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Scaling up community-based forest monitoring for REDD+: experiences from Guyana and Brazil

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Key Points

- Community-based forest monitoring can help achieve efficient, effective and equitable REDD+ outcomes.
- There are proven pathways in integrating community-collected data on carbon stocks and drivers of forest change into national forest monitoring efforts.
- Community-led impact assessments and monitoring of performance indicators should be promoted, to incentivise further participation and transparent benefit-sharing in REDD+.
- Coordination and data sharing protocols across different scales are needed to foster integration.
- Balancing local and external information needs and priorities is essential to ensure the relevance of community-collected information to multiple stakeholders, and the sustainability of these monitoring initiatives.
- Maintaining local monitoring, training and institutional capacity will require long-term funding, which REDD+ financing mechanisms could help meet.
- Standardising community monitoring methodologies, by establishing minimum standards and guidelines on best practice, can promote comparability and replication at scale.

Introduction

The emergence of REDD+[1] has generated a plethora of data requirements for understanding and monitoring the dynamics of tropical forests regions, and also renewed demands to maximise the efficiency, effectiveness and equity of forest policy interventions.

Community-based forest monitoring has the potential to contribute to these needs by complementing national forest monitoring systems and helping ensure the participation of local communities, while delivering a number of livelihood and conservation co-benefits.

By drawing on empirical evidence from two pilot case studies in Guyana and Brazil, and from the broader body of evidence, this paper seeks to: (1) highlight the importance of community-based forest monitoring; and (2) discuss the barriers and opportunities for scaling up (i.e. integrating and replicating) these models as part of holistic, jurisdictional (national or sub-national), REDD+ frameworks.

The role of community-based forest monitoring in REDD+

As tropical forest countries move toward full-scale REDD+ implementation, some key criteria underpin readiness efforts, and can help maximise 'win-win' outcomes. These include:

(1) Guaranteeing the meaningful participation of forest-dependent communities in the design and implementation of REDD+ schemes[2];

(2) Developing robust measuring, reporting and verification (MRV) instruments and comprehensive national forest monitoring and safeguard information

1 Reducing emissions from deforestation and forest degradation, plus forest conservation, sustainable forest management and the enhancement of forest carbon stocks.
2 United Nations Framework Convention on Climate Change (UNFCCC) Decision 9/CP.19; Decision 2/CP.17; Decision 1/CP.16; Decision 4/CP.15.

systems (SIS) to assess the impact of REDD+ efforts (see: Denier et al. 2014);

(3) Adopting relevant enabling policies, and legal and financial frameworks, to incentivise effective REDD+ actions and benefit-sharing mechanisms (Streck et al. 2009).

While national monitoring capacities have improved significantly, in particular for forest carbon, important information gaps and monitoring challenges remain. These relate to, for example, the determinants of forest cover change, socio-economic and biodiversity aspects of forests, and impacts of current REDD+ interventions and related policies beyond the forest sector (Salvini et al. 2014; de Sassi et al. 2015). Furthermore, governance challenges related to transparency, accountability and participation of communities in decision making are ongoing (Di Gregorio et al. 2013).

Studies have shown that involving local communities in forest monitoring[3] can help address issues of participation and shortcomings in monitoring, while generating livelihood and conservation benefits, to improve REDD+ interventions (Skutsch & McCall 2010; Danielsen et al. 2013).

Ultimately, such models show great potential for maximising the cost-efficiency, climate mitigation effectiveness and equity outcomes of REDD+.

Community-based forest monitoring for efficient, effective and equitable REDD+[4]

The **efficiency** of REDD+ will depend in part on readiness costs (i.e. start-up and capacity-building costs) and running costs of governance instruments such as MRV; as well as opportunity and implementation costs (Angelsen et al. 2009). Developing national forest monitoring systems that can accurately and rapidly report on forest carbon stocks and flows can be difficult and expensive (Böttcher et al. 2009; Morales-Barquero et al. 2014).

By drawing on local knowledge systems and on the advantage of being in or near forests, local communities can play a key role generating bottom-up information flows to improve the design and efficiency of forest monitoring systems for REDD+. A study by Danielsen et al. (2013) shows that communities can accurately document forest characteristics and measure carbon stocks - at a considerably lower cost[5] - to complement national forest carbon inventories. In addition, communities can also generate data on social and biodiversity indicators – especially in areas where baseline data is lacking and more expensive to obtain using external agents (see Danielsen et al. 2014; Luzar et al. 2011).

