco, Bilsborrow and Griess, 2018; Gray, and Bilsborrow, 2020; Ojeda-Luna *et al.,* 2020).

These differences are partially due to ethnic disparities in access to resources (natural, human, and capital) and to markets and services (Simmons, 1997; Sierra, 1999; Caviglia-Harris and Sills, 2005; Gray *et al.,* 2007). For example, one reason indigenous and tribal peoples tend to use less machinery and agrochemicals is that they have less access to capital.[17]

Nevertheless, **even when one accounts for the differences in access to resources and services, ethnicity is still a significant factor** (Godoy, Franks and Alvarado, 1998; Chowdhury and Turner, 2006; Barsimantov and Kendall, 2012; Bonilla-Moheno *et al.,* 2013; Vasco, Bilsborrow and Torres, 2015; Ellis *et al.,* 2017a; Torres *et al.,* 2018; Vasco, Bilsborrow and Griess, 2018).

The simple fact that two ethnic groups *can* produce things the same way does not necessarily imply that they *want* to do so. Several historical and ethnographic studies highlight the importance of traditions, norms, preferences, and ancestral knowledge (Atran *et al.,* 1999; Rudel, Bates and Machinguiashi, 2002; Hvolkof, 2006; Stocks, McMahan and Taber, 2008; Pérez and Smith, 2019). Every culture has its own vision of what a "good life" is and how to achieve it.

The close relation between indigenous and tribal peoples and the natural ecosystems in places they have inhabited for many generations has greatly influenced their cultures. This is reflected not only in their languages, food and medicinal

[17] This has important implications for deforestation, since one major direct cause of deforestation is the expansion of mechanized soybean and cereal cultivation, especially in Argentina, the Plurinational State of Bolivia, Paraguay, and the Brazilian Cerrado (de Sy, 2015; Graesser *et al.,* 2015).

Indigenous producer from the Guna People, Indigenous Territory of Púcuro, in Darién Province, Panama.

systems, spiritual beliefs, and ecological knowledge, but also in the way they manage their forests and landscapes.[18]

The land use characteristic that better distinguishes the indigenous peoples from the *mestizos* is that **extensive cattle ranching is much less important in the indigenous territories than in *mestizo* farms** (Rudel, Bates and Machinguiashi, 2002; Carr, 2004; Killeen *et al.,* 2008; Stocks, McMahan and Taber, 2008; Lu *et al.,* 2010; Müller *et al.,* 2012; Torres *et al.,* 2018; Vasco, Bilsborrow and Griess, 2018).[19] Historically, bovine cattle ranching was associated with the arrival of Spanish and

[18] They conserve many sacred sites in forest areas for spiritual reasons (Tan, Tran and Bhattacharyya, 2019).

[19] Following the same logic, one of the few studies that did not find significant differences in land use between indigenous peoples and non-indigenous colonos was in a Panamanian region with almost no livestock (Simmons, 1997).

Portuguese colonizers and cows have always played a larger role in *mestizo* production and consumption systems. Establishing pastures to demonstrate possession of – and acquire rights to – land has also been a common practice among *mestizos*, but not indigenous peoples. These differences have major implications for deforestation patterns in Latin America, since livestock expansion has been the region's largest driver of forest loss (de Sy 2015; Graesser *et al.*, 2015).[20]

Harvesting non-timber forest products (NTFPs) like bushmeat, medicinal plants, wild fruits, and fuelwood is an integral part of the indigenous and tribal cultures in forest regions and contributes notably to their livelihoods (Toledo *et al.*, 2003; Silva Crepaldi and Luna Peixoto, 2010). This also applies to some long-standing *mestizo* communities in forest areas (Dufour, 1990; Caviglia-Harris and Sills, 2005). But, on average, **NTFPs probably contribute more to indigenous and tribal peoples' livelihood strategies, which makes them appreciate forests more**.

Indigenous and tribal peoples' traditional knowledge about fauna and flora and their uses, pests and diseases, fire, climate, and soils, and how these elements respond to human practices, contribute greatly to forest management, use, restauration, and monitoring, and to adaptation to new situations (Reyes-García, 2009; Douterlunge, 2012; Mistry and Berardi, 2016; Mistry, Bilbao, and Berardi, 2016; Wilder *et al.*, 2016; Rodríguez, 2017; Reyes-García *et al.*, 2018; Schroeder and González, 2019; Sierra-Huelz *et al.*, 2020). This traditional knowledge allows indigenous and tribal peoples to understand forests better and benefit more from them, which is an incentive to maintain the forests in good condition.

The Tsimane indigenous people in the Plurinational State of Bolivia's Amazon offer an interesting example in this regard. Research shows that the Tsimane communities that have

[20] According to De Sy (2015), 71 percent of the area deforested in South America between 1990 and 2005 is currently used for pasture.

greater traditional ecological knowledge conserve their forests more and better than those that lack that knowledge (Paneque-Gálvez *et al.,* 2018). That suggests that **people who spend more time in the forest and know how to get greater benefits from them, take care of them better,** even when both groups share the same ethnicity.

Culture and knowledge are not static; they evolve (Rudel, Bates and Machinguiashi, 2002). Though it is better not to overgeneralize given that each indigenous people is unique (Stocks, McMahan and Taber, 2008; Lu *et al.,* 2010). Nevertheless, **until now, one can say many indigenous and tribal peoples have conserved their forests better than other non-indigenous or tribal social groups.**

b. Recognized collective property or usufruct rights

In most indigenous and tribal territories, the principal threats to the forest come from outsiders. Among the most important, are land occupations by ranchers, *colonos,* miners, oil palm producers, mechanized soybean and cereal farmers,

Awajun warrior in his community in the Peruvian jungle. Loreto, Peru.

petroleum companies, drug traffickers, and land speculators, logging by loggers, and forest fires these groups cause (Hayes, 2008; Stocks, McMahan, and Taber, 2008; RAISG, 2012; Pacheco and Benatti, 2015; Bebbington *et al.,* 2018; Gebrara, 2018; McSweeney *et al.,* 2018; Bayi, 2019; Walker *et al.,* 2020). Many of these groups receive government support and have enough capital to clear large areas of forest and buy machinery or livestock. Some are armed and/or involved in criminal activities.

Formal recognition by governments of the collective rights of indigenous and tribal peoples over their territories often helps to impede encroachment by external groups that destroy their forests. That may be because the government itself blocks their entrance or because the legal recognition legitimizes indigenous and tribal peoples' efforts to demarcate and monitor their territories and confront intruders. Many farmers and speculators clear forest mostly to gain control over the land, rather than to use that land for production, but that is harder to do where governments have recognized indigenous and tribal peoples' land rights.

Formal recognition not only protects forests in the indigenous and tribal peoples' territories themselves. It also provides an incentive for farmers outside the territories to use their existing land more intensively. Since they cannot occupy indigenous or tribal lands, they cannot deforest new areas to expanding their crops and pastures. So, improvements in agricultural productivity lead only to higher yields, not more deforestation. One recent study of ten Latin American countries shows that where indigenous territories had clear property rights, improvements in agricultural production led to less expansion in crop and pasture area between 1995 and 2015 (Ceddia, Gunter and Pazienza, 2019).

Deforestation rates are lower in indigenous and tribal territories where governments have formally recognized collective land rights; and improving the tenure security of these is a cost-effective way to reduce carbon emissions

Leticia, Amazon, Colombia.

(Nelson, Harris and, Stone, 2001; Hayes, 2007; Botazzi and Dao, 2013; Nolte *et al.,* 2013; Ding *et al.,* 2016; Blackman *et al.,* 2017; Bayi, 2019; Pérez and Smith, 2019; Velez *et al.,* 2019; Baragwanath and Bayi, 2020; de los Ríos Rueda, 2020). Börner *et al.* (2020) compared the effectiveness of various conservations policies and programs and found that the formal designation of indigenous areas was the most effective. Between 2000 and 2012 deforestation rates in titled indigenous territories in the Bolivian, Brazilian, and Colombian Amazon were only one third to one half of those in other forests with similar ecological characteristics and accessibility to markets (Ding *et al.,* 2016). The benefits from that lower deforestation were also much higher than the costs of land demarcation and titling and other associated measures (BOX 1).

Kakuamo indigenous person walks through the Sierra Nevada of Santa Marta, Colombia.

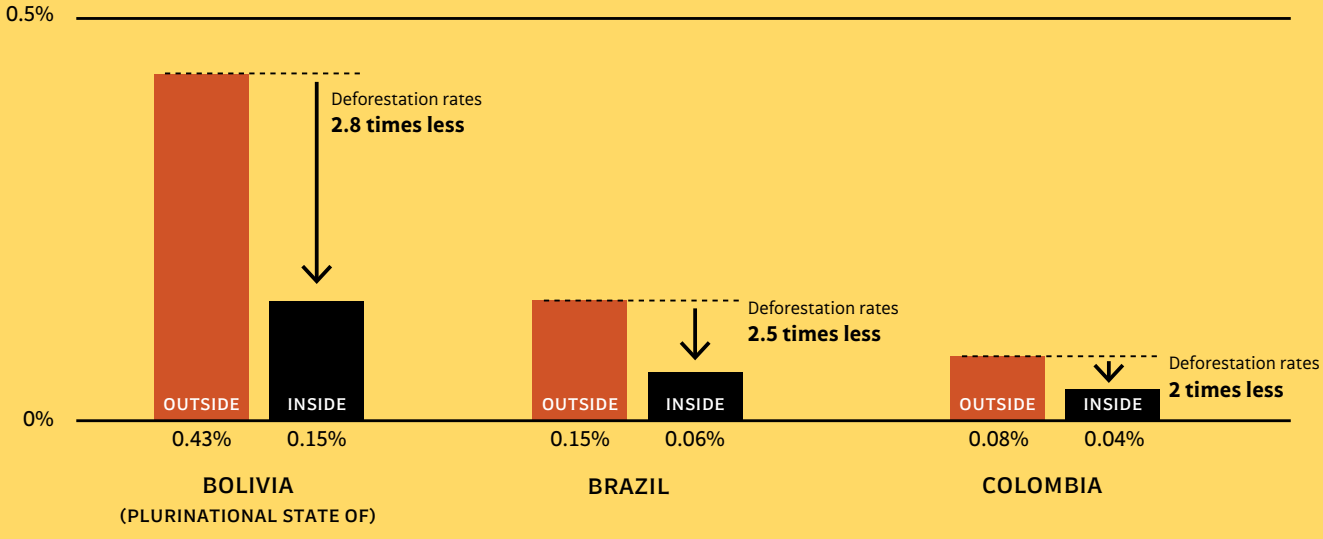
BOX 1

A cost-benefit assessment of titling Indigenous territories to reduce deforestation in the Amazon Regions of the Plurinational State of Bolivia, Brazil, and Colombia

Ding *et al.*, (2016) analyzes the costs and benefits associated with titling indigenous territories in the Amazon regions of the Plurinational State of Bolivia, Brazil, and Colombia. Using a statistical method, called "correspondence analysis", the study compares deforestation rates in titled indigenous territories between 2000 and 2012 with the deforestation rates of other Amazon forests with similar characteristics. The authors conclude that the deforestation rates in titled indigenous territories are only between one-third and one-half of the rates in the other forests studied in the three countries.

By knowing how much lower the deforestation in the titled indigenous territories was and how much carbon was in the forests where deforestation was avoided, the authors were able to calculate how much the recognized indigenous territories had reduced carbon emissions.

FIGURE 1. Deforestation rates, inside and outside indigenous woodlands where land property has been ensured.



According to the study, the titled collective territories avoided between 42.8 and 59.7 million metric tons (MtC) of CO_2 emissions each year. Based on a financial projection for twenty years, the authors estimated the Net Present Value (NPV) of the total emissions reductions in the three countries was between USD 25 and 34 billion dollars. The combined emissions reductions in the three countries were the equivalent of taking between 9 and 12.6 million vehicles out of circulation for one year.

The costs of guaranteeing tenure security in the indigenous territories was low. The authors estimate that it cost USD 45 dollars to title a hectare of land in the Plurinational State of Bolivia, USD 68 dollars per hectare in Brazil, and USD 6 dollars per hectare in Colombia. (That is the net present value of the investment calculated for a period of twenty years.) Comparing the cost of other carbon capture and store options with that of titling indigenous territories, the study shows that "that the costs of securing indigenous lands are 5 to 42 times lower than the average costs of avoided CO_2 through fossil carbon capture and storage for both coal – and gas – fired power plants."

SOURCE: Ding *et al.*, 2016.

Ding *et al.,* (2016) do not compare deforestation rates in indigenous territories with land titles with those in indigenous territories without title. It compares the former with forests outside indigenous territories that have similar ecological conditions and accessibility. So, strictly speaking, Ding *et al.* (2016) do not separate the effects of titling from other cultural or governance characteristics related to indigenous territories. Nevertheless, other studies have analyzed the specific effects of formal tenure recognition and reaffirm the conclusion of Ding *et al.* (2016) that titling has a large impact (Hayes, 2007, Blackman *et al.,* 2017; Halvorson, 2018; Bayi, 2019; Pérez and Smith, 2019; Romero and Saavedra, 2019; Baragwanath and Bayi, 2020). Bayi (2019) even demonstrates that each step in the process of registering indigenous land in Brazil is associated with a lower deforestation rate than the previous step. Given this, **formal recognition of indigenous and tribal peoples' collective tenure rights over their territories is a good practice for mitigating climate change, conserving biodiversity, and managing forests sustainably** (IPCC, 2019).

Nonetheless, there are **five situations where formal government recognition of collective territorial rights may not reduce forest destruction:**

i. When governments give mining, oil and gas, or logging concessions to companies that overlap with the indigenous and tribal territories, the indigenous or tribal authorities cannot exclude the mining, energy, or forestry companies responsible for clearing or degrading the forests (Walker *et al.,* 2020).[21]

ii. When governments fail to back efforts by the formal land rights holders to ensure their rights are respected, the practical value of having a title is greatly reduced.

[21] Almost one quarter of the land in indigenous territories in the Amazon Basin has overlapping mining and petroleum concessions, which greatly increase the pressure on the forests there (Walker *et al.*, 2020).

iii. If there is no pressure on the forests, recognizing land rights will not decrease deforestation since there is little deforestation to reduce (Pfaff *et al.*, 2014; Buntaine, Hamilton, and Millones, 2015; BenYishay *et al.*, 2017). In these cases, the positive effects of titling will not materialize until there is greater pressure on the forests.

iv. In some places where organized crime and other armed groups have strong presence and the government has limited capacity, formal tenure rights are less relevant (McSweeney *et al.*, 2018; Clerici *et al.*, 2020)

v. If the territory's inhabitants themselves are the ones interested in clearing forests and their authorities support them, a formal title probably won't reduce deforestation much.

Indigenous Academical School of Sepecue, in Talamanca, Limón Province, Costa Rica.

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c. Forest incentive policies

When governments help communities that care for forests to benefit economically from their efforts that gives them an extra incentive not to destroy those forests. Some community forestry and payment for environmental services policies and programs favor indigenous and tribal territories more than other landowners, and that may help explain why the territories' forests are in better shape.

Thanks partly to favorable community forestry policies in Mexico and other countries, sustainable timber production has generated substantial incomes for hundreds of the region's indigenous communities (Torres-Rojo and Magaña-Torres, 2006; Merino-Pérez and Martínez, 2014; Del Gatto *et al.,* 2018). The income from forest management gives these communities a strong incentive to maintain forest cover and probably helps to explain the low deforestation rates in indigenous areas such as the Sierra Norte of Oaxaca and Southern and Central Quintana Roo (among others) (Barsimantov and Kendall, 2012; Merino-Pérez and Martínez, 2014; Ellis *et al.,* 2017b; Ellis *et al.,* 2020). To ensure the forest resources are sustainable, many of Mexico's indigenous forest enterprises reserve a significant portion of their forest for conservation and harvest less timber than their management plans permit (Bray *et al.,* 2003; Pazos-Almada and Bray, 2018).

Some government payment for environmental services programs favor indigenous territories, including the Socio Bosque program in Ecuador, the National Forest Conservation Program (PNCB) in Peru, the Environmental Payment for Services program in Mexico, the Forest Incentives for Land Holders with Small Areas Suitable for Forests or Agroforests program (PINPEP) in Guatemala, the indigenous component of the Amazon Vision program in Colombia, and the Indigenous sub-program of the REDD+ Early Movers (REM) program in Acre, Brazil.[22]

[22] The payment for environmental services program of Costa Rica's National Fund for Forest Finance (FONAFIFO) includes indigenous territories but has not prioritized them over other landowners.

Woman of the Tikuna People, Leticia, Amazonas, Colombia.

These environmental payment for services programs reduced forest destruction in the territories they support. The Mexican, Ecuadorian, and Peruvian programs reduced deforestation, especially in places with higher deforestation risks[23] (Alix-García, Sims, and Yáñez-Paganas, 2015; Costedoat *et al.,* 2015; Cuenca *et al.,* 2018; Mohebalian and Aguilar, 2018; Alix-García *et al*., 2019; Eguiguren, Fischer, and Günter, 2019; Giudice *et al.,* 2019; Wunder *et al.,* 2020). It is likely these programs also reduced forest degradation. Mexican indigenous communities that receive payments monitor forests, control fires, and reforest more and report less commercial hunting and uncontrolled fires. Ecuadorian communities in Socio Bosque have less damage in their forests that have been logged and commercially valuable timber species are more prevalent

[23] In Peru, the reduction was small, at least during the program's initial stage (Giudice *et al*., 2019.).

(Rodríguez-Robayo, Ávila-Foucat, and Maldonado, 2016; Arriagada *et al.,* 2018a; Mohebalian and Aguilar, 2018; Alix-García *et al.,* 2019; Eguiguren, Fischer, and Günter, 2019).

d. Land use restrictions – protected areas

Protected areas restrict land use changes and extractive activities and it is harder to legally privatize public lands that have been designated as protected areas. Consequently, protected areas tend to have lower deforestation.

Latin America's indigenous and tribal territories heavily overlap with protected area. In principle, that alone might lead one to expect these territories would have lower deforestation. Almost half (47 percent) of the area that indigenous peoples occupy have been designated as protected areas, compared to only 17 percent of the non-indigenous areas (Garnett *et al.,* 2018).[24] Even when governments don't recognize indigenous or tribal rights in these territories, their classification as protected areas sometimes help forestall external incursions.

While the great overlap between indigenous and tribal territories and protected areas explains some of the low deforestation in these areas it is only one of various relevant variables. Indigenous territories that do not overlap with protected areas also have lower deforestation rates than other forests (Blackman *et al.,* 2017; Blackman and Veit, 2018; Walker *et al.,* 2020). Panama's indigenous territories that are entirely outside of protected areas reduce deforestation more than the indigenous territories that do overlap with protected areas (Vergara-Asenjo and Potvin, 2014). Moreover, protected areas that overlap with indigenous territories often have lower deforestation than other protected areas (de los Ríos Rueda, 2020). That implies that being an indigenous territory helps to

[24] In Central America, 37 percent of the area indigenous peoples "use and occupy" is in protected areas (See Map 2). The areas they use and occupy correspond to what this report refers to as "areas occupied by indigenous peoples".

Mayantuyacu (Huánuco) in the Peruvian Amazon.

conserve the forest, and that the protected area status alone is not enough to explain the results (Hayes, 2007; Stocks, McMahan, and Taber, 2008; Norman and Chomitz, 2011; Blankespoor, DasGupta, and Wheeler, 2014; Holland *et al.*, 2014; Schleicher *et al.*, 2017; Walker *et al.*, 2020).[25]

e. Low profitability of agriculture and limited accessibility

In general, **locations with less access to markets and services, infertile soils, steep slopes, and high precipitation generally have lower deforestation rates** (Kaimowitz and Angelsen, 1998). Commercial agriculture is less profitable there. Throughout the

[25] Although Adeney, Christensen Jr. and Pimm (2009) did not find significant differences between the two types of protected areas in the case of forests fires in Brazil.

tropics deforestation is lower in places farther from highways and secondary roads (Angelsen, 2010).

In Latin America and the Caribbean indigenous and tribal peoples and other traditional communities, such as riverine communities and *caboclos,* have historically been among the main inhabitants in such places. Since Colonial times, the Spaniards and later *mestizos* have tended to occupy locations suitable for intensive agriculture first and have had less presence in forest areas inhabited by indigenous peoples. Meanwhile, many African slaves or their descendants fled to remote forest zones to escape slavery and exploitation, where they created *quilombos, palenques,* and other types of communal territories. The remoteness and inaccessibility of these areas made them less profitable for commercial agriculture and harder for other groups to get there. Many of these inaccessible forest areas were very humid, had acidic soils, and/or flooded frequently. Endemic diseases such as malaria and yellow fever discouraged outside settlers from entering these areas or drove them off (Sawyer, 1993; Asenso-Okyere *et al.,* 2009). Hence, it is not surprising that indigenous and tribal territories have more forest cover and less deforestation.

Even so, **lack of roads, infertile soils, humid climates, and widespread diseases do not fully explain the differences in deforestation rates between indigenous and tribal territories and other forest areas. Multiples studies show that even when one compares forests in indigenous territories with other forests that have similar ecological conditions and access to markets and services, the former have lower deforestation rates** (Nelson, Harris, and Stone, 2001; Nelson and Chomitz, 2011; Nolte *et al.,* 2013; Blackman *et al.,* 2017; Blackman and Veit, 2018; Jusys, 2018).[26]

[26] The evidence is less clear in the case of the Ecuadorian Amazon. One study there found that differences in access to markets and ecological conditions explained almost all the difference in deforestation rates (Blackman and Veit, 2018), while another study found the opposite (Hollande *et al.,* 2014).

f. Availability of capital and labor

Another possible explanation for why indigenous and tribal territories have lower deforestation rates is that **indigenous and tribal peoples lack the resources needed to clear large forest areas and establish crops and pasture.** Deforesting large areas for farming and ranching requires a lot of capital and/or labor. Since indigenous and tribal peoples in forest regions generally have low incomes, they often lack the funds required to purchase cattle or machinery for extensive cattle ranching or mechanized agriculture – the two main activities behind deforestation. In addition, indigenous and tribal peoples have less access to agricultural credit and public subsidies and that limits their ability to deforest large areas. Theoretically, they could obtain capital from companies, large farmers, or non-indigenous organizations, but ethnic discrimination and other obstacles often impede it (Schwartzman and Zimmerman, 2005; Morsello, 2006).[27]

Low population densities in some indigenous territories might also explain the good condition of their forests, if they did not have enough labor to clear the forest and cultivate large areas, especially in the Amazon. It is probably no coincidence that Brazil's indigenous territories and *quilombos* with the highest population densities have a smaller proportion of their land in forest. On the other hand, though, almost half of Brazil's indigenous territories have population densities higher than the neighboring areas, but still conserve a much higher percentage of their vegetation than their neighbors (Begotti and Pérez, 2020).

[27] Although in some places criminal groups have been willing to fund indigenous and Afro-descendant villagers to engage in illegal mining or cultivating illicit crops, and that has greatly damaged the forests.

Indigenous woman from the Guna People, Púcuro Indigenous Territory, Province of Darien, Panama.

