REDD+ ACADEMY – LEARNING JOURNAL

3. DRIVERS OF DEFORESTATION AND FOREST DEGRADATION (DDFD)

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KEY MESSAGES

- A good understanding of direct and indirect drivers, as well as barriers, is necessary to design and implement effective results-based REDD+ actions;
- Indirect drivers very often influence the behaviour of direct drivers and actors;
- Future drivers and barriers are in all likelihood different from yesterday’s and today’s drivers and barriers;
- Engaging key stakeholders in the analytical work fosters an inclusive dialogue, although countries should base what level of consultation or accommodation and agreement between stakeholders is suitable and required, on their own national circumstances. In order to safeguard public benefits it will not always be possible to obtain buy-in from and/or agreements from key drivers, such as the industrial and commercial sector.
INTRODUCTION

This section presents the main drivers of deforestation and forest degradation (from here on referred to as DDFD) and proposes a framework to analyze them.

The section includes explanations about:

- The main DDFD;
- The importance of analyzing DDFD;
- How to analyze DDFD

WHAT ARE DRIVERS OF DEFORESTATION AND FOREST DEGRADATION (DDFD)?

In the context of REDD+, ‘drivers’ are actions and processes that result in deforestation and forest degradation. Understanding the key DDFD is important for several reasons and particularly critical for the development of national REDD+ strategies and/or action plans and the formulation of policies and measures.

Drivers can be separated into:

- ‘Direct drivers’ (also called ‘proximate causes’), i.e. human activities or immediate actions that directly impact forest cover and loss of carbon;
- ‘Indirect drivers’ (also called ‘underlying causes’ or ‘driving forces’), i.e. complex interactions of fundamental social, economic, political, cultural and technological processes.

See some examples of DDFD in the table 3.1.

### Table 3.1 Examples of DDFD

<table>
<thead>
<tr>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deforestation: subsistence (incl. short-fallow shifting cultivation) and large- and small-scale commercial agriculture, mining, infrastructure development and urban expansion</td>
<td>At the international level, e.g. markets, commodity prices, exchanges</td>
</tr>
<tr>
<td>Forest degradation: legal and illegal timber extraction, forest fires, livestock grazing in forests, fuelwood collection and charcoal production, long-fallow shifting cultivation</td>
<td>At the national level, e.g. population growth, domestic markets, national policies, fiscal incentives and subsidies</td>
</tr>
</tbody>
</table>

**Reflection Point**

Which drivers, direct or indirect, do you think would be the most difficult to address generally or in your own country? Make a list.

Think about the drivers, direct or indirect, in your country in the past. Which drivers do you think will still be important in the future? Do you expect there to be new ones? Make a list.
DIFFERENT DRIVERS FOR DIFFERENT REGIONS

Figures 3.2 and 3.3 present the impact of the various drivers on deforestation in Africa, Latin America and (sub)tropical Asia, from 2000-2010. Figure 3.2 presents the relative importance of each driver, while Figure 3.3 presents the area affected by each driver.

**Figure 3.2 Proportion of deforestation affected by different drivers (2000-2010)**

![Proportion of deforestation](source)

As the graphs show, agriculture is estimated to drive 80% of deforestation worldwide. Large-scale commercial agriculture is the biggest driver in Latin America, accounting for 2/3 of total deforested area, while commercial agriculture in Africa and (sub)tropical Asia accounts for 1/3 of total deforested area. Subsistence agriculture accounts for a similar proportion in each region.

**Figure 3.3 Total area affected by different deforestation drivers (2000-2010)**

![Total area affected](source)

The drivers of forest degradation (as distinct from deforestation) are depicted in a similar way in Figure 3.4.
The graph in Figure 3.4 clearly shows that in Latin America and (sub)tropical Asia, commercial timber extraction accounts for more than 70% of total degradation, while in Africa, the most important drivers are fuelwood collection and charcoal production.

Fiscal policies and incentives are particularly important indirect drivers of forest conversion. They influence land-use behaviour in sectors (especially agriculture) that encroach on forests. They occur at different stages in commodity supply chains, ranging from land access to production, downstream processing and manufacturing, and domestic and international demand-side measures such as market-price support or fuel blending mandates\(^1\), to stimulate production of biofuels from palm oil, sugar cane and soy which have a significant impact globally. The 2014 New Climate Economy Report\(^2\) notes that many countries subsidize key agricultural inputs, such as irrigation water and fertilizer, in order to boost productivity, and evidence suggests many subsidies can also lead to waste of financial resources and environmental damage.

Figure 3.5 provides a list of types of fiscal incentives, as well as examples, demonstrating the complexity of the topic.

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\(^1\) More information on fuel blending mandates, including current updates on fuel blending mandates by country, can be found at the following address: [http://globalrfa.org/biofuels-map/](http://globalrfa.org/biofuels-map/). Note that this covers CURRENT mandates, not % increases over time.