Meanwhile, local communities can also assist in improving the **effectiveness** of REDD+. Forest carbon sequestration, permanence and additionality, control of leakage, and drivers of forest change, are all essential indicators for evaluating effectiveness in REDD+.

Policy and forest governance reforms will be fundamental in REDD+, as weak governance is a key factor in enabling deforestation and forest degradation[6] (Springate-Baginski and Wollenberg 2010). Community-based monitoring models can play a part in improving multi-level forest governance and the effectiveness of REDD+ interventions by tracking the implementation of REDD+ activities (for example, reforestation programmes), and for assessing REDD+ policies on the ground (Sabogal et al. 2015). Furthermore, involvement in monitoring can stimulate dialogue and enhance communication about local needs and circumstances, contributing to more effective interventions[7].

With the right tools, incentives and capacity, communities are also able to identify and track the local drivers and processes of forest change, and displacements (i.e. leakage), which are specific to their context (Das et al. 2015; RFUK 2015; Pratihast et al. 2014). Communities can also help improve the accuracy of national monitoring instruments, by ground-truthing remote-sensing estimates (Schelhas et al. 2010; Pratihast et al. 2014; Bellfield et al. 2015).

Detailed local level surveys and measurements can increase understanding of degradation and other carbon stock changes within the forest (Salvini et al. 2014). Such approaches can inform decision-makers about ground conditions, identifying risks, trade-offs and priority areas for action (Korhonen-Kurki et al. 2013). At the local level, monitoring is also vital for forest communities to respond to pressures and changes in their environment (Padmanaba et al. 2012).

It is widely recognised that involvement in monitoring enhances natural resource management, with wider relevance for effective REDD+ agendas (Danielsen et al. 2012; Skutsch and McCall 2012). This can help inform local decisions and adapt responses on resource management, while empowering and strengthening communities and their institutions. Local communities can also use this data to engage in grievance mechanisms under REDD+ efforts.

3 Community-based forest monitoring initiatives vary in terms of the level of local participation, involvement of external actors, and the purpose of monitoring/themes being monitored (for further information and typologies see: Danielsen et al. 2009 or visit forestcompass.org).

4 Based on the 3E's concept in Angelsen and Wertz-Kanounnikoff 2008.

5 Biomass measurements by communities are comparable and 30-40% cheaper than professionals – albeit with high implementation costs due to remoteness and capacity building.

6 For other drivers see: Rautner et al. 2013.

7 Successful REDD+ initiatives require decision-makers at all scales to have access to different information and data layers, making REDD+ monitoring an inherently interdisciplinary, cross-scale endeavour (de Sassi et al. 2015).

Lastly, ensuring environmental and social benefits and positive impacts on governance and rights is fundamental for REDD+. As such, comprehensive safeguards frameworks and standards will be imperative for **equitable** REDD+ regimes, as will safeguard information systems (SIS) and associated grievance mechanisms to report on adherence to these commitments (Rey et al. 2013). Benefit- and cost-sharing mechanisms and processes will also be necessary components of these efforts (Angelsen et al. 2009; Tjajadi et al. 2015).

Data collected by forest communities will be critical for reporting on issues of equity in REDD+, and to overcome the challenge of gathering relevant information from multiple stakeholder groups at the scale and depth that is needed (MacFarquhar and Goodman 2015).

Community-collected information can help to highlight local risks and opportunities related to REDD+, and certify equity outcomes. It can reveal what cost (e.g. lost income opportunities) and socio-environmental co-benefits of REDD+ are generated, and how they are being distributed locally and across different social strata (related to ethnicity or gender, for example). This information will be key for communities and governments to uncover and understand trade-offs and synergies within REDD+ frameworks (Skutsch and Torres 2013; de Sassi et al. 2015).

Challenges and opportunities in scaling up community-based forest monitoring

While the value of community-based forest monitoring is increasingly being recognised, initiatives have predominantly been implemented on an isolated, site-by-site basis. Efforts to embed these approaches in national REDD+ schemes exist (Pratihast et al. 2013; Bellfield et al. 2015), however, a number of key bottlenecks for integrating and replicating community-based forest monitoring models remain.