INCREASED PRESSURE ON THE FORESTS OF THE INDIGENOUS AND TRIBAL TERRITORIES

Unless decisive action is taken soon, indigenous and tribal peoples will probably not be able to continue safeguarding their forests, as they have done until now. This is partly due to general trends affecting all the region's forests and partly to trends that specifically affect these territories.

Pressure on Latin America's forests is increasing. Annual carbon emissions related to changes in forest condition rose in all nine Amazon Basin countries between 2012 and 2016. For the entire Amazon Basin, they increased 200 percent during that period (Walker *et al.,* 2020). In the Plurinational State of Bolivia, Brazil, Colombia, the Bolivarian Republic of Venezuela, and Mesoamerica deforestation has been on the upswing since 2015 (Butler, 2019).

This general trend has also affected the indigenous and tribal territories. Between 2016 and 2018, deforestation rose 150 percent in the indigenous territories in Brazil (Walker *et al.,* 2020). Forest clearing also rose sharply in the indigenous regions of Campeche, Oaxaca, and Yucatan in Mexico and the Caribbean Coast of Nicaragua, among others (Ellis *et al.,* 2017a; Bryan, 2019; López Portillo and Mondragón, 2019).

The indigenous territories in almost all the Amazon Basin countries have suffered from increased forest degradation due to fires, mining, and unsustainable logging since 2012 (Walker *et al.,* 2020). Forests in the indigenous territories of the Plurinational State of Bolivia, Honduras, Nicaragua, and Paraguay have become more fragmented. Consequently, between 2000 and 2016 the area of intact forests in these territories fell by 20 percent in the Plurinational State of Bolivia, 30 percent in Honduras, 42 percent in Nicaragua, and 59 percent in Paraguay (Fa *et al.,* 2020).

a. General causes of increased pressure on forests

The structural trends increasing pressure on the region's forests include the following:

ECONOMIC

- Increased international demand for minerals, fuels, foodstuffs, forest products, illicit crops, and tourism (Bebbington *et al.,* 2018; Butler, 2019; Pendrill *et al.,*2019; Seymour and Harris, 2019).
- Expansion of roads and other transportation, storage, energy, and communications infrastructure (Bebbington *et al.,* 2018; Vilela *et al.,* 2020).

POLITICAL

- Greater *political influence of elite groups* linked to agriculture and extractive sectors (Carneiro da Cunha *et al.,* 2017; Fernández Milmanda, 2019).
- Politicians' desire to reactivate national economies by expanding extractive and agricultural activities to new regions (Arsel, Hogenboom, and Pellegrini, 2017).

GOVERNANCE

- Reductions in government budgets for environmental regulation and environmentally friendly activities (Sarmiento-Villamizar, Ordóñez-Cortés and Humberto-Alonso, 2017; Provencio and Carabiasas, 2019; Pereira *et al.,* 2020).
- Greater presence of organized crime in forest regions, seeking to grow and transport illicit crops, engage in illegal mining, and launder money from criminal activities (McSweeney *et al.,* 2018; Clerici *et al.,* 2020).

TECHNOLOGICAL

- Technological innovations in mining, oil and gas production, and agriculture, which allow producers to expand into new areas and make use of their natural resources (Kaimowitz and Smith, 2001; Deonandan and Dougherty, 2016).

DEMOGRAPHIC

- Constant *migration* to forest areas by *colonos* and indigenous villagers (Ellis *et al.,* 2017a; He *et al.,* 2019; Thiede and Gray, 2020).

ENVIRONMENTAL

- Climate change and forest fragmentation that make forests more susceptible to fire (Aragão *et al.,* 2018).[28]

High international gold prices (Álvarez-Berríos and Aide, 2017) and a power vacuum in Colombia's post-conflict zones following the peace accords there (Clerici *et al.,* 2020) are relevant shorter-term trends.

b. The effects on indigenous and tribal territories

These general trends have greatly affected the indigenous and tribal territories. For example:

ECONOMIC

- The infrastructure investments improve access to the territories and increase the pressure over their forests and inhabitants (Carneiro Filho and Braga de Souza, 2009; Fa *et al.,* 2020; Ferrante, Gomes, and Fearnside, 2020).

GOVERNANCE

- Some countries' governments have downgraded their efforts to recognize and ensure other groups respect indigenous and tribal tenure rights in titled territories, facilitating these groups efforts to usurp territorial resources (Ellis *et al.,* 2017a; RRI, 2018; Brito *et al.,* 2019; Bryan, 2019; He *et al.,* 2019; Begotti and Pérez, 2020).[29]

[28] These processes threaten to reach a tipping point, beyond which the humid forest ecosystem will be permanently converted into a savanna (Lovejoy and Nobre, 2019).

[29] For example, the Brazilian government recognized ("declared") less than one third as many new indigenous territories during the last decade than in the previous decade (Begotti and Pérez, 2020).

- Government desire to promote extractive activities has led them to grant mining, petroleum, and forestry concessions in these territories, frequently without indigenous and tribal consent. That has made it easier for outside groups to enter and clear or degrade forests (Ray and Chimienti, 2015; Bebbington *et al.,* 2018; Walker *et al.,* 2020).
- Many protected areas have been eliminated, shrunk, or weakened. That reduces their ability to limit forest destruction in places where those areas overlap with indigenous territories (Pack *et al.,* 2016; Ferrante and Fearnside, 2019; Golden-Kroner *et al.,* 2019).[30]
- Usurpation and degradation of local natural resources by external groups has provoked greater social conflict, which often takes on inter-ethnic dimensions. The number of indigenous and tribal people killed or arrested has risen accordingly (McSweeney *et al.,* 2018; Butt *et al.,* 2019; Byron, 2019; IACHR, 2019; Muggah and Franciotti, 2019).
- The decline in government budgets has affected the payment for environmental services programs and created additional hurdles for the approval of forest management plans and permits. That reduces communities' incentives to manage their forests (Fernández and Mendoza, 2015; Petersheim, 2018). Costa Rica has been cutting back on its payment for environmental services program since 2012 and Mexico since 2015, while Ecuador's funding has been stagnant since 2015 (Cravioto, 2019; El Telégrafo, 2019; FONAFIFO, 2019).

DEMOGRAPHIC

- Migration to the territories from other regions has expanded the pool of labor available for activities associated with deforestation and forest degradation (McSweeney, 2005; Thiede and Gray, 2020).

[30] Between 2000 and 2017 there were 120 cases where governments eliminated, reduced the size of, or weakened the legal status of protected areas in the Amazon Basin (Golden-Kroner *et al.,* 2019).

Indigenous youth performing traditional dance of the Guna People, Púcuro Indigenous Territory, Darien Province, Panama.

CULTURAL

- Greater access to urban areas, markets, and mass communications, and rural–urban migration, combined with the limited economic opportunities for young people in the territories, have weakened the inter-generational transmission of indigenous and tribal languages and traditions and knowledge about the forest ecosystems and their management (Camara-Leret *et al.,* 2016; Mistry, Bilbao and Berardi, 2016; Athayde *et al.,* 2017; Paneque-Gálvez *et al.,* 2018).

HEALTH

The COVID-19 pandemic has had a devastating effect in many of the region's indigenous and tribal territories (FILAC and FIAY, 2020). Thousands have gotten sick or died and many communities have lost their markets for forest products and tourism (Hernández, 2020). The pandemic has hindered

government efforts to stop land invasions, forest fires, and illegal logging in the territories (Cowie, 2020). In the current pandemic context, these incursions not only threaten the forests, they also spread the disease and put local people at risk.

Despite all of the above, other trends favored the protection of the indigenous territories. Recently, international recognition of the need to ensure the indigenous and tribal peoples' collective rights over their territories to mitigate climate change and protect biological and cultural diversity (IPBES, 2019; IPCC, 2019). The governments have recognized some new indigenous and tribal territories and created some new programs, which will be discussed shortly. Some of the trends mentioned above – such as greater access by indigenous and tribal peoples to markets, services, and information sources – had positive effects, even while creating new problems.

On balance though **the pressure on the inhabitants and forests of the indigenous and tribal territories has increased and the trends that traditionally protected the territories have weakened**.

Given this situation, it can no longer be assumed that the territories' forests are free from danger. Any reference scenario related to deforestation, forest degradation, and carbon emissions in these territories must consider these structural changes.[31] As a result, new, more forceful, measures are needed, so that the territories can offer attractive and safe living conditions for their inhabitants and their forests can continue to be large storehouses of forest carbon, biodiversity, and cultural riches, and support traditional livelihoods.

[31] Following this logic, the REDD Early Movers (REM) programs in Brazil, Colombia, and Ecuador allocated part of their funds to areas with high forest cover and low deforestation, recognizing rising deforestation risks (R. Linzatti, personal communication, June 7, 2020).

Native indigenous leader of the Bribri People, Association of Indigenous Women of Talamanca (ACOMUITA), Talamanca, Limón Province, Costa Rica.

FIVE TYPES OF MEASURES FOR MITIGATING CLIMATE CHANGE IN INDIGENOUS AND TRIBAL TERRITORIES

The recognition of collective land rights, payment for environmental services, and community forest management help to reduce forest destruction in indigenous and tribal territories. Unfortunately, these policies have weakened in recent years and new threats to the communities and forests have appeared. **This section presents measures to address these threats.**

The growing pressure on the population and forests of the indigenous and tribal territories requires a major holistic response, including public and private investments and policies, procedures, and institutional frameworks. Key components include:

i. strengthening **territorial rights**;
ii. **compensating environmental services**;
iii. promoting **community forestry**;
iv. reaffirming **traditional cultures and knowledge**; and
v. supporting **territorial governance** and indigenous and tribal organizations and institutions.

Given the strong synergies between these components, they should be thought of as a package – not just a menu to select options from.

a. Effective collective territorial rights

Formal recognition of **indigenous and tribal peoples' collective rights over their territories has been a key factor that explains the territories' low carbon emissions**. Legal certainty about rights over land, forests, and forest carbon limits encroachment and makes it easier to access funds, services, and markets.

Latin America and the Caribbean has gone farther than Africa and Asia in recognizing traditional rural communities' collective rights over their ancestral territories (RRI, 2018). All Central and South American countries have laws recognizing these rights except El Salvador, Suriname, and Uruguay (Wily, 2018). Through diverse legal mechanisms, the governments of the region have recognized the indigenous and tribal communities' long-term property or usufruct rights to more than 275 million of hectares of land and 200 million hectares of forests, the majority of which is in the Amazon Basin.[32]

Despite those developments, **the region's indigenous and tribal peoples have customary rights over tens of millions of hectares that governments have yet to recognize** (RRI, 2020). It is hard to say how much land remains to be recognized since much of the unrecognized area has not been mapped. Nonetheless, the Plurinational State of Bolivia, Brazil, Peru, Suriname, and the Bolivarian Republic of Venezuela probably each still have more than ten million hectares of unrecognized

[32] Each country has its own legal framework that regulates those collective rights. These vary with regard to: legal hierarchy (constitutional, ordinary law, decree); who owns the property (the indigenous or tribal community, national or municipal government, civil association, cooperative, or development association); the procedures used to recognize and register the territory and its owners; the bundle of rights provided (e.g. self-government, exclusion, management, due process); the groups benefited (e.g. indigenous, tribal, riverine, campesinos of varied ethnicities); and the number of communities per territory (i.e. one, multiple) (Roldán Ortega, 2004; Herrera-Garibay and Edouard, 2012; RRI, 2012; ECLAC and FILAC, 2020). To analyze the environmental and social implications of these differences merits a separate study.

indigenous and tribal territories, most of which has forest (ACT, 2010; IBC, 2016; Del Popolo, 2017; Mongabay, 2018; RAISG, 2019; Tamburini, 2019).[33] Argentina, Chile, Colombia, Ecuador, Guatemala, Guyana, Honduras, Panama, and Paraguay also have significant unrecognized areas (Rapoport Center, 2009; Del Popolo, 2014; Dooley and Griffiths, 2014; Vergara-Asenjo and Potvin, 2014; ECLAC, 2017; Dubertret, 2017; Atkinson *et al.,* 2018; Halvorson, 2018; Agard *et al.,* 2019; RAISG, 2019; FAPI, undated). Practically all the land indigenous peoples and Afro-descendants claim in Costa Rica and Nicaragua has been titled, but a significant portion of that has been illegally usurped (Finley-Brook, 2016; Del Popolo, 2017; Bryan, 2019).

Among the factors hindering recognition of indigenous and tribal territorial rights are:

- expensive, complex, and lengthy procedures;
- insufficient public investment in land administration for these areas;
- weak inter-institutional coordination between government agencies;
- overlapping rights to the same land;
- poorly designed, out-of-date, incomplete, and untransparent land registries;
- political and bureaucratic resistance to recognizing collective rights; and
- lack of awareness about the environmental and social benefits that recognizing these areas provides (Bustillos, Aguilar, and Grimaldo, 2015; Márquez Porras, Eguiguren Riofrío and Vera, 2018; Monterroso and Larson, 2018; Notess *et al.,* 2018; Monterroso *et al.,* 2019).

[33] Most unrecognized Bolivian and Peruvian indigenous territories are in the lowlands and Amazon, respectively. In Brazil, the biggest deficit is in Quilombolo territories in the Amazon and the northeast and indigenous territories outside the Amazon.

Indigenous women leader from the Guaraní Kaiowá People, Indigenous Territory of Dourados, Mato Grosso do Sul, Brazil.

Private companies that come to an area for the first time often find it easier and faster to obtain title than communities that have been there for centuries (Notess *et al.,* 2018).

Another common problem is that communities, organizations, and territorial authorities that try to establish their rights as the territories' legal owners or managers find it hard to register and be recognized as legal entities. Some countries do not recognize indigenous or tribal communities as legal entities. Others have procedures and practices that hinder registration by communities or their organizations and authorities (F. Edouard, personal communication, April 26, 2020).

Recognition of collective tenure rights does not always have meaningful short-term effects where there is little pressure on forests. With or without formal land rights, deforestation is low there (Buntaine, Hamilton, and

Millones, 2015; BenYishay *et al.,* 2017; Blackman and Veit, 2018). However, governments find it easier to formally recognize rights over territories before pressure increases and multiple groups compete for the same resources or different resources in the same areas. Currently, pressure seems to be increasing practically everywhere (Walker *et al.,* 2020).

The key question is not whether one can justify investments to formalize tenure rights over forestlands that still are not threatened, it is whether those rights will suffice to curtail forest destruction once the pressure rises. A priori, there is no way to definitively answer that question. However, the evidence suggests that formal tenure rights can be effective even when forests are under pressure, especially when communities organize to defend their rights, and governments support them (Bayi, 2019).

This last point is key, since there are places where communities have recognized land rights, but **governments do little to ensure respect for those rights.** Before issuing a land title, governments are expected to go through a land regularization ("*saneamiento*") process. They are supposed to identify competing land claims, assess their validity, cancel previous titles or registration that lack legal basis, establish rules of co-existence with third parties allowed to stay, and plan for the removal and possible relocation of other third parties. However, this often never happens or takes years to be completed (Finley-Brook, 2016; IACHR, 2019; Tamburini, 2019). Where property rights are clear, governments are supposed to intervene if a territorial property is illegally encroached upon, but they do not always do so (McSweeney *et al.,* 2018; Bryan, 2019; Correia, 2019).

Weak efforts by some governments to ensure respect for collective property rights have contributed to increasingly frequent violent attacks against territorial leaders and inhabitants. Hundreds of indigenous or Afro-descendant community leaders have been killed since 2017, especially in Brazil, Colombia, Guatemala, Honduras, Mexico, Nicaragua, and Peru, where governments have yet to implement effective measures to stop the violence (Global Witness, 2018, 2019, 2020).

In practically all Latin American countries, sub-soil rights belong to the state. There are also some countries where governments do not recognize indigenous and tribal peoples' collective rights over forests, water, or forest carbon (Anthias and Radcliffe, 2013; Ortiz Aranda and Madrid Zubirán, 2017; Anderson *et al.,* 2018). As a result, governments often grant companies mining, oil, and forestry concessions inside the territories, and the communities have no way to stop company personnel from entering and damaging their forests and rivers.

In Ecuador, for example, almost half the area in Amazonian indigenous territories (48 percent) has overlapping petroleum concessions, which explains much of the forest degradation there (Walker *et al.,* 2020). It may also be one reason some studies found that titling indigenous territories reduced deforestation less in Ecuador than in other neighboring countries (Blackman and Veit, 2018).

All Latin American countries have approved the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Most have ratified the International Labor Organization (ILO) Protocol 169 and have national legislation that recognizes indigenous and tribal peoples' right to Free, Prior and Informed Consent (FPIC) (ECLAC and FILAC, 2020).[34] So, in principle, there shouldn't be any mining, petroleum or forestry investment in indigenous and tribal territories without local consent. However, that is not always the case (Anaya, 2015; Wright and Tomaselli, 2019). Some countries do not consult to determine whether the communities support the projects, or the consultations use inadequate methods, which do not properly reflect community concerns.

The international norms do not allow governments to establish protected areas in indigenous and tribal territories without

[34] In the Plurinational State of Bolivia, Ecuador, Mexico, and the Bolivarian Republic of Venezuela the right to FPIC is enshrined in the Constitution. Most of the other countries have laws or regulations that recognize those rights (ECLAC and FILAC, 2020).

Young indigenous man navigating the Ucayali River (Peru).

the inhabitants' consent, but that happens frequently in many countries (UN, 2016). Many indigenous and tribal leaders complain that government environment officials fail to consult them about decisions affecting their territories, restrict their traditional hunting, fishing, and cultivation practices, and monopolize the available funds. In a few cases environmental agencies have even evicted indigenous communities from their territories against their will.[35] In some countries, including Brazil, Ecuador, Honduras, and Panama, when governments designate someplace as a protected area it become much harder or even impossible for indigenous or tribal communities to attain recognition of their rights over that area (Springer and Almeida, 2015) (BOX 2).

[35] On the other hand, the designation of protected areas has helped many indigenous and tribal communities to exclude the unwanted entrance of third parties and protect their natural resources.

BOX 2

Titling indigenous territories that overlap with protected areas in Panama

Panama was a pioneer in the region with regards to indigenous peoples' territorial rights. It recognized the first indigenous *comarca* (Guna Yala) in 1937, and the national Constitution of 1972 acknowledges indigenous rights to collective property. By 1997, the country had five *comarcas*, covering more than 12 percent of the country (1.6 million hectares), each established by a separate law.

In 2008, the Congress approved Law 72, known as the Collective Territories Law, which created a mechanism for titling smaller indigenous territories. The legislators expected it to be used to title almost 700 000 hectares in some thirty territories. However, the process advanced slowly. As of 2015 only five of the territories had received title.

As in other countries, several of Panama's *comarcas* overlap with protected areas. However, those overlaps did not impede them from being titled.

Nevertheless, after 2015 some government officials began to question if indigenous territories could legally receive title for land that overlapped with protected areas. That controversy paralyzed the titling process, since practically all the indigenous territories had overlaps.

The officials that raised the issue never produced a formal document laying out their position or fully clarified whether they were concerned mostly with legal or environmental issues. In any case, more than half the country's forests are in territories indigenous peoples have customary rights to and almost all those territories have low deforestation rates. The same goes for the specific territories indigenous peoples had been trying to get titled. In these territories the proportion of the land that still has forest cover is about the same as in the non-indigenous protected areas.

Between 2016 and 2018, indigenous leaders met frequently with the national authorities to demand their land titles. However, the issue was not resolved until a new government took office in 2019. In November 2019, the Ministry of Environment issued Ministerial Decree 0612, which recognized indigenous peoples' rights to their ancestral lands, even when they are in protected areas, citing national laws and international treaties to justify that conclusion (Ministerio de Ambiente, 2019). The Ministerial Decree opened the door to titling the remaining 25 indigenous territories without title. The communities were only required to submit "sustainable land use and community development plans" for approval by the Ministry of Environment. Ministerial Decree 0612 may also facilitate recognition of the country's sixth *comarca*, the Naso Tjër Di *comarca*, currently held up in the courts.

SOURCE: Vergara-Asenjo and Potvin, 2014; Halvorson, 2018; Republic of Panama, 2019.

Producer of the Naso People, Solong, Bocas del Toro Province, Panama.

Without community participation, protected areas that have communities inside or nearby have little chance of being well conserved (Mohedano-Roldán, Duit and Schultz, 2019). Some governments have established successful co-management schemes with indigenous and tribal communities (Rivera-Ángel and Lopes-Simonian, 2019; Dupuits and Cronkleton, 2020; Painter *et al.,* 2020), however, these remain more the exception than the rule. Most countries have yet to begin a serious intercultural dialogue between the environmental authorities and indigenous and tribal territorial leaders that would help them to learn from co-management experiences and expand them to larger areas.

Given the growing threats of invasion by invasion by external actors and initiatives imposed on the indigenous and tribal peoples without their permission, much greater efforts are needed to guarantee indigenous and tribal peoples collective territorial rights. This includes investments and policy dialogues oriented at:

i. Strengthening the government agencies responsible for these activities and the coordination between them.

ii. Speeding up the communal territories' mapping, ethnological studies, demarcation, titling (or registration), and regularization ("*saneamiento*").

iii. Delimiting and marking the territories' boundaries.

iv. Monitoring, reporting, and punishing the illegal usurpation of communal property.

v. Promoting alternative conflict resolution mechanisms.

vi. Facilitating the registration and legal recognition of communities and their organizations and territorial authorities.

vii. Improving the updating, accuracy, and transparency of the land registries and other information systems related to indigenous and tribal territorial authorities and tenure.

viii. Promoting co-management of protected areas inhabited by indigenous and tribal communities and intercultural dialogues between the environmental authorities and the communities.

ix. Ensuring that communities can exercise their right to Free, Prior and Informed Consent (FPIC) with regards to investments and policies that affect their territories.

x. Guaranteeing the right to life and physical security of territorial leaders and inhabitants and ensuring those responsible for violating these rights are punished.

b. Compensation for environmental services

Compensation for environmental services offers one of the main incentives for communities to take care of their forests and provides them with resources to do so. This compensation can take various forms, but payments for environmental services are the most common (Rosa, Kandel, and Dimas, 2004).

The Costa Rican, Ecuadorian, Guatemalan, Mexican, and Peruvian payment for environmental service programs have been the main mechanisms to compensate indigenous and tribal communities for their territories' environmental services.[36] Those programs have funded hundreds of indigenous and tribal communities to conserve more than four million hectares of forest(Rosa da Conceição, Borner, and Wunder, 2015; Figueroa *et al.,* 2016; Arriagada *et al.,* 2018a; Fischenich, 2018; Giudice *et al.,* 2019; von Hedemann, 2019).[37] **These programs had positive environmental results**.

[36] The indigenous components of the REDD+ in the Colombian Amazon and in Acre, Brazil, could also be considered compensation for environmental services, although they are not payment for environmental services programs, since they do not condition payment on specific environmental outcomes.

[37] This is about 10 percent of the titled indigenous or tribal land in the regions where these programs operate.

