ARKN-FCC
ASEAN REGIONAL KNOWLEDGE NETWORK ON FOREST AND CLIMATE CHANGE

DECISION SUPPORT TOOL

Identifying and Addressing Drivers of Deforestation and Forest Degradation

This Decision Support Tool was supported by the United States Agency for International Development's (USAID) Lowering Emissions in Asia's Forests (USAID LEAF) Program, a five-year cooperative agreement implemented by Winrock International (Winrock), in partnership with SNV – Netherlands Development Organization, Climate Focus and The Center for People and Forests (RECOFTC). The LEAF program began in 2011 and will continue until 2016.

ASEAN Regional Knowledge Network on Forest and Climate Change (ARKN-FCC)

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November 2014

FOREWORD

The ASEAN[1] Regional Knowledge Network on Forest and Climate Change (ARKN-FCC) was created in 2008 following the 11th Meeting of the ASEAN Senior Officials on Forestry (ASOF) at which the need to address issues at the nexus of climate change and forestry was highlighted. ARKN-FCC provides ASEAN Member States (AMS) with a platform to share knowledge and expertise in areas related to forests and climate change such as Reducing Emissions from Deforestation and Forest Degradation (REDD+). Information gathered and shared through the network supports ASEAN's decision-making process and strengthens ASEAN's role in climate change negotiations.

The High Level Panel Event on the Land Use Sector and Forests, conducted during UNFCCC COP-19 noted the importance of forestry in the post 2020 climate regime. With around half the ASEAN region covered by forests, AMS need to play significant roles in shaping the legally binding agreement on climate expected at UNFCCC COP-21 in Paris 2015. Many AMS are already engaged in REDD+ Readiness activities and while systems to account for and incentivize reductions in forest related emissions are being established there has been less focus on addressing drivers of deforestation and degradation.

At the 6th meeting of ARKN-FCC in Jakarta in October 2012 a "drivers decision making tool" was proposed and during two subsequent meetings in April and August 2013 a draft Decision Support Tool on Assessing Drivers of Deforestation and Degradation was developed. The draft was reviewed at the 8th meeting of ARKN-FCC in Bali, Indonesia in March 2014 and subsequently tested in Cambodia, the Philippines, Papua New Guinea and Viet Nam. The revised draft Decision Support Tool was presented together with results from testing in Cambodia at the CIFOR Forests Asia Summit in Jakarta in May 2014 and a final draft was reviewed following the 10th ARKN-FCC meeting in Jakarta in September 2014.

In supporting efforts to mitigate greenhouse gas emissions the Decision Support Tool aligns with the UNFCCC Warsaw Framework for REDD+ and also contributes to achieving Article 55 of the ASEAN Economic Blueprint, adopted at the 13th ASEAN Summit in 2007 to guide establishment of the ASEAN Economic Community in 2015. It is hoped that this Decision Support Tool will assist AMS and others to mobilize multi-stakeholder processes aimed at developing and implementing policies and measures to address drivers of deforestation and degradation. Through such efforts the forests of Southeast Asia can be better conserved for future generations and for greater climate stability.

Dr Nur Masripatin, ARKN-FCC Coordinator.

[1] ASEAN Member States (AMS) include Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam.

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INTRODUCTION

In the face of increasing pressures on forests, many countries have begun to explore REDD+ as a mechanism to provide finance for maintaining forest cover and reducing emissions from the forestry sector.[2] With imminent establishment of the ASEAN Economic Community in 2015, the importance of mitigating greenhouse gas emissions by means of effective policies and measures has been highlighted in Article 55 of the ASEAN Economic Community Blueprint (ASEAN, 2008). Projected reductions in forest area between 2010 and 2020 equate to estimated losses of 8.72 giga tonnes of CO2 and with forest conversion the primary driver of forest loss, estimates are that between 13% and 42% of species will be lost in Southeast Asia by 2100 (FAO, 2011; Sodhi et al., 2004).

Although a comprehensive assessment of drivers of deforestation and degradation is an essential part of REDD+ Readiness, it has so far been given a lower priority than topics such as measurement reporting and verification (MRV), reference levels, safeguards and financing. If significant reductions in forest-based emissions are to occur, there is an urgent need for increased focus on both an assessment of factors that drive deforestation and forest degradation, as well as tools and methods to address these drivers.

This decision support tool attempts to fill this gap by describing a process to assess and address drivers in REDD+ countries. This tool is the result of a collaborative process between the ASEAN Regional Knowledge Network on Forests and Climate Change (ARKN-FCC) and the USAID-funded Lowering Emissions in Asia's Forests (LEAF) project to develop guidance on how to implement a process that changes the trend and direction of the factors responsible for driving deforestation and forest degradation.

[2] REDD+ stands for Reducing Emissions from Deforestation and forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

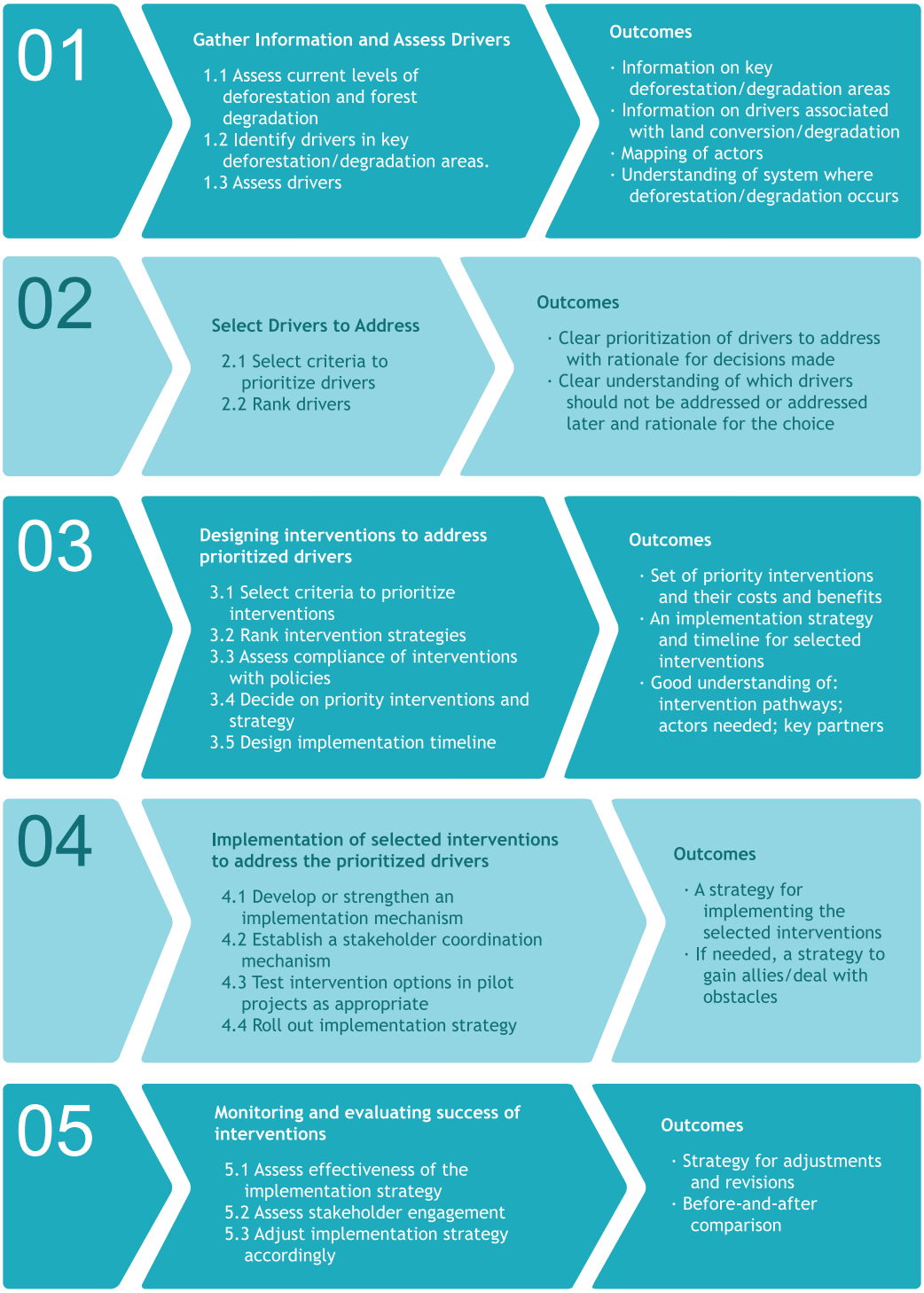
OVERVIEW

The decision support tool comprises five main steps as outlined in Figure 1 below.

- **Step 1** is an information gathering phase that includes an assessment of drivers;
- **Step 2** prioritizes which drivers are most feasible to address;
- **Step 3** design interventions strategies to address the selected drivers;
- **Step 4** is an implementation phase; and
- **Step 5** is a monitoring phase in which the success of the selected measures is evaluated allowing for the overall strategy to be adjusted accordingly.

Although it is intended that the outputs from each step build upon information collected from the previous step, there may be cases where implementing the described process results in steps being run partly in parallel. This tool should not be viewed as a rigid, overly prescriptive approach; individual steps can be taken independently and countries can enter this process at whichever step they are at given their national levels of development. Users may decide the most appropriate use of the tool, either following Steps 1-3 and integrating Steps 4-5 into their country's REDD+ national strategy/action plan, or following all steps where there is no wider process.

Figure 1 describes each step of the decision support tool in more detail, showing the activities during each step as well as the resulting outcomes.



How this guide is presented

Each step in the decision support tool is broken into two parts. The first, which we call the Methodology section, contains a short description of the individual sub-steps that need to be carried out during each step as well as outcomes from the given step. Methodology sections will be presented against a white background.