For the most part these exist due to technocratic and top-down data regimes, coupled with misperceptions and scepticism over the quality (e.g. scientific accuracy and validity) of community-acquired data (Danielsen et al. 2013; Pratihast et al. 2013; Austin and Stolle 2013). Lund (2014) argues that political barriers are created when the devolution of forest management and monitoring responsibilities to local stakeholders is perceived as a challenge to centralised REDD+ processes.

Experience implementing a Community-MRV project in Guyana, reveal pathways for integrating community monitoring results on carbon estimates and forest change within national level MRV systems (see the Guyana Case Study). However, while efforts were made to align methodologies developed with communities and those of the national REDD+ MRV system, empirical results from this initiative highlight the need for clearly defined monitoring protocols to guide data collection activities and the effective incorporation of results into national forest monitoring systems. The lack of agreed formats for reporting data[8] and the absence of relevant institutional mandates for assimilating locally-generated data hindered the transfer and use of data across scales[9].

Furthermore, without clear REDD+ frameworks for communities, certain externally-defined information-gathering priorities (such as carbon biomass estimates, for example) will have little relevance to local forest management regimes or perceived benefits to community members. These frameworks can also be fundamental in securing long-term funding sources to build local institutional management capacity and cover community-based monitoring costs– in particular when monitoring initiatives include technology[10] (Scheyvens 2012; Bellfield et al. 2015).

Sensitivities with monitoring, where such activities are typically associated with law enforcement, can also pose further barriers for integration. In the Chico Mendes Extractive Reserve in the state of Acre, Brazil, this issue hampered the collection of data on livelihood activities related to forest change in particular (e.g. cattle ranching); demonstrating certain limitations of community-based monitoring for REDD+. Despite these barriers, communities did successfully gather information on indicators relevant to participation and the effectiveness of different external environmental policies being pursued as part of Acre's jurisdictional REDD+ programme (see the Acre Case Study).

The devolution of monitoring roles to communities, framed as ground-level assessments of programme delivery and impacts related to REDD+, helped enhance the transparency and credibility of governance. It also provided incentives for communities to participate in monitoring activities.

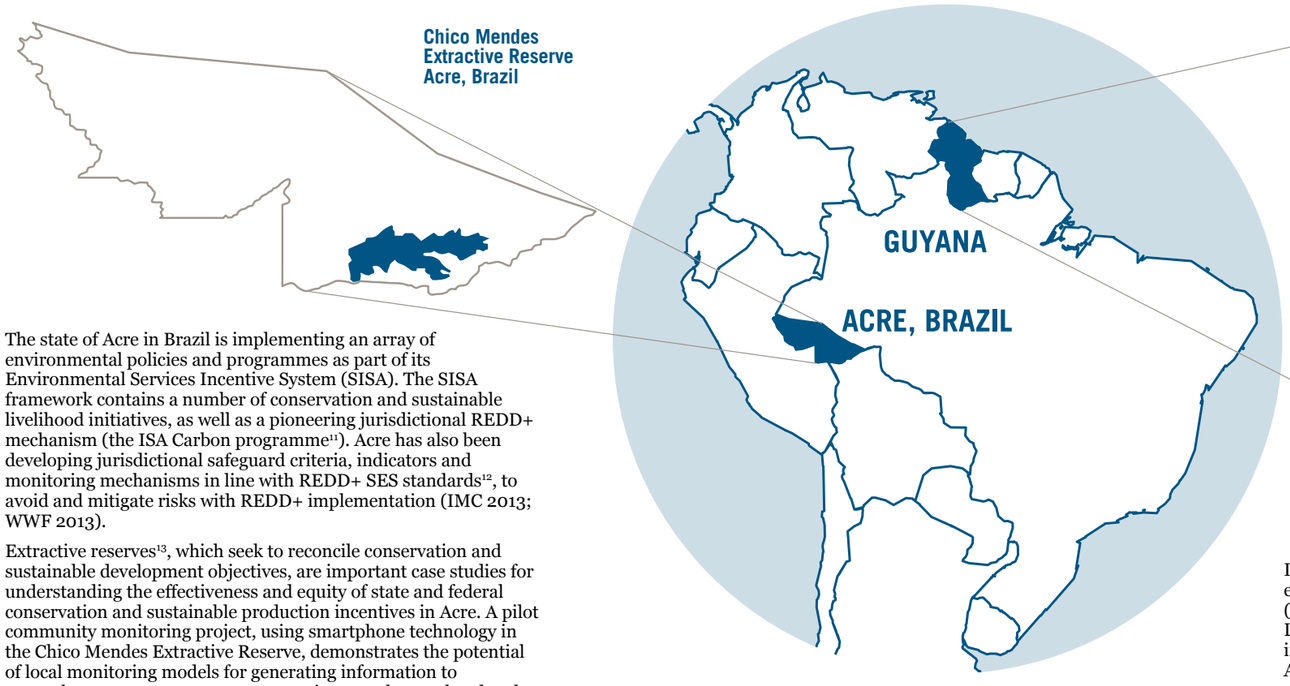
The defined role for communities in monitoring REDD+ has been successfully integrated into state institutions, through the Institute for Climate Change and Regulation of Environmental Services (IMC), in an effort to increase equity and improve the effectiveness of public sector policies and outcomes in Acre, Brazil (Sabogal et al. 2015).