The programs have also had favorable, though more limited, social impacts. They have achieved modest reductions in poverty, although household assets have yet to improve much; and the beneficiaries are largely satisfied with the results (Alix-García, Sims, and Yáñez-Paganas, 2015; Alix-García and Sims, 2017; Arriagada *et al.,* 2018a; Arriagada *et al.,* 2018b). Almost three quarters (74 percent) of Mexican communities that participated in the Payment for Environmental Services program reported that the program had improved their families' welfare, although only 42 percent said it had increased their household income (Figueroa *et al.,* 2016.) Ecuador's Socio Bosque program has reduced the frequency of land conflicts in indigenous and Afro-Ecuadorian territories (Jones *et al.,* 2020) and Peru's National Forest Conservation Program (PNCB) has discouraged invasion of indigenous territories (Kowler *et al.,* 2020).[38]

Most money from these programs goes to community-wide investments, although some goes to individual families. The community investments include secondary roads, schools, health facilities, community centers, scholarships, territorial management plans and patrols, and paying local people for forestry and agroforestry activities, among others (Borge and Martínez, 2009; de Kuning, 2011; Von Hedemann and Osorne, 2016; Arriagada *et al.,* 2018b; DiGiano, 2018; Alix-García *et al.,* 2019; Giudice *et al.,* 2019).

[38] The Guyanese government is currently considering including indigenous communities in the "payment for results" scheme it negotiated with Norway. Under this scheme communities would receive payments based on the level of their carbon emissions from deforestation and forest degradation. This has yet to be approved, but one study based on data from fifteen titled communities estimates that each community would receive between 166 500 and USD 283 750 per year (between 2 080 and USD 3 550 per family). That would be multiple times these families' current incomes, which vary between 300 and USD 600 per year (Overman *et al.*, 2018).

Mamo from the Arhuaco People, Sierra Nevada of Santa Marta, Colombia.

BOX 3

Socio Bosque: Ecuador pays indigenous and Afro-Ecuadorian communities to care for forests

In 2008, Ecuador's Ministry of Environment created the Socio Bosque Program to conserve forests, montane vegetation, and mangroves, reduce carbon emissions and forest fires, and improve rural living conditions.

The program initially concentrated on paid private farmers to conserve forests, but later it shifted its emphasis to the country's eleven indigenous peoples and Afro-Ecuadorians. The communities promise not to farm, log, or hunt in certain areas for twenty years. In exchange, Socio Bosque gives them payments to use for community activities; which can include everything from hiring community forest guards and clearing trails for land demarcation or fire barriers to building roads and community centers, and creating funds for credit, health, emergencies, education, and the elderly. To-date, 196 communities with over 240 000 inhabitants in different parts of the country have signed agreements, pledging to conserve 1 450 000 hectares of forest and other vegetation.

Studies about Socio Bosque have found positive results. While average annual deforestation rates in the districts where Socio Bosque worked declined from -1.09 percent between 2000 and 2008 to -0.18 percent between 2008 and 2016, deforestation rates in other districts rose during the same period. It is estimated that between 2008 and 2014 the program avoided the loss of 11 227 hectares of forest.

A survey of 501 indigenous and Afro-Ecuadorian program beneficiaries found that 96 percent approved of their communities' participation in Socio Bosque. This almost unanimous approval was apparently not motivated by the economic benefits for the individual families interviewed, which were limited. People appreciated the benefits to the entire community.

They mentioned that Socio Bosque reduced the invasion of their territories, improved the transparency and accountability of local organizations, increased participation in volunteer community activities, and helped to build local value chains.

Cultural aspects also stand out. The territories participating in Socio Bosque have used program funds to protect and restore churches and sacred sites and hold cultural events. The Shuar Arutam community invested in a School for Ancestral Traditional Knowledge. Mativaví-Salinas recovered a sacred site in a small forest remnant and San Miguel Negrero invested in a Marimba school, to maintain the Afro-Ecuadorian musical traditions.

Problems mentioned in the studies include lack of technical assistance, failure of credit funds, and internal conflicts over resource use. They note that even though many women participate in program activities, Socio Bosque made no specific effort to support initiatives of interest to women.

SOURCE: Arriagada *et al.,* 2018a; Cuenca *et al.,* 2018; Eguiguren, Fischer, and Günter, 2019; Perefán and Pabón, 2019; Jones *et al.,* 2020.

Socio Bosque: Ecotourism in the Kichwa Añangu Community, Ecuador.

Most programs pay communities to avoid forest clearing and harvesting of forest products in specific areas during an established period, which can vary between one and twenty years. However, there are also positive examples from Costa Rica, Guatemala, and Mexico, where the programs compensate communities for sustainable forest management activities and reforestation. Those activities helped make the efforts more sustainable and strengthened community cohesion (Von Hedemann and Osorne, 2016). The use of National Forest Conservation Program (PNCB) funds to finance agroforestry systems in Peru explained part of the reduction in deforestation the program achieved (Giudice *et al.,* 2019).

One frequent concern is that payments for environmental services substitute ("crowd out") voluntary community efforts and undermine social capital; that communities come to see forestry activities as a government responsibility and not something to do on their own initiative (Von Hedemann and

Osorne, 2016; Wunder *et al.,* 2020). So far, that does not seem to be the case, at least in Costa Rica and Mexico. In fact, **the evidence suggests these programs have strengthened social capital and promoted volunteer efforts** (Borge and Martínez, 2009; Rodríguez-Robayo, Ávila-Foucat and Maldonado, 2016; Alix-García *et al.,* 2018; Alix-García *et al.,* 2019).

If Latin America's indigenous and tribal peoples received just USD 5 per hectare per year for the 200 million hectares of forest they care for where governments have recognized their tenure rights that would provide them more than USD 1 billion yearly. In comparison, so far, the **public investments in these payment for environmental service programs has been rather modest**. Mexico has invested the most, but even there they only invested USD 56 million per year on average between 2003 and 2011, of which indigenous communities received about 40 percent (Alix-García, Sims, and Yáñez-Pagans 2015). None of the other four countries has invested more than USD 10 million per year on payments to these groups (Von Hedemann and Osborne, 2016; El Telégrafo, 2019; FONAFIFO, 2019; MINAM, 2019).

The average payment per hectare per year varies markedly between programs. Peru pays only about USD 3 per hectare. Ecuador pays around USD 9; Mexico roughly USD 30; Costa Rica about USD 60, and Guatemala more than USD 100 (de Koning, 2011; Von Hedemann, 2016; Alix-García *et al.,* 2019; FONAFIFO, 2019; MINAM, 2019).

Despite these instruments' proven effectiveness and the growing threats to the territories' forests, funding for these programs has tended to decline. **There is an urgent need to expand the compensation for environmental services for**

these territories to a level that corresponds with the threats.[39] Going forward, it would be important to promote programs that:

i. Are designed with the participation of the communities involved (Kowler *et al.,* 2020).

ii. Fit well with the communities' cultures, institutions, and preferences.

iii. Compensate communities for having managed their forests well and create the conditions to maintain that management indefinitely, rather than paying to purchase specific environmental services, by covering the opportunity costs owners incur by not using the land for other uses (Shapiro-Garza, 2019; van Dam, 2019).

iv. Contribute to strengthening social capital, promote democratic practices, transparency and accountability, build human capabilities, improve forest quality, and incubate sustainable productive and commercial activities.

v. Use technical assistance and accompaniment approaches that promote social participation, and don't substitute for it, as well as new methods for creating and sharing knowledge (Segura-Warnholtz, 2014).

vi. Leverage government funds to obtain counterpart contributions from universities, NGOs, and subnational governments, who can implement more holistic and participatory approaches, and offer higher quality technical assistance and training (Shapiro-Garza, 2019).

vii. Align well with other public policies related to forestry and agroforestry production, food security, social protection, and educational and job opportunities for youth.

[39] In some countries these programs may also provide a relevant and flexible mechanism to channel emergency support to the indigenous and tribal communities affected by the COVID-19 pandemic.

Miskito Indigenous Community, Krukira, on the north coast of the city of Bilwi, in the North Caribbean Coast Autonomous Region (RACCN), Nicaragua. (Ravaged in 2007 by Hurricane Felix, and again in 2020 by hurricanes Eta and Iota.)

c. Community forest management

Community forest management is the other main promising way to incentivize indigenous and tribal peoples to take good care of their forests and use forest resources to improve their welfare and standards of living. The low deforestation rates in community managed forests reflect that. To a large extent, the funds needed for these efforts can come from the forests themselves.

In the indigenous and tribal territories of Latin America and the Caribbean, community forestry principally takes places in four contexts:[40]

i. pine production in the coniferous forests of Mexico and Central America;

[40] Many *mestizo* communities are also involved in community forest management, but they are beyond the scope of this study.

ii. hardwood production in the tropical broadleaf forests;

iii. forest plantations and agroforestry plots throughout the continent; and

iv. non-timber products and tourism services in diverse types of forests.

The indigenous territories of Mexico and Northern Central America have more than five million hectares of coniferous forests, especially in Oaxaca, Guerrero, Michoacán, Guatemala's highlands, and the Caribbean Coast of Honduras and Nicaragua (Boege Schmidt, 2008). Hundreds of communities generate income and employment from pine forests they manage sustainably, and many have progressed towards generating higher levels of value added (Cubbage *et al.,* 2015). Some of the most successful have diversified their activities to include production of resins and other non-timber products, rural tourism, and payment for environmental services (Segura-Warnholtz, 2014). Mexico has over twenty-five years of experience with this and its government has provided the community enterprises significant support.

There are also many indigenous and tribal communities that harvest wood from broadleaf tropical forests. Quintana Roo (Mexico), the Chiquitania (Plurinational State of Bolivia), and the Peruvian Amazon are well-known in that regard (Pacheco, 2007; Boege Schmidt, 2008; Bray *et al.,* 2008; Gaviria and Sabogal, 2013). These have faced more difficulties than those in coniferous forests (Pokorny and Johnson, 2008). They generated promising results for decades, but some are currently facing major challenges.[41]

The region has a long tradition of indigenous and tribal production of coffee, cocoa, breadfruit, black pepper, plantains

[41] Although their members are mostly mestizos, the community forest concessions in Petén, Guatemala, provide a good example of the great potential for community forestry in broadleaf tropical forests when there is a favorable policy enabling environment (Blackman, 2015)

Mayan woman working with wood. Cooperativa Lol Koópte', Ejido Petcacab, Mexico.

and bananas, and other crops grown in agroforestry systems with substantial tree cover. It also has great experience with community organization to process and market these products (Toledo *et al.,* 2003; Jarrett, Cummins, and Logan-Hines, 2017; Juárez-López, Velázquez-Rosas and López-Binnqüist, 2017). In a few cases these systems have received support from government payment for environmental service programs and private voluntary forest carbon markets (Giudice *et al.,* 2019; Rontard, Reyes-Hernández and Aguilar-Robledo, 2020).

The harvesting, processing, and sale of non-timber forest products, such as oils and essences, natural fibers (including vines), fruits, mushrooms, nuts, coconuts, ornamental and medicinal plants, resins, and spring water, provide major benefits to indigenous and forest communities. **Women have a central (and often unnoticed) role in many of these activities** (Bose *et al.,* 2017).

Community forestry could contribute much more to forest conservation and to community wellbeing than it has to date. The main barrier has been public policies that keep communities from being able to profitably harvest and process their wood and other forest products.[42] The main regulatory and fiscal bottlenecks have been:

- lengthy and expensive bureaucratic procedures;
- corruption within the forest law enforcement agencies;
- forestry regulations that lack scientific basis;
- frequent policy changes; excessive taxes and administrative fees; and
- overemphasis on regulating community forestry enterprises compared to efforts to curtail deforestation for agriculture or illegal logging (Andersson and Pacheco, 2004; Pacheco *et al.,* 2008; Pokorny and Johnson, 2008).

Many international conventions, national constitutions, and judicial rulings have reaffirmed indigenous and tribal peoples' right to use their forest resources according to their own norms and customs. Nevertheless, efforts to adapt government regulatory frameworks to these groups' needs and cultures remain incipient (Sierra-Huelz *et al.,* 2020).

If communities have large volumes of commercially valuable timber and government or international funds pay their advisors, community forestry enterprises generally do well. But they often find it difficult to sustain themselves if those resources disappear, largely due to high transactions

[42] As the Independent Evaluation Group of the World Bank (IEG) has said, "Participatory Forest Management, when implemented effectively, has delivered livelihood enhancing benefits as well as positive environmental outcomes. But its potential is often hampered by the failure to devolve true authority to communities and by regulatory environments that often discriminate against small producers. Where this is the case, the benefits enjoyed by communities may be too limited to provide sufficient incentives to ensure sustainable forest management" (IEG, 2014).

costs (e.g. expensive studies required for permits, trips to resolve administrative problems, extensive paperwork, and administrative fees).

Funding for forestry installations and equipment and operational costs is similar. Even when they have great forest resources and good credit histories, indigenous and tribal forestry enterprises can rarely get loans from commercial banks. Special government and donor programs and projects help resolve that bottleneck for a time, but when they end the communities are often forced to depend on advances from buyers for their working capital (Mejía *et al.,* 2015).

Governments usually make less efforts to control non-timber forest products than timber. Even so, communities that seek to transition from informal to formal non-timber activities and receive support for their programs or projects often face problems (Laird, McLain, and Wynberg, 2010; Delgado, McCall, and López-Binqüist, 2016).

The same applies to much of the wood, fuelwood, and charcoal indigenous and tribal families produce informally. These activities generate substantial income, often with minimal environmental damage or government regulatory enforcement, but existing regulatory frameworks impede these communities from formalizing their activities and taking them to another level.

Indigenous women from the Mayan People working with wood. Cooperativa Lol Koópte', Ejido Petcacab, Mexico.

BOX 4

The Petcacab *Ejido*: an example of good Mayan forest management in Quintana Roo, México

For thirty years the Mayan indigenous community of Petcacab in Quintana Roo was left with no choice but to allow the Maderas Industrializadas de Quintana Roo (MIQRO) company to extract large volumes of mahogany with little benefit to local inhabitants. Even though the community formally owned the land, the government authorities of the period had given MIQRO a concession, which allowed it to harvest the timber, without the community's consent. That situation changed abruptly in 1983, when the government allowed the communities to directly manage and benefit from their own forest resources and began the Pilot Forestry Plan (Plan Piloto Forestal) to support community forestry enterprises.

Now, Petcacab has been sustainably harvesting its timber for almost forty years. It is a relatively prosperous community, with about 1 000 inhabitants, which sold USD 1 687 315 in forest products in 2016. It owns 51 176 hectares, of which it uses 81 percent for forestry, leaves 10 percent for strict conservation, and uses only 9 percent for agriculture and other purposes. Its forests are full of jaguars, deer, Guatemalan black howlers, tapirs, lowland pacas, pheasants, wild turkeys, and toucans. It sends 300 000 board feet of wood to Central Mexico each year, directly generating 280 jobs. The Forest Stewardship Council (FSC) has certified the good management of its forests. It processes its own wood, as well as wood from four neighboring communities.

The forest provides much more than just sawn boards to Petcacab's Mayan inhabitants. A 2006 study found they used 197 plants and 66 animal species. Community members sell wood palings and guano palm leaves as construction materials, charcoal for barbecues, wood furniture and handicrafts, natural chicle gum, and honey. They hunt and fish for their own subsistence. Local indigenous women formed their own carpentry business, called Lol Koópte', which uses sawmill residues to make furniture. The community also uses part of its conservation area for ecotourism.

From the beginning, the government has provided Petcacab with technical and financial assistance. Among other things, the National Forestry Commission (CONAFOR) has given them forestry incentives to design their forest management plan, pay for independent forest certification audits, establish the Maya women's business, and create a charcoal cooperative.

None of it has been easy. Petcacab's first community forestry enterprise collapsed due to bad management, and they replaced it with a more decentralized approach. In 2007 Hurricane Dean severely damaged the community's forests. Despite almost forty years of hard work and dedication, the community still finds it difficult to raise funds for new initiatives. Even so, Petcacab has advanced notably since the days of the MIQRO company, and the outlook looks favorable.

SOURCE: Ramírez Barajas, Torrescano Valle and Chan Rivas, 2006; La Jornada Maya, 2017; Ejido Petacab and Polinkin, 2016; La Jornada Maya, 2018; Distrito Centro, 2018; CNF, 2019.

Mayan Women from the Lol Koópte' Cooperative, Petcacab Ejido, Mexico.

Independent agencies that certify sustainable forest management recognize the need to adapt their approaches to the communities' conditions and needs. Hence, they have designed specific national standards for these types of forest management (Wiersum, Humphries, and van Bommel, 2011). Nevertheless, these processes probably can gain greater impetus until formal government forestry regulations are adapted to the needs and realities of indigenous and tribal communities.

So, along with tenure and compensation for environmental services, forest management is the third component that must be strengthened through additional funding and policy reforms. This would make it more profitable, sustainable, and socially beneficial, and provide an incentive to avoid land use change and forest degradation. Specifically, what is needed includes:

- **A substantial increase in public, non-governmental, and private funding**, including for non-timber forest products

and tourism, as well as wood products, which provides for the inclusion of women and youth. More funds are needed to prepare plans and obtain permits, build and maintain secondary roads, and purchase machinery and equipment, as well as for working capital, training and technical assistance, community monitoring, independent audits, and marketing. This could take to form of grants, loans, or equity capital. Funds from payment for environmental service programs should also support forest management.[43] Whatever the modality, the funding systems must be adapted to the indigenous and tribal communities' specific needs, and that the communities understand the arrangement and can decide for themselves whether they want to accept the conditions.

- **A simple and culturally sensitive regulatory approach, which is adapted to the needs of the groups involved.** This approach should prioritize training, technical advice, and other incentives over policing and control (Hirakuri, 2003). Rules and procedures should be adapted to local conditions and needs and as simple and easy to adopt as possible and based on both empirical and academic knowledge and steps taken to ensure those affected can help define the rules and monitor compliance.[44] Government authorities should support the processes' outcomes (Ostrom, 1990).
- **Stronger – and in some cases new – capacity to provide technical, organizational, and marketing advice to the community forestry enterprises.** Specific mechanisms will vary, but in every country there is a need to improve management, organizational, and commercial aspects, and not just the forestry practices. Value chains, identification of new markets, and negotiations between communities and

[43] It is also important to reduce the taxes and administrative fees that the community enterprises pay. It does not make any sense to fund these groups with one hand and take the money back with the other.

[44] For example, one might eliminate certain requirements in the case of low intensity logging, permit the use of chainsaws to saw timber manually, and promote regional forest management plans, rather than separate plans for each community or forest.

intermediaries must also be strengthened. Marketing based on location of origin and type of producer, as well as different types of social and environmental certification can be useful tools.

- **The communities themselves can do much of the monitoring of these systems of production**. That reduces costs, facilitates adaptative management, and helps communities to own the management process. Recent studies show that participatory monitoring methodologies can generate high quality reliable data (Balderas Torres and Skutsch, 2015; Mateo-Vega *et al.,* 2017; Yepes *et al.,* 2018).

  The immediate priority should be to reactivate forest management initiatives in the Plurinational State of Bolivia, Mexico, Peru, and Central America that had made major progress but were weakened by changes in public policies and the COVID-19 pandemic. It would also be important to prioritize support for indigenous and tribal territories where pressure on forests is growing rapidly, as in Brazil and Colombia.

d. Culture and traditional knowledge

Various aspects of indigenous peoples' cultures and knowledge favor good stewardship of forestry and agroforestry areas. This includes some of their values, beliefs, customs, productive practices, and field experiences; all of which are intimately related to their languages and cultural identities. Given the importance of these aspects for biodiversity conservation and climatic stability and the survival of these peoples as such, cultural revitalization and inter-generational transmission of knowledge is important for any holistic effort to protect indigenous and tribal territories. Cultural revitalization also favors the formation of social capital, which is essential for any collective action, including indigenous management of forested territories.

Indigenous and tribal cultures are intimately related to the ecosystems of the territories emerged from. Many words and phrases in their languages refer to animal or plant species or other characteristics of their ecosystems, and many foods and medicines are associated with the local ecology. Hence, the ecosystems and cultural identity are integrally related. Consequently, local conservation of nature and preserving ethnic identities are interlinked (Garibaldi and Turner, 2004; Pert *et al.,* 2015).

Without a doubt, the territories are losing traditional ecological knowledge (Camara-Leret *et al.,* 2016; Wilder *et al.,* 2016). But it is not just a question of preserving this knowledge; it is equally important to ensure the knowledge benefits local people, especially youth. Cultures and knowledge evolve constantly, and people conserve the elements they find relevant (Gómez-Baggethun and Reyes-García, 2013; Athayde *et al.,* 2017). To ensure that customs and knowledge are conserved and contribute to strengthening the territories' organizational, social, and environmental initiatives they must be sources of status and pride, fun to share, and provide material benefits.

Hence, **revitalizing languages, customs, and traditional knowledge is another central component of an integrated strategy to mitigate climate change by protecting the ecosystems of indigenous and tribal territories.** These elements contribute to the peoples' collective identities and ensure the preservation of their worldviews, and that helps them to manage well their ecosystems and natural wealth. Revitalizing traditional knowledge does not mean abandoning other types of knowledge, simply giving the former the attention it deserves (BOX 5).

BOX 5

Traditional indigenous knowledge contributes to fire management in the Brazilian *Cerrado*

The indigenous peoples of the *Cerrado* and savannas of northern South America have deep knowledge about how to manage fires. They are experts in where, when, and how to use fires for different purposes. For more than 4 000 years they have been perfecting their ability to use fires to recycle nutrients, hunt and fish, control pests and snakes, get plants to flower and bear fruit, conduct ceremonies, cut trails, and keep flammable material from accumulating. They usually do controlled burns in small areas when they are not too dry. These burns encourage the growth of local plants eaten by people and wildlife and do not damage the ecosystem.

That is quite different from how European colonizers and their descendants have used fires. They burn larger areas near the end of the dry season to clear forest, expand pastures and crops, and increase pasture yields. That is much more destructive.

Some South American governments totally prohibit setting fires outside cultivated plots. However, "no burn" policies lead dry leaves, branches, and small stems to accumulate, creating propitious conditions for larger and more destructive fires. Since climate change is making droughts more frequent and prolonged, that problem is getting worse.

Brazil's government abandoned its "no burn" approach in 2014. They modified the Forest Code and adopted a more holistic fire management policy, which allowed prescribed (controlled) burns and incorporated other ancestral practices of the traditional communities in the *Cerrado* and Roraima. They also established a special program for controlling fire in indigenous and quilombolo territories called Prevention and Combat of Forest Fires in Indigenous Territories (PREVFOGO). In 2015, 608 indigenous people participated in PREVFOGO's fire brigades, which helped to protect 17.1 million hectares.

The PREVFOGO program is based partially on a previous experience in Mato Grosso with the Paresi indigenous peoples, where government officials and indigenous elders collaborated to design a fire management plan that drew from traditional knowledge about the local ecology. In its first three years of operation, PREVFOGO greatly improved relations between the indigenous peoples and government technical staff and reduced the fires at the end of the dry season in three large territories by between 40 and 57 percent. Data from sixteen indigenous territories demonstrated that the ancestral fires practices favored the presence of edible fruits and wild animals much more than the previous "no burn" approach.

SOURCE: Pinello, 2011; Welch *et al.*, 2013; Mistry, Bilbao and Berardi, 2016; Moraes Falleiro, Trindade Santana and Ribas Berni, 2016; Davis, 2018; Eloy *et al.*, 2019; Moraes Falleiro *et al.*, 2019.