### Figure 3.5 Fiscal incentives

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grants and other direct payments</td>
<td>Transfers to companies or producers to cover specific costs, payments or vouchers to consumers to cover a portion of costs</td>
</tr>
<tr>
<td>Example: Cooking oil subsidies, subsidized land, fertilizer subsidies, inputs (planting materials, herbicides), rural development grants</td>
<td></td>
</tr>
<tr>
<td>Tax concessions</td>
<td>Tax exemptions, credits or deferrals</td>
</tr>
<tr>
<td>Example: Income tax deduction, lower foreign taxes, accelerated depreciation and amortization, loss-carry forward provisions, Value-Added Tax exemptions, biofuel import and stamp duty relief, tax holidays</td>
<td></td>
</tr>
<tr>
<td>In-kind subsidies</td>
<td>Non-monetary benefits that confer a benefit on the recipient</td>
</tr>
<tr>
<td>Example: Privileged or streamlined land access and permitting, publicly-funded research providing private benefit, corruption</td>
<td></td>
</tr>
<tr>
<td>Cross-subsidies</td>
<td>Market transfer or price discrimination within the scope of one unit</td>
</tr>
<tr>
<td>Example: Electricity and irrigation use within a public utility</td>
<td></td>
</tr>
<tr>
<td>Credit subsidies and government guarantees</td>
<td>Below-market interest loans, underwriting risk and loan guarantees, incentives promoting foreign investment</td>
</tr>
<tr>
<td>Example: Loss compensation, concessionary interest rates</td>
<td></td>
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<tr>
<td>Hybrid subsidies</td>
<td>Instruments utilizing the tax system to lower the costs of private investment</td>
</tr>
<tr>
<td>Example: Tax-free bonds, tax increment financing</td>
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<tr>
<td>Derivative subsidies</td>
<td>Subsidies to counter the distortions caused by other subsidies upstream, such as higher input prices for downstream manufacturers or consumers</td>
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<tr>
<td>Example: Compensatory or countervailing support, subsidy clusters</td>
<td></td>
</tr>
<tr>
<td>Procurement</td>
<td>Preferential public purchasing, special financing arrangements</td>
</tr>
<tr>
<td>Example: Public procurement commitments seeking to support domestic producers</td>
<td></td>
</tr>
<tr>
<td>Market price support (in the producer country)</td>
<td>Deficiency payments or artificial price support to cover the gap between target price for a good and actual market price</td>
</tr>
<tr>
<td>Example: Fuel blending mandates</td>
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### Trends that will affect future deforestation and forest degradation

Drivers will change over time, as well as over space and global trends can affect them such as:

#### Global population

An increase in global population is expected, predominantly in urban areas (fast-growing middle class), reaching 8.2 billion individuals in 2030. The largest increases in population will be in Africa (+235 million) and Asia & Pacific (+255 million). A stabilization of the population level is expected to take place after 2050, at around 8-10 billion individuals, due to rising living standards and declining birth rates (aging populations).

#### Agricultural commodities

Overall, a 70% increase in demand for food products is expected by 2050. Meat production is expected to increase by 85% (FAO, 2009). For oil seeds, there is an expected 23% production increase between 2011-2020, 2/3 of which to occur in developing countries (OECD/FAO, 2011\(^1\)). Furthermore a 45% rise in palm oil output is

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expected, mainly by Indonesia and Malaysia (OECD/FAO 2011). By 2020, biofuels will account for 21% of the increase in global coarse grains production above current levels, 29% of the global vegetable oil production’s increase, and 68% of global sugar cane production’s increase will go to biofuels (OECD/FAO, 2011).

WOOD PRODUCTS

It is expected that the annual plantation production capacity will rise to 1.8 billion m$^3$ per year by 2020. The increase should mostly come from tropical countries and the southern hemisphere, given that 80% of the production potential is located in the area. By 2020, Brazil, China and Russia should dominate the market of the international trade of wood products (FAO Advisory Committee on Paper and Wood Products, 2007$^4$). Finally, even though the EU and US import controls are beginning to reduce imports of illegally logged wood products, global and domestic trade willing to source illegal wood will increase in general, unless countries can increase legality in the forestry sector, which in many countries is very difficult due to weakness in enforcement capability. This means that sourcing illegal timber is expected to increase outside of the US and EU.

FUELWOOD AND CHARCOAL

The number of people relying on traditional biomass use globally should decrease by 175 million between 2008 and 2030. While global trends are expected to decline, a 34% increase in fuelwood consumption is expected between 2000 and 2020 in Sub-Saharan Africa (FAO, 2009). Demand for charcoal (another traditional fuel) is likely to increase due to increased urbanization.

THE IMPORTANCE OF ANALYSING DRIVERS

Several UNFCCC COP decisions refer to drivers, where developing countries are required to identify DDFD (Decision 4/CP.15), address these drivers in their national strategies or action plans (Decision 1/CP.16), and ensure that the response to drivers are adapted to national circumstances (Decision 15/CP.19). The text of the three decisions mentioned can be found below:

Paragraph 1 of decision 4/CP.15:

Requests developing country Parties, on the basis of work conducted on the methodological issues set out in decision 2/CP.13, paragraphs 7 and 11, to take the following guidance into account for activities relating to decision 2/CP.13, and without prejudging any further relevant decisions of the Conference of the Parties, in particular those relating to measurement and reporting:

- (a) To identify drivers of deforestation and forest degradation resulting in emissions and also the means to address these;

Paragraph 72 of decision 1/CP.16:

Also requests developing country Parties, when developing and implementing their national strategies or action plans, to address, inter alia, drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the safeguards identified in paragraph 2 of annex I to this decision, ensuring the full and effective participation of relevant stakeholders, inter alia, indigenous peoples and local communities;

Warsaw Framework decision on drivers (15/CP.19):

Also noting that livelihoods may be dependent on activities related to drivers of deforestation and forest degradation and that addressing these drivers may have an economic cost and implications for domestic resources,

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$^4$ [http://www.fao.org/forestry/en/]
1. Reaffirms the importance of addressing drivers of deforestation and forest degradation in the context of the development and implementation of national strategies and action plans by developing country Parties, as referred to in decision 1/CP.16, paragraphs 72 and 76;

2. Recognizes that drivers of deforestation and forest degradation have many causes, and that actions to address these drivers are unique to countries’ national circumstances, capacities and capabilities;

Why analyze drivers?

In order to reduce emissions and enhance removals from forests, it is important to identify, understand and address the most important drivers.

A robust and comprehensive analysis of drivers and a consensus across all national stakeholders can potentially contribute to a country’s efforts to:

- Agree at the national level on a vision for REDD+;
- Formulate a national REDD+ strategy and/or action plan with clear priorities;
- Justify the selection of particular REDD+ activities;
- Inform the design of policies and measures to address priority drivers;
- Link forest area changes as well as forest degradation to specific activities (see figure 3.6 for an example of this);
- Link information on drivers to Safeguard Information System and Environmental and Social Management Framework processes;
- Effectively engage key stakeholders, especially of the non-forest sectors, that are in many countries the main drivers of DDFD;
- Define priorities for forest monitoring and MRV;
- Inform national circumstances for adjusting reference emission levels;
- Tailor results-based actions that will generate result in GHG emission reductions, therefore allowing for generation of results-based payments.

Barriers for implementing “+” activities

Without a solid analysis of the drivers and a consensus on which are the most important, the capacity to achieve tangible REDD+ results and to access results-based payments is compromised. Countries aiming to focus their policies and measures (PAMs) and national REDD+ strategy or action plan on the “+” activities have to also analyze barriers to the enhancement and conservation of carbon stocks and sustainable management of forests. Constraints to implementing “+” activities are similar to barriers to investments in sustainable forest management and the drivers of deforestation, e.g. fiscal incentives.

Potential barriers (and there are some similarities with the DDFD) include, but are not limited to:

- Poorly defined and contested rights;
- Weak capacity and commitment to improve forest law compliance and reduce illegal logging and trade;
- Inappropriate and inconsistent public policies and arbitrary changes in policies;
- Lack of transparency and accountability;
- Lack of or poor cross-sectoral coordination, information sharing and willingness to work together across ministry mandates;
- Real or perceived shortages of land available for investment;

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5 This refers to “Conservation of forest carbon stocks; Sustainable management of forest; Enhancement of forest carbon stocks” (paragraph 70 in the Cancun Agreements).
• Social complexities and traditions (e.g. unwillingness to change land use or out-migration leading to labour shortages).

**REFLECTION POINT**

There are considerable benefits to analysing drivers, what do you think might be some problems associated with not analysing drivers of deforestation and degradation effectively?

**HOW TO ANALYZE DRIVERS**

A DDFD analysis might present the first opportunity to engage with different sectoral actors (e.g. various ministries, civil society, and private sector) and to foster an inclusive dialogue with the goal of reaching a national consensus.

The analysis should not be treated as a “one-off” study, but should be an iterative process that builds on existing and new knowledge and information. Further analytical work, especially after new issues have arisen, should provide additional insights on particular issues.

The primary direct drivers are often known, yet there may not be consensus about their importance among stakeholders, and further understanding may have to be built. The indirect drivers are usually less obvious and understood, yet have a strong influence on decision making and actions of direct drivers (e.g. rising or falling commodity prices). The analysis of the interactions between the indirect and direct drivers may require a range of analytical approaches, e.g. statistical analysis and modelling using economic and demographic indicators, as well as socio-economic, analyses, understanding market dynamics and commodity production/consumption patterns, etc.

The analysis of drivers might include:

• Analysis of policy and governance issues (global, national);
• Collecting national and local data, which is often not easily available and scattered among different sources, sectors and ministries;
• Linking forest area changes to specific activities and land-use changes (remote sensing analysis);
• Evaluation of spatial context and location, and other features (e.g. roads, settlements) to help with interpretation;
• Local and regional knowledge (experts and communities) and ground observations;
• Analysis of the various economic activities responsible for deforestation in order to identify a set of current economic incentives and disincentives and barriers to change;
• