WORKING PAPER

WORLD RESOURCES INSTITUTE

# Tracking Transformative Forest Actions to Reduce Emissions: An Illegal Logging Case Study

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Suggested Citation: Daviet, Florence et al. 2010. "Tracking Transformative Forest Actions to Reduce Emissions: An illegal logging case study". WRI Working Paper. World Resources Institute, Washington DC. Available online at http://www.wri.org/

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2. Environmental Investigation Agency

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## EXECUTIVE SUMMARY

### Climate-related forest actions

The world's forests play a unique and complex role in the global carbon budget, as emissions from land use change—particularly deforestation—represent around 12–15% of global greenhouse gas (GHG) emissions, yet forests also act as an essential carbon sink through storage and sequestration (van der Werf et al. 2009). Efforts to maintain standing forests or enhance total forest area will therefore be a vital component of international climate mitigation efforts.

At the 2007 meeting of the Conference of Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC), countries adopted the Bali Action Plan as a roadmap to a new international climate agreement. The Plan included a commitment to develop and implement "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries," commonly known as REDD (UNFCCC 2007, p. 3). During subsequent negotiations, the scope of REDD has expanded to include activities to manage forests sustainably and to increase and conserve carbon stocks (collectively known as REDD+).

While there continues to be a number of unresolved issues in the REDD+ negotiations, including how REDD+ activities would be financed and whether or not industrialized countries would be allowed to buy the emissions reductions generated by developing countries to meet their own targets, on one key element the negotiations have remained relatively steady: the need for a "performance-based" or "results-based" approach for recognizing and supporting actions taken under the Bali Action Plan. In practice this means countries need to have the ability to measure, report, and verify that they have taken promised actions to mitigate emissions

July 2010

(UNFCCC 2007; AWG-LCA 2009; UNFCCC 2009). For REDD+, these discussions have focused on the ability to quantify emissions reductions, including the capacity of all countries to complete and improve national GHG inventories over time.

In addition to the discussions in the UNFCCC, there are parallel conversations in which the issue of measurement, reporting, and verification (MRV) has emerged as an important topic. These have occurred in programs that provide upfront finance for countries taking readiness and emission reduction activities like the UN Collaborative Programme on REDD (UN-REDD), the World Bank's Forest Carbon Partnership Facility (FCPF) and Forest Investment Program (FIP), and in bilateral discussions between countries.

Finally, staff in countries responsible for developing REDD+ strategies have themselves identified the need to be able to track where REDD+ strategies are being successfully implemented in order to ensure proper policy design and implementation.

While it is not yet clear how all these initiatives will overlap in terms of the MRV discussion, in all three spaces there are several reasons why countries may wish or need to track activities and outcomes other than those represented by emissions reductions to demonstrate effectiveness in meeting their commitments to various stakeholders. First, given the complexity of the actions that will need to be taken, it may be difficult to track the performance of actions taken purely by looking at emissions reductions, particularly in the short term. Second, many developing countries will need financing support—in the form of grants, loans, or sales of future emissions reductions—to develop and implement national strategies designed to reduce emissions. Depending on country circumstances and the types of activities undertaken, demonstrating results to donor countries or initiatives may require tracking results using metrics other than emissions reductions. Third, and most importantly, domestic decision makers will need a broad array of data at their disposal to assess whether they are on course to achieving their climate mitigation goals and other linked objectives.

## About this paper

This paper explores the types of information and supporting data that domestic actors will need to ensure that national strategies to reduce emissions are being developed and implemented effectively. It does so by focusing on measures to address illegal logging, drawing on specific strategies and recommendations from stakeholder processes in Peru and Indonesia, to consider:

- the types of actions that countries may need to undertake;
- the types of information they will need to gather to track implementation of mitigation actions over time and how they might begin collecting this information; and
- the differential data needs for domestic and international MRV.

Based on this bottom-up information, we then provide options for how a performance-based approach in the UNFCCC and/or for upfront climate financing programs or initiatives could be developed without creating an additional burden on developing countries.

## Why an illegal logging case study?

There are several important reasons to use illegal logging actions as a starting point for addressing implementation of forest actions, as well as domestic and international information needs. Illegal logging is currently a significant driver of deforestation and/or forest degradation emissions in many developing countries. It is also a symptom of weak institutional capacity and forest governance, demonstrated, for example, by endemic corruption, unclear laws and policies, inconsistent enforcement, and poor oversight of forest management activities. As many of the institutions and actors which may be called on to implement REDD+ programs are the same as those currently working on logging and related forest issues, this weak governance presents a significant risk to the ability of countries to successfully reduce emissions from forest loss.

On the positive side, forest-rich countries have already made efforts to analyze the root causes of illegal logging and reduce its incidence. As our two case studies from Indonesia and Peru illustrate, there is a rich body of work to draw from, representing years of research, efforts to establish plans, multi-stakeholder processes, and international cooperation agreements. Governments that have already invested in combating illegal logging could build on this work in their REDD+ strategies. This experience can also provide valuable lessons for countries as they think through other drivers of emissions that they will need to address in their REDD+ strategies.

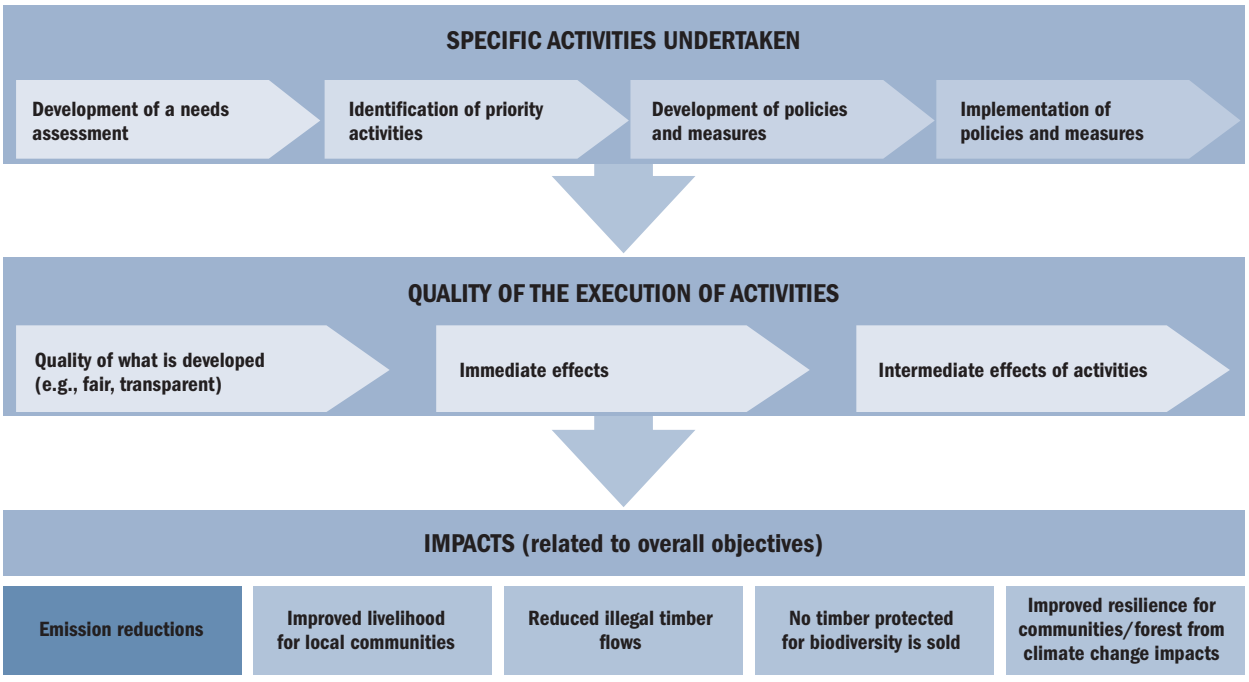
## A results framework for emission reduction actions

In order to examine the process of putting plans into action, we chose to highlight two forest-rich countries key to the success of REDD+: Peru and Indonesia. Both countries are participating in major REDD readiness programs, have been involved in domestic and international processes to address illegal logging issues, and play an important role in the global trade of valuable timber species and wood products. Our analysis examined the outputs of two stakeholder processes:

1. Efforts in Peru conducted by the Environmental Investigation Agency (EIA), a U.S. and U.K.-based nonprofit, to convene stakeholders typically omitted from government decision-making processes in the forest sector to solicit their views on how to combat illegal logging; and
2. A multi-year, multi-stakeholder process in Indonesia to conduct a rigorous analysis of existing drivers of illegal logging and develop a detailed action plan for addressing them.

Based on lessons learned, we produced a framework (Figure 1) to categorize types of information domestic actors will need in order to answer three critical questions: (1) Was there a robust baseline assessment and process for developing REDD+ strategies? (2) Have the activities identified been executed effectively? and (3) Has the suite of

Figure 1 | **A Results Framework for Implemented Actions**



activities implemented had the expected outcomes? In Section V we provide details about indicators that could be used in different parts of the framework. This section also describes the types of data required by these indicators to track progress. In Section VI we consider how the results framework could assist parties and stakeholders to think about what type of information might need to be reported to different types of international actors on the development and implementation of national greenhouse gas reduction strategies.

### Recommendations and next steps

Based on the analysis in this paper, we make the following recommendations for domestic policy makers in forest-rich developing countries and for Parties to the ongoing UNFCCC negotiations.

- Parties should ensure that language in the REDD+ Long-term Cooperative Action (LCA) text builds a results-based system that is sufficiently flexible to recognize and support actions required to address the drivers of deforestation and forest degradation across different country circumstances, including considering different "scaling up" options as part of the phased approach.
- Parties to the UNFCCC should consider reporting some performance information on the implementation of activities as part of the MRV package to bolster confidence of all Parties with regards to the legitimacy of mitigation activities being taken. This information would cover all activities implemented to reduce domestic emissions from land use, land use change and forestry, known collectively as LULUCF or REDD+, including "readiness" activities in earlier phases. Information from developed countries should not only include information about the implementation of forest policies and programs to reduce domestic emissions, but also domestic policies implemented to support REDD+ countries in meeting their climate objectives, such as financing provided or policies that alter demand for forest products.
- Existing international initiatives could inform and help to analyze what information would be most useful for countries implementing REDD+ activities and help countries develop a manageable framework to gather the data they will need over time. Such assistance could be provided by the UN-REDD Programme and the World Bank's Forest Investment Program (FIP) and Forest Carbon Partnership Facility (FCPF). This process would also help better define the types of information needed to track the use of upfront finance and investments in REDD+ activities.
- Regardless of outcomes of the international negotiations on MRV, domestic decision makers should consider adopting a broad results-based framework, such as the one outlined in this paper. In so doing, countries can lay a sound foundation for collecting the data needed to ensure they are using scarce resources effectively to meet their emissions reduction and sustainable development objectives.