PREVFOGO/IBAMA indigenous brigades fight forest fire in Porquinhos indigenous territory, Maranhão, Brazil.

Specifically, it would be important to:

- **Invest in relevant formal and informal educational systems.** To make public education programs more germane, bilingual and intercultural, education programs must be reinforced and more traditional knowledge incorporated into their curriculum (Eijck and Roth, 2007; Athayde *et al.,* 2017; De la Herrán and Rodríguez, 2017). While it makes sense to maintain some elements of the current curriculum, formal education should reaffirm traditional knowledge and not substitute for it, as often occurs (Reyes-García *et al.,* 2010; Cámara-Leret *et al.,* 2016; Athayde *et al.,* 2017).
- **Promote cultural revitalization initiatives.** Using innovative and entertaining methods that young people find attractive to document and share traditional knowledge can improve the social status of indigenous and tribal languages, customs, and traditional knowledge and the people who use them. This includes methods such as workshops, exchanges, multi-media programs, theater, dance, and oral story-telling (Athayde *et al.,* 2017; Fernández-Llamazares and Cabeza 2018). Where appropriate, such processes can also incorporate new practices, designs, and knowledge (Athayde *et al.,* 2017).

  Since older adults are the guardians of much of the traditional knowledge, inter-generational dialogues are crucial (Rivera Cumbe, 2018). The COVID-19 pandemic has made them all the more urgent, since the elders and their knowledge are at great risk. Women are especially important, since they are the main depositaries of many types of traditional knowledge and are heavily involved in transmitting knowledge to the next generation (Mayorga-Muñoz, Pacheco-Cornejo and Treggiari, 2017; Aswani, Lemahieu, and Sauer, 2018).[45] Both the territories' inhabitants and professionals with other types of knowledge and cultures can learn from intercultural dialogues.

[45] Along these same lines, when women lose their traditional roles as keepers of knowledge related to handicrafts, household gardens, traditional medicine, cooking, and other topics they often lose status, livelihood opportunities, and self-esteem (M. Estrada, personal communication, May 15, 2020).

Hands of a Mayan indigenous woman working with wood. Cooperativa Lol Koópte', Ejido Petcacab, Mexico.

These dialogues can also increase the perceived value of local cultures and knowledge in the eyes of external actors and the communities themselves.

- **Promote alternatives that use traditional knowledge to generate material benefits, especially for young people.** Finding ways to use traditional knowledge that provide material benefits can be a strong incentive to preserve that knowledge. That may involve both traditional activities, such as hunting, fishing, and collecting and processing useful plants, as well as new initiatives such as earning income from ecological or cultural tourism, traditional medicine, forest monitoring, or sale of forest products. It is important to fund indigenous and tribal organizations that work on cultural revitalization and traditional knowledge, both to promote these activities and encourage people to see them as potential sources of employment.

Indigenous brigades of PREVFOGO / IBAMA plan with the indigenous community of Porquinhos, Maranhão, Brazil.

e. Territorial governance and forms of organization

Strengthening territorial governance and indigenous and tribal organizations is a pre-requisite for maintaining the territories' well-being and ecosystems over the long-term. This means establishing more effective, inclusive, participatory, transparent, and culturally appropriate mechanisms for making decisions, managing resources, resolving conflicts, sharing benefits, applying norms, disseminating information, and interacting with external actors (F. Edouard, personal communication, April 26, 2020).

Traditional community governance in forest regions was based largely on kinship relations, communal assemblies, and traditional leaders (Padilla and Contreras Velozo, 2008). Community norms about the use of natural resources were mostly informal. Local leaders and groups did not handle much money and villagers participated in many community

activities on a volunteer basis. Community efforts to influence policies were sporadic and community economic initiatives rudimentary (Roper, 2003).

The traditional governance approaches were not always inclusive, especially with regards to the equitable participation of women, but they resolved many local problems. But as time went by, the growing demands on the communities pushed the traditional approaches to their limits. **Faced with an onslaught of government programs, foreign-funded projects, and NGOs, the communities felt the need to create more formal organizations with larger budgets.** To hold a village assembly, all one needed was to convene it; but bringing together leaders from many dispersed communities requires another level of resources (Bebbington and Biekart, 2007). In response to increasing threats from external groups, the territories have had to adopt more sophisticated and expensive advocacy strategies, including activities at the international level (Wolff, 2007; Toohey, 2012).

This presents institutional challenges for the communities and their organizations. Historically, they could rely mostly on volunteer labor and poorly paid part-time staff. But now they also need people with greater management, technical, and administrative skills.

To obtain funding, influence policies, compete in markets, negotiate with companies, handle legal problems, and operate at larger geographic scales, **indigenous and tribal peoples have had to adopt more formal organizational structures.** They created territorial governments, community forest enterprises, cooperatives, federations, regional coordinating bodies, territorial funds, indigenous political parties, community radios, and their own NGOs. Some of these are second, third, and even fourth-tier organizations operating at multiple scales (e.g. local, provincial, national, regional, and global) (Rosales González and Llanes Ortiz, 2003; Padilla and Contreras Velozo, 2008; Larson and Soto, 2012; Dupuits, 2015; Becker and Stahler-Sholk, 2019).

Association of Indigenous Women of Talamanca (ACOMUITA), Talamanca, Limón Province, Costa Rica.

Most of these organizations are still relatively new and fragile and must be accountable both to the agencies that fund and regulate them and the communities they serve. **It is not easy to balance the demands and expectations of these two worlds.** While the former thinks in terms of documents, logical frameworks, procedures, and financial calculations, the communities tend to value family relations, ethnic and local identities, oral communications, and traditional norms. The organizations need leaders, technical staff, and advisors prepared for and linked to the external world, but that sort of people often have educational levels and cultural behaviors that clash with those of the communities.

Traditional indigenous and tribal peoples' governance involved individual communities. But many of the territories and organizations include multiple communities. That presents new challenges, which are only beginning to be addressed (BOX 6).

BOX 6

Territorial governance is a central component of indigenous and tribal peoples' autonomy*

Indigenous and tribal peoples' territories are spaces for the production and reproduction of their systems of communal living, for exercising their freedom, and for manifesting their cultures, spiritual beliefs, and ancestral knowledge. They share their territorial spaces with other living beings, with whom they maintain a direct relationship, where each guarantees the sustainability of the other.

Rights over territories (and not just land), allows indigenous and tribal peoples to exercise authority and power, as does a public entity (such as a municipality or a district), within the limits of its jurisdiction and competencies. As such, it gives them the right to make decisions about and use their resources for the common good. That way they can participate as collective entities in the decisions that affect their territories. Within those territories they can follow their own norms, customs, and traditions, in coordination with other government authorities. They can regulate their own forms of social organization and political representation and orient and administer their economies and make use of their natural resources.

Together they can freely work towards their own spiritual, economic, environmental, social, and cultural sustainability. The territory provides a basis to exercise their collective rights, a vital space for them to development, with autonomy and respect for their authorities. It allows for production that is careful to maintain an ecological equilibrium and avoid environmental degradation, as part of a system of sustainable growth.

Various Latin American Constitutions and national laws recognize and guarantee the existence of indigenous and tribal communities or their equivalent as the basic units of rural social organization. Some give these communities, or groups of communities, legal status and attributions and/or recognize them as government entities. These laws refer to indigenous peoples' right to use their own traditional authorities and internal mechanisms to resolve conflicts within their territories. They also recognize their right to make decisions, judge, and enforce agreements using their own traditions (as long as those traditions do not violate the inherent rights of all human beings). As such, they recognize indigenous peoples' jurisdiction over their own internal affairs.

Indigenous legal systems are diverse, and the functions and attributions of indigenous jurisdictions vary depending on the cultures and traditions of the specific indigenous or tribal people involved. Although the indigenous organizations have common objectives, there are subtle differences in their positions on these issues.

For example, the Indigenous Coordinating Body of the Amazon Basin (COICA) argues that juridical pluralism is an undeniable and observable reality that dates to prior to the creation of the nation states and its autonomous independence simply needs to be respected. In contrast, the Andean Coordinating Body of Indigenous Organizations (CAOI) believes it is possible to create new Pluri-national States where indigenous peoples' could be recognized as co-equal components of the nation state itself (FILAC, 2012).

Independently of the specificities of each case, from an indigenous perspective, the formal recognition of the peoples and communities and their own autonomous organizational opens important legal and political opportunities to participate in public life, exercise authority, and obtain and defend their rights over key resources.

Even so, the reality is that governmental recognition and support for indigenous peoples own authorities and mechanisms for relative autonomy (e.g. *comarcas*, indigenous territories, autonomous regions, indigenous districts) is still somewhat exceptional; and that creates ongoing tensions with the state. Indigenous movements demand access to justice, but also their ability to resolve their conflicts through their own traditional authorities, according to their own customs (FILAC, 2012).

The reforms in this area are still incipient but could evolve towards the creation of an administrative regime to ensure these rights, already enshrined in the United Nations Declaration on the Rights of Indigenous Peoples. The new relationships with indigenous and tribal peoples must be oriented to overcome the failures to respect their individual and collective human rights, which often occur, exacerbated by discriminatory practices and deficient legal mechanisms.

These aspects are relevant for how to define or redefine policies and orient funding for forest preservation in indigenous and tribal territories. As this report has shown, those forests have suffered much less destruction than other forests in the region, however, that is rapidly changing and the threats to those forests and their inhabitants are increasing. To revert these new negative trends and implement the measures this report proposes, it will be important to take into account these issues related to indigenous and tribal peoples' autonomy.

* This box was prepared by Myrna Cunningham and Álvaro Pop, with technical support from Amparo Morales and Ricardo Changala.

For effective territorial governance, **this new generation of organizations must strengthen its technical and administrative capacity, without abandoning its origins and losing its social capital and cultural identity.** The latter give these organizations local legitimacy and is essential for community organizations and enterprises to succeed (Escobar-Izquierdo, 2015; Hodgdon *et al.,* 2015; Martínez-Bautista *et al.,* 2015; MacQueen *et al.,* 2020).

"Hybrid" arrangements, which combine traditional governance with more professional approaches, offer one partial solution. In these arrangements, community assemblies and traditional authorities still have the last word but delegate some decisions to professional managers or technical specialists. For example, some Guatemalan and Mexican forest communities have established separate forestry enterprises and hired managers to administer them to make them more efficient, but the managers are still fully accountable to the traditional authorities and community assemblies (Gazca-Zamora, 2014). Other traditional authorities have encouraged local professionals to establish NGOs to support them or have negotiated arrangements with outside NGOs, which agree to provide technical or administrative assistance under the leadership of the traditional authorities.

Many funders channel their support through intermediaries because they perceive grassroots organizations to be too weak to administer funds. That can create tensions and undermine the sense of local ownership and development of local capacity. Sometimes there are no feasible alternatives but using intermediaries should usually be a last resort. The starting point should be a good assessment of each group's capacity, which can be used to decide how much intermediation is needed (Uquillas and van Nieuwkoop, 2003).

A scarcity of trained local people with skills and experience in project management, administration, community organization, advocacy, communications, law, mapping,

environmental monitoring, agronomy, and silviculture is a key constraint. There are more educational centers and students than a few years ago, but public investment in education in indigenous and tribal regions is less than it should be, especially for higher education. The deficit is even greater with regards to education appropriate for the local conditions.

Short courses can be good for teaching specific skills such as the use of drones, GPS, social media, or accounting software, but cannot substitute for sustained investment in education that meets the needs of local groups. New intercultural institutes and universities have emerged to train young people in these regions and some well-consolidated indigenous peoples, such as the Guna in Panama, and certain forestry and agroforestry communities in Michoacán, Oaxaca, Quintana Roo, and Puebla, in Mexico, have provided scholarships for young people to get training and come back and work for their communities. The program to train "indigenous agroforestry agents" in Acre, Brazil, is another innovative initiative (DiGiano *et al.*, 2018). However, many more such initiatives are needed.

Meaningful participation of women in decision-making and benefit-sharing is essential for good territorial governance. In the last few decades, many local, national, and regional organizations of rural indigenous and tribal women have emerged (Donato *et al.*, 2007; Rousseau and Morales Hudon, 2018). They work on many topics relevant both for women specifically and for the whole communities. Women have also achieved much higher profiles in many organizations that include both men and women. Some organizations have created women's commissions and approved quotas for women's participation in leadership positions.

There are still strong obstacles to the full and equitable participation of indigenous and tribal women in the territories. Cultural norms and tenure policies favor

men (Flores *et al.*, 2016; RRI, 2017). Women have greater workloads and less access to education and the external world, and that can contribute to problems of self-esteem (Weise y Álvarez, 2018). Women also face a vicious circle, where lack of leadership experience makes it harder to attain leadership positions where they could acquire such experience (Zambrano and Uchuypoma, 2015). To overcome these problems, gender equality must be prioritized, and that commitment sustained over time.

Any initiative that seeks to improve the forest conditions in the indigenous and tribal territories over the long term cannot ignore these aspects of territorial governance and organization and the need to invest in them. **To resist the growing pressures on the territories' forests it is essential to strengthen the peoples' institutional and organizational mechanisms.**

While there are no recipes for that, there are relevant principles:

- **Adaptive management** that draws from **learning processes**. Finding the right balance between different objectives and approaches requires constant trial and error. The more systematic, critical, and participatory these processes are, the greater the likelihood of making the needed adjustments and building consensus around them.
- A **holistic vision** is key for managing the balance between multiple objectives, which are sometimes counterposed, as improving one aspect may negatively affect another.
- **As much local appropriation as possible, combined with mechanisms for social control**. To the extent possible, it is better to use transparency and social accountability mechanisms than external control and monitoring.
- **Reduction and simplification of rules, processes, and documentation**. The more complex and burdensome, the

Mayan woman working with wood. Cooperativa Lol Koópte', Ejido Petcacab, Mexico.

harder it will be to involve affected groups and easier to lose track of the central objectives.

- The **central role of women**. There is no way to respect the rights and desires of indigenous and tribal peoples without respecting those of women, since more than half of indigenous and tribal people are women. Women must be front and center in any consultation with these groups.
- **Cultural and community identities** offer opportunities to strengthen social capital and self-esteem and to overcome some of the differences in education levels and status.

A girl from the Arhuaco People learns from her mother the ancestral technique of weaving the Arhuaca backpack. Sierra Nevada of Santa Marta, Colombia.

CONCLUSIONS

Latin America and the Caribbean's indigenous and tribal territories play a prominent role in the stability of the regional and global climate and house a large part of global biological and cultural diversity, but their inhabitants lack decent incomes and access to services. Historically, these areas did not have much deforestation or forest degradation. Cultural factors, formal recognition of indigenous and tribal territorial rights, economic benefits indigenous and tribal peoples received from maintaining forest, government restrictions on land use change, remoteness, environmental conditions unsuitable for commercial agriculture, lack of capital, and low demographic pressure contributed to that.

Now, the threats to the people and forests of the indigenous and tribal territories are increasing. Demand for food, minerals, energy, timber, tourism, and other products and services is growing. That makes the territories' natural resources more valuable and encourages efforts to capture them.

Many factors that kept these forests from being destroyed have weakened:

- Road construction has made the territories more accessible.
- Technological advances have enabled mineral and hydrocarbon extraction and crop and livestock production in new regions.
- Some governments have curtailed their efforts in support of collective land rights.
- Various countries have reduced funding for payments for environmental services and to support community forestry.
- New companies and households have brought capital and/or labor to forest frontier regions.

- Greater contact with urban areas, formal education, mass communications, and markets has weakened traditional languages, customs, and knowledge.

These changes have not all been negative. Nevertheless, their combined effect has been to increase the threats to the territories' forests, inhabitants, and cultures. The territories' forests are still in better condition than other forests, but the trend is negative.

These new challenges demand a strong integrated response. The region and the world do not have the luxury of losing the territories' large stores of carbon and biological and cultural riches or permitting the violence to escalate. The COVID-19 pandemic has made the situation even more urgent. The pandemic has taken a great toll on the indigenous and tribal people but has not deterred the invasions of their territories. This grave situation requires much more investment in these territories, in addition to policy, procedural, and governance reforms.

This is a long-term problem that requires a long-term response, based on consolidating the territories' governance structures, policy instruments, social capital, abilities, and knowledge. That is the only way to maintain the integrity of the territories' ecosystems and their cultures and to improve their quality of life and avoid social conflicts indefinitely.

The new investment and policy initiatives must include five central components:

- communal territorial rights;
- compensation of environmental services;
- community forest management;
- cultural revitalization and traditional knowledge; and
- territorial governance and stronger indigenous and afro descendant organizations.

Awajun warrior in his community in the Peruvian jungle. Loreto, Peru.

Given the synergies between these components, they should be considered a package, not stand-alone initiatives. Territorial rights are a precondition for community forestry and payment for environmental service programs. Good territorial governance and well-functioning organizations provide a solid foundation for everything else. Cultural revitalization strengthens the social capital, self-esteem, and traditional knowledge all these efforts need to work. BOX 7 offers an indicative estimation of the economic viability of this package from a climate mitigation perspective, which suggest that the proposal could be viable.

BOX 7

The profitability of investing in climate action in the indigenous and tribal territories

Whenever one considers a public investment, it is important to assess its economic viability. Typically, climate mitigation projects compare the carbon emissions expected if the project is implemented with a reference scenario based on past emissions. In the case of the indigenous and tribal territories, past emissions were low, but without forceful action they are likely to rise to levels more like those of other forests with comparable environmental conditions and access to markets.

For the Amazon Basin, which includes almost three quarters of the carbon in the indigenous and tribal territories' forests, there is enough data to make an initial estimate of whether the activities this report recommends might be economically viable.

On average, indigenous and tribal territories in the Amazon Basin lost 0.17 percent of the carbon stored in their forests each year between 2003 and 2016 due to deforestation and forest degradation. In contrast, forests outside indigenous territories and protected areas lost 0.53 percent each year; 0.36 percent more than the indigenous territories (Walker *et al.*, 2020).*

One reason the annual deforestation rates were 0.36 percent lower in the indigenous and tribal territories was because they were in places that were less likely to be deforested, independent of whether they were indigenous or tribal. For example, they might be farther from roads, have less fertile soils or wetter climates. Blackman and Veit (2018) estimate that such factors explain roughly 30 percent of this 0.36 percent difference in deforestation rates between indigenous and tribal territories and other forests. Most of the remaining 70 percent of the difference in deforestation rates is presumably related to indigenous and tribal peoples' territorial rights, use of the forest, payments for environmental services, cultures and knowledge, land use restrictions, governance, and organization.

The most likely "Business as Usual" reference scenario is that, if nothing is done to strengthen these latter aspects, deforestation rates in indigenous and tribal territories will become more similar to those in other forests with similar soils, climates, and distance to roads. One subjective, but plausible, estimate, is that over the next decade on average these territories would provide only half as much protection as they do now, compared to similar non-indigenous forests outside protected areas.

If that were the case, these territories' annual carbon emissions would increase by 0.36 percent x 70 percent x 50 percent = 0.126 percent of the territories' forest carbon stock. That stock is currently 24 640 million metric tonnes of carbon (MtC). So, the additional emissions would be 24 640 MtC x 0.126 percent, or 31 MtC per year. At the price of USD 5 per ton of CO2e paid by the Green Climate Fund, if one could avoid that increase of 31 MtC of emissions that would be worth about USD 570 million per year.

Meanwhile, based on the costs of existing programs, on average the proposed investments in territorial rights, environmental service payments, community forestry, governance, and cultural revitalization might cost USD 40 per hectare (Ding *et al.*, 2016; Von Hedemann, 2016; Alix-García *et al.*, 2019; MINAM, 2019). If the activities covered half the forest in the Amazon Basin indigenous territories, it would cost USD 400 million per year. Well invested, that could be enough to avoid the previously mentioned 31 MtC of emissions, valued at USD 570 million per year.

So, from an economic perspective, one could probably justify an investment of this magnitude based solely on a reduction of expected carbon emissions, even without the other social, environmental, cultural, and governance benefits.** In addition, many other studies have shown the economic benefits of avoiding the emission of a ton of CO2e is more than USD 5 (Ding *et al.*, 2016). If one used those higher prices to calculate the economic benefits, they would obviously be larger.

* These figures do not include the additional carbon the trees capture each year. If they did, the expected benefits of the proposed investments would be significantly larger.

** Including the timing of the costs and benefits and interest rates would make this analysis more rigorous. However, it would not change the general results since the proposed actions are expected to provide their benefits almost immediately after the investments are made.

Indigenous man from the Kankuamo People, leader of forest governance in the Sierra of Nevada Santa Marta, Colombia.

The demarcation and titling of indigenous and tribal territories is a cost-effective option for reducing carbon emissions and increasing carbon capture. There are still tens of millions of hectares left to be demarcated and titled or registered, and that requires investment. Those efforts must be complemented with measures to ensure the titles are respected and tenure conflicts are resolved and to guarantee the indigenous and tribal peoples' right to Free, Prior and Informed Consent (FPIC) related to proposed investments and policies that affect their territories.

Payment for environmental services for indigenous and tribal peoples deliver good environmental and social outcomes and deserve to be expanded. In addition to paying communities not to deforest in the short term, they should focus on creating the institutional, economic, and social conditions that provide motives and means for the communities to guarantee the long-term integrity of their ecosystems.

Investments decisions should be based principally on the past pressure on these forests – which was often low – but on the need to prepare for the new emerging threats.

Community forest management, both for timber and non-timber products, can offer relevant economic opportunities for the territories' inhabitants. It lends itself to a landscape approach, favors communal and territorial enterprises and organizational structures, offers incentives to keep forests standing, stabilizes and/or improves forest conditions, and provides income and jobs.

Like other productive rural activities, community forest management requires public and private investment to accompany and advise communities, train human resources, identify markets and innovations, monitor outcomes, construct and maintain secondary roads, and provide capital for operational costs and long-term investment. These investments can generate good rates of return and catalyze dynamic productive sectors. However, that requires secure rights over forests and stable

regulatory environments with low transactions costs, which allow communities to use their resources profitably. Without that, some communities may still be able to manage their forests profitably, legally, and without degrading the forest while some program or project funds them, but that will difficult to sustain without a favorable policy environment.

Most forestry programs and projects in indigenous and tribal territories focus only on ecological and /or economic aspects and give scant attention to cultural and educational issues. However, the latter are key, especially for the medium and long term. This component requires investment in pertinent cultural and educational activities and policy reforms to promote traditional knowledge, production and consumption systems, ethnic pride and identify, social capital, and self-esteem. Well designed and financed bilingual and intercultural education can be powerful tools, together with other initiatives undertaken by the communities and their organizations.

Finally, it is important to invest in improving the governance of indigenous and Afro descendent territories and indigenous and tribal organizations. That requires striking a balance between strengthening the indigenous and tribal peoples' technical and administrative capacity and dynamizing more participatory processes. Extending their reach, while deepening their local roots. Over time, new more "hybrid" structures must emerge to accompany and finance the communities and their organizations. All these efforts must prioritize meaningful participation in decision-making by women and youth.

The accelerating threats to the territories' integrity demands rapid responses proportionate to the magnitude of the challenges. Much remains to be learned about how to strengthen indigenous and tribal territories, to improve their long-term social and environmental conditions, but the moment to act is now. Soon it could be too late.