Figure 2: Format of a Methodology section

Each step also includes an illustrative case study that outlines the efforts of a hypothetical country to protect its forests from the main drivers of deforestation and forest degradation. It follows the story of 'Florestania' and its government, civil society and private sector actors as they confront the challenge of identifying and addressing the main drivers of deforestation and forest degradation in their country. Each case study is designed to illustrate the main points of the accompanying Methodological section. For this reason, the story of Florestania is presented side-by-side to the main text of the steps of the decision tool. Case study sections will be presented against a pink background.

Figure 3: Format of a case study section.

Who is this guide for?

This decision support tool is aimed at national level REDD+ decision makers, REDD+ committee/taskforce members and other stakeholders working with the REDD+ process, in addition to economic development planners whose work extends beyond forestry issues such as REDD+. The tool is intended to help focus the REDD+ process on addressing the root causes of deforestation and forest degradation, thereby leading to a sustainable reduction in GHG emissions from land conversion.

One critically important factor for successfully addressing the drivers through the process outlined here is early and continuous participation of all actors and stakeholders that are associated in a country or region with the deforestation or forest degradation problem in the process. This includes all the relevant government entities, the private sector, local communities and local government, the civil society organizations and whoever else is seen as important in causing and/or addressing the problem. Also, it should be determined from the onset who (which entity) will be leading the process and who should be involved and why. Thus, clear decisions on who will facilitate the overall process and how this should be done are vital to the success of the decision support tool. Creating a continuous dialogue across the various stakeholders along all steps will help to ensure their buy-in to decisions taken along the way and lead to a smoother implementation of the selected measures.

METHODOLOGY STEP 1

Information gathering phase and drivers' assessment

In this first step, a thorough assessment of all the different driving forces exerting pressure on forest areas needs to be done. Here it can be helpful to distinguish explicitly between drivers leading to deforestation versus those that cause forest degradation (defined as the reduction of the capacity of a forest to provide goods and services, FAO 2002). These are likely to be different (or are different in their importance of causing the problem) and it is also likely that different actors have to be involved in addressing these factors.

In this phase the following activities are carried out and the gathered information brought into an easy an easy accessible format:

Step 1.1 - Assess current rates of deforestation and forest degradation

In order to obtain a clear picture of deforestation and forest degradation, it is important to first gather information on the magnitude of the problem and to identify the main geographic areas in which land-use change and forest degradation is occurring. Information sources can include literature reviews, reviews of existing public global data sets on deforestation, interpretation of remote sensing data, historical maps based on field surveys, or expert interviews (see Annex 1). To gain an accurate understanding of deforestation and forest degradation, an historical time series should be assembled from the period of the reference level using a minimum of three time intervals. Starting points for basic forest cover data include the FAO Global Forest Resource Assessment and University of Maryland Global Forest Change (Hansen et al.) datasets, both freely available online.

Table 1: Information sources and the scale at which they are useful

Information source	Subnational	National	Regional
Literature reviews	✓	✓	✓
Existing global data sets		✓	✓✓
Spatially explicitly analyses	✓✓	✓	
Expert interviews	✓✓	✓	
Local level surveys	✓✓		
Statistical information		✓✓	✓✓

✓ = relevant, ✓✓ = highly relevant

As Table 1 shows, the methods and information sources that are best for compiling the necessary information on rates of deforestation and forest degradation differ across geographical scales. This also holds true for assessing the drivers that lead to either one of the problems (see Step 1.3.b).

Step 1.2 - Identify drivers in key deforestation/ degradation areas

In areas that have been identified as regions of high deforestation (over 0.5% is generally cited as a high deforestation rate) and/or forest degradation, information needs to be compiled on what the key drivers are of deforestation and/or degradation, or what predisposing conditions are present which allow for deforestation and/or forest degradation to occur. Methods for identifying significant drivers are closely aligned with methods used to identify rates of deforestation and forest degradation including surveys of households and communities in deforestation areas, participatory rural appraisals, expert interviews, remote sensing analysis, literature review, and the analysis of national statistical information (see Annex 1). As with Step 1.1, no single method should be relied upon to provide a comprehensive analysis. Asking communities or households on their perceptions or knowledge on what caused the changes detected in forest could for example be brought together with statistical data on logging activities or changes in agricultural land in the area and their causes. It is important in this data gathering phase to include information on both how the change occurred, as well as who caused it (see Step 1.3 e).

The information derived from one or a number of the described methods can be brought together in the form of a 'systems diagram' showing how the change in forest cover has been caused and why (see Figure 4). When assessing drivers, it should be clearly differentiated between factors leading to forest degradation versus factors causing complete deforestation. The drivers for either can be different and countries could also choose just to prioritize addressing one set of drivers over the other.

Step 1.3 - Assess drivers

Drivers have various characteristics that are important to assess, as they will determine which measures are appropriate for reducing the pressure a driver exerts. While it is possible to deal with many drivers, others are out of the reach of a specific actor or decision maker. This is particularly the case for so-called 'natural' drivers, such as geological or biological processes that are impossible to influence by humans. Most, but not all 'man-made' drivers, however, can be controlled. An analysis of drivers should therefore include the following characteristics for each driver, as these will be important both for prioritizing and developing intervention options:

A. **Direct or indirect** driver of deforestation and forest degradation: Direct drivers are defined as human activities that directly reduce forest carbon stocks, either through deforestation or forest degradation (e.g., Geist and Lambin 2002; Schaeffer et al. 2005; Kissinger et al. 2012). Indirect drivers are defined as the complex interactions of larger scale factors underlying direct drivers. They often operate diffusely and influence more than one direct driver (Millennium Ecosystem Assessment 2003). Understanding how a driver acts is key for devising the most appropriate interventions, for selecting the relevant actors that need to address the driver and for avoiding unintended consequences that can arise with implanting interventions to address a driver (see more in Step 3 and 4).

B. The **scale** at which the driver operates: Drivers can operate at the local, national, regional or international scale. Information on the scale of operation is important when deciding on intervention options as the scale determines which actors can control a particular driver. Usually a higher

scale actor can control a lower scale driver (e.g., a national government can exert power over a local driver, such as illegal logging practices), while it is difficult for the government to control an international one (e.g., international commodity prices).

C. Identification of **key actors** associated with the identified drivers, as well as 'forest champions' that are likely to play a role in forest conservation and/or restoration. Identifying clearly who the actors are that are associated with a particular driver is important information needed for prioritizing drivers to address as well as when selecting the appropriate intervention options. How to identify the actors for each driver depends on the specific driver and the country situation as well as on if the driver is an indirect or a direct driver and therefore how remote it is from causing the change in forests visible on the ground. In many cases it will be relatively straightforward who the actors are that can be associated with a driver and should result from the gathered information in Step 1.2. With regard to 'forest champions,' these may include a wide variety of actors who actually would want to protect forests. A representative list likely would include environmentalists, forest products industry firms, forest managers, plantation companies and eco-tourism companies. In many countries, important actors to include in consultations could range from small landholder communities to large and powerful commercial firms. As a result, stakeholder discussions could end up resembling negotiations more than consultations, and it will require a strong framework for balancing actors' participation.

D. Identifying **trends and trajectories** in drivers: The direction of a driver and the pressure it exerts can change over time. Understanding some of the trends that can be foreseen for a driver, if it will become more important or not in the future, is very helpful when deciding what drivers to address within a specific location. If for example prices of a certain agricultural commodity whose expansion has driven deforestation in the past, such as palm oil, are likely to rise in the future, addressing this driver will have a higher priority than if prices are foreseen to decline. See Annex 2 for an overview of methodologies that can assist in analyzing drivers' trends.

E. Drivers' **interactions**: Drivers interact with each other to produce different outcomes. The most obvious interactions can be seen between one or more indirect driver that influence a particular direct driver (e.g., demographic and economic drivers determining the expansion of agricultural land into forest areas). The interactions are not always obvious or easy to detect requiring careful analysis of land use data together with other types of information, such as national statistical information, policy analysis documents etc. There is, however, an emerging literature on how certain sets of drivers interact across a range of settings, and methods such as the Syndromes Approach (Bishop 2011) can be helpful when mapping out the system. Understanding systemic interactions between drivers in a specific location is essential to devising successful driver intervention strategies and will help to detect and mitigate unintended consequences of intervention strategies.

Outcomes of Step 1

Upon completion of Step 1 the following outcomes should be available:

- Maps/Information on key deforestation/forest degradation areas
- Information on all the drivers associated with land conversion/ degradation and their relationship
- Mapping of the actors associated with each driver, as well as likely 'forest champions' whose involvement could help to counteract such drivers
- An understanding of the context within which deforestation/forest degradation takes place

CASE STUDY STEP 1

Information gathering phase and drivers' assessment

To begin its work, the government needed to gather information on the starting situation, assess the current overall rates of deforestation and forest degradation, identify the various drivers operating in the major hotspot areas of the country, and then assess the various drivers acting in those hotspots.

Step 1.1 - Assess current levels of deforestation and forest degradation

To get an overall background snapshot of deforestation and forest degradation in country, participants in the Florestania REDD+ Task Force (RTF) began with a general assessment of current deforestation and forest degradation levels. RTF first assessed statistical information from free data sets on forest cover (scanning TREES-3, and Global Forest Watch 2.0) and new spatially explicit analysis of forest cover trends. These provided a geographic overview of the forest trends across the country, which indicated high levels of forest loss occurring near roads in recent years. To complement this RTF compiled a literature review to understand changes in national forest and land use sectorial activities and forest management history (and in particular to gain more information on forest degradation). The literature review also provided important information on future variables such as changing global and regional commodity prices, planned construction and any relevant policy implications. The RTF review supported preliminary statistical information pointing to roads (especially newly constructed highways through forest areas) as main deforestation and forest degradation areas in the country. Finally, RTF interviewed forestry and rural development experts to gain a contextual understanding of national and subnational land use patterns, whose feedback corroborated road construction as the main hotspot areas of deforestation and forest degradation.

Step 1.2 - Identify drivers in key deforestation/degradation areas

Next, RTF worked to establish what were the main variables driving deforestation and forest degradation. Here, they conducted surveys of randomly selected communities in the areas of forest loss identified in Step 1.1. RTF supplemented this data with information from expert interviews, remote sensing and statistical analyses, and literature review in Step 1.1. Their overall analysis identified road construction as most significantly contributing to deforestation and forest degradation, as well as migration into and settlement of forest areas along new highways and commercial and subsistence agriculture land conversion (operating outside and inside forests, respectively). Agriculture however was seen to present a mix of both driver (e.g., tea plantations) and conservation-promoting or compatible (e.g., shade grown coffee) activities. Finally, RTF distinguished between deforestation and forest degradation drivers (e.g., forest clearing such as by fire in swidden agriculture versus firewood gathering).

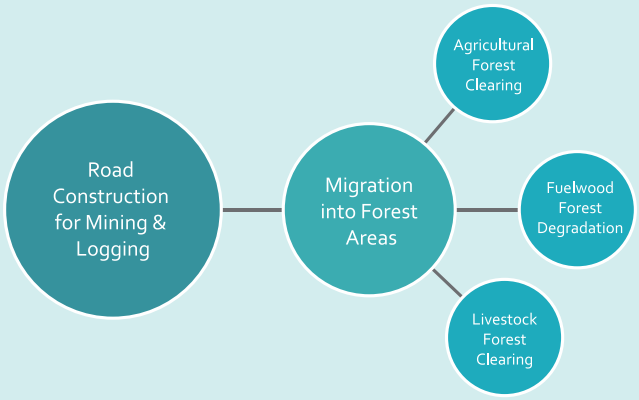
Table 2: Drivers identified in Florestania

Deforestation/ Forest Degradation	Driver
Deforestation	Road Construction
Deforestation	Migration into forest areas
Deforestation	Commercial Agriculture
Deforestation	Subsistence Agriculture
Degradation	Fuelwood Gathering
Degradation	Forest Fire

Step 1.3 - Assess drivers

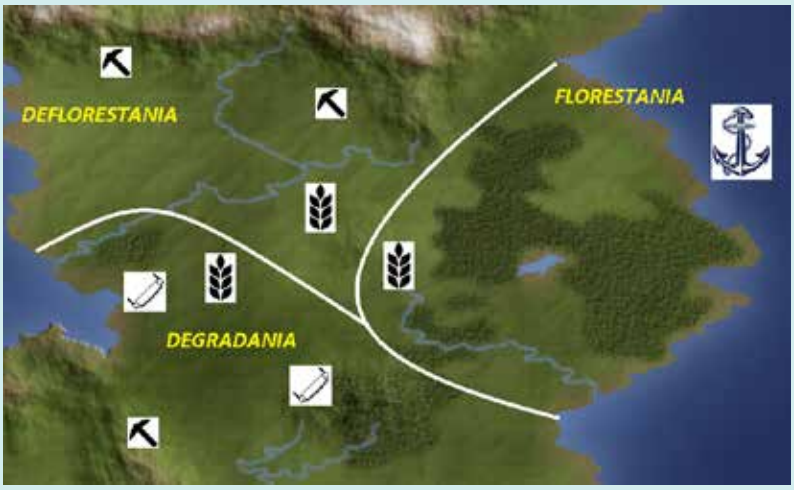
In order to gain a clear picture of drivers operating in the hotspot areas identified in step 1.1, RTF first worked to understand how the forces causing deforestation and forest degradation in Florestania were functioning. Although the new road construction does not result in a great deal of direct deforestation itself, it often incites a wide range of knock-on drivers, including primarily migration of people from other areas into forest areas along the roads, who cut new paths in search of land for small-scale mining, crop and livestock cultivation (see Figure 4 below).

Figure 4: Deforestation drivers in Florestania



Rather than assume road construction itself to be operating independently, RTF considered what forces have been operating to influence this overall pattern (e.g., local or external demand for commodities) at what scale and by what actors, and what underlying conditions have been supporting the driver or preventing more sustainable outcomes. After some discussion the RTF came to realize that road construction actually operates on the basis of other larger drivers, which in turn influence other drivers. Specifically, the RTF concluded that the road construction was mainly due to expansion of agriculture, mining and timber production from the neighboring countries Degradania and Deflorestania, which needed to send increased volumes of their products quickly to the port on the far side of Florestania, as shown in Figure 5 below.

Figure 5: Map of Florestania & neighboring region



RTF then considered the scale of operation of the drivers (i.e., whether at international, national, or local scale) in order to assess which drivers are within their control and even merited intervention strategies. For the drivers that are considered outside of the control of national entities, adaptation strategies were to be developed. RTF determined the extent to which foreign versus national demand for commodities had operated in the hotspot areas, and focused on addressing those national drivers they could realistically address. (The other drivers in the road construction hotspot areas are for the most part determined to be nationally endogenous.) The RTF considered that most large global drivers such as commodities demand were too far outside Florestania's control and other smaller drivers too localized to be able to address at a national scale.

However, RTF still needed to understand the trends and trajectories of both foreign and domestic drivers for the major agricultural commodities of the country (chiefly soy, palm oil and timber). With this in mind, RTF analyzed predicted development factors (e.g., population increases, economic fluctuations and planned infrastructure developments), and new or expected policy changes (e.g., national development policies and sectoral plans, logging and land rights regulations). Additionally, the RTF considered whether any potential scientific or technological innovations might help either reduce or increase the impacts of the drivers identified. In this regard, they discussed the potential effects of new genetically-modified organisms (GMOs) adapted for marginal lands and development of new low-temperature rubber varieties capable of high yields in sub-tropical regions.

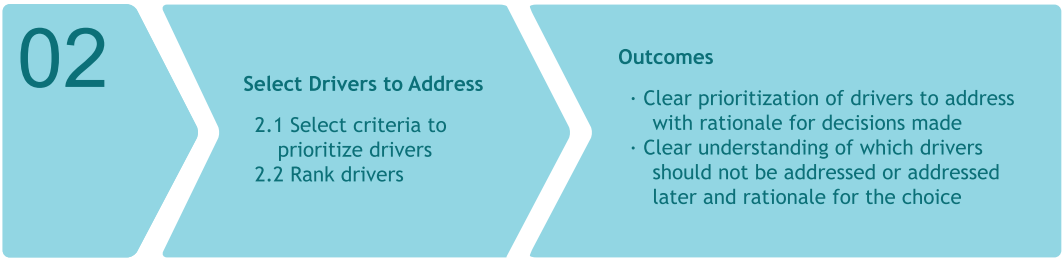
Next, RTF focused on interactions between drivers. For this, the initial literature survey and expert interviews plus statistical analysis of Step 1.1 had identified several types of likely interactions, which the officials probed further. Beyond the obvious main interaction of new road construction (driven by commodity demand) catalyzing most other drivers in the region via a "domino effect" sequence, several other interactions were identified. For example, economic growth at different levels of socioeconomic development and different attitudes towards environmental protection (the two often correlated) changes the direction of the road construction driver. Conversely, secure land and forest tenure, affluence and education levels, strong law enforcement, active presence of environmental and/or civil society

non-governmental organizations, and sustainable economic opportunities (e.g., markets for sustainable timber and non-timber forest goods) nearby the local forest areas showed an inverse relationship with deforestation and forest degradation levels.

Finally, RTF created a list of main actors related to the main drivers identified so far in the driver analysis, as well as 'forest champions' who would want to conserve the forest. Roughly in order from most to least significant, they listed the following actors related to drivers: large-scale commercial agricultural commodity producers, exporters, local aggregators and buyers (e.g., soy, palm oil and forest plantations), industry, subsistence farmers, local and state government policy makers and law enforcement officials, and related non-governmental organizations and private sector representatives. Regarding 'forest champions,' RTF identified the following: eco-tourism companies (mainly leading walks in the forest canopy and wildlife-watching trips), sustainable timber and rubber industries, environmental groups, and social forestry managers. Then RTF created social and institutional maps of actors and relations between them, and strategized how best to approach and involve them.

METHODOLOGY STEP 2

Select drivers to address



Once the relevant information on land use changes, deforestation and forest degradation and the factors driving this process is compiled a selection needs to be made as to which drivers should be addressed and how. Since not all drivers can be addressed by the actors involved in the process an important distinction should be made from the beginning between drivers that can be addressed and those that actors will have to adapt to. Drivers that cannot be addressed directly include certain natural events, such as biological or geological processes as well as international drivers that are difficult to control by national or local decision makers. That said, adaptation does not mean that nothing can be done about these drivers or that no action is required. These drivers should still be clearly identified in the process as they will still require the implementation of measure to deal with them.

Addressing drivers will affect various stakeholders inside and outside the forestry sector. It is therefore imperative to set up a process that is consultative and cross-sectoral, i.e. that includes representatives from all the actor groups identified in Step 1. This will also later help to ensure their cooperation and buy-in into measures selected to address a specific driver. Notwithstanding this, from the beginning of the process it needs to be clear who will take decisions on which driver to address with a given intervention.

Step 2.1 - Select criteria to prioritize drivers

Different stakeholders will have different opinions on the drivers identified in Step 1 and how to address them. A set of criteria should be defined and negotiated across all stakeholders that will be involved or affected by addressing these drivers. Part of the selection process should include a

negotiation of how criteria will set the priority for which drivers to address. These criteria will differ in each country but can include a wide range of options, such as:

- Importance of a driver (i.e. the level of carbon emissions resulting from it),
- Ease of addressing a driver (i.e. political feasibility),
- Whether the driver can be affected or controlled, or if one must adapt to it,
- Importance to particular stakeholders (e.g., measured by survey)
- Opportunity costs,
- Contribution of driver to economic growth and poverty alleviation
- Co-benefits from addressing the driver of other social or environmental goals,
- Risks associated with addressing a certain driver.
- Since there are likely to be different biases, the establishment of a clear decision-making structure with conflict management tools in place is important to ensure the smooth execution and ultimate success of the process.

Step 2.2 - Rank drivers

Once criteria have been selected a ranking of drivers should be performed. Each driver needs to be assessed compared to the other identified drivers for a specific criterion. Since the ranking might differ by country and/or region, it should be made clear from the outset at which scale the responsible entity addressing the problem can act. The driver ranking process allows stakeholders to make a transparent decision about which drivers should be addressed in which order and why.

Outcomes of step 2

- Clear prioritization of drivers to address with rationale for decisions made
- Clear understanding of which drivers should not be addressed or addressed later and rationale for the choice

CASE STUDY STEP 2

Select drivers to address

Having performed sufficient background information gathering and analysis, the RTF assembled a REDD+ Stakeholder Group (RSG) consisting of representatives from all the major actor groups found in Step 1. As funds are limited in Florestania as in any country, however, the team would need to decide which drivers (and with that, which forest areas) they would address from the list identified in Step 1. With RTF's guidance, RSG developed internal guidelines for engagement with a strong decision making and conflict management mechanisms in order to clarify which actors take decision on which drivers or issues.

Step 2.1 - Select criteria to prioritize drivers

Before deciding which drivers to address, the RSG first developed a selection criteria framework it could then use to prioritize drivers. The framework developed began with a wide range of criteria. First, this included the driver's overall importance (i.e. the sheer level of deforestation and forest degradation and how much carbon emissions was released from it, which in turn related to the driver had and geophysical factors such as forest density, soil types and carbon levels). Second, the RSG included the ease of tackling a given driver, be it due to political infeasibility or compelling opposing interests relating to either that driver itself or the area(s) in which the driver operated in Florestania. Third, RSG listed the driver's opportunity costs and in particular whether it would be better to attempt to stop high cost drivers or instead focus on simply lessening their impacts. Fourth, the Group included the contribution of driver to economic growth. Fifth, potential social and environmental co-benefits associated with tackling different drivers were included in the framework (e.g., job creation, biodiversity protection and water filtration). Finally, the RSG included the potential risks of a given intervention driver in the framework. Here, in particular the Group focused on the political risk that parties supporting tackling a given driver might lose to another in favor of not doing so, thus favoring drivers that may enjoy broader cross-party support.

Step 2.2 - Rank drivers

After establishing its list of criteria to use in evaluating the drivers, the RSG scored the various drivers for each criterion (as shown in Table 3 below, on a scale of 1 to 10 from least to greatest utility) (after first discussing as a group and then voting anonymously). Then, the Group added up scores and the drivers with the best score were chosen to be tackled first. Based on this process, the RSG prioritized the top drivers to be addressed in the following order:

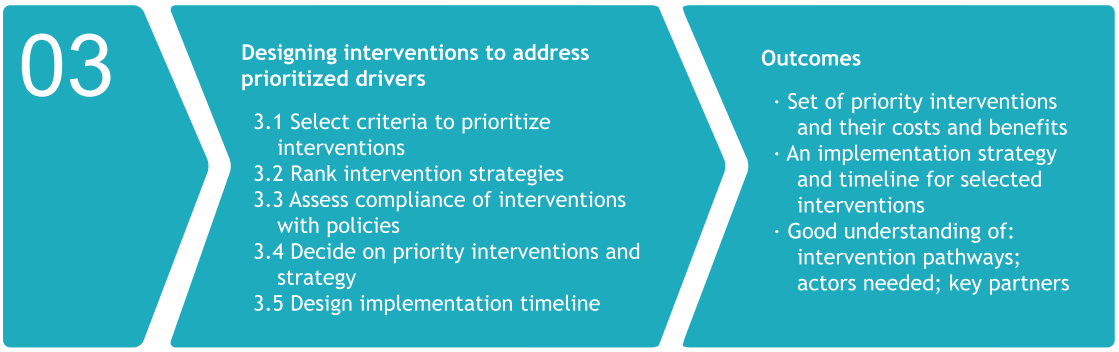
- Forest road construction
- Subsistence agriculture
- Large-scale agriculture
- Small-scale wood gathering

Table 3: Ranking of Drivers

Driver	Mitigation Importance	Ease of Tackling Driver	Driver Opportunity Costs	Social and Environmental Benefits	Intervention Risks	Total
Road Construction	10	5	8	10	4	37
Subsistence Agriculture	9	6	9	6	1	31
Commercial Agriculture	5	5	10	7	2	29
Firewood Gathering	7	3	8	4	4	26
Forest Fire	3	2	7	5	7	24
Migration into forest areas	5	4	6	5	1	21

METHODOLOGY STEP 3

Designing interventions to address prioritized drivers



It should now be clear which drivers should be addressed in a country or region, in which order they should be addressed, and the trend in impacts that drivers are likely to have in the future. There should also be a clear set of criteria on how these drivers were selected to ensure transparency in the process. At this point, stakeholders should design interventions to address these drivers.

A wide range of measures to address drivers of deforestation and forest degradation exist, which can be political, technical, financial or a combination of these factors. A useful framework for understanding how interventions can be implemented uses three criteria based on the outcome that an intervention can achieve:

- **Incentives**: Will the intervention create an incentive that changes the behavior of a particular actor towards more sustainable activities?
- **Disincentive**: Will it create a disincentive against unsustainable practices?
- **Enabling environment**: Will it develop the enabling conditions for sustainable practices?

Table 4 describes various interventions using this classification. In addition the table shows at which geographical scale these interventions should be implemented. During this design process, the assessment of the scale at which drivers operate (done during Step 1) becomes important. If the scale at which the intervention can be implemented is not the same as the scale at which the driver operates, it is unlikely that the measure will be successful in meeting the expected outcome.

It should be noted that generally, because these drivers are easier to control, solutions to drivers have most often been suggested at the local level, and to a lesser extent at the national scale (Kissinger et al 2012). All major drivers, should be addressed, or efforts to reduce deforestation and forest degradation will remain partial.

Table 4: Interventions to address drivers of deforestation that either create incentives, disincentives or the enabling environment for behavioral change (adapted from Streck & Zurek 2013)

Instruments	Incentives	Disincentives	Enabling Environment
International	• Certification schemes for deforestation free products • Support credit lines and programs that create access to finance for smallholders • Create direct financial incentives through carbon payments • Transition costs support (covering the costs and risks of certification and change in practice	• Import moratoria • Mandatory labeling and import restrictions (with potential trade implications) • Support for protected areas	• Effective information systems • Capacity building and institutional strengthening • Technology transfer and support • Research and development of appropriate technologies
National	• Certification schemes for deforestation free products • Revision of subsidies and establishment of incentive systems	• Moratoria (on products from deforested land) • Land-use regulations • Land zoning and planning • Declaration of protected areas	• Land tenure security • Institutional capacity and reform • Strengthening and training of extension services • Building of stakeholder support • Research in crops important at country level
Local	• Payments for environmental services • Targeted training of incentive services	• Zoning • Taxes • Fines for forest clearing	• Participatory landscape and forest management • Enhancing governance performance • Resolving land tenure issues • Adaptive research into specific farming systems

Step 3.1 - Select criteria to prioritize possible driver intervention strategies

A number of criteria can help to select the best intervention strategies to address the prioritized drivers in a particular setting. These include:

- Scale at which the driver operates and therefore if the driver can be controlled by the respective decision makers (e.g., national and sub-national government)
- Ease of implementation
- Affected actors
- Scale at which the implementing actor(s) work
- Fit with existing policy and legal environment
- Leverage across multiple drivers
- Applicability in various settings
- Costs and benefits of the interventions (including political costs)
- Risk of failing

Step 3.2 - Develop potential policies and measures to address drivers

As outlined in Table 4 above, policy and measures for addressing drivers may be classified generally into three categories. Disincentives (including 'command and control' type regulations, as well as taxes and levies) constitutes the first and often most widely used of policy tools. Incentives, such as market-based approaches, certification schemes and payments for environmental services, have grown in popularity in recent years. As a third catch-all category, 'enabling environment' type policies and measures include a wide variety of interventions to change the underlying conditions of a country or region that may be linked with indirect drivers. Examples include public awareness and capacity building, land tenure reform/titling, and community forestry.

Given the broad spectrum of policies and measures available to address a given driver, it is helpful to begin this step by reviewing past initiatives that have been implemented in the country and the region. In order to best learn from past experiences, such a review would do well to consider both those interventions that have had some success and those that have not. Against this

historical background, a group of potential policies and measures that may make the most sense to implement can then be identified.

Step 3.3 - Rank possible intervention strategies per driver

Depending on the chosen criterion/criteria to prioritize the interventions for the selected drivers a ranking can be done in order to achieve a transparent decision on which measures to implement. This ranking might reveal trade-offs across possible interventions, e.g., a particular intervention might be easy to implement, but will affect important stakeholders negatively. Documenting these trade-offs during the ranking process will ensure that implementable and sustainable decision will result from the ranking.

Different methods can help in the process of ranking drivers and moving towards a decision (see Annex 3). These can include more quantitative methods such as cost-benefit analysis, complex methods such as Scenario Planning (normally used by institutions conducting planning or development) or simple tools such as qualitative, participatory ranking during a workshop. Each of these approaches will yield information with differing degrees of depth and require of course different amounts for human and financial resources.

Step 3.4 - Assess compliance of selected intervention with existing policy frameworks

An important consideration for selecting interventions is if they comply with existing policy frameworks at the national level (e.g., national laws related to the protection of indigenous people), or potentially at a regional or international level (e.g., conformity with a regional agreement or the Cancun safeguards). In some cases interventions that seem to be the most straightforward for addressing an important driver do not fully comply with existing national policy frameworks. In others the appropriate national frameworks may not exist to implement a given intervention (e.g., if no definition of carbon tenure exists at the national level). In these cases proposed interventions may need to be supported via policy or legislative revision. Depending on the intervention chosen, this may be done either via a modification of existing law or regulations, or via a longer process of developing an entirely new policy or legislation.

Lack of integration across levels of government can also be a challenge and in developing interventions to address drivers close coordination between national and sub-national level government is likely to be necessary to avoid conflicts and inconsistencies.

Step 3.5 - Final decision on priority interventions and implementation strategy

Next, a decision needs to be made on which interventions to implement, how, and who the responsible actor for each intervention is. This should then result in sharing the proposed implementation strategy or plan with government agencies and all involved parties (see also Step 4). Here, it will also be important to carefully conduct outreach and engagement to ensure that all relevant actors are aware of the results of the drivers' assessment process and the decisions taken on the various measures to be implemented. If the stakeholder engagement process was well designed from the beginning, this step will be less important than if there were any gaps or conflicts along the way.

Step 3.6 - Design timeline for implementation of interventions and a monitoring system

In a penultimate step, a clear timeline for integrating the selected interventions with the national REDD+ strategy or action plan needs to be established and a system created that allows monitoring if the implementation happens accordingly. For this, the entity responsible for the overall oversight of the process could for example establish a set of indicators that show progress of the implementation process. Where no REDD+ action plan or strategy exists in a country, an implementation timeline should be developed that makes sense given the country's particular national and subnational context and aligned with any relevant REDD+ and related intervention steps.

Here it is essential to ensure that the timeline corresponds to the three-phase schedule established for REDD+ activities in a country, as outlined in Figure 6 below.

Figure 6: Three Phases of REDD+ Readiness

Step 3.7 - Announce intervention and conduct public awareness raising

Once the intervention strategy and timeline are decided, the responsible entity needs to announce the full intervention plans and monitoring system to the government, stakeholders, and general public. This can be done via a public speech or other tested policy launch method. In parallel with the launch of the intervention, the government can conduct an awareness raising campaign that explains the reasons and methods for the intervention clearly and concisely to the general public. The information provided should cover what drivers will be addressed, why they will be addressed, how, when and where the interventions will be implemented and under whose responsibility.

Although awareness raising may be customized to relevant areas or demographic groups and tailored based on languages or capacities of the target population, some general principles may be worth considering. Where interventions are to introduce new incentives, awareness raising should not overemphasize income or benefits without also discussing potential risks and costs. In order to prevent readers or listeners from re-interpreting implications of general messages, awareness materials should be clear and simple.

Outcomes of step 3

- Set of priority interventions to address most important drivers and their costs and benefits
- An implementation strategy and timeline for all selected interventions
- Intervention launch and awareness raising campaign
- Good understanding of intervention pathways
- Good understanding of actors that need to be involved
- Good understanding of key partners

CASE STUDY STEP 3

Designing interventions to address prioritized drivers

Having decided on the top priority issues to address, the RSG then set about designing interventions to tackle those drivers. This step required the greatest process-based thinking from RSG about how the drivers prioritized work and how various interventions may function to discourage them and/or mitigate their effects, encourage alternatives to the driver, or create an overall enabling environment in which the driver will no longer function with the same force. These considerations in turn depended largely on questions regarding the various stakeholders to be targeted and how best to address them to achieve the desired goals of reduced deforestation and forest degradation. In particular, the RSG considered that roads are a main deforestation driver in Florestania but have also been found to contribute significantly to poverty reduction and development, which suggested allowing construction but incorporating use of mitigation measures.

Step 3.1 - Select criteria to prioritize possible driver intervention strategies

First, the RSG worked to choose which criteria it would use to rank the various interventions at its disposal. From the list of criteria available to them they performed a rapid economic analysis to consider: (a) whether the intervention would address the scale at which the driver operates and the scale at which those actors involved operates; (b) feasibility of implementation; and (c) leverage of the strategy across multiple drivers.

Step 3.2 - Develop potential policies and measures to address drivers

Next, the RSG created an initial set of potential policies and measures to address the drivers they had identified. Initially they considered the historical interventions that had been conducted in the country for similar drivers, most of which had failed so far and they could eliminate from consideration. Based

on this, the interventions they preliminarily selected to consider were the following, all operating at a national level:

Incentives:

- REDD+ incentives & support for alternative livelihoods (in the forest area)
- Development efforts (in areas from which emigration into the forest area is occurring)

Disincentives:

- Ban on commercial timber harvesting without sustainable certification
- Checkpoints and forest patrols
- Creation of protected areas

Enabling environment:

- Land tenure security (mainly targeting areas near roads)
- Institutional strengthening and coordination (primarily across forestry, transport, agriculture environment ministries)
- Awareness raising
- Mandatory SEA/ESIA and potential re-routing of roads
- Creating a national board for sustainable land investments (including foreign and domestic investment)

Step 3.3 - Rank possible intervention strategies per driver

Having decided on a set of criteria with which the RSG could select an intervention strategy, the Group ranked the intervention strategies per driver, as demonstrated in Table 5 below.

Table 5: Ranking of Florestania driver intervention strategies. Overall scoring was given on a scale of 1 (poor) to 10 (strong). Criteria key (a) whether intervention addresses scale of operation; (b) feasibility of implementation; (c) leverage of the strategy across multiple drivers; and (d) cost-benefit analysis.

Driver		Incentives	Disincentives		Enabling Environment	
	Criteria	Support for alternative livelihoods	Ban on uncertified logging	Protected Areas	Awareness Campaign	National Board
Forest road construction	a)	3	5	10	4	3
	b)	4	3	7	5	17
	c)	7	7	3	10	6
	Total	**14**	**15**	**20**	**19**	**26**
Subsistence agriculture	a)	10	5	5	3	2
	b)	5	7	6	1	14
	c)	10	10	9	7	8
	Total	**25**	**22**	**20**	**11**	**24**
Large-scale agriculture	a)	10	7	10	5	10
	b)	3	15	7	9	3
	c)	7	4	3	1	2
	Total	**20**	**26**	**20**	**15**	**15**
Commercial timber harvesting	a)	10	3	5	5	5
	b)	5	5	6	10	8
	c)	10	9	3	7	10
	Total	**25**	**17**	**14**	**22**	**22**
Total		**84**	**80**	**74**	**67**	**87**

As National Board for Sustainable Land Investments and EIA/SEA, REDD+ Incentives and Support for Alternative Livelihoods, and Protected Areas and Ecotourism Opportunities interventions received the highest score of the five strategies examined by the RSG quantitative analysis, the RSG decided to pursue these three interventions in the context of an overall low emissions development planning strategy. However, as they only had funding for two of the three interventions, they decided that the government would address

the National Board for Sustainable Land Investments and EIA/SEA, and REDD+ Incentives and Support for Alternative Livelihoods, and the RSG asked an international NGO working together with local civil society groups to conduct the Protected Areas and Ecotourism Opportunities intervention.

Step 3.4 - Assess compliance of selected intervention with existing policy frameworks

The RSG next considered whether the intervention chosen fit within relevant Florestania domestic and international policy frameworks. Domestically, this was done in order to verify that the intervention would not be useless if the overwhelming force of the country's national policies run counter to its intent and would swallow up an attempt to reverse destructive subsidies in the forest sector. Also, it was particularly important for the RSG to ensure that the intervention complemented and supported the national Low-Emissions Development Strategy (LEDS). Following a review of the national economics strategy, LEDS and its related sectorial plans, the RSG concluded that the interventions would build on the LEDS and general policy framework generally. However, the RSG also concluded that the protected areas intervention likely would curtail livelihood opportunities for local populations as originally planned. In select areas where local and indigenous cultures could be adversely affected, the RSG decided to institute co-management of forests and tailored national safeguards to protect these communities. At an international level, the Group sought to ensure the intervention met requirements under the Cancun Safeguards and UNDRIP, both of which it met. Additionally, the RSG contracted with an NGO to take care of monitoring and evaluation of environmental and social safeguards. Having verified that the proposed intervention met both these tests, the RSG proceeded with its development.

Table 6: Overview of Legislation Targeted by RSG Intervention

Law	Provision(s) to be removed/revised	Provision(s) to be inserted
Forestry Law	N/A	Creating provisions for REDD+ incentives, roadside protected areas and ecotourism opportunities
REDD+ Decree	N/A	Link reductions in degradation and deforestation to incentives via: - UNFCCC-compliant MRV mechanism - UNFCCC-compliant safeguard system
Investment Law	Subsidies for forest clearing to land sector investors in country	Create National board for sustainable land investments Mandatory SEA/ESIA for all land sector investments
Agriculture Law	Subsidies for forest clearing in order to promote agricultural land expansion	Focus on intensification and improving market linkages and reducing post-harvest losses rather than extensification and increased production
Transportation Law	N/A	Improving transportation networks in areas away from forests

As the intervention chosen required a selective overhaul of the country's legislative framework, the RSG conducted a systematic regulatory review to scan for all the legislation that would need to be amended (see Table 6). This review found primarily that the country's agriculture, forestry, and investment laws, as well as the country's national and subnational LEDS, would require revision. The RSG then met with members of a Parliamentary legislative drafting committee and developed a plan to introduce its proposed regulatory revisions.

Step 3.5 - Final decision on priority interventions and implementation strategy

Having verified its likely complementarity with Florestania's national policy framework, LEDS and obligations under international law, the RSG made a final

decision to pursue the intervention of developing the appropriate policies for Protected Areas/Ecotourism and REDD+ Incentives in the Forestry, Transportation and Agriculture Laws. At this point, the RSG submitted a proposal on the intervention strategy to the Ministries responsible for each law (i.e., Forestry Investment, Transportation and Agriculture) and with each Ministry identified a focal point with whom to work. Additionally, the RSG conducted outreach and engagement of the strategy in order to ensure all relevant stakeholders were appraised of the proposed policy interventions and related strategy for their implementation.

Step 3.6 - Design timeline for implementation of interventions and a monitoring system

Having developed its general policy revision process, the RSG then developed a timeline for implementing the intervention strategy. The RSG was careful to match its driver intervention timeline with its overall timeline of REDD+ three phase planning, development and implementation. The timeline included a set of regulatory and policy revisions for implementing the intervention and a set of indicators to monitor and evaluate the intervention.

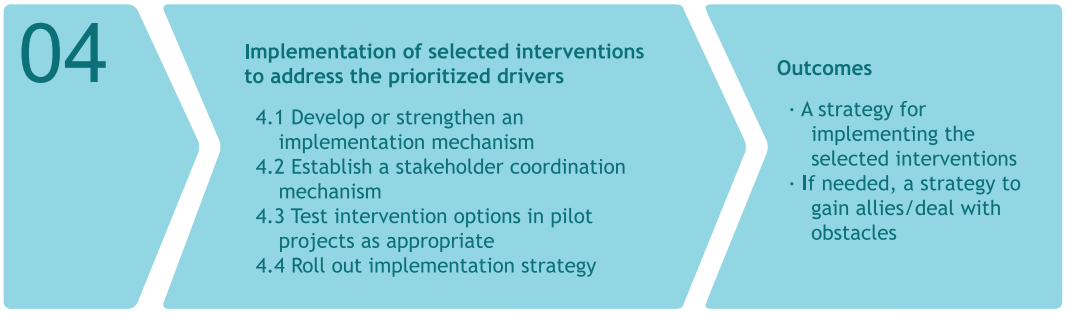
Step 3.7 - Announce intervention and conduct public awareness raising

After finalizing the regulatory and policy revisions plans, a monitoring system and overall timeline, the RSG developed a set of awareness raising materials, as follows.

Material type	Objective	Target group(s)
One-page information sheet on climate change impacts and drivers of deforestation and degradation	Provide general overview of deforestation and forest degradation	Local communities, subnational community forestry associations, others as relevant
Intervention brochure in local language	Describe interventions in protected areas/ ecotourism and REDD+ incentives	Local communities, subnational community forestry associations
Intervention brochure in English	Describe interventions in protected areas/ ecotourism and REDD+ incentives	Government officials, civil society, research groups, foreign development partners

METHODOLOGY STEP 4

Implementation of selected interventions to address the prioritized drivers



In this step all the results of the previous analysis are brought together and implementation of all the agreed measures begins. This step and step 5 should be integrated into the national REDD+ strategy/action plan or can be followed independently where there is no wider process.

Step 4.1 - Develop or strengthen an institutional implementation mechanism

Ideally a lead agency should be established to ensure a successful implementation of the selected measures and coordination across all the different actors that need to be involved in the process, such as the coordination across a set of ministries for example. In addition, a mechanism should be set up that ascribes decision-making competencies to the selected institutions. For this a cross institutional task force can be very helpful as it ensure the dialogue across the various actors that need to be involved in implementing the tool.

Step 4.2 - Establish a stakeholder coordination mechanism for implementation

The key to successful implementation of selected measures is stakeholder acceptance. As described in Step 1 all important actors associated with a driver (including 'forest champions') will have been mapped. In many cases these actors

are likely to be associated with a number of drivers. This information is crucial for setting up a mechanism that facilitates coordination of stakeholders in implementing selected measures and for developing a transparent information sharing system. In particular, it will be necessary to understand which stakeholders will share responsibilities at different levels to help resolve potential conflicts.

Step 4.3 - Test intervention options in pilot projects as appropriate

Depending on the measure selected for addressing a certain driver it might be good to first test its implementation in a specific location. This will allow for learning from the implantation and for easy monitoring of the effects of the interventions in a small location. In case the test reveals that there are still big difficulties in the process and the selected interventions, the implementing team might have to go back to Step 2 or 3.

Step 4.4 - Roll out full implementation strategy

Depending on the timeline created in Step 3, a strategy needs to be agreed upon and finalized on how all the selected interventions can be coordinated with each other, who the responsible implementation agency is for each intervention and how implementation will take place. A reporting system will have to be established so that the entity charged with the oversight of the whole process can monitor progress.

Outcomes of step 4

- A strategy for implementing the selected interventions
- If needed, a strategy to gain allies/deal with obstacles

CASE STUDY STEP 4

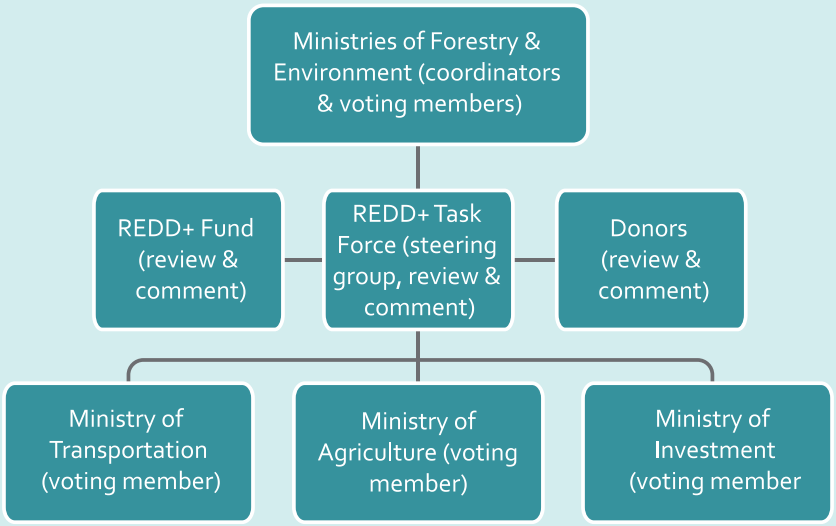
Implementation of selected interventions to address the prioritized drivers

Having identified the main drivers in Florestania, chosen those to address, outlined an intervention strategy of promoting sustainable land investment planning and providing performance-based REDD+ incentives, and finally marked out a process by which to implement the intervention, the RSG is ready to implement its intervention.

Step 4.1 - Develop or strengthen an institutional implementation mechanism

Following an extended joint meeting of the RSG together with focal points from Ministries of Forestry, Environment, Investment, Transportation and Agriculture and stakeholders from civil society, private sector and non-governmental organizations, a vote was taken for representatives of the Forestry and Environment Ministries to lead the intervention's implementation and coordination across the five Ministries (with each Ministry having an equal vote in decisions) and all stakeholders in the process. Each Ministry would lead in researching, drafting and presenting to the combined group on textual alternatives for the legislative interventions in their respective organic statutes and regulations. Additionally, CSO representatives would coordinate local level consultations with the inclusion of communities, local government, indigenous, private sector and with equitable gender representation. Participants at the extended joint meeting considered four proposed decision-making arrangements presented by the RTF and decided on the following structure for the REDD+ Stakeholders Group's overall intervention:

Figure 7: REDD+ stakeholder group decision-making organizational chart



Step 4.2 - Establish a stakeholder coordination mechanism for implementation

In order to ensure the process had adequate consideration and buy-in from relevant government agencies, civil society, non-governmental organizations and private sector, the joint group meeting agreed on a mechanism for stakeholder coordination and inputs. As shown in Figure 7 above, the REDD+ Fund and the country's REDD+ Donors were given the power to review and comment on proposed textual alternatives for the legislation in question, to which the Ministries of Forestry & Environment (acting as co-coordinators) and the RTF (acting as steering group) would respond within a given time period. Given the need to respect national sovereignty and the need to ensure the government's buy-in to the chosen intervention, the decision on the way forward would remain in the power of the government (in the form of the five Ministry's final votes). In order to balance the need for a streamlined and efficient input process with one that was comprehensive and representative of Florestania society and interests, the RSG membership was limited to six groups, as follows:

1. Environmental/Civil Society NGO
2. University Representative
3. National Government Representative
4. Provincial Government Representative
5. Large-scale Rural Land Use Private Sector Representative
6. Small-scale Rural Land Use Private Sector Representative

Step 4.3 - Test intervention options in pilot projects as appropriate

Before implementing the full intervention nationally, the RSG decided to test the intervention in select pilot regions across Florestania. Acting on a brief from the Ministries of Forestry and Environment proposing several areas and following comments from all members of the RSG, the group picked one test region in each of the country's four forest strata where deforestation and degradation-related transportation and investment sector subsidies were lifted and exchanged for sustainable land investment planning and performance-based REDD+ incentives. A baseline survey was conducted of the test sites prior to implementing the pilots and then the sites were monitored monthly over a six-month period to track changes in behavior and forest outcomes.

Step 4.4 - Roll out full implementation strategy

After an evaluation was conducted of the pilot sites for six months, the RSG discussed the results and concluded the intervention was having positive results except for in the sustainable investment intervention, which lacked a strong enough legal mandate to force adequate strategic planning early enough in the investment decision process. An evaluation report was circulated amongst all stakeholders in the RSG for review and comment, which the RSG members considered and responded to after internal discussion. The RSG agreed to upscale implementation of the intervention to address the entire country. At this point, the group reviewed its original implementation plan and tailored it based on lessons from the pilot interventions. In particular, the incentives were re-structured in order to better target likely actors and improve forest conservation outcomes, as well as to meet the concerns of private sector participants. To rectify weak implementation of the investment planning

intervention, the RSG and the Investment Ministry sharpened the language in the legal mandate for government-mandated private sector sustainable investment planning. The Ministry of Forestry and Ministry of Environment agreed to continue to co-coordinate the intervention implementation, with each Ministry taking primary responsibility for their individual legislative revisions. The indicators and criteria established for the monitoring system in Step 3.6 was also continued, with each Ministry reporting to the Ministries of Forestry and Environment representatives leading the RSG, who shared the information with the entire RSG and conducted RSG meetings on a biannual basis as well as on ad hoc basis as necessary.

Additionally, the RSG considered how to harmonize their intervention with other natural resource and development programs underway in Florestania, in particular with REDD+ initiatives in the country. The RSG decided that the simplest means to achieve this would be to integrate the interventions into the country's Low-Emissions Development Strategy (LEDS) and the REDD+ Strategy.

METHODOLOGY STEP 5

Monitoring and evaluating success of interventions

This final step in the process is often omitted in processes to address drivers. Learning from success and failures of the implemented measures and assessing if the measures actually led to a reduction of deforestation or forest degradation is necessary in order to ensure that interventions can be adjusted along the way and potential negative consequences addressed as soon as possible. To do that, a monitoring and evaluation system is essential.

Step 5.1 - Assess effectiveness of the implementation strategy

In order to assess if the strategy for implementing the interventions to address the selected drivers of deforestation and forest degradation is working and shows the expected results, a number of criteria have to be selected that help in monitoring the effectiveness of the strategy. These criteria will differ according to assessed intervention, but a general list can include:

- Assessment of deforestation or forest degradation trends in the target area;
- Implementation of interventions according to an agreed time line;
- Effects on the target population (e.g., change in behavior);
- Effects on non-target population;
- Effects on a set of environmental variables;
- Creation of co-benefits with respect to social or environmental outcomes.

In addition to assessing the effectiveness of the strategy, its efficiency and equitability outcomes can also be evaluated. At the beginning of Step 5, it should be clarified what to assess exactly and the criteria and indicators should be chosen accordingly.

The ultimate indicator of success of the strategy though will be if deforestation or forest degradation has been reduced. The results of the implementation strategy assessment will then have to be used to decide on changes that need to be made to the strategy (see also Step 5.3).

Step 5.2 - Assess stakeholder engagement

As mentioned, across all four previous steps the involvement of stakeholders along the process is essential to successfully implementing measures to reduce deforestation and forest degradation. Stakeholder engagement can therefore be an indicator of whether or not the process is going well. If, for example, stakeholders disengaged from certain tasks or mechanisms this can be a sign that the overall process could face problems. Learning what went wrong and how is important for making adjustments in time and for the next iteration of the process.

Criteria to assess stakeholder engagement can include:

- How long stakeholders were engaged;
- If difficult issues arose and how they were addressed;
- Leadership shown by different stakeholders.

Step 5.3 - Adjust implementation strategy and document findings

The findings from assessing the implementation strategy and stakeholder engagement need to be translated into adjustments to the overall implementation strategy. This will ultimately help to enhance the long term success of the entire process outlined here to address drivers of deforestation and forest degradation, as short comings can be addressed in time before they jeopardize all the work done. The lessons from the assessment should also be

documented carefully so that they can then also be introduced into the next iteration of the process, if the process (or some of the first steps) is repeated to ensure that all drivers are addressed sufficiently.

Step 5.4 Report on assessment findings and revisions to implementation strategy

As a final step, the documented findings need to be presented back to the government and all relevant stakeholders in a clear and concise report. This is important so that decision makers and stakeholders see why and how adjustments are being made, and thus ensure buy-in from participants.

Outcomes of Step 5

- Strategy for adjustments and revisions
- Assessment of implementation strategy and stakeholder engagement
- Assessment findings documented
- Report to government and stakeholders on assessment findings and implementation strategy revisions

CASE STUDY STEP 5

Monitoring and evaluating success of interventions

Step 5.1 - Assess effectiveness of the implementation strategy

After implementing the interventions in forestry, agriculture, transportation and investment legislation, the RSG developed a comprehensive monitoring and evaluation plan, which measured progress against agreed reference levels and the national forest monitoring system. The plan called for biannual reports from each Ministry, which after two years of implementation resulted in the findings highlighted in Table 7 below.

Table 7: Summary of the second annual monitoring and evaluation results

Criteria	Evaluation
Reductions in deforestation and forest degradation	Target area: 9% reduction in deforestation, 11% reduction in forest degradation Outside Target area: 3% reduction in deforestation, 5% reduction in forest degradation
Environmental	Biodiversity: Assessments demonstrated improvements (avg. 25%) increase in biodiversity indicators Forest Health: Survey indicated modest (avg. 15%) increase in forest health. Adaption Co-benefits: REDD+ payments only made for sustainable forest types (e.g., no payments for eucalyptus)
Social	Equity Considerations: Payments received in most small land-holdings (80%), awareness raising problematic
Efficiency of Implementation	Time: Program implemented with some (6 mos.) delays but not excessive. Cost: Overall savings of USD 1M in switch from subsidies for forest clearing to REDD+ performance-based payments

Overall, the monitoring and evaluation survey reported good albeit modest impacts from the intervention, with small reductions in deforestation and forest degradation, improvements in biodiversity and forest health, as well as adaptation and social variable co-benefits. However, the transportation sector did not respond positively to the change in incentives and there was a six month delay in the approval process of the new laws. Performance-based payments were received into the REDD+ Fund and distributed to reward performance in reducing emissions.

Step 5.2 - Assess stakeholder engagement

Awareness raising for local authorities and population was not effective during the first year. Therefore a negligible level of change in deforestation rate or behavior was detected in the first year. After collaborating with local community based organizations and local media in the second year, the trends were more positive.

Step 5.3 - Adjust implementation strategy and document findings

As transportation sector behavior was not changed after removing subsidies for forest clearing and mandates of sustainable investment and increasing transportation networks away from highly forested areas alone, it was decided to institute tolls on forest roads in order to make them significantly more expensive than non-forest roads and offset the time savings-related profits favoring their use. Additionally, in order to better coordinate the drivers intervention monitoring and evaluation with REDD+ and NAMAs work ongoing in the country (and in particular to better attribute deforestation, forest degradation and corresponding emissions reductions to different projects and programs), the program linked the MRV system, program implementation monitoring and safeguard monitoring with the joint program being developed for the national REDD+ system. Findings from the monitoring and evaluation were fed back into the national LEDS and REDD+ Strategy in order to better define the country's overall approach.

Step 5.4 Report on assessment findings and revisions to implementation strategy

Finally, the RSG presented back to government ministries and a wider group of relevant stakeholders from civil society, private sector and NGOs a report on the results of evaluation and revisions to the interventions implementation strategy and the overall national LEDS and REDD+ Strategies.

Annex 1. Methods for assessing historical forest degradation and deforestation and identifying drivers

Literature reviews: Literature reviews provide a strong starting point to assess existing work and information gaps. Articles published in peer reviewed journals are generally considered to be of high quality and objectivity, and can be found using free internet search engines such as Google Scholar. Government publications, NGO/CSO reports, or Masters and Doctoral dissertation can also provide important information; however, methodologies used should be subject to greater scrutiny as such publications may be more biased.

Existing global remote sensing data sets: Existing global data sets on deforestation can complement other information sources during this step. While the spatial resolution of global data sets is generally low, they are adequate for an overview of regional or national estimates of deforestation (see the Resources section for global data set sources).

Interpretation of remotely sensed data: Spatially explicit analyses using imagery of the highest resolution possible generally provide the most accurate and detailed quantitative synopsis of deforestation and forest degradation. A variety of methods are available including visual interpretation and supervised and unsupervised classification using software such as ENVI, E-Cognition, IDRISI, ERDAS IMAGINE, and ArcGIS. Any analysis should include an accuracy assessment using higher resolution data and/or ground-truthing. Remote sensing can be used both to determine the extent of deforestation and possibly degradation and to identify the driver although the application of remote sensing to forest degradation remains relatively limited. Open source initiatives such as the World Resource Institute's Global Forest Watch 2.0 or Terra-i (http://www.terra-i.org) aim to provide near real-time remote sensing analysis of deforestation and can be used where capacity is limited. Global Forest Watch further hopes to use crowd-sourcing as a means of identifying drivers of deforestation and forest degradation.

Expert interviews: Expert interviews can also provide important qualitative information on deforestation and forest degradation trends. Government officials, academics, NGOs staff, local communities, and private sector employees may all provide useful information on deforestation and forest

Annex 2. Methods for assessing trends and trajectories of drivers

Commodity volatility indices: Predicting future prices of commodities is difficult, though tools are available to examine the volatility of commodity prices which, in turn, can help predict the risk of a future spike in deforestation driven by agricultural expansion. Two widely used and readily available measures of volatility are historical price volatility and implied price volatility. Historical price volatility, as it name implies, is a measurement of past price fluctuations. Implied price volatility is based on futures contracts purchased on commodity exchanges like the Chicago Board of Trade. In comparison to historical price volatility it provides a global dimension by conveying how international markets expect prices to change in the future. Combining these two measures of volatility, a country can begin to examine the risk of sudden increases in deforestation due to a rise in commodity prices.

Assessment of development factors: In addition to scrutinizing global market trends, an examination of development factors including population increase, planned infrastructure expansion, and economic growth can enhance understanding of the future trajectory of drivers and pre-disposing conditions. Although simple analyses are invaluable in predicting the future impacts of drivers, geospatial modeling software which links historical trends with projected development factors has also been developed,. Commonly used software includes Geographical Modeling (GEoMoD), the Land Change Modeler (LCM), the Conversion of Land use and Its Effect Model (CLuEs) and the Integrated Carbon Ecology and Economics model (ICEE).

Policy Analysis: An assessment of future and planned policies can further aid understanding of the future potential trend of drivers of deforestation or forest degradation. A diverse range of policies should be included in the analysis including free trade agreements, sectoral or national development plans and policies, mandates for forest management certification or timber legality verification, policies related to land tenure, moratoriums on logging or land use conversion, policies on economic or agricultural concessions, forest law enforcement and governance, protected area and conservation legislation.

Science and Technology Analysis: Technological innovation has both the potential to exacerbate or alleviate drivers of land-use change. In the context of REDD+ countries could specifically examine technology transfer related to silviculture and agriculture and the potential impacts they would have on drivers' trends. The identification of technologies that can alleviate drivers will also help in the prioritization step (step 2).

Annex 3. Methods for ranking interventions to address drivers

Cost-benefit analysis: A cost-benefit analysis (CBA) provides a widely-used method by which to rationalize the selection of policy and measures to address drivers of deforestation and degradation. CBAs weigh the total costs of a project (often projected in monetary terms) against the total benefits to determine feasibility and to compare different proposed intervention. Costs and benefits can be measured at different scales, and a CBA study should correspond to the scale at which a driver operates. For example in the case of a local intervention to address a driver, opportunity costs for local land users may be a key metric in the analysis. However an intervention at the national scale may take into account the share of national GDP associated with a driver. Policy makers should take into account that costs and benefits of REDD+ are note purely financial; land use practices provide livelihood benefits and ecosystem services that can be difficult to monetize. Subsistence agriculture, for example, may provide little or no financial returns for a rural family but also could be the only form of livelihood support. More resources for carrying out cost-benefit analyses can be found in the Resources section.

Sensitivity analysis around certain policy options: A sensitivity analysis can be used to evaluate the robustness and precision of a CBA study, allowing policy makers to evaluate how uncertainties in their parameters might affect the outcome of the CBA. In implementing a sensitivity analysis, one or more uncertain parameters (assumption) in the CBA are adjusted and the results are re-calculated. If the adjusted parameter does not change the outcome of the CBA than the model can be considered robust; conversely, a change in the CBA outcome would make its results less reliable.

Scenario development for a set of intervention options: Scenario development (also called scenario planning) has found wide application within the policy setting arena, particularly when the system within which different policy options have to be implemented is very complex and uncertainty about outcomes high. Scenario development can be used to play out various intervention options into the future (thus developing a set of scenarios) to evaluate if they might yield the desired outcomes or which intervention (or set of interventions) is most likely to achieve a desired goal. In this case a

sub-branch of scenario development can be used, which starts from a desired outcome in the future and works its way backwards to the present through various scenarios. Looking across the different scenarios allows comparing the pros and cons of different interventions and their pathways. More details on scenario development and other for forward looking methodologies can be found in the Resources Section.

Multiple-criteria decision analysis: Multiple-criteria decision analysis (MCDA) is a wide area of research applied to a range of problems involving conflicting criteria with the goals of both more informed and better decisions. Although numerous methods have been developed under the umbrella of MCDA research, Multi-Attribute Utility Theory (MAUT) and Simple, Multi-Attribute Rating Technique (SMART) are especially relevant tools for eliciting of stakeholder preferences (via direct surveys or available data) with which may be developed corresponding utility functions for both market and non-market goods, services and management regimes. In recent years, MAUT has been used to scientifically evaluate tradeoffs and inform decision-making in a variety of similar fields such as sustainable agriculture, health care management and forest land-use choices and has been proposed as means to enable spatially-based analysis of multiple objectives for REDD+ in the Philippines. SMART involves a far simpler process of ranking goals and creating corresponding weights, which are calculated by a basic multivariate function to find the outcome with the highest utility. SMART offers a far more efficient means to achieve the same goals as MAUT and can provide a more accurate solution, although is less objectively rigorous as weights may be decided by researchers or decision-makers themselves. As an example of a SMART-type weighted decision analysis, see the Mexican Payments for Hydrological Environmental Services (PSAH) scheme.

REFERENCES

ASEAN Economic Community Blueprint. 2008. Available from: http://www.asean.org/archive/5187-10.pdf

Bishop, K.M., Graumlich, L.J., and Halvorson, W.L. 2011. Defining resource stressor syndromes in southwestern national parks. Park Science. Available from: http://www.nature.nps.gov/ParkScience/Archive/PDF/Article_PDFs/ParkScience27%283%29Winter2010-2011_25-28_MonroeBishop_et_al_2758.pdf

FAO. 2002. Proceedings: second expert meeting on harmonizing forest-related definitions for use by various stakeholders. Rome. Available from: http://www.fao.org/docrep/005/y4171e/y4171e00.HTM

FAO. 2011. Southeast Asia Subregional Report. Asia-Pacific Forestry Sector Outlook Study II. FAO, Bangkok. Available from: http://www.fao.org/docrep/013/i1964e/i1964e00.htm

Geist, H.J. and Lambin, E.F. 2002. Proximate Causes and Underlying Driving Forces of Tropical Deforestation. American Institute of Biological Sciences. Available from: http://www.bioone.org/doi/abs/10.1641/0006-3568%282002%29052%5B0143%3APCAUDF%5D2.0.CO%3B2?journalCode=bisi.

Kissinger, G., Herold, M., De Sy, V. 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting. Vancouver, Canada. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66151/Drivers_of_deforestation_and_forest_degradation.pdf

Millennium Ecosystem Assessment Reports. 2005. Available from: http://www.millenniumassessment.org/documents/document.356.aspx.pdf

Schaeffer,R., Rodrigues, R.L.V., Laurance, W.F., Albernaz, A.K.M., Fearnside, P.M., Vasconcelos, H.L. et al. (2005) 'Underlying causes of deforestation', Science 307(5712): 1046-1047.

Schwartz, P. 1991. The Art of the Long View. Doubleday/Currency.

Sodhi, N.S., Koh, L.P., Brook, B.W. & Lg, P.K.L.2004. Southeast Asian biodiversity: an impending disaster. Trends Ecol. Evol., 19:654-660.

Streck, C. and Zurek, M. 2013. Addressing Agricultural Drivers of Deforestation: Opportunities for Catalytic Donor Interventions. Climate Focus. Available from: http://www.climatefocus.com/documents/addressing_agricultural_drivers_of_deforestation

OTHER RESOURCES

Commonwealth of Australia. 2006. Handbook of Cost-Benefit Analysis. Department of Finance and Administration. Available from: http://www.finance.gov.au/finframework/docs/Handbook_of_CB_analysis.pdf

Commonwealth of Australia. 2006. Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies. Department of Finance and Administration. Available from: http://www.finance.gov.au/finframework/docs/Intro_to_CB_analysis.pdf

Conway, M. Thinking Futures: The Practice of Foresight – Scenario Planning. Available from: http://thinkingfutures.net/resources/scenario-planning/

Evans, K., de Jong, W., Cronkleton, P., Sheil, D., Lynam, T. Kusumanto, t., Colfer, C.J.P. 2006. Guide to participatory tools for forest communities. Bogor, Indonesia: Center for International Forestry Research (CIFOR). Available from: http://www.cifor.org/publications/pdf_files/Books/BKristen0601.pdf

Evans, K., Velarde, S.J., Prieto, R.P., Rao, S.N., Sertzen, S., Dávila, K., Cronkleton, P., de Jong, W. 2006. Field guide to the Future: Four Ways for Communities to Think Ahead. CIFOR. Nairobi, Kenya. Available from: http://www.cifor.org/publications/pdf_files/Books/BCronkleton0601.pdf

Holland, P. Presentation on Cost-Benefit Analysis. Secretariat of the Pacific Community. Available from: http://lrdeconomics.files.wordpress.com/2012/05/1-paula-holland-agr-intro-to-cba.ppt

Holland, P. 2012. Simple Introduction to Cost-Benefit Analysis (Prepared for SPREP PACC Cost-Benefit Analysis Workshop: Food Security Pilot Demonstration Projects, Suva, 24-27 January 2012). Secretariat of the Pacific Community. Available from: http://lrdeconomics.files.wordpress.com/2012/05/pr84.pdf

Jackson, W.J. and Ingles, A.W. 1998. Participatory Techniques for Community Forestry: a field manual. IUCN. Available from: http://www.iucn.org/about/work/programmes/forest/?686/Participatory-Techniques-for-Community-Forestry-a-field-manual

Olander, L.P., Gibbs, H., Steininger, M., Swenson, J., Murray, B.C. 2007. Data and Methods to Estimate National Historical Deforestation Baselines in Support of UNFCCC REDD. Nicholas Institute for Environmental Policy Solutions, Duke University. Available from: http://nicholasinstitute.duke.edu/sites/default/files/publications/data-and-methods-to-estimate-national-historical-deforestation-baselines-in-support-of-unfccc-redd-paper.pdf

Price, C. 2008. Cost Benefit Analysis of Continuous Cover Forestry. Bangor University. Available from: http://www.robin-wood.eu/uploads/robinwood_cbad.pdf

Prasetyo, E. 2013. Converting or Conserving the Forests: A Cost-Benefit Analysis of Implementing REDD in Indonesia. Columbia University. Available From: http://www.academia.edu/3532767/Converting_or_Conserving_the_Forests_A_Cost-Benefit_Analysis_of_Implementing_REDD_in_Indonesia

Silva Ecosystem Consultants Ltd. 1996. Discussion of Cost-Benefit Analysis. Winlaw, British Columbia, Canada. Available from: http://www.silvafor.org/assets/silva/PDF/Methodology/CostBenefit.pdf

Wollenberg, E., Edmunds, D. and Buck, B. 2000. Anticipating Change: Scenarios as a Tool for Adaptive Forest Management, a guide. CIFOR. Bogor, Indonesia. Available from: http://www.cifor.org/publications/pdf_files/SCENARIO.pdf