8 For example, biomass data collected using digital forms on smartphone devices by community members were not compatible with the paper format that was being used to report on carbon estimates in Guyana.

9 A data sharing protocol developed in Guyana did enable flows of information among government and community institutions, on deforestation drivers for example, while sensitive data on social issues was kept by the communities (Sabogal 2015). However the format for how data should be shared was not defined in advance, nor was there agreement on developing appropriate institutional capacity to manage this process.

10 Digital technologies have been promoted to overcome challenges to community-based forest monitoring such as data accuracy, transcription errors, illiteracy barriers, and to enable more effective information transfers; they have also opened opportunities for integration across scale and disciplines, albeit with challenges (de Sassi et al. 2015; Bellfield et al. 2015).

CASE STUDY 1.
COMMUNITY MONITORING AND ACRE'S JURISDICTIONAL REDD+ PROGRAMME IN BRAZIL

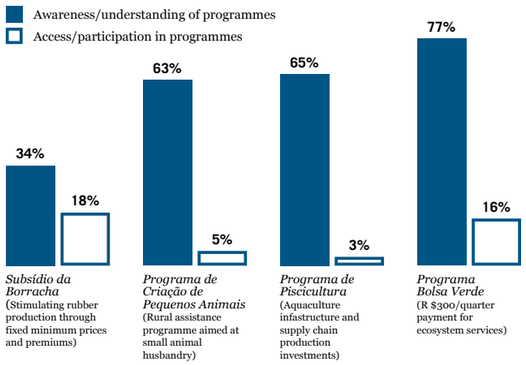


The state of Acre in Brazil is implementing an array of environmental policies and programmes as part of its Environmental Services Incentive System (SISA). The SISA framework contains a number of conservation and sustainable livelihood initiatives, as well as a pioneering jurisdictional REDD+ mechanism (the ISA Carbon programme[11]). Acre has also been developing jurisdictional safeguard criteria, indicators and monitoring mechanisms in line with REDD+ SES standards[12], to avoid and mitigate risks with REDD+ implementation (IMC 2013; WWF 2013).

Extractive reserves[13], which seek to reconcile conservation and sustainable development objectives, are important case studies for understanding the effectiveness and equity of state and federal conservation and sustainable production incentives in Acre. A pilot community monitoring project, using smartphone technology in the Chico Mendes Extractive Reserve, demonstrates the potential of local monitoring models for generating information to strengthen co-management structures in sparsely populated and remote protected areas, and inform wider forest governance and safeguard systems (Sabogal et al. 2015).

Results from local-level assessments of governance, participation, and benefit sharing indicators in the reserve (e.g. awareness, access, perceived effectiveness of public policies and instruments), reveal important insights on the performance of current incentive systems.

GRAPH 1:
PARTICIPATION IN REDD+ AND ALTERNATIVE LIVELIHOOD INCENTIVE PROGRAMMES IN ACRE CASE STUDY



For example, in Graph 1, the results of households surveys[14] revealed that while 77% of respondents were aware of the *Bolsa Verde* payment for ecosystem services programme (R $300.00 per quarter for each household), uptake was as low as 16%. The most perceived inhibiting factors of this programme, among those who did participate, were related to registration and accessing the payments. In fact, a large proportion of the money was being used to cover the cost of travelling out of the reserve; initially to register and then repeatedly to collect the money, minimising the impact of the incentive. Such findings highlight shortcomings in the way that these policies are reaching communities. Information such as this demonstrates the potential of bottom-up models in calibrating understanding of the overall effectiveness of REDD+ related activities and the ways that benefits are being shared within the SISA system; helping to track the fulfilment of key safeguard criteria under Acre's safeguards framework.

This case study also reveals the limitations in collecting data for REDD+. Historical relations with government agencies in the case study area meant that monitoring was often related to law enforcement and penalties applied by authorities under existing forest management plans. These realities, coupled with low social cohesion and contested resource use, generated mistrust and fear among community members. Many were wary of providing information on certain livelihood activities, such as cattle rearing or timber extraction; or even getting involved in monitoring activities, as they feared it could bring negative impacts (Sabogal et al. 2015).

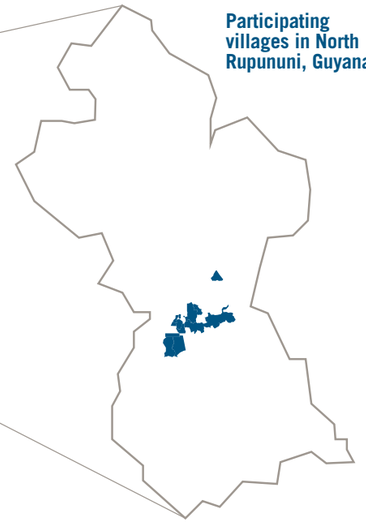
11 Incentivos a Serviços Ambientais do Carbono Florestal

12 REDD+ Social and Environmental Standards were developed with the Climate, Community and Biodiversity Alliance and Care International.

13 Extractive Reserves are a legally-defined type of protected area, within the category of conservation units for sustainable use. They represent 16.5% of Acre state (2,704,334 hectares).

14 A total of 931 digital survey questionnaires: this is a representative sample including 53% of a total 1766 households identified in the 2009 census in the Chico Mendes Extractive Reserve (SEMA, 2010)

CASE STUDY 2.
REDD+ MRV AND COMMUNITY-BASED FOREST MONITORING SYSTEMS IN GUYANA



In 2009, Guyana signed a bilateral agreement with Norway establishing a REDD+ performance-based finance mechanism (USD $250 million over five years) to implement the country's Low Carbon Development Strategy (LCDS). While this agreement initially covered state lands, provisions were made for titled Amerindian communities to be able to 'opt in' to the REDD+ programme (GoG 2011).

The Community-MRV project[15], using smartphone technology, was piloted among sixteen Makushi indigenous villages as part of REDD+ demonstration activities in North Rupununi, Guyana[16]. Through its participatory design and bottom-up implementation, both local and government stakeholders collaborated to identify different monitoring themes and indicators; some relevant to carbon biomass and drivers of deforestation, and others related to community natural resource use and wellbeing.

This initiative provided key inputs for developing and improving the national MRV system in Guyana. It did this by generating information on local perceptions of priority determinants of forest cover change (Table 1), and identifying and categorising forest disturbance types to validate remote sensing images, as well as measuring above ground carbon stocks in community forest lands (Bellfield et al. 2015).

Results from these activities helped the government further understand the dynamics local drivers of forest change, and in particular, the role of traditional shifting agricultural practices in the region. It also clarified uncertainties from remote sensing imagery, through *in situ* observations of areas shown to be deforested. This ground truthing found that 61% of 2,171 sample points were other forms of forest disturbance, such as fallow farms or rock formations, rather than clear cut areas.

Participating communities benefited from their findings in terms of their increased understanding of pressures on local forest resources and livelihoods, their ability to make informed decisions on land use practices, and their capacity to influence and engage in the development of REDD+ programmes in their territories.