## I. CONTEXT

Within the international climate negotiations in the UNFCCC there has been an increasing emphasis on the need for both developed (Annex I) and developing (non-Annex I) countries to undertake actions to curb global GHG emissions, or create so-called nationally appropriate mitigation actions (NAMAs). Since December 2009, at least 77 of the growing number of Parties that have associated with or expressed their support for the Copenhagen Accord have submitted NAMAs, mostly expressed as emission reduction targets for inclusion in the appendices of the Copenhagen Accord. To date, at least 25 non-Annex I countries that have put forward NAMAs have specified that reducing emissions from deforestation and increasing sequestration of carbon sinks or other forest-related actions will be a part of their national strategies to meet their mitigation goals (see Appendix A).

The discussion about actions that developing countries might take to reduce emissions from activities that impact forests started in earnest at Bali in 2007, where Parties

agreed to develop "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries" (UNFCCC 2007, p. 3). Since Bali, the scope expanded to include activities to manage forests sustainably and increase carbon stocks (REDD+). There has also been intensive discussion on the substance of what an agreement would include, including how REDD+ activities would be financed and whether or not developed countries would be allowed to buy the emissions reductions generated by developing countries to meet their own targets.

In addition to the UNFCCC discussions, there have been a number of multilateral and bilateral initiatives to build capacity for and pilot REDD+ activities, which are helping to define the shape of a potential agreement. Of the 25 countries with forest-related NAMAs listed in the Copenhagen Accord, 10 are participating in multilateral and bilateral capacity building and readiness initiatives focused on REDD+. Given the attention on REDD+ in the negotiations, and the size of forest-related emissions compared to those from other sectors in many of these countries, it is not surprising that developing countries are focusing on these types of actions in their NAMAs.

### The importance of how change is recognized

The final contours of an agreement on REDD+ and NAMAs within a new international climate regime remain unclear, as is the nature and extent of the links between the two concepts. What is clear, however, is that one of the main questions still to be answered is how developing countries will be recognized and supported for actions taken to reduce emissions. The Bali Action Plan called for all Parties to have actions that can be measured, reported, and verified, though it differentiates between Annex I and non-Annex I Parties with regards to the exact nature of the actions and MRV. Language in the Copenhagen Accord also makes clear the importance of MRV, stating:

> Mitigation actions taken by Non-Annex I Parties will be *subject to their domestic measurement, reporting and verification* the result of which will be reported through their national communications every two years. Non-Annex I Parties will communicate information on the implementation of their actions through National Communications, with provisions for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected. Nationally appropriate mitigation actions seeking international support will be recorded in a registry along with relevant technology, finance and capacity building support. …These supported nationally appropriate mitigation actions will be subject to international measurement, reporting and verification in accordance with guidelines adopted by the Conference of the Parties. (UNFCCC 2009, emphasis added)

In REDD+ discussions, there is also a clear emphasis on a performance-based approach, focused mostly on quantified emissions reductions for MRV. But while measuring emissions reductions is at the heart of a performance-based approach for REDD+, there are elements both within the REDD+ debates and in the broader NAMA discussions which indicate that the framework for developing and implementing REDD+ policies and measures, as well as for seeking support for these, may require other methods and metrics for tracking change. This is an issue that is not settled and needs further consideration by Parties.

For example, in paragraph 7 of the draft REDD+ text within the primary UNFCCC negotiating track, Parties have included text for a "phased" approach. This would include "the development of national strategies or action plans, policies and measures and capacity-building, followed by the implementation of national policies and measures, and national strategies or action plans and, as appropriate, sub national strategies, that could involve further capacity-building, technology transfer and results-based demonstration activities, and evolving into results-based actions [that shall be fully measured, reported and verified]" (AWG-LCA 2009).

While in this paragraph "results-based" seems only to speak to the quantification of emissions reductions, the text also

requests the Convention's Subsidiary Body on Scientific and Technological Advice (SBSTA) to develop "robust and transparent national forest monitoring and reporting systems" that include monitoring of activities as well as the environmental, social, and governance safeguards set out in the text (AWG-LCA 2009), which speaks to thinking about more than emissions reductions monitoring.

Regardless of how an international agreement will recognize REDD+ actions, many countries will need upfront financing—loans, grants, or investments in return for future emission reduction credits—in order to implement forest emission reduction activities. It is unlikely that most of these reductions will be immediately observed while countries are still developing their strategies to reduce emissions and developing the institutional capacity to implement pledged activities. Outside the formal UNFCCC negotiations, multilateral initiatives have been set up to finance both readiness activities (e.g., the FCPF and the UN-REDD Programme) and implementation of actions that should enable or achieve emissions reductions (e.g., the FIP). As these initiatives are progressing they are increasingly considering both how to help countries monitor whether the implementation of activities is occurring effectively and how to track that financing is being used effectively and meets the program's mandates to do no harm.

Finally, meeting requirements linked to climate finance and international agreements is not the only reason for country decision makers to think about different approaches for tracking the implementation and success of their activities. Most important is the ability of domestic actors to assess whether the financing and resources deployed are achieving overall domestic goals and objectives. This is a point that has been made by a number of countries, such as Costa Rica and Argentina, in their Readiness Preparation Proposals (R-PPs) to the FCPF (Government of Argentina 2010; Government of Costa Rica 2010), as well as by Tanzania during an intervention at a capacity building discussion in Bonn, who noted the need for "monitoring progress and the use of performance indicators" (ENB 2010, p. 7).

Ensuring that non-carbon performance metrics capture the activities that countries undertake in these early phases will be important in creating a comprehensive and practical performance-based approach to REDD and one that is more likely to be effective in reaching its ultimate goals.

## II. ILLEGAL LOGGING AND REDD+

Initial reactions to placing illegal logging within the REDD+ context have been mixed. Not everyone agrees that successfully reducing illegal logging will *ipso facto* reduce emission levels. It is therefore important to acknowledge from the start that for combating illegal logging to contribute to REDD+ through direct emissions impacts it must be part of a purposeful strategy to reduce overall levels of logging, not simply to legalize logging and increase total extraction.

Despite this caveat, there are several reasons to consider illegal logging actions as a starting point for thinking about forest NAMAs and international information needs. First, illegal logging is currently a significant driver of deforestation and/or forest degradation emissions in many developing countries. In some key countries the links between curtailing illegal logging and potential REDD+ strategies have already been shown to be very strong. For example, in parts of the Brazilian Amazon and Indonesia, illegal logging has been found to be a precursor to deforestation as well as a significant source of emissions from forest degradation (Curran et al. 2004).

Second, illegal logging is a symptom of weak forest governance such as inconsistent law enforcement, endemic corruption, unclear laws and policies, and poor oversight of forest management activities. As many of the same institutions and actors may be called on to implement REDD+ programs, this weak governance presents a significant risk to the ability of countries to successfully reduce emissions from forest loss. Several countries have already recognized that addressing illegal logging is part of a comprehensive approach to achieving REDD+ goals. For example, Indonesia and Costa Rica have noted the impor-

tance of strengthening law enforcement and improving timber management practices in REDD+ strategy documents currently being developed though the FCPF.

Third, illegal logging has been linked to poverty, loss of traditional local community livelihoods, increased violence, and other harmful impacts to local communities that stand in the way of sustainable development and human wellbeing (EIA 2007). Efforts to reduce illegal logging therefore carry the potential of multiple social as well as environmental co-benefits.

Fourth, countries that have already invested in combating illegal logging could build on this work to jumpstart their REDD+ strategies. The investment that some forest-rich countries are already making in this arena should not be marginalized by the REDD+ discussions, but rather leveraged and expanded.

Fifth, the extensive work that has already taken place to combat illegal logging can also provide valuable lessons for countries as they think through other drivers of emissions they need to address in their REDD+ strategies. Although some of the actors and issues are different, a comprehensive analysis of drivers such as frontier agricultural expansion or industrial-scale plantation establishment will undoubtedly reveal similar underlying governance and institutional weaknesses and the need for similar priority actions (Pfaff et al. 2010).

Sixth, a clear link has been made between the existing commodity markets driving illegal logging and the actors both inside and outside the country generating the demand for those products. In assessing other drivers of deforestation it is likely that these same links could also be made. As a case study, therefore, it provides an opportunity to consider the role of non-REDD+ partner countries that could implement, measure, and report complementary mitigation actions in this sector. For example, what actions—ranging from enactment of laws prohibiting trade in illegal timber to support for voluntary private-sector initiatives or agricultural research agendas—could countries take to reduce the drivers of deforestation and forest degradation that occur beyond their national borders? What criteria should be considered to ensure that such actions are legally and politically acceptable, and are additional to other REDD+ funding and other types of mitigation actions? To date there has been little discussion of this potentially fruitful approach within the UNFCCC negotiations or discussion processes.

Finally, illegal logging is an example of a driver of deforestation and forest degradation in which defining a baseline/reference emission level with any level of accuracy and precision will be challenging, especially in the early days. This attribute may mean that a more appropriate approach to performance-based financing models would not only aim to track emissions reductions but also to track progress in implementing activities.

## III. CASE STUDIES: PERU AND INDONESIA

In order to examine the process of developing plans and putting them into action, we chose to highlight two countries key for REDD+ discussions that have already taken steps to address illegal logging at domestic and international levels. Indonesia is a major source of greenhouse gases, with land use, land-use change, and forestry accounting for approximately 74.5% of its emissions profile (CAIT 2010). While Peru's contribution to global greenhouse gas emissions is small by comparison, the Peruvian Amazon is an important storehouse of carbon and a valuable provider of ecosystem services and local livelihoods.

Furthermore, Peru and Indonesia are participating in readiness mechanisms that are informing the early stages of REDD+, and both have also recently been selected as pilot countries in the Forest Investment Program of the World Bank's Strategic Climate Funds. The FIP represents significant funding devoted to policy implementation and scaling up of readiness activities in key forested countries. This will lay the groundwork for Peru and Indonesia to be pioneers of REDD+ policy implementation, as well as pilot

cases for how to track actions undertaken using upfront climate financing.

While initiatives in Indonesia are more advanced than in Peru, both countries have taken some proactive steps to tackle illegal logging and its underlying causes. In Peru, over the last decade both the government and civil society have made attempts to understand the drivers of, and design a strategy to address, illegal logging. Efforts have included a Multi-Sectoral Commission for the Fight Against Illegal Logging (CMLTI), which was created in 2004 on the recommendation of a working group assigned to develop a "National Multi-Sectoral Strategy for Fighting Illegal Logging". Other than the creation of the commission, the strategy has not been implemented to any significant degree and illegal logging continues to be a serious issue in Peru. However, this may change as a result of a 2008 Trade Promotion Agreement with the United States, which includes an "Annex on Forest Governance" that outlines priority actions for reforming forest governance and keeping illegal wood out of trade streams.

In Indonesia, concerns over illegal logging have increased over the last decade as decentralization created conflict over who had the authority to issue forest concessions, and weak law enforcement made it difficult to enforce forest laws (Casson et al. 2006). Government efforts to counter black market activity include a 2005 Presidential Instruction to 18 national agencies to coordinate in the fight against illegal logging (INPRES 2005). Beyond these domestic efforts, donor-led efforts also initiated stakeholder processes resulting in a national action plan to tackle drivers of illegal logging. Since 2007 Indonesia has been involved in formal negotiations with the European Union (EU) to sign a Voluntary Partnership Agreement under the Forest Law Enforcement, Governance and Trade (FLEGT) program. While the agreement is not yet finalized, one required element, a Timber Legality Standard, was completed in 2009.

Indonesia and Peru both also present unique challenges for the control of illegal logging due to the high international demand for their commercially valuable timber species and other wood-based commodities. For example, in Peru big leaf mahogany is listed under Appendix II of the Convention on International Trade in Endangered Species (CITES), meaning that internationally traded mahogany is subject to verification to check that that exported volumes have been legally harvested (Grogan and Barreto 2004). Despite this protection, low densities of the species combined with illegal logging activities have caused its range to shrink by 50% and now threaten its ecological viability (Kometter et al. 2004). The Peruvian government estimates that 95% of the mahogany that leaves the country has been extracted illegally, much of it destined for the United States and Mexico (CMLTI 2003; Putzel et al. 2008).

In Indonesia, extraction of valuable timber species such as ramin (listed in Appendix II of CITES) and merbau (under review for CITES listing) also foster illegal logging. In addition, the expansion of oil palm plantations and demand for cheap processed wood products such as sawn timber, plywood, and wood pulp, also contribute to international pressures on Indonesia's forests. It is estimated that international markets comprise 57.5% of Indonesia's wood product market, while estimates of illegal logging in its timber output range up to 80% (Casson et al. 2006), though more recent estimates put that number closer to 40-61% (Lawson and MacFaul 2010).

## Two processes for developing strategies

### *Peru*

In 2010, the Environmental Investigation Agency (EIA) conducted a series of workshops that convened stakeholders typically omitted from government decision-making processes in the forest sector. The objective was to elicit stakeholder views on the major drivers of illegal logging and the types of counter activities they believed should be prioritized, and then to feed this information into the broader policy process. The discussions also solicited stakeholder perspectives on the status of existing efforts to improve forest governance and combat illegal logging.

Workshops were held in the capitals of the country's three major forested regions—Pucallpa, Ucayali; Iquitos, Loreto; and Puerto Maldonado, Madre de Dios—as well as in the nation's capital, Lima. They were attended by 120 people from 69 institutions representing environmental NGOs, indigenous organizations, government agencies, and private-sector associations in Peru. The workshops resulted in a series of recommendations for action. In general, suggestions from participants focused on the different systems, processes, and capacity needs that should be developed and strengthened. Table 1 summarizes the major policy changes and specific recommendations sought.

### *Indonesia*

In 2002, a joint WWF-World Bank Alliance initiative began a multi-stakeholder process to develop an action plan for illegal logging (Casson et al. 2006). This work took place in three phases:

1. Initial research in which both national and international experts reviewed and analyzed the existing literature and information on illegal logging in Indonesia;
2. A stakeholder process that presented the analysis of phase 1 to focus groups for review, conducted individual meetings with key actors from government, industry, and the judiciary, and convened multi-stakeholder workshops that reviewed both phase 1 analyses and the results of the focus groups/individual discussions;
3. The results of the research and consultation phases were developed into a report that combined in-depth analysis of the problem with detailed recommendations that form an action plan for addressing illegal logging and its causes in Indonesia.

In addition to this assessment, we also drew from a subsequent assessment of illegal logging in Indonesia that was conducted in 2008 using a set of indicators developed by Chatham House. The Chatham House assessment was based on the collection of several types of data, including policy arrangements in producer, processor, and consumer countries, quantitative data on levels of illegal logging, and other information on progress on efforts to reduce illegal logging (Lawson and MacFaul 2010).

## Recommendations and solutions identified

While the different processes carried out in Peru and Indonesia were not necessarily thought to produce the final definitive strategies or plans that would be implemented, they nevertheless resulted in many detailed recommendations aimed at improving forest-sector systems and processes to reduce illegal logging. Table 1 summarizes some of the key findings from these two processes with regard to seven policy areas. While not an exhaustive list, these recommendations were selected for discussion based on their inclusion in both sets of country recommendations (for the full documents of recommendations, see Casson et al. 2006 and EIA 2010).

The outputs of the EIA stakeholder workshops contained many specific, contextual recommendations, which often centered on the need to develop more transparent systems and practices in Peru's forest administration. For example, building a better forest service through improving working conditions, hiring processes, and personnel monitoring were all identified as important administrative activities that would be essential to improve the ability of law enforcement officials to perform their duties. Additionally, improving access to forest information by building a database system and improving timber tracking were other essential strategies participants discussed. In addition to recommendations regarding the lack of working systems, corruption, and personnel problems, gaps in legal frameworks were also identified a part of the reason for poor law enforcement.

In Indonesia, we were able to compare the recommendations developed by the multi-stakeholder process with some of the findings of the Chatham House illegal logging assessment, which occurred several years later, and identify areas where improvements had occurred and where gaps remain. For example, Indonesia has taken steps to clarify legality through its participation in negotiations to develop the aforementioned Voluntary Partnership Agreement through the EU's FLEGT initiative. Likewise, processes to

Table 1 | **Key Findings**

| POLICY RECOMMENDATIONS | | |
|---|---|---|
| **Types of Activities:** | **Peru[1]** | **Indonesia[2]** |
| **Establish clear and consistent legal framework** | · Strengthen rules on export of illegal products<br>· Include financiers of illegal logging in penal code | · Improve forest legislation to make certain actions illegal (e.g., road building in conservation areas)<br>· Address overlaps and inconsistencies in laws and regulations |
| **Improve capacity and effectiveness of law enforcement** | · Fair and transparent public hiring process<br>· Clear code of conduct for staff<br>· Adequate staff salaries and performance incentives<br>· Personnel monitoring system<br>· Improved working conditions including formal contracts, personal security, and legal support<br>· Adequate budget allocation and resources<br>· Develop and implement an anti-corruption plan | · Training for forest law enforcement on methods of detection, case preparation, and use of forest data<br>· Training for judiciary on relevant forest laws<br>· Amend procedural laws and establish clear sanctions for investigators who fail to pursue investigations<br>· Broaden jurisdiction of law enforcement officials to pursue illegal logging cases<br>· Improve coordination between agencies involved in law enforcement |
| **Create effective information systems** | · Develop publicly available national database on forest information<br>· Create intersectoral agreement on information sharing between actors<br>· Improve physical access to information (for example, by public facilities for verification and review) | · Develop publicly available information system with relevant forest information that is updated regularly<br>· Develop standard operating procedures to ensure coherent data collection and analysis |
| **Improve transparency and public participation** | · Develop the new forest law with a transparent and inclusive stakeholder process<br>· Government should clearly define processes for including stakeholders, incorporating feedback, and public comment | · Develop disclosure policy on forest sector information through a stakeholder process<br>· Post information on independent websites<br>· Actively distribute information through public campaigns and the media |
| **Improve timber chain of custody tracking** | · Identify a focal point agency to lead monitoring and control of the forest sector<br>· Unify databases to improve timber chain of custody<br>· Focus monitoring efforts on forest management units/extraction sites | · Develop a data reconciliation system<br>· Improve design and implementation of tamper-resistant documentation and computerized systems<br>· Reduce use of illegally obtained paper licenses |
| **Improve local livelihoods** | · Identify and propose legal and viable alternative activities for indigenous peoples and native communities | · Support community-based forestry schemes<br>· Develop social forestry schemes that provide alternatives for local people<br>· Encourage co-management of protected and conservation forest areas |
| **Reduce demand for illegal timber** | · Monitor trade flows and react to shifts in species demand (for example, by adapting extraction fees for species in high demand)<br>· Adopt law that prohibits trade in illegally sourced wood products and requires proof of legality for purchased timber | · Encourage consumer countries to adopt legislation or public procurement policies to source wood from legal and sustainably managed sources (such as the amended U.S. Lacey Act)<br>· Develop and implement FLEGT Voluntary Partnership Agreement (VPA)<br>· Identify strategies to reduce domestic timber demand<br>· Encourage domestic consumers to purchase legal and sustainable timber products |

1. Recommendations from EIA stakeholder workshops
2. Recommendations derived from proposed suggestions in "A Multistakeholder Action Plan to Curb Illegal Logging and Improve Law Enforcement in Indonesia" and findings of the Chatham House Illegal Logging Indicators Indonesia assessment.

improve information systems and update forest permitting processes have begun, but suffer from poor implementation and in some cases poor system design. The results from the Chatham House assessment also pinpointed a few areas not included as recommendations in the multi-stakeholder action plan, such as the need for an independent forest monitor.

In Indonesia much of the emphasis, specifically in the findings of the Chatham House illegal logging assessment, centers on the need to improve implementation of laws and policies. In some cases, explanations for why laws or systems are not well implemented exist in the Indonesia stakeholder document as part of the recommendations; in others the recommendations do not include that level of detail.

## IV. TRACKING WHAT MATTERS

### Defining the characteristics

As noted in the Costa Rican Readiness Preparation Proposal to the World Bank's Forest Carbon Partnership Facility, "The rationale for monitoring the implementation of the strategy is to record the activities that are executed within the REDD+ strategy, to monitor whether they are being implemented as planned, and assess whether they are leading to the expected results" (Government of Costa Rica 2010, p. 85).

By examining the recommendations and strategies identified from Indonesia and Peru, it is possible to identify what types of information are required to answer these questions, as well as highlighting some of the broader considerations for the REDD+ discussions.

### 1. Considering the level of participation

Reviewing the recommendations made by stakeholders who perceive the illegal logging problem at different scales (local versus national) provides an interesting illustration of advantages that a more inclusive stakeholder process can provide when developing policy plans. In the Peru workshops, local actors not only identified concrete, actionable proposals that they believe would make an immediate difference in addressing illegal logging issues, but could link the impacts of addressing these problems directly to their wellbeing and interests.

Perhaps most interesting in this regard are the recommendations regarding the working conditions of local enforcement agents. As Table 1 indicates, local stakeholders in Peru identified a series of reasons why law enforcement officials often do not carry out their duties with regard to illegal logging. These included lack of formal contracts and poor working conditions, such as inadequate salaries, physical safety concerns, and lack of legal support when cases are brought against them by loggers. This valuable level of specificity exists across many of the recommendations made through the Peru discussions. It demonstrates not only that local-level consultation can lead to more concrete strategies but also provides information about how the lives of local people can be directly improved by including their input into decision making and addressing their concerns in the implementation of activities.

Whereas the Peru stakeholder workshops explicitly sought the perspectives of local stakeholders working in or near the forest frontier, stakeholder engagement in the Indonesia plan was broader. In general, the recommendations of Indonesia's multi-stakeholder action plan focus on national-level concerns alongside some ideas for local-level needs; however, the Indonesian recommendations include more specific actions for the broader macroeconomic and institutional setting of the country. These include, for example, the need to address the overcapacity of Indonesia's processing mills and the promotion of legal timber trade by encouraging consumer countries to implement demand-side policies. While some of these types of actions were identified by the Peru workshops, they were not fleshed out in significant detail.

This implies a monitoring system that tracks stakeholder engagement needs to assess not only that there has been a stakeholder process, but to consider who was involved and how substantial their participation was.

### 2. Multiple actions will need to be successful to achieve any impact

One aspect of combating illegal logging that is made very clear in Table 1 is that in all cases multiple activities—each with various subcomponents and addressing various actors—will need to be carried out to impact and change illegal logging practices. What is also clear is that even the successful implementation of some of the broader activities will not solve the illegal logging problem immediately, though these activites may be fundamental to developing a system that will allow illegal logging to be managed over time. In implementing REDD+ strategies, the same dynamic is likely to occur. This implies that a monitoring system needs to be able to track the progress that is being made on "sub-strategies" and activities, as well as the broader trends that will indicate whether policies and programs are having their needed impact over time. In addition, it reinforces the idea that different types of information may be required to assess the effectiveness of these "sub-strategies" and activities, compared to what is needed for tracking impact (in this case, emissions reductions).

### 3. Tracking how things are done is as important as what is done

As Table 1 summarizes, often qualities brought by the system or policy being adopted (e.g., transparency, accountability, participation, and coordination) are considered to be as important as the activity itself by both local and national stakeholders. For example, in both Peru and Indonesia, creating up-to-date information systems for forest-relevant data was cited as a key factor for reducing illegal logging. However, recommendations also stressed the need for these systems to be publicly accessible, ensuring transparency and enabling stakeholders to hold actors accountable by accessing accurate data. Other recommendations included increased coordination between agencies and capacity building among key forestry-sector actors including communities, law enforcement officials, and members of the judiciary. These qualities are often viewed as the principles associated with good governance. The emphasis on these qualities or principles suggests that governance weaknesses are significant underlying drivers of illegal forest activities in many countries.

This, in turn, underscores the need for countries to assess forestry-sector governance issues and subsequently to track not only the creation of a responsive policy, information system, or other response, but also its implementation. Numerous tools have been developed by international organizations that provide methods to diagnose where gaps are occurring and suggest initial solutions. These include the methodology developed by Chatham House to assess the state of illegal logging and the Governance of Forests Initiative indicator toolkit developed by WRI and two Brazil-based non-profits, Instituto Centro de Vida (ICV) and IMAZON. There is a useful and significant degree of overlap between the recommendations from the Peru and Indonesia processes and the generalized toolkits developed to help assess governance gaps that impact forests.

### 4. Policies often have multiple impacts that need to be tracked

Though not fleshed out in much detail, both the Peru and Indonesia processes identify the need to find alternative livelihoods for local communities currently involved in illegal logging activities. In both countries, stakeholders recognize that it is difficult for individuals to refuse the employment opportunities that are provided by undertaking these illegal activities, given their level of poverty and the difficulty of finding alternatives.

In REDD+ discussions, the need to identify alternative development or sustainable livelihood options to reduce poverty is one objective that is often raised as being fundamental for achieving REDD+. Whether looking at the implementation of REDD+ strategies or illegal logging activities, assessing whether poverty is in fact being addressed and communities are adopting alternative livelihoods is likely to be as important for measuring the success of the program as tracking the reduction of emissions, though the actors interested in the information may not always be the same.

### 5. Addressing drivers may require strategies beyond national borders

In addition to considering measures to address livelihoods, enforcement, or detection measures to reduce illegal logging, both stakeholder processes acknowledged the need to tackle illegal logging through reducing demand for illegal timber beyond national borders. In Peru, international demand for mahogany and cedar, as well as other ecologically important species not yet endangered, is a leading cause of illegal logging and consequently forest degradation (Putzel et al. 2008). In Indonesia, recommendations included the need to reduce both domestic and international demand for timber, in part through encouraging the adoption of procurement policies that require proof of legality. This emphasis on international demand as a driver of illegal logging—particularly for high-value commercial species—highlights the need for consumer countries to take action and to track their implementation and impacts.

## V. A RESULTS FRAMEWORK

Tracking the effectiveness of policies and measures requires systems that can gather and distill a broad array of information. The specific types of information needed will vary on a country-by-country basis, depending on the types of policies and measures prioritized, the means of carrying out subsequent actions, the objectives and expected impacts of those actions, and the unique information needs of various domestic stakeholders. While acknowledging that no two countries will gather the exactly the same types of information, in this section we propose a "tracking framework" that broadly categorizes various information needs for tracking the effectiveness of policies and measures both across different types of activities and through time.

The results framework was designed with the recognition that assessing the performance of activities undertaken at different moments in time requires different types of information to capture change and overcome the challenge that some impacts may not be immediate and may not result from any single activity. The goal of the framework is to help decision makers think concretely about the types of information they would want to gather and the potential uses of that information. The framework should be seen as a starting point for discussions for policy makers, experts, and stakeholders working to develop comprehensive information tracking systems. We then draw upon the policies and measures identified in the Peru and Indonesia case studies to provide specific examples of potential information needs across the different levels of the framework, as well as sample performance indicators that might be used to collect that information.

The framework includes three tiers (see Figure 2). In the first tier, *activities undertaken*, we identify four major types of activities that are typical of the general policy process. First, a needs assessment is undertaken to identify key problems and potential solutions, followed by a prioritization process. Next, specific policies and measures are developed and eventually implemented. In this tier, information needs are fairly simple and are geared toward answering the question: has the activity been undertaken or not? In other words, the information collected in tier one should help determine:

a. If a needs assessment has been conducted;

b. If a strategic plan exists that prioritizes a set of identified needs (e.g., a national REDD+ strategy);

c. If specific policies and measures have been developed consistently with the strategic plan (e.g., the adoption of a carbon rights law); and

d. If the developed policies and measures have been implemented (e.g., the creation of a system to register carbon rights).

The second tier of the framework, *quality of execution*, is designed to track information about how the activities identified in tier one were undertaken. Assessing the quality of execution, in addition to more simplistic assessments of whether an activity has been executed or not, can provide a more detailed picture of the effectiveness of policies and

measures, as well as information about the changes that are needed in the case of low levels of effectiveness. We identify three major categories of information that could be useful for tracking the quality of execution, although tracking the effectiveness of a given activity may not necessarily require information from all three categories:

a. The qualitative or quantitative attributes of the activity itself. For example, if the activity is to develop a timber tracking information system, one might ask if the system is comprehensive, accurate, up-to-date, publicly accessible, and encourages information sharing.

b. The immediate effects of the activity. For example, if the new information system is being regularly used by the actors that make decisions and manage different elements throughout the timber value chain.

c. The success of the activity, likely in combination with other related activities, relative to expected outcomes. For example, is the new information system resulting in improved information for identifying the types of illegality occurring, which results in appropriate measures being taken, such as law enforcement and prosecutions?

Deciding what information to gather at this tier is likely to be difficult and potentially overwhelming, since quality can be defined in many different ways by different stakeholders, and measuring quality may involve large quantities of information. However, as some of the examples below illustrate, some of this information is likely already being generated and simply needs to be collected and analyzed. In other cases, new information may need to be collected.

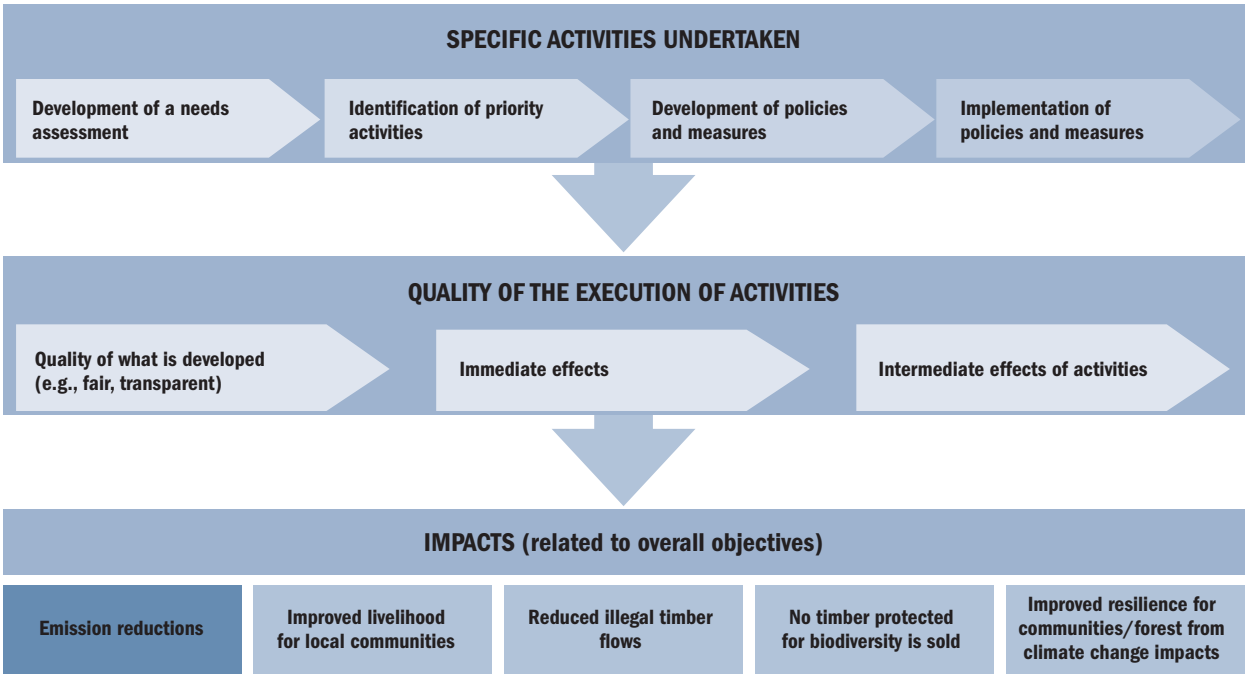
The third tier of the framework, *impacts*, takes into account information about broader trends to ensure that activities undertaken will collectively lead to the desired national outcomes or impacts, such as "reduced illegal logging" or "reduced deforestation emissions." For the latter outcome in particular, there has already been much effort to think about ways to track success in terms of carbon emissions. However, there are other types of information that may be useful to track success, which still require more consideration. For example, some countries hope to implement activities that will also improve the resilience of local communities and/or forest ecosystems to climate change impacts. Understanding what information is needed in these cases is the subject of another paper; however, this paper illustrates the type of information that could be collected when the broader objective is to reduce illegal logging.

## Information and data: a series of examples

The following examples are provided to illustrate the types of data that might need to be collected within systems designed to monitor implementation. The examples draw from one of the strategies to combat illegal logging identified in the Peru case study: to improve the capacity and effectiveness of law enforcement. This particular strategy includes a number of related sub-activities, such as a fair and transparent public hiring process, clear code of conduct for staff, adequate staff salaries and performance incentives, personnel monitoring system, improved working conditions including formal contracts, personal security and legal support, adequate budget allocation and resources, and the development and implementation of an anti-corruption plan. Each example explores potential indicators that could be used to track performance at the different tiers of the framework and at different times to flesh out what types of data might be needed and available, and in some cases, who might track that information over time.

Example 1 explores information needs for tracking the quality of a needs assessment process, since often the needs assessment is one of the first activities countries will undertake before developing a specific strategy, such as a national REDD+ strategy. Example 2 moves forward in time to identify information needs for determining whether or not a specific activity has been undertaken. In this example, the specific activity being undertaken is the development of a fair and transparent hiring policy. Example 3 then explores the information needs for determining the quality of activity execution, in this case the immediate effects of having developed a personnel monitoring system to support the implementation of a personnel performance policy. In the example, therefore, we consider whether there are indicators that

Figure 2 | **A Results Framework for Implemented Actions**




could be used to identify whether or not relevant stakeholders are effectively using the personnel monitoring system. Example 4 considers the types of information that would allow decision makers to track whether multiple activities are having their anticipated impacts, which are in this case identified to be the improved capacity of actors to take enforcement actions. Finally, example 5 considers the types of information countries might collect to monitor a broader impact indicator—reducing illegal logging.

For several of these examples we found that the Governance of Forests Initiative indicator toolkit and the Chatham House methodology to assess illegal logging provided very useful starting points for thinking about what information and data would be required.

## Example 1: Quality of execution: tracking a needs assessment process

**Quality of what is developed (e.g., fair, transparent)**

In many countries there are multiple need assessments and plans which have been generated through various processes but have never subsequently been used or implemented. One of the first elements required to turn plans into action is the interest of multiple stakeholders in seeing the activities implemented and outcomes achieved. This often means the involvement of key stakeholders from the earliest stages—the needs assessment—as well as during the process for prioritizing actions.

The need for an effective needs assessment process when seeking to develop strategies has been discussed in many publications. In the REDD+ discussion it has come up most directly in the context of the UN-REDD Programme and the

FCPF, which even includes a guidance document on how to prepare a consultation process for the development of a Readiness Preparation Proposal (FCPF 2009). In the context of combating illegal logging, the EU FLEGT program, which has promoted national-level multi-stakeholder engagement on forest governance and legality in countries including Indonesia, Malaysia, Ghana, and the Democratic Republic of Congo, has been an important component and has been written about extensively (EU 2007a).

When addressing a complex and multi-level question such as how to tackle illegal logging or reduce deforestation, tracking information about the way the needs assessment process is conducted can help decision makers ensure that they are properly informed by the opinions and needs of all stakeholders directly affected by the activities proposed. This will likely mean expanding the overall objectives that a policy needs to achieve. For example, the need to alleviate poverty or achieve other sustainable development goals may be a vital component of a strategy to reduce illegal logging, or to reduce emissions from deforestation and forest degradation. Such an approach should ensure a broader buy-in for the strategies that will be applied, which in turn will stimulate broader support by stakeholders to see activities succeed (Anau et al. 2002).

The following are a number of criteria often listed in the literature as required to develop a good process:

- A clear process for public participation;
- Meaningful public participation, both at the local and national level, with a particular focus on involving those actors directly implicated in the problem and solution;
- Public access to information on the basis and goals of the policy or plan; and a
- Clear accountability mechanism for incorporating stakeholder feedback in the planning process (e.g., FCPF 2009)

Methodologies exist to assess whether such criteria have been met. For example, the Electricity Governance Initiative (EGI) provides the following concrete guidance on assessing whether public access to information was provided on the goals of a policy or plan:

> "[T]he assessment [monitoring] team could interview policy makers involved in the policy decision to understand which background documents were central to the decision under study. Next, the team could interview various stakeholders from a broad spectrum of interests (such as businesses, NGOs, consumer activists, environmentalists, and social activists) to ascertain whether the relevant documents were, in fact, available in a timely fashion and with relative ease of access. It may be easier for businesses or other more powerful stakeholders to access these documents. The assessment team should be sensitive to this asymmetry in their assessment. They should interview a range of stakeholders to ascertain whether they were all able to access all documents, and make sure to reflect on any such asymmetries in the indicator explanation." (Dixit et al. 2007, p. 62)

Specifically, the EGI toolkit recommends collecting the following information as a part of the assessment:

- *Breadth of documentation availability*: Background documents from various sources that form the basis for evaluating policy options are made publicly available. The available background documents that underpin a policy decision should include official government documents, as well as proposals and interventions from various stakeholders. Both types of documents are needed for the public to have an accurate sense of the interests at stake in a decision.
- *Ease of access*: Documents can easily be accessed by the public. Specifically, documents should be posted on a website, available in a library or reading room, and distributed by the relevant ministry upon request.
- *Timeliness of availability*: Documents are made available at least a month before the date by which public input is sought, in order to give stakeholders an adequate

opportunity to understand issues prior to formulating their comments.

- *Accessible by a range of stakeholders*: A range of stakeholders from business to NGOs and consumer groups are able to access all available documents.

### *Interconnected indicators*

Tracking the next steps related to the needs assessment process—in particular the use of its findings—will also be very important. Tracking whether the findings are used or not, and why, will also help to assess the quality of the process used to develop and prioritize strategies and develop plans after the needs assessment is completed.

### *Types of data*

The data collection in example 1 relies heavily on surveys of stakeholders' experiences in this area. However, it is important to use multiple types of data to ensure the information provided is not misleading. For example, in this case the researcher would check websites, press releases, or other information provided by policy makers in public places about the availability of data, in addition to the surveys, to gather data.

The use of different types of data (e.g., surveys and legal analyses) as well as different types of information (e.g., quality of execution and impact information) to capture what is occurring is built into a number of existing tools used to assess a situation. For example, in the Chatham House illegal logging assessments many different types of information are considered in drawing conclusions about the situation in any given country (Lawson and MacFaul 2010).

While it is human nature to underestimate the uncertainty around quantitative assessments and to be very cautious of more qualitative assessments, there could be significant uncertainties in both cases, driven in parts by the way in which the baseline is set and the quality of data that supports the assessments. For example, the challenges facing such assessments can be appreciated when examining how to track illegal timber flows or related indicators and then use this information to understand the scale and nature of the problem (Lawson and MacFaul 2010) or when looking at the data in Annex 1 LULUCF inventories and the changes over time resulting from improvements in data collection (Daviet et al. 2009).

## Example 2: Activities undertaken: a fair and transparent hiring policy

**Implementation of policies and measures**

Corruption often plagues developing country ministries, which hold power over forest resources and land, and can have devastating impacts, such as the loss of public revenues and forest access for local communities (HRW 2009). A fair and transparent public hiring policy is seen as a cornerstone for ensuring that the most qualified individuals are selected for positions and reducing the opportunities for conflicts of interest or corruption during recruitment.

At this stage we are simply looking at whether a hiring policy exists and is consistent with the objective of having a fair and transparent hiring process. To assess the later question, the following information is needed:

a. Do clear criteria for hiring and promotion exist in the relevant agencies, for example is future staff required to disclose any conflicts of interest?

b. Are there clear consequences for not following the practices outlined?

c. Does the policy require that there be a system in place to monitor the implementation of the policy?

Decision makers could use the information generated by these questions to improve the policy.

### *A fair and transparent hiring system, tracking the quality of execution*

After developing a policy, a system will be needed to actually track its subsequent implementation. This would require an individual or team to examine practices the year

after the new criteria and procedures are implemented to ensure they are being applied, for example: (1) Do human resources officers have information that tracks the hiring and promotions processes and shows how decisions are made? (2) Have procedures to address non-compliance with the criteria been used? (3) Are there cases in which conflicts have been disclosed? and (4) What were the implications?

In this case a regular review of practices—for example by staff in the human resources department—should occur to make sure the change is truly institutionalized and respected. Example 3 explores further what might be needed in such a tracking system.

### Example 3: Quality of execution: a personnel monitoring system

**Immediate effects**

The presence of a personnel monitoring system has been identified as a fundamental component in ensuring that institutions have the best possible staff for undertaking forest management or other activities. A personnel monitoring system is used to support mechanisms that reward staff doing good work and address issues or concerns with regards to work quality (GFI 2009).

At this stage, it is assumed that a personnel monitoring policy and the systems designed to ensure agencies are required to follow the policy are in place. The question is therefore whether the systems are being used and are effective. This requires locating data to answer the following questions, developed as an indicator in the Governance of Forests Initiative indicator toolkit (2009, p. 41):

- Are there actors monitoring the implementation of activities that are independent from actors undertaking day-to-day management activities?
- Is there a monitoring system that is used regularly?
- Is the monitoring based on a broad range of criteria and indicators of performance?
- Is monitoring complemented by independent audits of performance?
- Have corrective measures been taken to address identified problems?
- Are performance reports based on the criteria and indicators identified that are widely accessible to the public?

*Types of data*

Again, different types of data will be needed to answer these questions and establish whether an effective personnel monitoring system is in place. In some cases the assessor would need to talk directly to the individuals doing the monitoring for the forest agency, for example to establish if there is a system in place that they can and do use. In others, an assessor would seek documentation of the criteria and indicators of performance being used. For question "e," documentation regarding corrective measures would be required and interviews might also be necessary. The availability of performance reports can be relatively objectively assessed, for example: is it available on a website? Is it available on request? Is it sent when requested by the researcher?

### Example 4: Quality of execution: the effect of improving capacity and reducing corruption

**Intermediate effects of activities**

Once the various activities identified in the strategy have been implemented, the bigger question is whether these activities add up to an effective solution to at least part of the overall problem identified. For example, do these activities lead to an increase in the effective prosecution of those accused of committing forest-related crimes? To answer this question one could consider whether:

a. More law enforcement officers are following clear procedures for collecting evidence and documentation for offenses as the basis for arrest, judicial proceedings, etc.;

b. Data is being used by prosecutors to develop cases; and

c. More cases are being successfully prosecuted in a similar time period, e.g., a year.

The Chatham House tool has additional relevant indicators that could be considered, such as:

d. Total volume or value of timber seized during year ($m^3$).

e. Number or total value of fines issued or collected during a year.

f. Number of illegal logging cases initiated during a year.

g. Number of custodial sentences issued during a year.

h. Number of mill or harvesting licenses revoked for illegal logging during a year.

Whatever indicators are chosen to capture whether the effects of multiple activities have been successful, indicators will need to be selected and data collected from the outset to track change accurately over time. This is true of all information gathered for the results framework: initial data about the policy situation as it stands at that time will be needed to establish a baseline. Subsequently, the same types of data will need to be reexamined periodically during implementation. A failure at any point to see the expected change may mean the need to reassess the activity and the ways in which it was being executed.

In many cases decision makers already have this information in hand but do not yet use it for policy assessment and improvement. For example, in Brazil staff from Instituto Centro de Vida were able to identify the number of illegal forest activity administrative processes in Mato Grosso that were canceled as a result of the incorrect gathering of infraction data or filling out infraction forms. They looked at a sample of the "forest management" cases put forward and the documentation of the result of the cases (A. Thuault, pers. comm., June 18, 2010; Brito 2009). This type of data would be very useful for decision makers to consider when seeking the type of information listed above, but would require that (a) judges clearly list why a case has been decided in a certain way; (b) that the assessor have access to the information, the ability to collect it, and a mandate and budget to undertake the activities; and (c) the information is fed back to decision makers who are seeking to improve practices and have a process by which to do so.

## Example 5: Alternative impact data to assess success

**Reduced illegal timber flows**

One of the questions posed in the Chatham House illegal logging assessment is whether government agencies are systematically using appropriate information gathering tools to identify illegal activities, such as remote sensing systems, in-the-field investigator tools, material flow analysis (such as wood input/output estimates or comparison of import/export data), and log tracking and checkpoint systems (Lawson and MacFaul 2010). Though the data is not currently being collected with sufficient thoroughness to build a complete picture, these tools could be used to capture more direct quantitative data than has been considered above to track the success of a strategy. For example, a wood balance analysis[1] could provide an alternative approach to thinking about tracking the success of implementation of a series of activities to reduce illegal logging.

However, the same paucity of data that makes it difficult to set a reference emission level for this driver of deforestation and forest degradation will also make using these methods challenging unless countries make a specific effort to gather better data. The Chatham House report states that it has made some reasonably confident conclusions about

1. Wood balance analysis attempts to measure illegal logging in producer countries by comparing legal supplies of logs (licensed harvesting and legal imports) with total demand for timber (the logs needed to account for total domestic consumption and exports). Import-source analysis seeks to estimate the amount of illegally-sourced wood being cut to feed individual consumer countries by converting wood products into round wood equivalent (the volume of logs required to produce a given product), then multiplying the overall quantities of imports from individual producer countries by estimates of the rates of illegal logging in those countries (Lawson and MacFaul 2010).

the direction and extent of change in the rate of illegal logging in producer countries—based on wood-balance models, expert perceptions surveys, and other data-but it also notes that better information is required in the future if a more precise and more complete picture is to be achieved. In particular, to achieve higher levels of precision in wood balance models, governments need to improve efforts to collect reliable figures for legal timber production and consumption and need to be more transparent with the information obtained (Lawson and MacFaul 2010).

Chatham House experts also identify some alternative options to gather information, including trying to measure illegal logging directly by comparing satellite imagery with official concession maps and harvesting plans (Lawson and MacFaul 2010). Again they emphasize that the consistent and rigorous collection of this data by the government and its availability to stakeholders is fundamental for its usefulness. They also consider engagement of a formal independent monitor of forest law enforcement and governance, such as that which is in place in Cameroon, to be an effective tool for gathering information (Lawson and MacFaul 2010).

### *Other types of impacts*

Biodiversity, poverty alleviation, and sustainable development are all alternative impacts that may be simultaneous objectives of an action taken that also mitigates GHG emissions. In each case different indicators will be required, although some of the underlying data, or processes to collect data, will be similar. For example, one way to track whether illegal logging rates are decreasing or biodiversity is being protected may include looking at the types of tree species that are being harvested. In those countries where endangered species are protected from legal harvest, the percentage of this type of timber harvested should diminish. Another potential indicator might be diminishing rates of roads being cut into primary or intact forests or national parks. This information could be captured by the same types of satellite data used to track timber harvest in concession areas.

## VI. LINKING DOMESTIC ACTIVITIES TO INTERNATIONAL PROCESSES

Domestic decision makers who embark on the kind of information and data gathering exercises outlined above for REDD+ will in the course of their activities compile a significant amount of information. International discussions then have key questions to address: namely (1) which information gathered at the domestic level should be communicated to the international community; (2) how the information reported differs depending on the type of initiatives/processes to which it is being submitted (e.g., UNFCCC versus FIP); (3) how frequently it should be reported; (4) how it should be communicated; and (5) whether and how it should be "verified."

The answers will depend in part on whether and how developed countries are providing support and for what types of activities. For example, programs providing upfront financing or support to implement specific activities, rather than payments for emissions reductions, may require different types of information to feel confident about the use of the financing they have provided. In the UNFCCC process, there may also be incentives for countries to report on additional types of information that is not linked specifically to financing, to demonstrate progress in implementing climate mitigation actions. This approach may be especially important where activities are building the enabling environment to achieve emissions reductions, or are difficult to quantify with certainty. It may also help identify where emissions reductions are the result of the effective implementation of specific activities, rather than other drivers of change. How Parties envisage NAMAs, REDD+, and how to recognize "scaling up" activities in the phases will determine what types of information will be important. Box 1 gives some initial thoughts on this point related to the analysis undertaken in this paper.

In any international system, a reporting approach that incorporates information about the development and implementation of mitigation plans, as well as GHG inventories, would allow for innovation as well as mutual

### Box 1 | Performance Metrics and the Phases

Since many countries may not immediately be able to achieve national-level emissions reductions from REDD+, there have been different discussions about how to allow countries to "scale up" to this approach. Part of the solution posited has been the phased approach. When thinking about the relationship between the phased approach and performance metrics, Parties have mostly focused on three options: (1) moving from sub-national to national reference emission levels; (2) using alternative impact performance metrics, such as reduced deforestation; and (3) limiting the scope of REDD+ to focus on emissions from deforestation only.

All three options are interesting to consider, however they all continue to focus on impact/outcome monitoring: e.g. emissions reductions. As can be seen from the illegal logging case studies, these options may not be compatible with activities to reduce the drivers of deforestation and forest degradation emissions. While the strategies of Peru and Indonesia include the need for localized activities and interventions that could fit in a sub-national approach, they will also require simultaneous national-level actions and reforms, such as mandating that financial institutions apply new social and environmental safeguards to ensure that development projects do not generate unsustainable demands on existing forests. Nor, when implementing activities to address a driver like illegal logging, will it always be clear whether the greater impact will be emissions reductions from reducing deforestation or forest degradation for a given activity. Therefore, tracking only one indicator may underestimate the broader value of the activities for emissions reductions.

When considering how to develop a system with positive incentives for countries that are implementing strategies, where there will be a lag-time for emissions reductions at the national level to appear, a fourth approach should be considered: using alternative performance metrics to track the implementation of strategies to address the drivers of deforestation and forest degradation as well as developing national GHG inventories.

recognition among countries. Countries would have more flexibility in defining indicators for tracking change based on domestic circumstances, while the use of standardized approaches for quantifying emissions and sequestration would enable eventual comparability across countries and an overview of ambition and the result of effort across the international system.

In many ways this approach has similarities to the current reporting to the UNFCCC, which includes both national communications with more qualitative information and inventories with more quantitative data. The guidelines governing national communications, however, may not be sufficiently rigorous to produce a clear and consistent picture of the effectiveness of policy implementation (Fransen 2009). Arguably, they could be improved through countries including more information from the "quality of execution" portion of the above discussion.

Whatever system is adopted, the amount of information that could in theory be provided about the implementation of specific activities is potentially overwhelming. Consequently, the following section presents four options that could help foster effective information provision, and assist Parties in thinking about different approaches for limiting the amount of reported data. The components in each option could be used separately or in various combinations. In each case it is assumed that countries will also have emission/sequestration inventories and be able to track changes in emissions over time.

#### *Option 1*

This option builds on the approach taken in the EU FLEGT process (see Box 2). Countries would report on specific activities at a relatively simple level, for example, noting where a policy, tool, or process has been developed and applied (e.g., the specific activities undertaken described in tier 1 of Figure 2). Additionally, they could report on processes in place to monitor and adjust activities imple-

mented domestically. Specific indicators to ensure that effective institutions and practices are in place could be developed in the same vein as those described in the section above, but would speak to the implementation of all REDD+ activities in the country. In other words, countries would report on the effectiveness of their institutions and systems to track and monitor the implementation of activities, rather than providing any information from the quality of the execution of activities, as described in tier 2 of Figure 2.

As part of this approach, or indeed of any of the three options, an independent monitor could be employed (also an approach used in the EU FLEGT process) to build further confidence.[2] However, where countries have robust domestic monitoring systems already in place this

### Box 2 | EU FLEGT Case Study: Capturing Domestic Information for International Reporting

The European Union's Forest Law Enforcement, Governance and Trade program seeks to establish voluntary trade agreements with forest-rich timber-exporting countries that commit the parties to bilateral trade in only verified legal timber. A timber licensing scheme has been created that provides an example of parallel domestic and international monitoring components. Countries are required to develop a legality assurance system (LAS) that ensures all licensed timber is produced in compliance with relevant social, environmental, and fiscal laws and is subject to control within the national supply chain. The operational components of this system are subject to domestic verification under the auspices of the relevant government agency or outsourced service provider. In addition to this requirement, countries must establish an independent or third-party monitoring body responsible for assessing the system's overall performance. This body reports to a Joint Implementation Committee composed of representatives from the European Commission and the partner country responsible for implementation of the Voluntary Partnership Agreement (VPA). The independent monitor is also responsible for making technical recommendations for improving the system, in the event that it is not functioning effectively.

Conceptually, the FLEGT system is designed to separate the function of gathering specific domestic information on individual forest crimes or regulatory infractions from that of monitoring the overall effectiveness of the legality assurance system. Terms of reference for the independent monitoring body are established during the agreement's negotiation with each country. This allows flexibility in the design and implementation of monitoring systems, reflecting different institutional arrangements and levels of risk, while providing for a minimum level of assurance and accountability from all countries entering into a VPA. The EU has developed technical guidance for various elements of independent monitoring. These include developing a transparent mechanism for appointing third-party monitors, ensuring independence of monitoring from other elements of the legality assurance system, and developing transparent monitoring methodologies that seek stakeholder input (EU 2007b).

Thus far, three countries have signed such an agreement with the EU: Ghana, Republic of Congo, and Cameroon; others are in line. Ghana's is the most advanced, with recently developed terms of reference for independent monitoring. These TOR assign tasks that include: assessment of the overall implementation and effectiveness of the LAS; identification and documentation of system failures; assessment of corrective actions taken; assessment of the adequacy of data management systems supporting FLEGT licensing; and reporting of findings to the Joint Implementation Committee alongside a public summary report.

The overall goal of this system design is to ensure independent mechanisms are in place that can track whether the VPA systems and policies, such as issuance of credible FLEGT licenses or a timber tracking system, are being implemented effectively.

A similar system design in which domestic actions are monitored in more detail, with international reporting requirements that focus primarily on system credibility/effectiveness and performance-based results, could provide an effective solution for reporting actions supported by international finance.

Table 2 | **A Combined Approach**

| Components | Types of Information Reported |
|---|---|
| **1. Information about activities undertaken** | Adoption of new policies, development of new tools, processes, or programs (e.g., the development of a new information system) |
| **2. Information about the monitoring of systems that track the quality of implementation** | Successful implementation of policy process and administration of systems, for example:<br>a. Are there actors monitoring the implementation of activities who are independent from actors undertaking day-to-day management activities?<br>b. Is there a monitoring system that is used regularly?<br>c. Is the monitoring based on an suitable and manageable range of criteria and indicators of performance?<br>d. Is monitoring complemented by independent audits of performance?<br>e. Have corrective measures been taken to address identified problems?<br>f. Are performance reports based on the criteria and indicators identified widely accessible? |
| **3. Monitoring of intermediate impacts (e.g., impacts of law enforcement efforts)** | Indicators that show changes resulting from a series of activities, for example, tracking the number of successfully prosecuted cases to assess a change in management or enforcement practices |
| **4. Monitoring impacts related to the policy goals other than emissions reductions (e.g., poverty alleviation, reduction of illegal logging)** | Alternative policy goals are being met (e.g., reductions in household poverty demonstrated through surveys or other metrics; wood balance modeling estimates of illegal logging are declining) |
| **5. Emissions and emissions reductions** | Forest and GHG inventories to track changes in emissions over time |

may not be necessary, or could be altered to fit country circumstances.

### *Option 2*

Another approach might be for countries to report on specific activities taken at a relatively simple level (e.g., tier 1, Figure 2) and then to identify the types of information that would represent monitoring implementation at a more aggregate level—such as in Example 4—to indicate where the implementation of solutions is having an effect. The number of indicators needed to communicate change at an aggregated level would be more manageable than communicating the outcomes of every activity taken to achieve solutions identified in REDD+ strategies. They could also be tailored to national circumstances and the strategies being pursued.

### *Option 3*

A third option would look like option 2, but rather than using indicators relative to the effect of implementation of activities, indicators could be based on alternative, complementary "impact" indicators linked to the objective of identified strategies. For example, if the REDD+ strategies were seeking to reduce the number of cows per hectare, improve livelihoods, and reduce GHG emissions, data could be collected on all three objectives to track the status of implementation.

### *Option 4: A Combined Approach*

The quality and the credibility of data used to pursue any of these three approaches will dictate whether the information gathered can be trusted. This is also true of GHG inventories, where the experience of Annex I countries shows that robust GHG inventory systems can take years to develop. Even after 10 years, the quality of LULUCF inventories in Annex I countries still requires improvements in most cases, and very large variations in reported data still occur from year to year, as can be seen for example by the recent revision of the Canadian LULUCF inventory due to new forest management information (Daviet et al. 2009). As this experience is likely to be mirrored in developing countries, drawing on different types of information may present the best approach to a robust system for tracking change. Table 2 therefore combines elements from all three options.

## VII. REDD+ ACTIONS THAT CROSS BORDERS

Stakeholders in both Indonesia and Peru identify a role for demand-side measures for addressing illegal logging. Demand for no-questions-asked timber can be domestic or international. Countries producing timber can identify policies and measures to tackle this demand in their own territories, but "consumer country" trading partners also need to take action to address their role in the problem to ensure an effective solution.

Governments of several timber importing countries have established, or are considering actions to set up, demand-side programs precisely to try to bridge that gap. For example, the EU's initial approach through its FLEGT initiative engages bilaterally with countries though voluntary partnership agreements that commit the parties to trade in only verified legal timber (see Box 2 for more information). The U.S., under the amended Lacey Act, prohibits the import, export, and commerce of wood products produced outside of any country's laws.

Various EU countries, Japan, and New Zealand have also put procurement policies in place (Lopez-Casero and Scheyvens 2008); as of July 7, 2010, the EU has passed a new timber regulation that prohibits introduction of illegal timber into EU markets and requires a standard of due diligence similar in basic ways to the Lacey Act. The U.S., for its part, is working through bilateral MOUs and in some cases trade agreements to expand its support to individual countries seeking to clarify their domestic rules and laws.

International demand-side measures aimed at managing the drivers of deforestation are also being contemplated in the context of non-timber products. Proposed standards on biofuels and other agricultural products could be used to discourage the import and sale of land-intensive products that are driving the conversion of forests into farmland and plantations in many countries.

International demand-side measures are deployed at the border in the form of import bans, or at the point of sale in the form of standards-based labeling or procurement measures. They have proved to be controversial, in both the trade and climate policy debates, due to their potential to interfere with free trade. If the measures are not negotiated and agreed upon between the exporting and importing countries, exporting countries may view them as unfairly coercive and an extraterritorial interference with sovereignty. Because they require the importer to distinguish among otherwise physically identical products on the basis of their production method, demand-side measures can be seen as indirectly and unfairly discriminatory against the exporting country.

Current programs to combat illegal logging, however, can provide some early lessons on how to increase the legal and political acceptability of demand-side measures, particularly to REDD+ countries, in a multilateral setting

The first lesson is that demand-side measures should be designed, as far as possible, to promote the sustainable forestry management laws and policies developed and adopted by the REDD+ country itself.

The second is that the legal and political acceptability of either of these kinds of trade measures—even if they are based on exporting country policies—would be enhanced through bilateral and multilateral diplomacy aimed at coordinating enforcement across borders and harmonizing standards. While the use of trade bans as a means of enforcing legality or other standards of the exporting country might be welcomed by some stakeholders, they may not be if the importing country is using its own interpretation of those standards and whether they have been enforced. Both the EU FLEGT and the amended Lacey Act have been clearly set up to support exporting countries' laws; where these are not clear, there is the intent to assist producer countries to clarify those laws and set up the institutions and processes needed to implement and monitor the effective implementation of the laws. The Convention on International Trade in Endangered Species (CITES) also uses these two approaches—capacity building around development and implementation of

legislation in export countries linked to coherent trade measures—to create a holistic system (Reeve 2002).

Third, it may be that countries will wish to differentiate between measures to reduce or halt imports of products harvested or produced illegally (as defined by the country of origin) and standards-based labeling or procurement requirements designed to discourage the purchase of products that have incentivized deforestation or forest degradation (that is legal, as defined by the country of origin), thereby causing GHG emissions. These two types of measures will have different impacts in the producer country. The first type of measure, which aligns most closely with the types of bilateral agreements already in existence with regards to timber, speaks directly to creating an "enabling environment" for actors who may wish to take REDD+ actions, or other domestic forest or land management activities. The latter distinguishes among products based on their impact on GHG emissions. While this should in fact be the result of countries taking actions to reduce emissions from land use and forestry activities, the laws and standards are likely to be new and require more discussion than the first types of measures. The demand for such practices, however, has already been voiced by various stakeholders, as they become more aware of climate change issues and the need to understand the GHG footprint of the goods they are consuming; therefore, these second set of measures perhaps merit further consideration to ensure improved cooperation between producer and consumer countries.

If countries agreed that there are some policies that all countries should enact to strengthen the REDD+ initiative, further discussions could be held on identifying which would be politically and legally acceptable. Ultimately countries could agree to take collective—bilateral or multilateral—action. Tracking implementation of these policies by any "consumer" country could then specifically consider whether the approach taken has met the criteria set out in the negotiations, for example:

1. *The type of response*, i.e., whether the policy is to assist in creating an enabling environment for countries by focusing on illegality, or whether the policy seeks to increase the incentives for private actors globally to consider how their production impacts GHG emissions.
2. *Recognition of other Parties' laws*, i.e., Parties could track whether importing countries are imposing standards they have developed, or whether bilateral or multilateral standards are being applied.
3. *Capacity building*, i.e., Parties might wish to consider whether bilateral or multilateral agreements also include support to implement the systems required to meet the standard.

Information about how these criteria are being met along with some of the more generic criteria developed in Table 2 could then be tracked as part of the agreement. Some criteria will differ depending on whether producer or consumer countries are agreeing to take such actions. In Table 3, provisions for consumer countries are mostly considered; producer and processing countries might also want to take such actions if they also import many products or if they chose to undertake domestic demand-side actions.

## VIII. CONCLUSIONS

In this paper we examine illegal logging case studies to make the case that MRV of domestic REDD+ actions will require consideration of more than emissions reductions alone. The processes from Peru and Indonesia indicate that large undertakings such as eradicating illegal logging are complex, and that a suite of actions are typically necessary to achieve policy goals. Similarly, in the REDD+ context, achieving the ultimate goal of reducing emissions at the national level will require many actions at different levels, and more than emissions metrics will be required to indicate whether policies and programs are resulting in the changes needed to achieve emissions reductions.

Table 3 | **Potential Categories of Information for Collective Actions**

| Components | Types of Information Reported |
|---|---|
| **1. Information about activities taken** | Adoption of new policies, development of new tools, processes, or programs, for example:<br>· Legislation prohibiting import of illegal timber or plant products (i.e., Lacey Act)<br>· Public and private-sector procurement policies<br>· Bilateral or multilateral trade or other arrangements (i.e., FLEGT VPAs, Free Trade Agreements) |
| **2. Information about how the activities meet the criteria set out by the Parties** | For example:<br>1. The type of response<br>2. Recognition of other Parties' laws and practices<br>3. Capacity building |
| **3. Information about the domestic monitoring of systems that track the quality of implementation** | Successful implementation of policy process and administration of systems in place in the consumer countries (e.g., as shown in Table 2) |
| **4. Monitoring of intermediate impacts expected by the consumer country policy and measures** | Indicators that show changes resulting from a series of activities to implement programs, for example:<br>· Tracking company efforts to evaluate their supply chains<br>· Tracking the budget made available for implementing the activities identified, including capacity building activities<br>· Tracking the number of successfully prosecuted cases of illegal imports<br>· Incidence of illegal shipment confiscation<br>· Number of penalties or fines levied on importers of illegal timber<br>· Import-source analysis<br>· Tracking to what extent trade flows are moving toward less sensitive markets as a result of demand-side measures |

Countries will have to track the process and impacts of policy implementation if they are to ensure that their REDD+ programs are effective. Since in many cases a successful REDD+ program will also need to achieve poverty alleviation and sustainable development objectives, success in meeting these alternative goals will also need to be tracked. However, MRV at the international level requires a different approach. In this context we consider that while performance metrics will be necessary that capture information other than emissions reductions, how much information is needed will depend on the type of actors (e.g., UNFCCC or upfront investors like the FIP), the programs that are developed, and the type of performance they are willing to recognize and support.

Using the case studies of stakeholder processes in Peru and Indonesia, we draw conclusions from the strategy recommendations to inform the development of a results framework that can be used for development and tracking of forest or mitigation actions. We list the lessons which helped frame our conclusions below.

## Lessons learned

*1. The types of actions that countries will need to undertake*

The results of the stakeholder analyses identified in this paper provide a snapshot of the types of actions required to tackle illegal logging. While the actions countries undertake will to a large extent be context specific, there are sufficient similarities, at least in the Peru and Indonesia cases, to provide some initial insights as to the types of information that will be needed.

For example, the stakeholder views expressed in the Peru and Indonesia processes, as well as the findings of the Chatham House illegal logging assessment, indicate that poor implementation presents a major barrier to effective actions, even in cases where the law in question might be well designed. This implementation hurdle will be an important issue for countries to confront as they develop REDD+ strategies; therefore, consideration of how to improve capacity, coordination, accountability, participation, and transparency of actors and systems in the forest sector will likely be a key goal.

Furthermore, the types of actions identified underscore the importance of holistic strategies that include steps taken by international actors. For example, building a comprehensive approach to addressing global drivers of deforestation and forest degradation such as demand for timber and other wood-based products requires actions from developed as well as developing countries to reduce consumption or develop policies that address flows of illegal timber across boundaries.

Finally, in many cases the types of actions countries will need to engage in will have multiple objectives and impacts, some which may overlap with other policy processes. For example, providing alternative livelihoods to forest communities has been identified as a key objective of many REDD+ and illegal logging strategies. Similarly, recommendations on improving public participation in stakeholder processes, development of transparent and effective information systems, and clarifying legal frameworks are all examples of strategies from illegal logging conversations that are frequently discussed in the REDD+ space as well.

### *2. The types of information necessary for tracking implementation of actions*

Strengthening implementation is a key component of achieving policy goals such as reduced illegal logging or emissions from deforestation; consequently, the ability to track whether implementation is occurring and how actions are being carried out (i.e., quality of execution) is especially important. The types of actions identified by the Peru and Indonesia stakeholders underscored this fact and informed our thinking on how different types of information will be necessary for countries implementing and tracking actions.

In the results framework three categories of information are identified: activities undertaken, quality of execution, and impacts. By tracking the continuous process of conducting needs assessments, developing strategies, implementing actions, and evaluating their intermediate and overall impacts, it will be possible for countries to build confidence in their capacity to carry out commitments and eventually achieve goals of emissions reductions and related policy goals such as sustainable development and poverty alleviation.

### *3. Differential data needs for domestic and international processes*

As can be seen from the breadth of activities identified in the Peru and Indonesia stakeholder processes, and the results framework presenting the categories of data to be tracked, the level of monitoring detail required in the domestic context is significant. However, in the international context this level of detail will not be necessary. Options for the types of data reported internationally will need to be worked out in UNFCCC or other bilateral and multilateral processes, but could include approaches in which countries report on aggregated impacts or effectiveness of systems, rather than reporting on detailed implementation in the same way that would be required for domestic purposes. This approach can provide a robust yet flexible mechanism for countries to demonstrate that they are taking actions or to report back to international donors to show how financing is being used and impacting policy goals.

## Recommendations and next steps

Based on the analysis in this paper, we make the following recommendations for domestic policy makers in forest-rich developing countries and for Parties to the ongoing UNFCCC negotiations.

- Parties should ensure that language in the LCA builds a results-based system that is sufficiently flexible to recognize and support actions required to address the drivers of deforestation and forest degradation across different country circumstances, including considering different “scaling up” options as part of the phased approach.
- Parties to the UNFCCC should consider reporting some performance information on the implementation of activities as part of the MRV package to bolster confidence of all Parties with regards to the legitimacy of mitigation activities being taken. This information would

cover all activities implemented to reduce domestic emissions from land use, land use change and forestry, known collectively as LULUCF or REDD+, including "readiness" activities in earlier phases. Information from developed countries should not only include information about the implementation of forest policies and programs to reduce domestic emissions, but also domestic policies implemented to support REDD+ countries in meeting their climate objectives, such as financing provided or policies that alter demand for forest products.

- Existing international initiatives could inform and help analyze what information would be most useful for countries implementing REDD+ activities and help countries develop a manageable framework to gather the data they will need over time. Such assistance could be provided by the UN-REDD Programme and the World Bank's Forest Investment Program and Forest Carbon Partnership Facility. This process would also help better define the types of information needed to track the use of upfront finance and investments in REDD+ activities.
- Regardless of outcomes of the negotiations on MRV at the international level, domestic decision makers should consider adopting a broad results framework, such as the one outlined in this paper. In so doing, countries can lay a sound foundation for collecting the data needed to ensure they are using scarce resources effectively to meet their emission reduction and sustainable development objectives.

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## Appendix A. Non-Annex 1 REDD+ NAMAs submitted to the UNFCCC

| Country | % LULUCF emissions of total emissions[1] | Area of Forest in 2005 (1,000 ha)[2] | Change in extent of forest, 1990-2005[3] | REDD-related action in NAMA[4] |
|---|---|---|---|---|
| Armenia | | 283 | -18% | Restoration of degraded forests, afforestation and reducing the volumes of deforestation, sustaining soil $CO_2$ content and ensuring its increase |
| Benin | | 2,351 | -29% | Sustainable management of natural forest and development of forest plantations to reinforce carbon stocks |
| Botswana | | 11,943 | -13% | Mitigation will involve reducing $CO_2$ from deforestation – or capturing $CO_2$ by, for example, planting forests. |
| Brazil | 66.1% | 477,698 | -8% | Reduction in Amazon deforestation (range of estimated reduction: 564 million tons of $CO_2$ e in 2020); Reduction in 'Cerrado' deforestation (range of estimated reduction: 104 million tons of CO2 e in 2020); Restoration of grazing land (range of estimated reduction: 83 to 104 million tons of $CO_2$ e in 2010) |
| Central African Republic[5] | | 22,755 | -1.9% | Increase forest cover from 11% in 2005 to 25% in 2050 through reforestation, forest management, and the FLEGT process; Promotion of sustainable management of forests and the certification of forests of production; Promotion of the silviculture and the valuation of village, community and private plantations; Promotion and valuation of non-wooded forest products; Development of REDD activities |
| China | -1% | 197,290 | 25% | Will increase forest coverage by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 from 2005 levels |
| Republic of Congo[5] | | 22,471 | -1% | Development of REDD activities; Development of silviculture in degraded forests and silvicultural activities in dense forests; Elaboration of a national land use plan; Promotion of sustainable management of the certification of forests of production; Promotion of silviculture and the valuation of village, community and private plantations; Promotion and valuation of non-wooded forest products; Reforestation of eroded land; Promotion of jobs for the youth towards the regeneration and sustainable management of forest ecosystems |
| Costa Rica | | 2,391 | -7% | On a preliminary basis, efforts for mitigation will focus on the following sectors: transport, energy, forestry and waste management |
| Cote d'Ivoire | | 10,405 | 2% | Reconstitute, convert and sustainably manage the forests of the rural domain and the permanent domain of the State |
| Ethiopia | | 13,000 | -14% | Enhanced district-level reforestation actions for the increment of vegetation cover of 214,440 $km^2$ of degraded lands, lands affected by gullies and slopes including through the management of community areas closed off to grazing; 28,736.70 $km^2$ of natural high forest area sustainably managed in order to reduce GHG emissions from deforestation and forest degradation; 4,390.96 $km^2$ of deciduous forest land sustainably managed to reduce GHG emissions from deforestation and forest degradation; 198,175 $km^2$ of existing forest in exhaustion or production forests established and sustainably managed for the purpose of sequestering carbon; Implementation of agroforestry practices and systems on 261,840 $km^2$ of agricultural land for livelihood improvement and carbon sequestration |
| Eritrea | | 1,554 | -4% | Implement projects and programmes which reduce deforestation and forest degradation and which enhance soil carbon stocks in agricultural soils; Develop and implement projects and programmes for sustainable management of biomass resources, forests and sea thereby conserving and enhancing sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol |
| Gabon | | 21,775 | -1% | Engage in sustainable forest management, reforestation, regeneration and afforestation, etc. In 2010, national forests are 6,000,000 ha. With the proper funds, the national forests will remain the same in 2020, and with diverse pressures from international mechanisms, could increase to 10,000,000 ha in 2020 (see communication for more details) |
| Ghana | | 5,517 | -26% | Promote sustainable forest management; Implement REDD++ mechanism; Implement various forest governance initiatives (Voluntary Partnership Agreement and Forest Law; Enforcement Governance and Trade, non-legally binding instrument); Develop and enforce land use plans; Enhance rehabilitation of degraded forest lands; Promote small afforestation/reforestation activities at the community level; Establish commercial plantations |
| Indonesia | 74.5% | 88,495 | -24% | Reduction in rate of deforestation and land degradation<br>Development of carbon sequestration projects in forestry and agriculture |
| Jordan | | 83 | 0% | Control and stop deforestation, expand forest areas and tree covered areas |

Appendix A. **Non-Annex 1 REDD+ NAMAs submitted to the UNFCCC** *(continued)*

| Country | % LULUCF emissions of total emissions[1] | Area of Forest in 2005 (1,000 ha)[2] | Change in extent of forest, 1990-2005[3] | REDD-related action in NAMA[4] |
|---|---|---|---|---|
| Madagascar | | 12,838 | -6% | Put in place reforestation on a large scale in the 22 regions of Madagascar; Restore the humid zone of Torotorofotsy with an area of 9,000 ha; Improve the management of protected areas through the implementation of a management plan that includes biodiversity management; Development of REDD+ policy and strategy; Reinforcement of current pilot projects that contribute to the implementation of a national strategy on REDD+; Reinforcement of technical capacities on all levels; Development of the institutional and legal framework for the implementation of REDD+; Improvement of knowledge on REDD+ of the general public and decision makers; Improvement of the financial mechanisms for the implementation of REDD+ |
| Mauritania[5] | | 267 | -36% | Bring forest cover from 3.2% in 2009 to 9% in 2050 in relation to the national surface area, through reforestation |
| Mexico | 6.5% | 64,238 | -7% | Included its Special Climate Change Program in 2009 as a NAMA, which includes the forest sector. |
| Mongolia | | 10,252 | -11% | Improve forest management through options such as natural regeneration, plantation forestry, agro-forestry, shelter belts and bioelectricity; Reduce emissions from deforestation and forest degradation, improve sustainable management of forests and enhance forest carbon stocks in Mongolian forest sector |
| Morocco[5] | | 4,364 | 2% | Reforestation according to the "Plan Directeur de Reboisement (PDR)" (Afforestation Plan) adopted in 1994, that puts in place the reforestation of 50,000 ha/year until 2013, and the reforestation of 1 million hectares on the horizon of 2030. Potential of mitigation: 209 kte $CO_2$/year; Protection of the forest from fires by the implementation of the permanent "Plan Directeur de Preventation et de Lutte Contre les Incendies (PDCI)" adopted in 2003. Potential of mitigation: in the process of evaluation |
| Papua New Guinea | 100% | 29,437 | -7% | Will decrease emissions from forestry to 26-32 Mt $CO_2$e by 2030, versus the 50-52 Mt $CO_2$e 2010 level and the 53-64 Mt $CO_2$e 2030 level under BAU |
| Sierra Leone | | 2,754 | -10% | Establish a network of 12 protected areas by 2015; Sustainable management and protection of forest reserves; Delineation and restoration of vulnerable habitats and ecosystems in the western area of Sierra Leone; Provide support for a national assessment of forest resources; Improve forest governance to maintain the proportion of land area covered by forests to at least 3.4 million ha by 2015, through the development of legislation, regulations and by-laws for environmental protection, including control of deforestation, firewood collection and charcoal production and through capacity building, training and support to law enforcement services and the Ministry of Agriculture (Forestry Department); Development of an integrated natural resources and environmental management programme for Sierra Leone, including sustainable land management programmes, particularly in relation to ecosystems |
| Macedonia | | 906 | 0% | Implementation of the national strategic documents in the forestry sector through forestation and re-forestation; Prevention measures against fires, and prevention of 'illegal cut.' NAMAs were derived from the 2nd National Communication |
| Togo | | 685 | -43% | Bring the forest cover from 7% in 2005 to 30% in 2050 compared to the national surface area through reforestation. |

Notes
1. Source: Climate Analysis Indicators Tool (CAIT). http://cait.wri.org/
2. Source: Forest Resources Assessment 2005 – global tables. "Change in extent of forest and other wooded land 1990-2005." http://www.fao.org/forestry/32033/en/
3. Source: ibid. Note that numbers are rounded to the nearest whole number.
4. Abbreviated from country submissions.
5. Translated from French.

## ACKNOWLEDGMENTS

The authors thank NORAD for their generous financial support of this working paper.

The authors thank the following for their review and comments on this working paper's text: Crystal Davis, Taryn Fransen, Polly Ghazi, Adam Grant, Jennifer Morgan, Mark Roberts, and Jacob Werksman.

Financial contributions and/or reviews do not constitute acceptance or endorsement of WRI's findings. The authors are solely responsible for any omissions or errors.

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