Indigenous leader of the Guna People, Púcuro Indigenous Territory, Darien Province, Panama.

REFERENCES

Adeney, J. M., Christensen Jr., N. L. & Pimm, S. L. 2009. Reserves Protect Against Deforestation Fires in the Amazon. *PLoS One*, 4(4): e5014. https://doi.org/10.1371/journal.pone.0005014.

Agard, O., Atkinson, S., Benjamin, P., Cornelius, S., Daniels, W., Hastings, K., James, R., Joseph, G., Joseph, S., Larson, R., Mc Garrell, M., Peters, C., Richmond, T., Robinson, K., Thomas, D., Thompson, N., & Walker, N. 2019. *Our Land, Our Life: A participatory assessment of the land tenure situation of indigenous peoples in Guyana. Report for Region 7*. Georgetown, Guyana, Amerindian Peoples Association (APA), Forest Peoples Programme (FPP) and Rainforest Foundation US.

Alix-García, J.M., Sims, K. R. E & Yáñez-Pagans, P. 2015. Only One Tree From Each Seed? Environmental Effectiveness and Poverty Alleviation in Mexico's Payment for Ecosystem Services Program. *American Economic Journal: Economic Policy*, 7(4): 1-40. https://www.aeaweb.org/articles?id=10.1257/pol.20130139.

Alix-García, J. M. & Sims, K. R. E. 2017. Parks versus PES: Evaluating Direct and Incentive-Based Land Conservation in Mexico. *Journal of Environmental Economics and Management*, 86: 8-28. https://doi.org/10.1016/j.jeem.2016.11.010).

Alix-García, J. M., Sims, K. R. E., Orozco-Olvera, V. H., Costica, L. E., Fernández-Medina, J.D. & Romo Monroy, S. 2018. Payments for Environmental Services Supported Social Capital While Increasing Land Management. *Proceedings of National Academy of Sciences (PNAS)*, 115(27): 7016-7021. https://doi.org/10.1073/pnas.1720873115.

Alix-García, J. M, Sims, K. R. E., Orozco-Olvera, V. H., Costica, L., Fernández-Medina, J. D., Romo-Monroy, S., & Pagiola, S. 2019. Can Environmental Cash Transfer Reduce Deforestation and Improve Social Outcomes? A Regression Discontinuity Analysis of Mexico's National Program (2011-2014). Policy Research Working Paper WPS 8707, Impact Evaluation Series. Washington D. C, World Bank.

Álvarez-Berríos, N. L. & Aide, T. M. 2015. Global Demand for Gold is Another Threat for Tropical Forests. *Environmental Research Letters*, 10 (1). https://iopscience.iop.org/article/10.1088/1748-9326/10/2/029501.

Amazon Conservation Team (ACT). 2010. *Land Rights, Tenure, and Use of Indigenous Peoples and Maroons in Suriname, Support for the Sustainable Development of the Interior – Collective Rights. Final Report*. Paramaribo.

Anaya, S. J. 2015. Report of the Special Rapporteur on the Rights of Indigenous Peoples on Extractive Industries and Indigenous Peoples. *Arizona Journal of International and Comparative Law* 32(1): 109–42. https://arizonajournal.org/wp-content/uploads/2015/10/5-Extractive-Industries-Report.pdf.

Anderson, C. M., Asner, G. P., Llactayo, W. & Lambin, E. F. 2018. Overlapping Land Allocations Reduce Deforestation in Peru. *Land Use Policy*, 79: 174-178.

Andersson, K. & Pacheco, D. 2006. Turning to Forestry for a Way Out of Poverty: Is Formalizing Property Rights Enough? In B. Guha-Khasnobis, R. Kanbur, & E. Ostrom, eds., *Linking the Formal and Informal Economy: Concepts and Policies*. Oxford, Oxford University Press.

Angelsen, A. 2010. Policies for Reduced Deforestation and their Impact on Agricultural Production. *Proceedings from the National Academy of Sciences (PNAS)*, 107(46): 19639-19644. https://www.pnas.org/content/107/46/19639.

Anthias, P. & Radcliffe, S. A. 2013. The ethno-environmental fix and its limits: Indigenous land titling and the production of not quite neoliberal natures in Bolivia. *Geoforum*, 64: 257-269. https://www.sciencedirect.com/science/article/abs/pii/S0016718513001371?via%3Dihub.

Antinori, C. & Bray, D. B. 2005. Community forestry enterprises as entrepreneurial firms: Economic and institutional perspectives from Mexico. *World Development*, 33(9): 1529-1543. https://www.sciencedirect.com/science/article/abs/pii/S0305750X05001002.

Aragão, L. E, Anderson, L. O., Fonseca, M. G., Rosan, T. M., Vedovato, L. B., Wagner, F. H., Silva, C. V. J., Silva Junior, C. H .L., Arai, E., Aguiar, A. P., Barlow, J., Berenguer, E., Deeter, M. N., Domingues, L. G., Gatti, L., Gloor, M., Malhi, Y., Marengo, J. A., Miller, J. B., Philips, O. L. & Saatchi, S. 2018. 21st Century Drought-Related Fires Counteract the Decline of Amazon Deforestation Carbon Emissions. *Nature Communications*, 9, 536. https://doi.org/10.1038/s41467-017-02771-y.

Armenteras, D., Rodríguez, N. y& Retana, J. 2009. Are conservation strategies effective in avoiding the deforestation of the Colombian Guyana shield? *Biological Conservation*, 142: 1411-1419. https://www.sciencedirect.com/science/article/abs/pii/S0006320709000767.

Arriagada, R., Cotacachi, D. Schling, M. & Morrison, J. 2018a. *Comunidades sostenibles: Evaluación de impacto del Programa Socio Bosque en poblaciones indígenas y tribales*. Nota Técnica IDB-TN-1564, noviembre, División de Género y Diversidad. Washington D. C., IADB.

Arriagada, R., Villaseñor, A., Rubiano, E., Cotacachi, D. y Morrison, J. 2018b. Analysing the impacts of PES programmes beyond economic rationale: Perceptions of ecosystem services provision associated to the Mexican case. *Ecosystem Services*, 29: 116-127. https://doi.org/10.1016/j.ecoser.2017.12.007.

Arsel, M., Hogenboom, B. & Pellegrini, L. 2017. The extractive imperative and the boom in environmental conflicts at the end of the progressive cycle in Latin America. *The Extractive Industries and Society*, 3(4): 877-879. https://www.sciencedirect.com/science/article/abs/pii/S2214790X16301976.

Asenso-Okyere, K., Asante, F. A., Tarekegn, J., & Andam, K. S. 2009. The linkages between agriculture and malaria: Issues for policy, research, and capacity strengthening. IFPRI discussions papers 861. Washington D. C, International Food Policy Research Institute (IFPRI).

Aswani, S., Lemahieu, A. & Sauer, W. H. H. 2018. Global trends of local ecological knowledge and future implications. *PLoS ONE*, 13(4): e0195440. https://doi.org/10.1371/journal. pone.0195440.

Athayde, S., Silva-Lugo, J. L., Schmink, M. & Heckenberger, M. 2017. The Same, but Different: Indigenous Knowledge Retention, Erosion, and Innovation in the Brazilian Amazon. *Human Ecology,* 45: 533-544. https://link.springer.com/article/10.1007/s10745-017-9919-0.

Atkinson, S., Benjamin, P., Benjamin, V., Mc Garrell, M., James, R., James, E., Perreira, R., Peters, C., Robinson, K., Wilson, D., Williams, I. & Thomas, D. 2018. *Our Land, Our Life: A participatory assessment of the land tenure situation of indigenous peoples in Guyana, Report for Region 8*. Georgetown, Guyana, APA, FPP y Rainforest Foundation US.

Atran, S., Medin, D., Ross, N., Lynch, E., Coley, J., Ucan Ek', E. & Vapnarsky, V. 1999. Folkecology and commons management in the Maya Lowlands. *Proceedings of the National Academy of Sciences (PNAS)*, 96(13): 7598-7603. https://www.researchgate.net/publication/235616468_Folkecology_and_Commons_Management_in_the_Maya_Lowlands.

Balderas Torres, A. & Skutsch, M. 2015. Special Issue: The Potential Role for Community Monitoring in MRV and for Benefit Sharing in REDD+. *Forests*, 6(1): 244-251. https://doi.org/10.3390/f6010244.

Baragwanath, K. & Bayi, E. 2020. Collective Property Rights Reduce Deforestation in the Brazilian Amazon. *Proceedings of the National Academy of Sciences (PNAS),* 117(34): 20495-20502. https://www.amazoniasocioambiental.org/wp-content/uploads/2020/08/10.1073@pnas.1917874117.pdf.

Barsimantov, J. & Kendall, J. 2012. Community Forestry, Common Property, and Deforestation in Eight Mexican States. *The Journal of Environment & Development*, 21(4): 414-437. https://doi.org/10.1177/1070496512447249.

Bayi, E. 2019. Indigenous Peoples of Brazil: Guardians of the Amazon Rainforest. Evaluating the Effectiveness of Indigenous Territories in Curtailing Deforestation Within the Brazilian Amazon., Department of Political Sciences, University of California-San Diego (Phd dissertation).

Bebbington, A. & Biekart, K. 2007. *Northern NGOs and indigenous organizations in Peru, Ecuador and Bolivia: Reflecting on the past to look to the future.* Amsterdam. Ibis, Hivos, Oxfam America and SNV.

Bebbington, A., Humphreys Bebbington, D., Sauls, L. A., Rogan, J., Agrawal, S. Gamboa, S., Imhof, A., Johnson, K., Rosa, H., Royo, A., Toumbouroum T., & Verdum, R. 2018. Resource extraction and infrastructure threaten forest cover and community rights. *Proceedings of the National Academy of Sciences (PNAS)*, 115(52): 13164-13173. https://www.pnas.org/content/115/52/13164.

Becker, M. & Stalher-Sholk, R. 2019. Indigenous Movements in Latin America. *Oxford Research Encyclopedia of Politics*.

Begotti, R. A. & Pérez, C. A. 2020. Rapidly escalating threats to the biodiversity and ethnocultural capital of Brazilian Indigenous Lands. *Land Use Policy*, 96: 104694. https://doi.org/10.1016/j.landusepol.2020.104694.

Belmaker, G. 2018. Brazilian 'Quilombo' Community Entitled with 220 000 Hectares of Rainforest. In Mongabay, 7 March 2018. (also available at: https://news.mongabay.com/2018/03/brazilian-quilombo-community-entitled-with-220000-hectares-of-rainforest/).

BenYishay, A., Heuser, S., Runfola, D. & Trichler. R. 2017. Indigenous land rights and deforestation: Evidence from the Brazilian Amazon. *Journal of Environmental Economics and Management*, 86: 29-47. https://www.aiddata.org/publications/indigenous-land-rights-and-deforestation-evidence-from-the-brazilian-amazon-2.

Blackman, A. 2015. Strict versus Mixed-use Protected Areas: Guatemala's Maya Biosphere Reserve. *Ecological Economics*, 112: 14-24. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.567.8862&rep=rep1&type=pdf.

Blackman, A., Corral, L., Santos Lima E. & Asner, G. P. 2017. Titling indigenous communities protects forests in the Peruvian Amazon. *Proceedings of the National Academy of Sciences (PNAS)*, 114(16): 4123-4128. https://doi.org/10.1073/pnas.1603290114.

Blackman, A. & Veit, P. 2018. Titled Amazon Indigenous Communities Cut Forest Carbon Emissions. *Ecological Economics*, 153: 56–67. http://doi.org/10.1016/j.ecolecon.2018.06.016.

Blankespoor, B., Dasgupta, S. & Wheeler, D. 2014. *Protected areas and deforestation: new results from high resolution panel data*. Policy Research Working Paper 7091. Washington D. C., World Bank.

Boege Schmidt, E. 2008. *El patrimonio biocultural de los pueblos indígenas de México: hacia la conservación in situ de la biodiversidad y agrodiversidad en los territorios indígenas*. Ciudad de México, Instituto Nacional de Antropología e Historia (INAH) and Comisión Nacional para el Desarrollo de los Pueblos Indígenas (CDI).

Bonilla-Mejía, L. & Higuera-Mendieta, I. 2019. Protected Areas Under Weak Institutions: Evidence from Colombia. *World Development*, 122: 585-596. https://doi.org/10.1016/j.worlddev.2019.06.019.

Bonilla-Moheno, M., Redo, D. J., Mitchell Aide, T., Clark, M. L. & Grau, H. R. 2013. Vegetation change and land tenure in Mexico: A country-wide analysis. *Land Use Policy*, 30: 355-64. https://doi.org/10.1016/j.landusepol.2012.04.002.

Borge, C. & Martínez, J. 2009. *El pago por servicios ambientales en territorios indígenas de Costa Rica*. Payments for Environmental Services (PES) learning paper; no. 2009-1. Washington D. C., World Bank.

Börner, J., Schulz, D., Wunder, S. & Pfaff, A. 2020. The Effectiveness of Forest Conservation Policies and Programs. *Annual Review of Resource Economics*, 12. https://doi.org/10.1146/annurev-resource-110119-025703.

Bose, P., Larson, A. M., Lastarria-Cornheil, S., Radel, C., Schmink, M., Schmook, B. & Vásquez-García, V. 2017. Women's rights to land and communal forest tenure: A way forward for research and policy agenda in Latin America. *Women's Studies International Forum*, 65: 53-59. https://doi.org/10.1016/j.wsif.2017.10.005.

Bottazzi, P., & Dao, Q. 2013. On the road through the Bolivian Amazon: A multi-level land governance analysis of deforestation. *Land Use Policy*, 30(1): 137-146. https://doi.org/10.1016/j.landusepol.2012.03.010.

Bray, D. B., Durán, E., Ramos, V. H., Mas, J. F., Velázquez, A., McNab, R. B., Barry, D. & Radachowsky, J. 2008. Tropical deforestation, community forests, and protected areas in the Maya Forest. *Ecology and Society* 13(2): 56. https://www.cifor.org/knowledge/publication/2711/.

Bray, D. B., Merino-Pérez, L., Negreros-Castillo, P., Segura-Warnholtz, G., Torres-Rojo, J. M. & Vester, H. F. M. 2003. Mexico's Community Managed Forests as a Global Model for Sustainable Landscapes. *Conservation Biology*, 17 (3): 672-677. https://www.cifor.org/knowledge/publication/2711/).

Brito, B., Barreto, P., Brandão Jr., A, Baima, S. & Gomes, P. H. 2019. Stimulus for land grabbing and deforestation in the Brazilian Amazon. *Environmental Research Letters*, 14(6): 064018. https://doi.org/10.1088/1748-9326/ab1e24.

Bryan, J. 2019. For Nicaragua's Indigenous Communities Land Rights in Name Only. NACLA *Report on the Americas*, 51: 55-64. https://doi.org/10.1080/10714839.2019.1593692.

Buntaine, M. T., Hamilton, S. E. & Millones, M. 2015. Titling community land to prevent deforestation: An evaluation of a best-case program in Morona-Santiago, Ecuador. *Global Environmental Change*, 33: 32-43. http://doi.org/10.1016/j.gloenvcha.2015.04.001.

Bustillos, L., Aguilar, V. & Grimaldo, C. 2015. Derecho territorial indígena como derecho humano. Un análisis del proceso de autodemarcación de territorios indígenas en Venezuela (1999–2014). *Revista Latinoamericana de Derechos Humanos*, 26(2): 169-185. https://doi.org/10.15359/rldh.26-2.8.

Butler, R. A. 2019. Tropical forests' lost decade: the 2010s. Analysis by Rhett A. Butler. Mongabay, 17 December 2019, (also available at: https://news.mongabay.com/2019/12/tropical-forests-lost-decade-the-2010s/).

Butt, N., Lambrick, F., Menton, M. & Renwick, A. 2019. The supply chain of violence. *Nature Sustainability*, 2: 742-747. https://doi.org/10.1038/s41893-019-0349-4.

Cámara-Leret, R., Copete, J. C., Balslev, H., Soto Gómez, M.& Macía, M. J. 2016. Amerindian and Afro-American Perceptions of Their Traditional Knowledge in the Chocó Biodiversity Hotspot. *Economic Botany*, 70(2): 160-175. https://doi.org/10.1007/s12231-016-9341-3.

Carneiro da Cunha, M., Caixeta, R., Campbell, J. M., Fausto, C., Kelly, J. A., Lomnitz, C., Londoño-Sulkin, C. D., Pompeia, C. & Vilaça, A. 2017. Indigenous peoples boxed in by Brazil's political crisis. HAU: *Journal of Ethnographic Theory*, 7(2): 403-426. https://doi.org/10.14318/hau7.2.033.

Carneiro Filho, A. & Braga de Souza, O. 2009. *Atlas of pressures and threats to indigenous lands in the Brazilian Amazon.* Sao Paulo, Instituto SocioAmbiental (ISA). https://repositories.lib.utexas.edu/handle/2152/17336.

Carr, D. L. 2004. Ladino and Q'eqchí Maya land use and land clearing in the Sierra de Lancandón National Park, Petén, Guatemala. *Agriculture and Human Values*, 21(2): 171-179.

Carranza T., Balmford, A., Kapos, A. & Manica, A. 2014. Protected Area Effectiveness In Reducing Conversion in a Rapidly Vanishing Ecosystem: the Brazilian Cerrado. *Conservation Letters*, 7(3), 216-223. https://doi.org/10.1111/conl.12049.

Caviglia-Harris, J. L. & Sills, E. O. 2005. Land use and income diversification: Comparing traditional and colonist populations in the Brazilian Amazon. *Agricultural Economics*, 32(3): 221-237.

Ceddia, M. G., Gunter, U. & Corriveau-Bourque, A. 2015. Land tenure and agricultural expansion in Latin America: The role of Indigenous Peoples' and local communities' forest rights. *Global Environmental Change*, 35: 316–322. https://doi.org/10.1016/j.gloenvcha.2015.09.010.

Ceddia, M. G., Gunter, U. & Pazienza, P. 2019. Indigenous peoples' land rights and agricultural expansion in Latin America: A dynamic panel data approach. *Forest Policy and Economics*, 109: 102001. https://doi.org/10.1016/j.forpol.2019.102001.

Chowdhury, R. R. & Turner II, B. L. 2006. Reconciling Agency and Structure in Empirical Analysis: Smallholder Land Use in the Southern Yucatán, Mexico. *Annals of the Association of American Geographers*, 96(2): 302-322. https://doi.org/10.1111/j.1467-8306.2006.00479.x.

Clerici, N., Armenteras, D., Kareiva, P., Botero, R., Ramírez-Delgado, J. P., Forero-Medina, G., Ochoa, J., Pedraza, C., Schneider, L., Lora, C., Gómez, C., Linares, M., Hirashiki, C. & Biggs, D. 2020. Deforestation in Colombian protected areas increased during post-conflict periods. *Scientific Reports*, 10: 4971. https://doi.org/10.1038/s41598-020-61861-y.

Comisión Nacional Forestal de México (CNF). 2019. Con apoyo de la CONAFOR, mujeres mayas crean empresa forestal, 25 March 2019, (also available at: https://www.gob.mx/conafor/prensa/con-apoyo-de-la-conafor-mujeres-mayas-crean-empresa-forestal).

Cooperative Republic of Guyana. 2018. *Revised National Forest Policy Statement 2018*. Georgetown.

Correia, J. E. 2019. Unsettling territory: Indigenous mobilizations, the territorial turn, and the limits of land rights in the Paraguay-Brazil borderlands. *Journal of Latin American Geography*, 18 (1): 11-37. https://digitalcommons.lsu.edu/jlag/vol18/iss1/3/.

Costa, M. H., Fleck, L. C., Cohn, A. S., Abrahão, G. M., Brando, P. M., Coe, M. T., Fu, R., Lawrence, D., Pires, G. F., Pousa & Soares-Filho, B. S. 2019. Climate risks to Amazon agriculture suggest a rationale to conserve local ecosystems. *Frontiers in Ecology and Environment*, 17(10): 584-590. https://doi.org/10.1002/fee.2124.

Costedoat, S., Corbera, E., Ezzine-de-Blas, D., Honey-Rosés, J., Baylis, K. & Castillo-Santiago, M. Á. 2015. How Effective Are Biodiversity Conservation Payments in Mexico? *PLoS ONE*, 10(3): e0119881. https://doi.org/10.1371/journal.pone.0119881.

Cowie, S. 2020. Brasil: brote del COVID-19 abre camino a la invasión de tierras indígenas. Mongabay, 29 April 2020, (also available at: https://es.mongabay.com/2020/04/brasil-invasion-de-tierras-indigenas-covid-19/).

Craviato, F. 2019. *Análisis de las Reglas de Operación del programa Apoyos para el Desarrollo Forestal Sostenible 2019*. Ciudad de México, Consejo Civil Mexicano para la Silvicultura Sostenible.

Cubbage, F. W., Davis, R. R., Rodríguez Paredes, D., Mollenhauer, R., Kraus Elsin, Y. Frey, G. E., González Hernández, I. A., Albarrán Hurtado, H., Salazar Cruz, A. M. & Chemor Salas, D. N. 2015. Community forestry enterprises in Mexico: Sustainability and competitiveness. *Journal of Sustainable Forestry*, 34: 623-650. https://doi.org/10.1080/10549811.2015.1040514.

Cuenca P., Robalino, J., Arriagada, R. & Echeverría, C. 2018. Are government incentives effective for avoided deforestation in the tropical Andean forest? *PLoS ONE*, 13(9): e0203545. https://doi.org/10.1371/journal.pone.0203545.

Davis, A. 2018. *Partnerships Forged in Fire*. San Salvador, PRISMA Foundation.

De Camino Velozo, R. 2018. *Diagnóstico del sector forestal en Nicaragua: Movilizando el sector forestal y atrayendo inversiones*. Nota Técnica IDB-TN-01610, Departamento de Países de Centroamérica, Haití, México, Panamá y República Dominicana. Washington D. C., IADB.

de Espíndola, G. M., de Aguiar, A. P. D., Pebesma, E., Câmara, G. & Fonseca. L. 2012. Agricultural land use dynamics in the Brazilian Amazon based on remote sensing and census data. *Applied Geography*, 32(2): 240-252. https://doi.org/10.1016/j.apgeog.2011.04.003.

de Koning, F., Aguiñaga, M., Bravo, M., Chiu, M., Lascano, M., Lozada, T. & Suárez, L. 2011. Bridging the gap between forest conservation and poverty alleviation: the Ecuadorian Socio Bosque program. *Environmental Science & Policy*, 14 (5): 531-542. https://doi.org/10.1016/j.envsci.2011.04.007.

De la Herrán Gascón, A. & Rodríguez Blanco, Y. 2017. Indicadores de supervivencia y muerte de culturas y lenguas indígenas originarias en contextos hispanohablantes excluyentes: la enseñanza como clave. *Revista Iberoamericana de Educación*, 73(1): 163-184. https://doi.org/10.35362/rie731131.

Delgado, T. S., McCall, M. K. & López-Binqüist, C. 2016. Recognized but not supported: Assessing the incorporation of non-timber products into Mexican forest policy. *Forest Policy and Economics*, 71: 36-42. https://doi.org/10.1016/j.forpol.2016.07.002.

Del Gatto, F., Mbairamadji, J., Richards, M. & Reeb, D. 2018. *Small-scale forest enterprises in Latin America: unlocking their potential for sustainable livelihoods*. Forestry Working Paper No. 10. FAO. Roma. (also available at: http://www.fao.org/forestry/47778-0435b5847e57ed0602b7e2f727fea6e53.pdf).

Del Popolo, F. (ed.). 2017. *Los pueblos indígenas en América (Abya Yala): desafíos para la igualdad en la diversidad*. Libros de la CEPAL, N° 151 (LC/PUB.2017/26). Santiago, ECLAC.

Deonandan, K. & Dougherty, M. L. (eds.). 2016. *Mining in Latin America: Critical Approaches to the New Extraction*. London and New York, Routledge.

De los Ríos Rueda, C. 2020. The Double Fence: Overlapping Institutions and Deforestation in the Colombian Amazon. Documentos CEDE #4. Bogotá, Universidad de los Andes.

De Sy, V., Herold, M., Achard, F., Beuchle, R., Clevers, J. G. P. W., Lindquist, E. & Verchot, L. 2015. Land use patterns and related carbon losses following deforestation in South America. *Environmental Research Letters*, 10(12): 124004. https://doi.org/10.1088/1748-9326/10/12/124004.

DiGiano, M., Mendoza, E., Luiza Ochoa, M., Ardila, J., Oliveira de Lima, F. & Nepstad, D. 2018. *The Twenty-Year-Old Partnership Between Indigenous Peoples and the Government of Acre, Brazil*. Earth Innovation Institute.

Ding, H., Veit, P. G., Blackman, A., Gray, E., Reytar, K., Altamirano, J. C. & Hodgdon, B. 2016. *Climate Benefits, Tenure Costs: The Economic Case for Securing Indigenous Land Rights in the Amazon*. Washington D. C., World Resources Institute (WRI).

Distrito Centro 2018. Carboneros de Petcacab pactan alianza interinstitucional para impulsar la diversificación productiva. Facebook Distrito Centro, 18 July 2018, (also available at: https://www.facebook.com/DistritoCentroFCP/posts/carboneros-de-petcacab-pactan-alianza-interinstitucional-para-impulsar-la-divers/1033449020156072/).

Donato, L. M., Escobar, E. M., Escobar, P., Pazmiño, A. & Ulloa, A. (eds.). 2007. *Mujeres indígenas, territorialidad y biodiversidad en el contexto latinoamericano.* Bogotá, Universidad Nacional de Colombia-Fundación Natura de Colombia-Unión Mundial para la Naturaleza-UNODC-Oficina de las Naciones Unidas contra la Droga y el Delito.

Dooley, K. & Griffiths, T. (eds.). 2014. *Indigenous Peoples' Rights, Forests, and Climate Policies in Guyana, A Special Report*. Georgetown, Guyana, APA, FPP.

Douterlunge, D., Levy-Tacher, S. I., Golicher, D. J. & Román Dañobeytia, F. 2010. Applying Indigenous Knowledge to the Restoration of Degraded Tropical Rain Forest Clearings Dominated by Bracken Fern. *Restoration Ecology*, 18(3): 322-329. https://doi.org/10.1111/j.1526-100X.2008.00459.x.

Dubertret. F. 2015. *Estimating national percentages of indigenous and community lands: methods and findings for the Americas. Landmark.* (also available at: http://communityland.s3.amazonaws.com/LandMark_public/LandMark-MethodsPercentage_America20170623.pdf).

Dufour, D. L. 1990. Use of Tropical Rainforests by Native Amazonians. *Bioscience,* 40(9): 652-659. https://www.jstor.org/stable/1311432.

Dulitzky, A. E. 2005. A Region in Denial: Racial Discrimination and Racism in Latin America. In A. Dzidzienyo & S. Oboler (eds.), *Neither Enemies nor Friends: Latinos, Blacks, Afro-Latinos.* New York, Palgrave MacMillan.

Dupuits, E. 2015. Transnational self-help networks and community forestry: A theoretical framework. *Forest Policy and Economics*, 58: 5-11. https://doi.org/10.1016/j.forpol.2014.07.007.

Dupuits, E. & Cronkleton, P. 2020. Indigenous tenure security and local participation in climate mitigation programs: Exploring the institutional gaps of REDD+ implementation in the Peruvian Amazon. *Environmental Policy and Governance*, 30(4): 1-12. https://doi.org/10.1002/eet.1888.

Economic Commission for Latin America and the Caribbean (ECLAC). 2014. *Los pueblos indígenas en América Latina. Avances en el último decenio y retos pendientes para la garantía de sus derechos. Síntesis.* Santiago. (also available at: https://www.cepal.org/es/publicaciones/37050-pueblos-indigenas-america-latina-avances-ultimo-decenio-retos-pendientes-la).

ECLAC & Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean (FILAC). 2020. *Los pueblos indígenas de América Latina - Abya Yala y la Agenda 2030 para el Desarrollo Sostenible: tensiones y desafíos desde una perspectiva territorial*. Santiago, ECLAC. https://www.cepal.org/es/publicaciones/45664-pueblos-indigenas-america-latina-abya-yala-la-agenda-2030-desarrollo-sostenible.

Eden, M. J. & Andrade, A. 1988. Colonos, Agriculture, and Adaptation in the Colombian Amazon. *Journal of Biogeography*, 15(1):79-85. https://www.jstor.org/stable/2845048.

Eguiguren, P., Fischer, R. & Günter, S. 2019. Degradation of Ecosystem Services and Deforestation With and With-out Incentive-Based Forest Conservation in the Ecuadorian Amazon. *Forests*, 10(5): 442. https://doi.org/10.3390/f10050442.

Eijck, M. V. & Roth, W. M. 2007. Keeping the local local: Recalibrating the status of science and traditional ecological knowledge (TEK) in education. *Science Education*, 91(6): 926–947. https://doi.org/10.1002/sce.20227.

Ejido Petcacab & Polinkin. 2016. Programa de Manejo Forestal Maderable y No Maderable, Municipio de Felipe Carillo Puerto.

Ellis, E. A., Martínez, A. N., Ortega, M. G., Gómez, I. U. H. & Castillo, D. C. 2020. Forest cover dynamics in the Selva Maya of Central and Southern Quintana Roo, Mexico: deforestation or degradation? *Journal of Land Use Science*, 15: 25-51.

Ellis, E. A., Romero Montero, J. A., Hernández Gómez, I. U., Porter-Bolland, L. & Ellis, P. W. 2017a. Private property and Mennonites are major drivers of forest cover loss in Central Yucatan Peninsula, Mexico. *Land Use Policy*, 69: 474-484. https://doi.org/10.1016/j.landusepol.2017.09.048.

Ellis, E. A., Romero Montero, J. A. y Hernández Gómez, I. U. 2017b. Deforestation Processes in the State of Quintana Roo, Mexico: The Role of Land Use and Community Forestry. *Tropical Conservation Science*, 10: 1-12. (disponible en: https://doi.org/10.1177/1940082917697259).

Ellison, D., Morris, C. E., Locatelli, B., Sheil, D., Cohen, J., Murdiyarso, D., Gutiérrez, V., van Noordwijk, M., Creed, I. F., Pokorny, J., Gaveau, D., Spracklen, D. V., Bargués-Tobella, A., Ilstedt, U., Teuling, A. J., Gebrehiwot, S. G., Sands, D. C., Muys, B. & Sullivan, C. A. 2017. Trees, forests, and water: Cool insights for a hot world. *Global Environmental Change*, 43: 51-61. https://doi.org/10.1016/j.gloenvcha.2017.01.002.

Eloy, L., Bilbao, B. A., Mistry, J. & Schmidt, I. B. 2019. From fire suppression to fire management: Advances and resistances to changes in fire policy in the savannas of Brazil and Venezuela. *The Geographical Journal*, 185(1): 10-22. https://doi.org/10.1111/geoj.12245.

El Telégrafo. 2019. Programa Socio Bosque cubre 7% de zonas verdes del país. *El Telégrafo*, 22 February 2019, (also available at: https://www.eltelegrafo.com.ec/noticias/sociedad/6/programasociobosque-zonasverdes-yasuni).

Ellwanger, J. H., Kulmann-Leal, B., Kaminski, V. L., Valverde-Villegas, J. M., da Veiga, A. B. G., Spilki, F. R., Fearnside, P. M., Caesar, L., Giatti, L. L., Wallau, G. L., Almeida, S. E. M., Borba, M. R., da Hora, V. P. & Chies, J. A. B. 2020. Beyond diversity loss and climate change: Impacts of Amazon deforestation on infectious diseases and public health. *Anais da Academia Brasileira de Ciências*, 92(1): e20191375. https://doi.org/10.1590/0001-3765202020191375.

Escobar Izquierdo, S. M. 2015. *Análisis de la contribución de la Empresa Forestal Comunitaria Tupiza en los medios y estrategias de vida de las comunidades Nuevo Belén y La Pulida de la Comarca Emberá Wounaan, Panamá*. Escuela de Posgrado, Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) (Phd dissertation).

Estremadoiro, E. 2019. Un 55% de la tierra saneada está en poder de los indígenas y colonos. *El Deber*, 25 May 2019, (also available at: https://eldeber.com.bo/economia/un-55-de-la-tierra-saneada-esta-en-poder-de-los-indigenas-y-colonos_136187).

Fa, J. E., Watson, J. E. M., Leiper, I., Potapov, P., Evans, T. D., Burgess, N. D., Molnár, Z., Fernández-Llamazares, Á., Duncan, T., Wang, S., Austin, B. J., Jonas, H., Robinson, C. J., Malmer, P., Zander, K. K., Jackson, M. V., Ellis, E., Brondizio, E. S. & Garnett, S. T. 2020. Importance of Indigenous Peoples' Land for the Conservation of Intact Forest Landscapes. *Frontiers in Ecology and the Environment*, 18(3): 135-140. http://ecotope.org/people/ellis/papers/fa_2020.pdf.

Food and Agriculture Organization of the United Nations (FAO). 2017. *Latin American and Caribbean Forest Commission. Thirtieth Session. Tegucigalpa - Honduras, 25-29 September 2017. The State of the Forest Sector in the Region. Secretariat Note*. Santiago. (also available at: http://www.fao.org/3/a-bt191e.pdf).

Federación por la Autodeterminación de los Pueblos Indígenas (FAPI). undated. Tierras Indígenas: Compilación de los datos de tierras indígenas en Paraguay. (also available at: https://www.tierrasindigenas.org/).

Fernández-Llamazares, Á. & Cabeza, M. 2018. Rediscovering the Potential of Indigenous Story Telling for Conservation Practice. *Conservation Letters* 11(3): e12398. https://doi.org/10.1111/conl.12398.

Fernández-Llamazares, Á., Terraube, J., Gavin, M. C., Pyhälä, A., Siani, S. M. O., Cabeza, M. & Brondizio, E. S. 2020. Reframing the Wilderness Concept can Bolster Collaborative Conservation. *Trends in Ecology & Evolution*, 35(9): 750–753. https://doi.org/10.1016/j.tree.2020.06.005.

Fernández Milmanda, B., 2019. Agrarian Elites and Democracy in Latin America After the Third Wave. Oxford Research Encyclopedia of Politics. Oxford University Press.

Fernández, E. & Mendoza, N. 2015. *Sobrerregulación forestal: un obstáculo para el desarrollo sustentable de México*. Ciudad de México, Consejo Civil Mexicano para la Silvicultura Sostenible.

Ferrante, L. & Fearnside, P. M. 2019. Brazil's new president and 'ruralists' threaten Amazonia's environment, traditional peoples, and the global climate. *Environmental Conservation*, 46(4): 261–263. https://doi.org/10.1017/S0376892919000213.

Ferrante, L, Gomes, M. & Fearnside, P. M. 2020. Amazonian indigenous peoples are threatened by Brazil's Highway BR-319. *Land Use Policy*, 94: 104548. https://doi.org/10.1016/j.landusepol.2020.104548.

Figueroa, F., Caro-Borrero, Á., Revollo-Fernández, D., Merino, L., Almeida-Leñero, L., Paré, L., Espinosa, D. & Mazari-Hiriart, M. 2016. "I like to conserve the forest, but I also like the *cash*". Socioeconomic factors influencing the motivation to be engaged in the Mexican Payment for Environmental Services Programme. *Journal of Forest Economics*, 22: 36–51. http://dx.doi.org/10.1016/j.jfe.2015.11.002.

FILAC. 2012. *Sistema para el monitoreo de la protección de los derechos y la promoción del buen vivir de los pueblos indígenas, manual de uso del sistema y experiencias de aplicación*. La Paz, FILAC.

FILAC y Foro Indígena Abya Yala (FIAY). 2020. *Los pueblos indígenas ante la pandemia del COVID-19. Primer Informe Regional.* La Paz, FILAC.

Finley-Brook, M. 2016. Territorial "Fix"? Tenure Insecurity in Titled Indigenous Territories. *Bulletin of Latin American Research*, 35(3): 338–354. https://doi.org/10.1111/blar.12489.

Fischenich, P. G. 2018. *Transferencias directas condicionadas para la conservación de los bosques tropicales comunitarios en la región amazónica*. Bonn, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Flantua S., Bilbao, B. & Rosales, J. 2013. Indigenous land use and land cover changes in the National Park of Canaima, Venezuela: Pemón Sector II Kamarata. In L. T. Lopes, S. Arley, J. Silveira da Costa & E. R. Baptistas (eds.), *Libro Escudo Guianês, biodiversidade, conservação dos recursos naturais e cultura*, 209–224. Belem, Georgetown, NAEA, GSF.

Flores, S. Evans, K. Larson, A. M., Pikitle, A. & Marchena, R. 2016. *La participación de mujeres indígenas rurales para fortalecer la gobernanza comunitaria*. CIFOR InfoBrief No. 140. (also available at: https://doi.org/10.17528/cifor/006142).

Fondo Nacional de Financiamiento Forestal (FONAFIFO). 2019. Hectáreas PSA, árboles SAF y montos contratados en los territorios indígenas de Costa Rica, del Programa de Pago por Servicios Ambientales, período 1997-2018. (also avalaible at: https://www.fonafifo.go.cr/es/servicios/estadisticas-de-psa/).

Frechette, A., Ginsburg, C. & Walker, W. 2018. *A Global Baseline of Carbon Storage in Collective Lands: Indigenous and Local Community Contributions to Climate Change Mitigation*. Washington D. C., Rights and Resources Initiative (RRI), Woods Hole Research Center (WHRC), World Resources Institute (WRI).

Freire, G., Díaz-Bonilla, D., Schwartz-Orellano, S., Soler-López, J. & Carbonari, F. 2018. *Afro-descendants in Latin America, Towards a Framework of Inclusion*. Washington D. C., World Bank.

Frizzelle, B. G., Walsh, S. J., Mena, C. F. & Erlien, C. M. 2005. Land Use Change Patterns of Colonists and Indigenous Groups in the Northern Ecuadorian Amazon: A Comparison of Landsat TM Spectral and Spatial Analyses. Presentación en la American Society for Photogrammetry and Remote Sensing Annual Conference 2005: Geospatial Goes Global: from Your Neighborhood to the Whole Planet. Baltimore, Maryland. (also available at: https://www.cpc.unc.edu/resources/publications/bib/2775/).

Fundação Nacional do Indio (FUNAI). 2020. Modalidades de terras indígenas. (also available at: http://www.funai.gov.br/index.php/indios-no-brasil/terras-indigenas).

García-López, G. A. 2019. Rethinking elite persistence in neoliberalism: Foresters and techno-bureaucratic logics in Mexico's community forestry. *World Development*, 120: 169-181. https://doi.org/10.1016/j.worlddev.2018.03.018.

Garibaldi, A. & Turner, N. 2004. Cultural Keystone Species: Implications for Ecological Conservation and Restoration. *Ecology and Society* 9(3): 1. https://www.ecologyandsociety.org/vol9/iss3/art1/inline.html.

Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., Watson, J. E. M., , Zander, K. K., Austin, B., Brondizio, E. S., French-Collier, N., Duncan, T., Ellis, E., Geyle, H., Jackson, M. V., Jonas, H., Malmer, P., McGowan, B., Sivongxay, A. & Leiper, I. 2018. A spatial overview of the global importance of Indigenous lands for conservation: supplementary information. *Nature Sustainability*, 1(7): 369-374. https://www.sprep.org/attachments/VirLib/Regional/indigenous-protected-areas-spatial.pdf.

Gaviria, A. & Sabogal, C. (eds.). 2013. *Sistematización de seis experiencias de manejo forestal comunitario en la Amazonía peruana*. Lima, Ministerio de Agricultura– Ministerio de Medio Ambiente.

Gazca-Zamora, J. 2014. Gobernanza y gestión comunitaria de recursos naturales en la Sierra Norte de Oaxaca. *Región y sociedad*, 26(60): 89-120. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1870-39252014000300004&lng=es&tlng=es.

Gebara, M. F. 2018. Tenure reforms in indigenous lands: Decentralized forest management or illegalism. *Current Opinion in Environmental Sustainability*, 32: 60-67. https://doi.org/10.1016/j.cosust.2018.04.008.

Guégan, J. F., Ayouba, A., Capelle, J. & de Thoisy, B. 2020. Forests and emerging infectious diseases: Unleashing the beast within. *Environmental Research Letters*, 15(8): 083007. https://doi.org/10.1088/1748-9326/ab8dd7.

Giudice, R., Börner, J., Wunder, S. & Cisneros, E. 2019. Selection biases and spillovers from collective conservation incentives in the Peruvian Amazon. *Environmental Research Letters*, 14(4): 1-13. https://doi.org/10.1088/1748-9326/aafc839.

Global Witness. 2018. *¿A qué precio? Negocios irresponsables y el asesinato de personas defensoras de la tierra y el medio ambiente en 2017*. London.

Global Witness. 2019. *¿Enemigos del Estado? De cómo los gobiernos y las empresas silencian a las personas defensoras, reporte 29 de julio del 2020*. London.

Global Witness. 2020. *Defender el mañana: crisis climática y amenazas contra las personas defensores de la tierra y el medio ambiente*. London.

Godoy, R., Franks, J. R. & Alvarado, M. C. 1998. Adoption of Modern Agricultural Technologies by Lowland Indigenous Groups in Bolivia: The Role of Households, Villages, Ethnicity, and Markets. *Human Ecology*, 26(3): 351-369. https://doi.org/10.1023/A:1018779131004.

Golden-Kroner, R. E., Qin, S., Cook, C. N., Kirthivasan, P. Pack, S. M., Bonilla, O. D., Cort-Kansinally, K. A., Countinho, B., Feng, M., Martínez-García M. I., He, Y., Kennedy, C. J., Lebreton, C., Ledezma, J. C., Lovejoy, T. E., Luther, D. A., Parmanand, Y., Ruiz-Agudelo, C., Yerena, E., Morón-Zambrano, V. & Mascia, M. B. 2019. The uncertain future of protected lands and waters. *Science*, 364(6443): 881-886.

Gómez-Baggethun, E. & Reyes-García, V. 2013. Reinterpreting Change in Traditional Ecological Knowledge. *Human Ecology*, 41(4): 643-647.

Graesser, J., Aide, T. M., Grau, H. R. & Ramankutty, N. 2015. Cropland / Pastureland Dynamics and the Slow of Deforestation in Latin America. *Environmental Research Letters*, 10(3): 034017. https://doi.org/10.1088/1748-9326/10/3/034017.

Gray, C. L., Bilsborrow, R. E., Bremmer, J, L. & Lu, F. 2008. Indigenous Land Use in the Ecuadorian Amazon: A Cross-Cultural and Multilevel Analysis. *Human Ecology*, 36(1): 97-109.

Gray, C. L. & Bilsborrow, R. E. 2020. Stability and change within indigenous land use in the Ecuadorian Amazon. *Global Environmental Change*, 63: 102116. https://doi.org/10.1016/j.gloenvcha.2020.102116.

Grupo Promotor de Tierras Comunales (GPTC). 2009. *Estrategia Nacional para el Manejo y Conservación de Recursos Naturales en Tierras Comunales.* Guatemala, Consejo Nacional de Áreas Protegidas (CONAP).

Hajjar, R. F., Kozak, R. A. & Innes, J. L. 2012. Is decentralization leading to "real" decision-making power for forest-dependent communities? Case studies from Mexico and Brazil. *Ecology and Society*, 17(1): 12. http://dx.doi.org/10.5751/ES-04570-170112.

Halvorson, C. 2018. The Problem of Overlap: The Panamanian Government Stalls on Indigenous Land Titling on Protected Areas. (also available at: https://www.corneredbypas.com/panama).

Hayes, T. M. 2007. *Forest Governance in a Frontier: An Analysis of the Dynamic Interplay Between Property Rights, Land Use Norms, and Agricultural Expansion in the Mosquitia Forest Corridor of Honduras and Nicaragua*. School of Public and Environmental Affairs and Department of Political Sciences, Indiana University (PhD dissertation).

Hayes, T. M. 2008. The Robustness of Indigenous Common-property Systems to Frontier Expansion: Institutional Interplay in the Mosquitia Forest Corridor. *Conservation and Society,* 6(2): 117-129.

Hayes, T. M. & Murtinho, F. 2010. Are indigenous forest reserves sustainable? An analysis of present and future land-use trends in Bosawas, Nicaragua. *International Journal of Sustainable Development and World Ecology*, 15(6): 497-511. https://doi.org/10.1080/13504500809469845.

He, Y., Baldiviezo, J. P., Agrawal, A., Candaguira, V. & Perfecto, I. 2019. Guardians of the Forests: How Should an Indigenous Community in Eastern Bolivia Defend Their Land and Forests under Increasing Political and Economic Pressures? *Case Studies in the Environment*, 3(1): 1–14. https://doi.org/10.1525/cse.2019.sc.946307.

Hernández, M. A. 2020. México: comunidades forestales piden un salvavidas del Estado para no ahogarse ante la crisis del COVID-19. Mongabay Latam, 13 May 2020, (also available at https://es.mongabay.com/2020/05/mexico-covid-19-afecta-empresas-forestales-comunitarias/).

Herrera-Arango, J. 2017. *La tenencia de tierras colectivas en Colombia: datos y tendencias*. CIFOR Infobrief 203. (also available at: https://doi.org/10.17528/cifor/006704).

Herrara-Garibay, A. & Edouard, F. 2012. *La tenencia de la territorios indígenas y REDD+ como un incentivo de manejo forestal: el caso de los países mesoamericanos*. Programa ONU-REDD. Roma, FAO, PNUMA, PNUD. (also available at: http://www.fao.org/3/a-i2875s.pdf).

Hirakuri, S. R. 2003. *Can Law Save the Forest? Lessons from Finland and Brazil*. CIFOR. Bogor. (also available at: https://www.cifor.org/publications/pdf_files/Books/Law.pdf).

Hodgdon, B. D., Ramírez, F., Terrero, O. & López, G. 2015. The Centrality of Social Capital: Forestry and Enterprise Development Among the Indigenous Mayangna of Awas Tingni (North Atlantic Autonomous Region, Nicaragua). Rainforest Alliance, Community Forestry Case Studies 1/10. New York, Rainforest Alliance.

Holland, M. B., de Koning, F., Morales, M., Naughton Treves, L., Robinson, B. E. & Suárez, L. 2014. Complex Tenure and Deforestation: Implications for Conservation Incentives in the Ecuadorian Amazon. *World Development*, 55: 21-36.

Houghton, R. A., Birdsey, R. A., Nassikas, A. & McGlinchey, D. 2017. Forests and Land Use: Undervalued Assets for Global Climate Stabilization. Falmouth, MA, Woods Hole Research Center Policy Brief.

Hvolkof, S. 2006. Progress of the Victims: Political Ecology in the Peruvian Amazon. In A. Biersack & J. B. Greenberg (eds.), *Reimagining political ecology*. Durham, Duke University Press.

Independent Evaluation Group (IEG). 2014. *Managing Forest Resources for Sustainable Development: an Evaluation of the World Bank Group's Experience*. Washington D. C., World Bank.

Instituto del Bien Común (IBC). 2016. *Tierras comunales: más que preservar el pasado es asegurar el futuro. El estado de las comunidades indígenas en el Perú.* Lima. (disponible en: http://www.ibcperu.org/wp-content/uploads/2016/05/Informe-2016-TIERRAS-COMUNALESb.pdf).

Inter-American Commission on Human Rights (IACHR). 2013. *Pueblos indígenas en aislamiento voluntario y contacto inicial en las Américas: Recomendaciones para el Pleno Respecto para sus Derechos Humanos.* / [Preparado por la Relatoría sobre los Derechos de los Pueblos Indígenas de la Comisión Interamericana de Derechos Humanos]. OAS/Ser.L./V/II, Documento 47/13, 30 de diciembre. http://www.oas.org/es/cidh/indigenas/docs/pdf/Informe-Pueblos-Indigenas-Aislamiento-Voluntario.pdf.

IACHR. 2019. *Pueblos indígenas y tribales de la Panamazonía*: Aprobado por la Comisión Interamericana de Derechos Humanos el 29 de septiembre de 2019 / Comisión Interamericana de Derechos Humanos. p.; cm. (OAS. Documentos oficiales; OEA/Ser.L/V/II). http://www.oas.org/es/cidh/informes/pdfs/Panamazonia2019.pdf.

Inter-American Court of Human Rights. 2007. *Caso del Pueblo Saramaka vs. Surinam. Sentencia del 28 de noviembre de 2007 (Excepciones Preliminares, Fondo, Reparaciones y Costas)*. Serie C. no. 172. https://www.corteidh.or.cr/docs/casos/articulos/seriec_172_esp.pdf.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2019. *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn.

Intergovernmental Panel on Climate Change (IPCC). 2018. Summary for Policymakers. In V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor & T. Waterfield (eds.), *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*

IPCC. 2019. Summary for Policymakers. In P. R. Shukla, J. Skea, E. Calvo Buendía, V. Masson-Delmotte, H. O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi & J. Malley (eds.), *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.*

Instituto Socioambiental (ISA), Comissão Arns & Conectas Direitos Humanos. 2020. *Ameaças e violação de direitos humanos no Brasil: povos indígenas isolados*. Brazil.

International Labor Organization (ILO). 2014. *Convenio Núm. 169 de la OIT sobre Pueblos Indígenas y Tribales. Declaración de las Naciones Unidas sobre los Derechos de los Pueblos Indígenas*. Lima, OIT/Oficina Regional para América Latina y el Caribe.

Jarrett, C., Cummins, I. & Logan-Hines, E. 2017. Adapting Indigenous Agroforestry Systems for Integrative Landscape Management and Sustainable Supply Chain Development in Napo, Ecuador. In F. Montagnini (ed.), *Integrating Landscapes: Agroforestry for Biodiversity Conservation and Food Sovereignty*. Advances in Agroforestry, 12. Springer. Cham.

Jones, K. W., Etchart, N., Holland, M., Naughton-Treves, L. & Arriagada, R. 2020. The impact of paying for forest conservation on perceived tenure security in Ecuador. *Conservation Letters*, february. https://doi.org/10.1111/conl.12710.

Juárez-López, B. M., Velázquez-Rosas, N. & López-Binnqüist, C. 2017. Tree Diversity and Uses in Coffee Plantations of a Mixe Community in Oaxaca, Mexico. *Journal of Ethnobiology*, 37(4): 765-778.

Jusys, T. 2018. Changing Patterns of Deforestation Avoidance by Different Protection Types in the Brazilian Amazon. *PLoS ONE* 13(4): e0195900. https://doi.org/10.1371/journal. pone.0195900.

Kaimowitz, D. 2015. Indigenous Peoples and Deforestation in Latin America. In C. Martin, *On the Edge, The State and Fate of the World's Tropical Rainforests*. Vancouver, Graystone Books.

Kaimowitz, D. & Angelsen, A. 1998. *Economic Models of Tropical Deforestation: A Review*. Bogor, CIFOR.

Kaimowitz, D. & Smith, J. 2001. Soybean technology and the loss of natural vegetation in Brazil and Bolivia. In A. Angelsen & D. Kaimowitz (eds.), *Agricultural Technologies and Tropical Deforestation*. Wallingford, Oxon, CABI Publishing.

Kambel, E. R. 2006. *Indigenous Peoples and Maroons in Suriname*. Economic and Sector Studies Series RE3-06-005. Washington D. C., IADB.

Killeen, T. J., Guerra, A. Calzada, M., Correa, L. Calderón, V., Soria, L. Quezada, B. y Steininger, M. K. 2008. Total historical land-use change in eastern Bolivia: Who, where, when, and how much? *Ecology and Society* 13(1): 36. (also available at: http://www.ecologyandsociety.org/vol13/iss1/art36/).

Kowler, L. F., Pratihast, A. K., Pérez Ojeda del Arco, A., Larson, A. M., Braun, C. y Herold, M. 2020. Aiming for Sustainability and Scalibity: Community Engagement in Forest Payment Schemes. *Forests*, 11(4): 444. (also available at: https://doi.org/10.3390/f11040444).

La Jornada Maya. 2017. Dos ejidos de QRoo certifican más de 69 mil ha de bosque. *La Jornada Maya*, 20 September 2017, (also available at: https://www.inforural.com.mx/dos-ejidos-de-qroo-certifican-mas-de-69-mil-ha-de-bosque/).

La Jornada Maya. 2018. Ejido Petcacab, ejemplo de desarrollo forestal: CJG. *La Jornada Maya*, 1 April 2018.

Laird, S. A., McLain, R. J. & Wynberg, R. P. 2010. *Wild Product Governance: Finding Policies That Work For Non-Timber Forest Products*. London, Earthscan.

Larson, A. M. & Soto, F. 2012. *Territorialidad y gobernanza, Tejiendo Retos en los Territorios Indígenas de la RAAN, Nicaragua*. Managua, Instituto Nitlapa de la Universidad Centroamericana (UCA).

Loh, J. & Harmon, D. 2014. *Biocultural Diversity: Threatened Species, Endangered Languages*. Netherlands, WWF.

López Portillo, V. & Mondragón, M. 2019. Reporta Global Forest Watch máximos en pérdida forestal desde 2001. WRI México, 24 June 2019, (also available at: https://wrimexico.org/bloga/reporta-global-forest-watch-m%C3%A1ximos-en-p%C3%A9rdida-de-cobertura-forestal-desde-2001).

Lovejoy, T. & Nobre, C. 2019. Amazon tipping Point: Last chance for action. *Science Advances*, 5(12), eaba 2949.

Lu, F., Gray, C., Bilsborrow, R. E., Mena, C. F., Erlien, C. M., Bremner, J., Barbiera, A. & Walsh, S. J. 2010. Contrasting Colonist and Indigenous Impacts on Amazonian Forests. *Conservation Biology*, 24 (3): 881-885. https://www.jstor.org/stable/40603304.

MacQueen, D., Bolin, A., Greijmans, M., Grouwels, S. & Humphries, S. 2020. Innovations Towards Prosperity Emerging in Locally Controlled Forest Business Models and Prospects for Scaling Up. *World Development*, 125: 104382. https://doi.org/10.1016/j.worlddev.2018.08.004.

Márquez Porras, R., Eguiguren Riofrío, M. B. & Vera, A. V. 2018. Titles of Contention: Socio-Cultural Change and Conflict Over Legalization of Indigenous Lands in Southeastern Ecuador. *Latin American Perspectives*, 45(6): 68-80. https://doi.org/10.1177/0094582X18792005.

Martínez-Bautista, H., Zamudio-Sánchez, F. J., Alvarado-Segura, A. A., Ramírez Maldonado, H. & Fuentes-Salinas, M. 2015. Factores que determinan el éxito o fracaso de proyectos forestales comunitarios con financiamiento gubernamental en México. *Bosques (Valdivia),* 36(3): 363-374. https://scielo.conicyt.cl/scielo.php?pid=S0717-92002015000300004&script=sci_arttext&tlng=en.

Mateo-Vega, J., Potvin, C., Monteza, J., Bacorizo, J., Barrigón, J. Barrigón, R. López, N., Omi, L., Opua, M., Serrano, J., Cushman, K. C. & Meyer, C. 2017. Full and effective participation of indigenous peoples in forest monitoring for reducing emissions from deforestation and forest degradation (REDD+): trial in Panama's Darién. *Ecosphere* 8(2): 1-19, e01635. https://doi.org/10.1002/ecs2.1635.

Mayorga-Muñoz, C., Pacheco-Cornejo, H. & Treggiari, F. 2017. El rol de la mujer indígena mapuche en la preservación de recursos genéticos y conocimientos tradicionales asociados. Un análisis jurídico desde la perspectiva de género. *Revista Jurídicas,* 14(2): 29-45. http://juridicas.ucaldas.edu.co/downloads/Juridicas14(2)_3.pdf.

McSweeney, K. 2005. Indigenous Population Growth in the Lowland Neotropics: Social Science Insights for Biodiversity Conservation. *Conservation Biology*: 19(5): 1375-1384. https://www.jstor.org/stable/3591105.

McSweeney, K., Wrathall, D. J., Nielsen, E. A. & Pearson, Z. 2018. Grounding traffic: The cocaine commodity chain and land grabbing in eastern Honduras. *Geoforum*, 95: 122-132. https://doi.org/10.1016/j.geoforum.2018.07.008.

Mejía, E., Pacheco, P., Muzo, A. & Torres, B. 2015. Smallholders and timber extraction in the Ecuadorian Amazon: amidst market opportunities and regulatory constraints. *International Forestry Review,* 17(S1): 38-50. https://doi.org/10.1505/146554815814668954.

Merino-Pérez, L. & Martínez, A. E. 2014. *A vuelo de pájaro: Las condiciones de las comunidades con bosques templados en México.* Ciudad de México, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO).

Ministerio de Medio Ambiente de Perú (MINAM). 2019. *Memoria Institucional 2018 del Programa Nacional de Conservación de Bosques para la Mitigación del Cambio Climático.* Lima.

Mistry, J. & Berardi, A. 2016. Bridging indigenous and scientific knowledge. *Science,* 352(6291): 1274–1275.

Mistry J., Bilbao, B. A. & Berardi, A. 2016. Community owned solutions for fire management in tropical ecosystems: case studies from Indigenous communities of South America. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences,* 371(1696): 20150174.

Mohebalian, P. M. & Aguilar, F. X. 2018. Beneath the Canopy: Tropical Forests Enrolled in Conservation Payments Reveal Evidence of Less Degradation. *Ecological Economics*, 143: 64-73.

Mohedano-Roldán, A., Duit, A. & Schultz, L. 2019. Does stakeholder participation increase the legitimacy of nature reserves in local communities? Evidence from 92 Biosphere Reserves in 36 countries. *Journal of Environmental Policy and Planning*, 21(2): 188-203. https://doi.org/10.1080/1523908X.2019.1566058.

Montenegro, R. & Castellanos, E. 2008. Dinámica forestal en seis bosques comunitarios comparada con la dinámica forestal observada en los respectivos municipios. *Revista de La Universidad Del Valle de Guatemala* 17: 70–9.

Monterroso, I. & Larson, A. M. 2018. *Challenges in Formalizing the Rights of Native Communities in Peru*. CIFOR Infobrief 231. Bogor, CIFOR.

Monterroso, I., Larson, A. M., Quaedvlieg, J., Valencia, F., Jarama, L. & Saldaña, J. 2019. Formalización del derecho colectivo de las comunidades nativas en Perú: la perspectiva de los funcionarios que lo implementan. CIFOR InfoBrief 240. Bogor, CIFOR.

Moraes Falleiro, R., Trinidade Santana, M. & Ribas Berni, C. 2016. As Contribuições do Manejo Integrado do Fogo para o Controle dos Incêndios Florestais nas Terras Indígenas do Brasil. *Biodiversidade Brasileira Revista Científica* 6(2). https://doi.org/10.37002/biobrasil.v%25vi%25i.655.

Moraes Falleiro, R., Aparecida Correa, M., Carregosa dos Santos, L. & Siquiera de Oliveira, M. 2019. Avaliação do manejo tradicional do fogo em uma savana amazônica. 7º Conferencia Internacional sobre Incendios Florestais. *Biodiversidade Brasileira Revista Científica*, 9(1). https://doi.org/10.37002/biobrasil.v%25vi%25i.927.

Morsello, C. 2006. Company–community non-timber forest product deals in the Brazilian Amazon: A review of opportunities and problems. *Forest Policy and Economics*, 8: 485-493. https://doi.org/10.1016/j.forpol.2005.08.010.

Muggah, R. & Franciotti, J. 2019. New Data Points to Staggering Violence in the Amazon. *Americas Quarterly*, 5 December 2019, (also available at: https://www.americasquarterly.org/content/new-data-points-staggering-violence-amazon).

Müller, R., Müller, D., Schierhorn, F., Gerold, G. & Pacheco, P. 2012. Proximate causes of deforestation in the Bolivian lowlands: an analysis of spatial dynamics. *Regional Environmental Change*, 12: 445–459. https://doi.org/10.1007/s10113-011-0259-0.

Nelson, A. & Chomitz, K. M. 2011. Effectiveness of strict vs. multiple use protected areas in reducing tropical forest fires: A global analysis using matching methods. *PLoS ONE*, *6*(8). http://doi.org/10.1371/journal.pone.0022722.

Nelson, G., Harris, V. & Stone, S. 2001. Deforestation, Land Use, and Property Rights: Empirical Evidence from Darién, Panama. *Land Economics*, 77(2): 187-205. https://www.jstor.org/stable/3147089.

Nepstad, D., Schwartzman, S., Bamberger, B., Santilli, M., Ray, D., Schlesinger, P., Lefebvre, P., Alencar, A., Prinz, E., Fiske, G. & Rolla, A. 2006. Inhibition of Amazon Deforestation and Fire by Parks and Indigenous Lands. *Conservation Biology,* 20(1): 65-73.

Nolte, C., Agrawal, A., Silvius, K. M. & Soares-Filho, B. S. 2013. Governance regime and location influence: Avoided deforestation success in protected areas in the Brazilian Amazon. *Proceedings of the National Academy of Sciences*, 110(13): 4956-4961. https://doi.org/10.1073/pnas.1214786110.

Notess, L., Veit, P. G., Monterroso, I., Andiko, Sulle, E., Larson, A. M., Gindroz, A. S., Quaedvlieg, J. & Williams, A. 2018. *The Scramble for Land Rights, Reducing Inequities Between Communities and Companies*. Washington D. C.

Ojeda-Luna, T., Zhunusova, E., Günter, S. & Dieter, M. 2020. Measuring forest and agricultural income in the Ecuadorian lowland rainforest frontiers: Do deforestation and conservation strategies matter? *Forest Policy and Economics*, 111: 102034. https://doi.org/10.1016/j.forpol.2019.1020349.

Oliveira, P., Asner, G., Knap, D., Almeyda, A., Galván-Gildemeister, R., Keene, S., Raybin, R. & Smith, R. 2007. Land-use allocation protects the Peruvian Amazon. *Science*, 317(5842): 1233-1236.

Ortiz Aranda, M. X. & Madrid Zubirán, S. 2017. *Territorios forestales comunitarios amenazados por la minería en México*. Ciudad de México, Consejo Mexicano de Silvicultura Sostenible (CCMSS).

Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, Cambridge University Press.

Overman, H., Butt, N., Cummings, A. R., Luzar, J. B. y Fragoso, J. M. V. 2018. National REDD+ Implications for Tenured Indigenous Communities in Guyana, and Communities' Impact on Forest Carbon Stocks. *Forests*, 9(231): 1-17.

Pacheco, D. 2007. *An Institutional Analysis of Decentralization and Indigenous Timber Management in Common-Property Forests of Bolivia's Lowlands*. School of Public and Environmental Affairs and Political Sciences Department, University of Indiana (Phd dissertation).

Pacheco, P., Ibarra, E., Cronkleton, P. & Amaral, P. 2008. Políticas públicas que afectan el manejo forestal comunitario. En C. Sabogal, B. Pokorny, W. de Jong, B. Louman, P. Pacheco, D. Stoian, & N. Porro (eds.), *Manejo forestal comunitario en América Tropical: Experiencias, lecciones aprendidas y retos para el futuro.* Bogor, CIFOR.

Pack, S. M., Napolitano Ferreira, M., Khritivasan, R. K., Murrow, J. Bernard, E. & Mascia, M. B. 2016. Protected area downgrading, downsizing, and degazettement (PADDD) in the Amazon. *Biological Conservation*, 197: 32-39.

Padilla, A. & Contreras-Veloso, Y. 2008. La gobernanza del bosque indígena en la Mosquitia hondureña, estudio de caso de la Zona de Mocorón. In A. Padilla (ed.), *Revalorando la institucionalidad indígena, Gobernanza de bosques por Pueblos Indígenas, Casos de Guatemala, Honduras y Nicaragua*. San José, Unión Internacional para la Conservación de la Naturaleza (UICN), Oficina Regional para Mesoamérica (ORMA).

Painter, L., Nallar, R., del Carmen Fleytas, M., Loayza, O., Reinaga, A. & Villalba, L. 2020. Reconciliation of cattle ranching with biodiversity and social inclusion objectives in large private properties in Paraguay and collective indigenous lands in Bolivia. *Agricultural Systems*, 184: 102861.

Paiva, P. F. P. R, de Lourdes Pinheiro Ruivo, M., Marques da Silva Junior, O., de Nazare Martins Maciel, M., Gleice Martines Braga, T., Marilia Nogueira de Andrade, M., Cerqueira dos Santos Junior, P., Saraiva da Rocha, E. Para Monteiro de Freitas, T., da Silva Leite, T.V., Oliveira Monteiro Gama, L. H., de Sousa Santos, L. Gomes da Silva, M., Rocha Silva, E. R. & Monteiro Ferreira, B. 2020. Deforestation in protected areas in the Amazon: A Threat to Biodiversity. *Biodiversity and Conservation*, 29: 19-38. https://doi.org/10.1007/s10531-019-01867-9.

Paneque-Gálvez, J., Mas, J.-F., Guèze, M., Luz, A. C., Macía, M. J., Orta-Martínez, M., Pino, J. & Reyes-García, V. 2013. Land tenure and forest cover change. The case of southwestern Beni, Bolivian Amazon, 1986-2009. 2013. *Applied Geography,* 43: 113-126. http://dx.doi.org/10.1016/j.apgeog.2013.06.005.

Paneque-Gálvez, J., Pérez-Llorente, I., Luz, A. C., Guèze, M., Mas, J. F., Macía, M. J., Martínez, M.O. & Reyes-García, V. 2018. High Overlap Between Traditional Ecological Knowledge and Forest Conservation Found in the Bolivian Amazon. *Ambio,* 47(8): 908-923.

Pazos-Almada, B. & Bray, D. B. 2018. Community-Based Land Sparing: Territorial Land-Use Zoning and Forest Management in the Sierra Norte of Oaxaca, Mexico. *Land Use Policy*, 78: 219-226. https://doi.org/10.1016/j.landusepol.2018.06.056.

Pendrill, F., Persson, U. M., Godar, J., Kastner, T., Moran, D., Schmidt, S. & Wood, R. 2019. Agricultural and forestry trade drives large share of tropical deforestation emissions. *Global Environmental Change*, 56: 1-10. https://doi.org/10.1016/j.gloenvcha.2019.03.002.

Perefán, C. & Pabón, M. 2019. Comunidades sostenibles: Evaluación socio cultural del Programa Socio Bosque. Nota Técnica Número IDB-TN-01587. Washington D. C., IADB.

Pereira, E. J. de A. L., Ribeiro, L. C. de S., Freitas, L. F. da S. & de Barros Pereira, H. B. 2020. Brazilian Policy and Agribusiness Damage the Amazon Rainforest. *Land Use Policy*, 92: 104491. https://doi.org/10.1016/j.landusepol.2020.104491.

Pérez, C. J. & Smith, C. A. 2019. Indigenous Knowledge System and Conservation of Settled Territories in the Bolivian Amazon. *Sustainability*, 11(21): 1-41. https://ideas.repec.org/a/gam/jsusta/v11y2019i21p6099-d282855.html.

Pert, P. L., Hill, R., Maclean, K., Dale, A., Rist, P. Schmider, J., Talbot, L & Tawake, L. 2015. Mapping cultural ecosystem services with rainforest aboriginal peoples: Integrating biocultural diversity, governance and social variation. *Ecosystem Services*, 13: 41-56. https://doi.org/10.1016/j.ecoser.2014.10.012.

Petersheim, C. 2018. Mexico's Federal Forestry Legislation: Curse or Blessing for Sustainable Resource Management by Forest Ejidos in the State of Campeche? *Gestión y Ambiente,* 21(supl. 2): 95-99. https://doi.org/10.15446/ga.v21n2supl.778679.

Pfaff, A., Robalino, J., Lima, E., Sandoval, C. & Herrera, L. D. 2014. Governance, Location, and Avoided Deforestation from Protected Areas: Greater Restrictions Can Have Lower Impact Due to Differences in Locations. *World Development*, 5: 7-20. https://doi.org/10.1016/j.worlddev.2013.01.011.

Pinello, V. R. 2011. The Use of Fire in the Cerrado and Amazonian Rainforests of Brazil: Past and Present. *Fire Ecology*, 7(1): 24-39. https://doi.org/10.4996/fireecology.0701024.

Pokorny, B. & Johnson, J. 2008. Community Forestry in the Amazon: The Unsolved Challenge of Forests and the Poor. *Natural Resource Perspectives* 112, Overseas Development Institute. https://www.odi.org/publications/1144-community-forestry-amazon-unsolved-challenge-forests-and-poor.

Porter-Bolland, L., Ellis, E. A., Guariguata, M. R., Ruiz-Mallén, I., Negrete-Yankelevich, S. & Reyes-García, V. 2012. Community managed forests and forest protected areas: an assessment of their conservation effectiveness across the tropics. *Forest Ecology and Management*, 268: 6-17. http://dx.doi.org/10.1016/j.foreco.2011.05.034

Potapov, P., Hansen, M. C., Laestadius, L., Turubanova, S., Yaroshenko, A., Thies, C., Smith, W., Zhuravleva, I., Komarova, A., Minnemeyer, S. & Esipova, E. 2017. The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Science Advances*, 3(1): e1600821.

Provencio, E. & Carabias, J. 2019. El presupuesto federal de medio ambiente: un trato injustificado y desproporcionado. Este País, 3 April 2019, (also available at: https://estepais.com/ambiente/el-presupuesto-federal-de-medio-ambiente-un-trato-injustificado-y-desproporcionado/).

Ramírez Barajas, P. J., Torrescano Valle, N. & Chan Rivas, C. V. 2006. Diagnóstico del aprovechamiento de flora y fauna por los mayas del Ejido Petcacab y evaluación de la cacería y pesca, Felipe Carrillo Puerto, Quintana Roo. Sociedad de Productores Forestales Ejidales de Quintana Roo S.C. Informe final SNIB-CONABIO proyecto No. BJ008. México D. F.

Rapoport Center. 2009. *Territorios olvidados, derechos incumplidos: Afroecuatorianos en áreas rurales y su lucha por tierra, igualdad y seguridad, Un reporte de la delegación Rapoport en derechos de tierra afroecuatoriana*. Austin, The Bernard and Audre Rapaport Center for Human Rights and Justice, University of Texas, Law School.

Ray, R. & Chimienti, A. 2017. A Line in the Equatorial Forests: Chinese Investment and the Environmental and Social Impacts of Extractive Industries in Ecuador. In R. Ray, K. Gallagher, A. Lopez, C. Sanborn & A. López (eds.), *China and Sustainable Development in Latin America: The Social and Environmental Dimension* (pp. 107-144). Anthem Press.

Red Amazónica de Información Socioambiental Georreferenciada (RAISG). 2012. Amazonía Bajo Presión. (also available at: https://www.amazoniasocioambiental.org/en/publication/amazonia-under-pressure/).

RAISG. 2019. Amazonía 2019 – Areas Protegidas y Territorios Indígenas. (also available at: https://www.amazoniasocioambiental.org/es/publicacion/amazonia-2019-areas-protegidas-y-territorios-indigenas/).

República de Panamá, Ministerio de Ambiente, Resolución No DM-0612-2019 de 29 de noviembre de 2019, *Gaceta Oficial Digital* No 28912-A, (also available at: https://www.gacetaoficial.gob.pa/pdfTemp/28912_A/75936.pdf).

Reyes-García, V. 2009. Conocimiento ecológico tradicional para la conservación: dinámicas y conflictos. *Papeles*, 107: 39-55. https://www.portalces.org/biblioteca/cambio-climatico/conocimiento-ecologico-tradicional-para-conservacion-dinamicas.

Reyes-García, V., Fernández-Llamazares, Á., McElwee, P., Molnár, Z., Öllerer, K., Wilson, S. J. & Brondizio, E. S. 2018. The contributions of Indigenous Peoples and local communities to ecological restoration. *Restoration Ecology*, 27(1): 3-8. https://doi.org/10.1111/rec.12894.

Reyes-García, V., Kightley, E., Ruiz-Mallén, I., Fuentes-Peláez, N., Demps, K., Huanca, T.& Martínez-Rodríguez, M. R. 2010. Schooling and local environmental knowledge: Do they complement or substitute each other? *International Journal of Educational Development*, 30: 305-313. https://doi.org/10.1016/j.ijedudev.2009.11.007.

Ricketts, T. H., Soares-Filho, B., da Fonseca, G. A. B., Nepstad, D., Pfaff, A., Petsonk, A. Anderson, A., Boucher, D., Cattaneo, A., Conte, M., Creighton, K., Linden, L., Maretti, C., Moutinho, P., Ullman, R. & Victurine, R. 2010. Indigenous Lands, Protected Areas, and Slowing Climate Change. *PLoS Biol* 8(3): e1000331. https://doi.org/10.1371/journal.pbio.1000331.

Rivera-Ángel, F. A. & Lopes-Simonian, L. T. 2019. Los regímenes especiales de manejo: el caso del PNN Yaigojé Apaporis–Colombia. *Amazonia Investiga*, 8(24): 561-578. https://orcid.org/0000-0001-5667-5451.

Rivera Cumbre, M. 2018. Diálogos intergeneracionales, una apuesta por salvaguardar la sabiduría de la ruralidad colombiana. *Millcayac Revista Digital*, 5(8): 121-142. http://revistas.uncu.edu.ar/ojs/index.php/millca-digital/article/view/1105.

Rodríguez, I. 2017. Linking well-being with cultural revitalization for greater cognitive justice in conservation: lessons from Venezuela in Canaima National Park. *Ecology and Society*, 22(4): 24. https://doi.org/10.5751/ES-09758-220424.

Rodríguez-Robayo, K. J., Ávila-Foucat, V. S. & Maldonado, J. H. 2016. Indigenous communities' perception regarding payments for environmental services programme in Oaxaca Mexico. *Ecosystem Services*, 17: 163-171.

Roldán Ortega, R. 2004. *Models for Recognizing Indigenous Land Rights in Latin America*. Biodiversity Series, Paper #99. Washington D.C., World Bank.

Romero, M. & Saavedra, S. 2019. Communal Property Rights and Deforestation: Evidence From Colombia. (also availaible at: https://ssrn.com/abstract=3179052).

Rontard, B., Reyes-Hernández, H. & Aguilar-Robledo, M. 2020. Pagos por captura de carbono en el mercado voluntario en México: diversidad y complejidad de su aplicación en Chiapas y Oaxaca. *Sociedad y Ambiente*, 22: 212-236. https://doi.org/10.31840/sya.vi22.2106.

Roper, J. M. 2003. *An Assessment of Indigenous Participation in Commercial Forestry Markets: The Case of Nicaragua's Northern Atlantic Autonomous Region*. Washington D. C., Forest Trends.

Rosa, H., Kandel, S. & Dimas, L. 2004. *Compensación por servicios ambientales y comunidades rurales: Lecciones de las Américas y temas críticos para fortalecer estrategias comunitarias*. Ciudad de México, Instituto Nacional de Ecología (INE).

Rosa da Conceição, H., Börner, J. & Wunder, S. 2015. Why were upscaled incentive programs for forest conservation adopted? Comparing policy choices in Brazil, Ecuador, and Peru. *Ecosystem Services,* 15: 243-252.

Rosales González, M. & Llanes Ortiz, G.J. 2003. La defensa y la transformación de un legado: organizaciones indígenas en la Península de Yucatán. In *Los investigadores de la cultura maya*, Tomo II. Campeche, Universidad Autónoma de Campeche.

Rousseau, S. & Morales Hudon, A. 2018. *Movimientos de mujeres indígenas en Latinoamérica: Género y Etnicidad en el Perú, México y Bolivia*. Lima, Fondo Editorial Pontificia Universidad Católica del Perú.

Rights and Resources Initiative (RRI). 2012. *¿Cuáles derechos? Un análisis comparativo de la legislación nacional de los países en vías de desarrollo relacionada a los derechos de tenencia de los bosques de los Pueblos Indígenas y de las comunidades locales*. Washington, D. C.

RRI. 2015. *Who Owns the World's Land? A global baseline of formally recognized indigenous and community land rights*. Washington, D. C.

RRI. 2017. *Power and Potential: A Comparative Analysis of National Laws and Regulations concerning Women's Rights to Community Forests*. Washington, D. C.

RRI. 2018. *Ante una Encrucijada, Tendencias significativas en el reconocimiento de la tenencia forestal comunitaria, 2002 a 2017*. Washington D. C.

RRI. 2020. *Estimate of the area of land and territories of Indigenous Peoples, local communities, and Afrodescendants where their rights have not been recognized*. Washington, D. C.

Rudel, T. K., Bates, D. & Machinguiashi, R. 2002. Ecologically Noble Amerindians? Cattle Ranching and Cash Cropping among Shuar and Colonists in Ecuador. *Latin American Research Review*, 37(1): 144-159. https://www.jstor.org/stable/2692107.

Saatchi, S. S., Harris, N. L., Brown, S., Lefsky, M., Mitchard, E. T. A., Salas, W., Zutta, B. R., Buermann, W., Lewis, S. L., Hagen, S., Petrova, S., White, L., Silman, M. & Morel, A. 2011. Benchmark map of forest carbon stocks in tropical regions across three continents. *Proceedings of the National Academy of Sciences* (PNAS), 108(24): 9899-9904. https://doi.org/10.1073/pnas.1019576108.

Salinas, E., Wallace, R., Painter, L., Lehm, Z., Loayza, O., Pabón, C. & Ramírez, A. 2017. *El valor ambiental, económico y sociocultural de la gestión territorial indígena en el Gran Paisaje Madidi. Resumen ejecutivo*. La Paz, CIPTA, CIPLA and WCS.

Sanderson, E. W., Jaiteh, M., Levy, M. A., Redford, K. H., Wannebo, A. V. & Woolmer, G. 2002. The Human Footprint and the Last of the Wild. *Bioscience*, 50(10): 891-894. https://doi.org/10.1641/0006-3568(2002)052[0891:THFATL]2.0.CO;2.

Sarmiento-Villamizar, L. H., Ordóñez-Cortés, R. & Humberto-Alonso, A. 2017. Revisión de Gasto: Sector Ambiente y Desarrollo Sostenible. Bogotá, Fedesarrollo.

Sawyer, D. 1993. Economic and social consequences of malaria in new colonization projects in Brazil. *Social Science and Medicine*, 37(9): 1131-1136. https://doi.org/10.1016/0277-9536(93)90252-Y.

Schleicher, J., Peres, C. A., Amano, T., Llactayo, W. & Leader-Williams, N. 2017. Conservation performance of different conservation governance regimes in the Peruvian Amazon. *Scientific Reports* 7:11318: 1-10. https://doi.org/10.1038/s41598-017-10736-w.

Schroeder, H. & González, N. C. 2019. Bridging knowledge divides: The case of indigenous ontologies of territoriality and REDD+. *Forest Policy and Economics*, 100: 198–206. https://doi.org/10.1016/j.forpol.2018.12.010.

Schuster, R., Germain, R. R., Bennett, J. R., Reo, N. J. & Arecese, P. 2019. Vertebrate biodiversity on indigenous-managed lands in Australia, Brazil, and Canada equals that in protected areas. *Environmental Science and Policy*, 101: 1-6. https://doi.org/10.1016/j.envsci.2019.07.002.

Schwartzman, S. & Zimmerman, B. 2005. Conservation Alliances with Indigenous Peoples of the Amazon. *Conservation Biology*, 19(3): 721-727. http://www.wild.org/wp-content/uploads/2009/05/schwartzman-zimmerman-indigenous.pdf.

Segura-Warnholtz, G. 2014. Quince años de políticas públicas para la acción colectiva en comunidades forestales. *Revista Mexicana de Sociología*, 76: 105-135. http://www.scielo.org.mx/scielo.php?script=sci_abstract&pid=S0188-25032014000600005&lng=es&nrm=iso.

Seymour, F. y Harris, N. 2019. Reducing tropical deforestation. *Science*, 365(6455): 756-757.

Shapiro-Garza, E. 2019. An Alternative Theorization of Payment for Ecosystem Services from Mexico: Origins and Influence. *Development and Change*, 51(1): 196–223. https://doi.org/10.1111/dech.12552.

Sheil, D. 2018. Forests, atmospheric water and an uncertain future: the new biology of the global water cycle. *Forest Ecosystems*, 5: 19. https://doi.org/10.1186/s40663-018-0138-y.

Sierra-Huelz, J. A., Gerez Fernández, P., López Binnqüist, C., Guibrunet, L. & Ellis, E. A. 2020. Traditional Ecological Knowledge in Community Forest Management: Evolution and Limitations in Mexican Forest Law, Policy, and Practice. *Forests* 11(4): 403. https://doi.org/10.3390/f11040403.

Silva Crepaldi, M. O. & Luna Peixoto, A. 2010. Use and knowledge of plants by "Quilombolas" as subsidies for conservation efforts in an area of Atlantic Forest in Espírito Santo State, Brazil. *Biodiversity Conservation*, 19(37): 37-60.

Simmons, C. S. 1997. Forest management practices in the Bayano region of Panama: Cultural variations. *World Development*, 25(6): 989-1000. https://doi.org/10.1016/S0305-750X(97)00002-8.

Sierra, R. 1999. Traditional resource-use systems and tropical deforestation in a multi-ethnic region in North-West Ecuador. *Environmental Conservation*, 26(2): 136-145. https://doi.org/10.1017/S0376892999000181.

Springer, J. & Almeida, F. 2015. *Protected Areas and the Land Rights of Indigenous Peoples and Local Communities Current Issues and Future Agenda*. Washington, D. C., RRI.

Stocks, A., McMahan, B. y Taber, P. 2007. Indigenous, colonist, and government impacts on Nicaragua's Bosawas Reserve. *Conservation Biology*, 21(6): 1495-1505. https://doi.org/10.1111/j.1523-1739.2007.00793.x.

Suter, M. G., Miller, K. A., Anggraeni, I., Ebi, K. L., Game, E. T., Krenz, J., Masuda, Y. J., Sheppard, L., Wolff, N. H. & Spector, J. T., 2019. Association between work in deforested, compared to forested, areas and human heat strain: an experimental study in a rural tropical environment. *Environmental Research Letters*, 14 (8): 1-10. https://iopscience.iop.org/article/10.1088/1748-9326/ab2b53/data.

Tamburini, L. 2019. *Atlas Sociopolítico sobre los territorios indígenas en las tierras bajas de Bolivia*. Santa Cruz de la Sierra, Centro de Estudios Jurídicos e Investigación Social (CEJIS) e International Working Group on Indigenous Affairs (IWGIA).

Thiede, B. C. & Gray, C. 2020. Characterizing the indigenous forest peoples of Latin America: Results from census data. *World Development*, 125: 1-14. https://doi.org/10.1016/j.worlddev.2019.104685.

Toledo, V. M., Ortiz-Espejel, B., Cortés, L., Moguel, P. & Ordóñez, M. D. J. 2003. The multiple use of tropical forests by indigenous peoples in Mexico: a case of adaptive management. *Conservation Ecology*, 7(3): 9. https://www.consecol.org/vol7/iss3/art9/.

Toohey, D. E. 2012. Indigenous Peoples, Environmental Groups, Networks, and the Political Economy of Rainforest Destruction in Brazil. *International Journal of Peace Studies*, 17(1): 73-97. https://www.jstor.org/stable/41853029.

Torres, B., Günter, S., Acevedo-Cabra, R. & Knoke, T. 2018. Livelihood strategies, ethnicity and rural income: The case of migrant settlers and indigenous populations in the Ecuadorian Amazon. *Forest Policy and Economics*, 86: 22-34. http://dx.doi.org/10.1016/j.forpol.2017.10.011.

Torres-Rojo, J. M. & Magaña-Torres, O. S. 2006. Management of Mexican community forests with timber production objectives. *Allgemeine Forst und Jagdzeitung*, 177(3), 63-71.

Tran, T. C., Ban, N. C. & Bhattacharyya, J. 2020. A review of successes, challenges, and lessons from Indigenous protected and conserved areas. *Biological Conservation*, 241: 108271. https://doi.org/10.1016/j.biocon.2019.108271.

Unión Internacional de Conservación de la Naturaleza (UICN). 2016. Mapa de Pueblos Indígenas, Áreas Protegidas y Ecosistemas Naturales en Centroamérica en PDF. (also available at: https://www.arcgis.com/home/item.html?id=38deae9061d948e39e29faa920c4698f).

United Nations (UN). 2007. *Declaración de las Naciones Unidas sobre los Derechos de los Pueblos Indígenas.* New York.

UN. 2016. *Report of the Special Rapporteur of the Human Rights Council on the rights of indigenous peoples Victoria Tauli-Corpuz. A771/229*. Geneva.

United Nations Indigenous Peoples Partnership (UNIPP). 2012. *Delivering as One UN at the Country Level in Partnership with Indigenous Peoples and Governments*. Geneva.

Uquillas, J. E. & van Nieuwkoop, M. 2003. Social Capital as a Factor in Indigenous Peoples Development in Ecuador. Sustainable Development Working Paper No. 15, Indigenous Peoples Development Series. Washington D. C., World Bank.

Van Dam, C. 2019. *La economía de la mitigación del cambio climático en territorios indígenas*. Washington D. C., Forest Trends.

Vasco, C., Bilsborrow, R. & Torres, B. 2015. Income diversification of migrant colonists vs. indigenous populations: Contrasting strategies in the Amazon. *Journal of Rural Studies*, 42: 1-10. https://doi.org/10.1016/j.jrurstud.2015.09.003.

Vasco, C., Bilsborrow, R. & Griess, V. 2018. Agricultural land use among mestizo colonist and indigenous populations: Contrasting patterns in the Amazon. *PLoS ONE*, E 13(7): 1-16, e0199518. https://doi.org/10.1371/journal.pone.0199518.

Vélez, M. A., Robalino, J., Cárdenas, J. C., Paz, A., Pacay, E. & Ojeda, A. 2019. Is Collective Titling Enough to Protect Forests? Evidence from the Afro-Descendant Communities in the Colombian Pacific Region. Documento CEDE No. 2019. https://dx.doi.org/10.2139/ssrn.3334497.

Vergara-Asenjo, G. & Potvin, C. 2014. Forest protection and tenure status: The key role of indigenous peoples and protected areas in Panama. *Global Environmental Change*, 28: 205-215. http://dx.doi.org/10.1016/j.gloenvcha.2014.07.002.

Vilela, T., Malky-Harb, A., Bruner, A., de Silva-Arruda, V. L., Ribeiro, V., Costa Alencar, A. A., Escobedo-Grandez, A. J., Rojas, A., Laina, A. & Botero, R. 2020. A Better Amazon Road Network for People and the Environment. *Proceedings of the National Academy of Sciences (PNAS)*, 117(13): 7095-7102. https://doi.org/10.1073/pnas.1910853117.

Von Hedemann, N. 2019. *Incentives, Livelihoods, and Forest Ecology: Payments for Ecosystem Services in Guatemala's Western Highlands*. School of Geography and Development, University of Arizona (PhD dissertation).

Von Hedemann, N. & Osborne, T. 2016. Incentivos forestales del Estado y la Administración Comunal: Una ecología política de pagos y compensación por servicios ambientales en el altiplano de Guatemala. *Journal of Latin American Geography*, 15 (1): 1-29.

Walker, W. S., Gorelik, S. R., Baccini, A., Aragón-Osej, J. L., Josse, C, Meyer, C., Macedo, M. N., Augusto, C., Ríos, S., Katan Jua, T. P., Almeida, A., Cuéllar, S., Llanos, A, Zager, I., Mirabal Díaz, J. G., Solvik, K. K., Farina, M. K., Moutinho, P. & Schwartzman, S. 2020. The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon indigenous territories and protected areas. *Proceedings of the National Academy of Sciences (PNAS)*, 117(6): 3015-3025. https://doi.org/10.1073/pnas.1913321117.

Weise, C. & Álvarez, I. M. 2018. Identidad y percepciones de género. Retos para la formación de mujeres líderes indígenas. *Aposta, Revista de Ciencias Sociales*, 77: 257-287.

Welch, J. R., Brondizio, E. S., Hetrick, S. S. & Coimbra Jr., C. E. A. 2013. Indigenous Burning as Conservation Practice: Neotropical Savanna Recovery amid Agribusiness Deforestation in Central Brazil. *PLOS One*, 8 (12): e81226. https://doi.org/10.1371/journal.pone.0081226.

Wiersum, K. F., Humphries, S. & van Bommel, S. 2013. Certification of community forestry enterprises: experiences with incorporating community forestry in a global system for forest governance. *Small-scale Forestry*, 12: 15-31. https://doi.org/10.1007/s11842-011-9190-y.

Wilder, B. T., O'Meara, C., Monti, L. & Nabhan, G. P. 2016. The Importance of Indigenous Knowledge in Curbing the Loss of Language and Biodiversity. *Bioscience*, 66(6): 499-509. https://doi.org/10.1093/biosci/biw026.

Wily, L. A. 2018. Collective Land Ownership in the 21st Century: Overview of Global Trends. *Land*, 7(2): 1-26. https://doi.org/10.3390/land7020068.

Wolff, J. 2007. (De)Mobilizing the Marginalised: A Comparison of the Argentine *Piqueteros* and Ecuador's Indigenous Movement. *Journal of Latin American Studies*, 39(1): 1-29. https://doi.org/10.1017/S0022216X0600201X.

Wright, C. & Tomaselli, A. (eds.). 2019. *The Prior Consultation of Indigenous Peoples in Latin America: Inside the Implementation Gap*. New York and Oxon, Routledge.

Wunder, S., Börner, J., Ezzine-de-Blas, D., Feder, S. & Pagiola, S. 2020. Payment for Environmental Services: Past Performance and Pending Potentials. *Annual Review of Resource Economics*, 12, October. https://doi.org/10.1146/annurev-resource-100518-094206.

Yepes, A., Arango, C. F., Cabrera, E., González, J. J., Galindo, G., Barbosa, A. P., Urrego, D., Tobón, P., Suárez, A. & Camacho, A. 2018. Propuesta de lineamientos para el monitoreo comunitario participativo en Colombia y su articulación con el Sistema Nacional de Monitoreo de Bosques. Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM), Ministerio de Ambiente y Desarrollo Sostenible y Programa ONU-REDD Colombia.

Zambrano, G. & Uchuypoma, D. 2015. *Intersectando desigualdades: participación política de mujeres indígenas a nivel subnacional en el Perú*. Lima, Pontificia Universidad Católica del Perú.

[Forest governance by indigenous and tribal peoples.
An opportunity for climate action in Latin America and the Caribbean]

Corrigendum

[May 13th, 2021]

The following corrections were made to the PDF
of the report after it went to print.

PAGE	LOCATION	TEXT IN PRINTED PDF	TEXT IN CORRECTED PDF
ii	At the end of page	None	Last updated 13/05/2021
iii	Full page	In memory of Robinson López Descanse (1985-2020), indigenous-amazonic leader of the Inga people. He was a governor of his community. Founder and President of the Association of Andean-Amazonic Inga Councils (Kausai), Technical Secretary of the National Human Rights Commission for Indigenous Peoples and Coordinator of the National Human Rights and for Peace Organization of Indigenous Peoples of the Colombian Amazon. Later, he was named Climate-change Coordinator of the Coordinating Body of the Indigenous Organizations of the Amazon Basin. Robinson, only aged 35, died on August 21st 2020 due to COVID-19. We respectfully dedicate this report to Robinson, a man who devoted his life to his people.	In memory of Robinson López Descanse (1984-2020), indigenous-amazonic leader of the Inga Peoples. He served as governor of his community. Founder and president of the Association of Indigenous Councils of the Inga Peoples of the Municipality of Villagarzon, Commissioner of the National Human Rights Commission for Indigenous Peoples and Coordinator of the National Human Rights and for Peace Organization of Indigenous Peoples of the Colombian Amazon. Later, he was appointed Climate-change Coordinator of the Coordinating Body of the Indigenous Organizations of the Amazon Basin. Robinson, of only 36 years of age, died on August 21st 2020 due to COVID-19. We respectfully dedicate this report to Robinson, a man who devoted his life to his people.
104	Top on the page	(Weiss y Álvarez, 2017)	(Weise y Álvarez, 2018)

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