However, policy uncertainties at the national level, in particular on the REDD+ 'opt-in' mechanism for Amerindian communities, undermined efforts to embed a community-based forest monitoring model within a wider policy framework. This had concomitant impacts on the permanence and sustainability of this scheme. Without a defined REDD+ structure, communities are unlikely to persevere with monitoring and its related costs, except perhaps for some indicators directly tied to local priorities (such as resource use and community wellbeing).

Furthermore, without long-term financing options that a REDD+ mechanism could potentially provide, such initiatives are constrained[17] to project level and short-term scenarios. These realities highlight the necessity and urgency of a clearly established national REDD+ framework in Guyana, as a first step in clarifying community participation in monitoring.

Nevertheless, community monitoring experiences in North Rupununi do provide a valuable basis for future participatory monitoring components under a final national REDD+ framework. The model has been replicated in southern Guyana[18] through a community-to-community training programme using capacity built through the pilot scheme. This replication demonstrates promising pathways for such models at scale (Bellfield et al. 2015).

TABLE 1:
COMMUNITY-RANKED FOREST CHANGE DRIVERS IN NORTH RUPUNUNI, GUYANA[19]

DRIVER PRIORITISATION AND RANKINGS		DEGRADATION	DEFORESTATION[20]
1	Traditional rotational shifting and cash crop agriculture	○	
2	Selective timber extraction (subsistence and commercial) and associated infrastructure (log storage/camp sites and access roads)	○	●
3	Community infrastructure (village housing, roads, health and education facilities, airstrips, sport fields, etc.)		●
4	Small-scale and artisanal mining (gold and diamond)	○	●
5	Forest fires (anthropogenic)	○	
6	Natural (non-anthropogenic change) fire and& winds/storms	○	
7	Brick-making (seasonal charcoal production)	○	

15 http://forestcompass.org/case-studies/community-based-forest-monitoring-north-rupununi-guyana

16 A memorandum of understanding was signed with the Guyana Forestry Commission (GFC) establishing the Annai District Community Demonstration Site, to trial this C-MRV approach.

17 Tangible local benefits are imperative, as relying on community reciprocity or participation alone cannot compensate for the opportunity cost of foregoing more attractive economic activities (like mining). In case of Guyana, community members undertaking monitoring activities require financial compensation for their services, which will require external funding sources (Bellfield et al. 2015:153).

18 http://forestcompass.org/case-studies/community-measurement-reporting-and-verification-wai-wai-kanashen-guyana

19 Results of a participatory workshop held in Annai on community drivers of deforestation with members of 16 villages of the North Rupununi region.

20 Forests are defined as one ha. with a minimum tree cover of 30% , and minimum height of 5 meters. Deforestation is one hectare or more of forest that has been permanently cleared/ clear cut.

Recommendations

Experiences from Guyana and Brazil show promising pathways to scale-up community monitoring models in REDD+. However, these two case studies also reveal some significant social, economic and political barriers.

In order to catalyse integration of community-based monitoring models within wider REDD+ frameworks, key areas of focus for policy makers and facilitators in the near-term include:

- Promoting the use and sharing of community-generated information through cross-scale coordination and data sharing agreements, and institutional mandates for data assimilation;
- Balancing local and external monitoring needs and priorities to ensure the relevance of information to multiple stakeholders and the sustainability of monitoring initiatives. These participatory monitoring frameworks can include indicators that address mutual and specific monitoring interests;
- Earmarking funds generated through REDD+ financial mechanisms to sustain and catalyse local monitoring, training and institutional capacity-building;
- Standardising aspects of community-based forest monitoring methodologies by establishing basic minimum standards and protocols, and guidelines on best practice. This can help improve comparability and replication at scale.
- Promoting community-led impact assessments and monitoring of performance indicators to incentivise participation and benefit-sharing transparency in REDD+ (in addition to indicators on carbon stocks and drivers of forest change).

These reinforce similar recommendations suggested by Angelsen et al. 2012, Danielsen et al. 2013, and Herold and Skutsch 2011.

Conclusions

The success of REDD+ depends on strategies that recognise the important role of local communities in managing tropical forests[21] and in supporting REDD+ implementation efforts – particularly in terms of monitoring and safeguards requirements.

The involvement of local communities in forest monitoring can be a viable approach to foster meaningful participation, promote information exchanges to answer critical design questions, and enhance transparency and better forest governance in REDD+.

Experiences from the North Rupununi, Guyana and the state of Acre, Brazil, show important insights into how to allow community-based forest monitoring to fulfil its potential in REDD+.

Further reading and resources available on www.forestcompass.org

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21 ITTO and RRI 2011.

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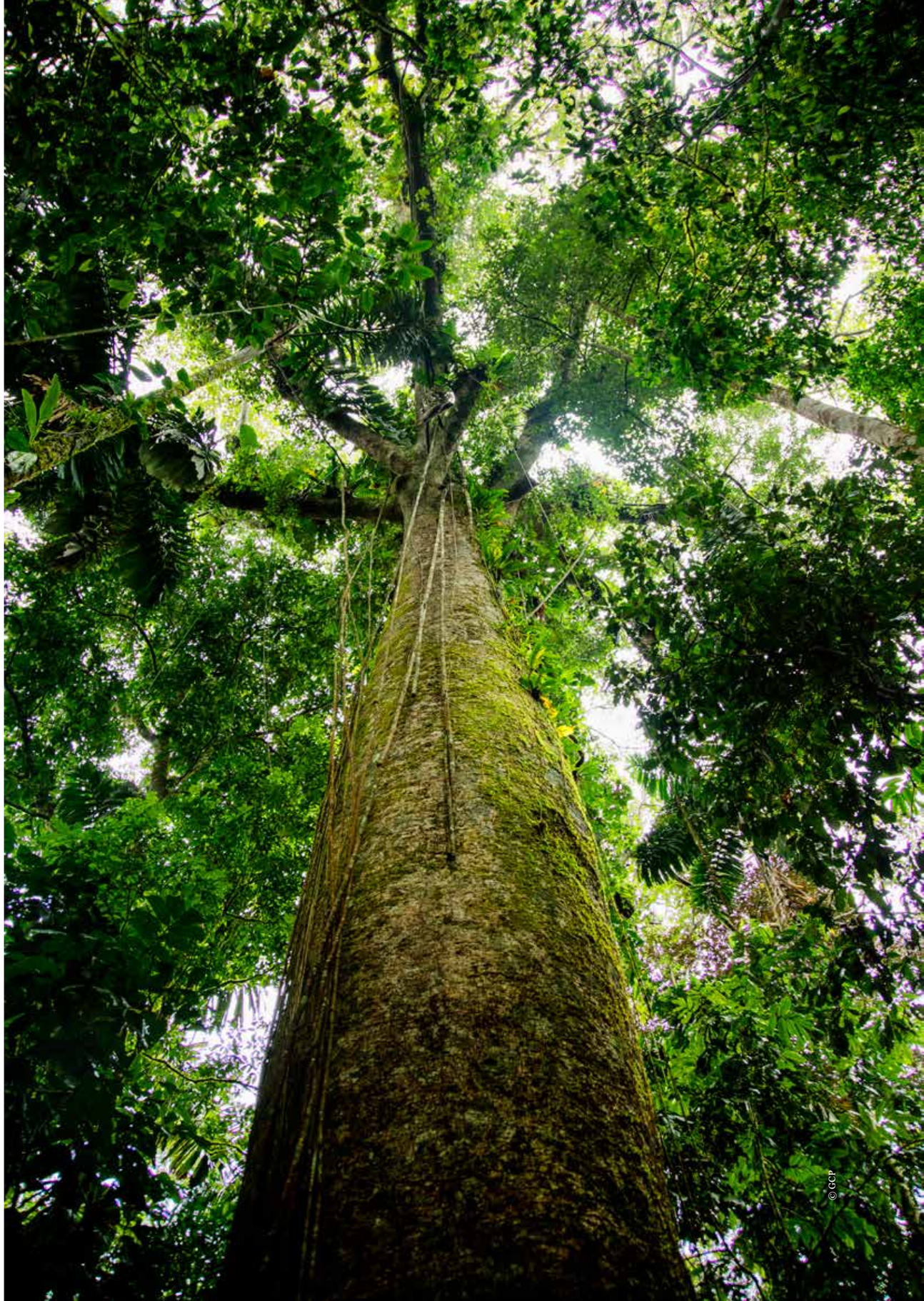


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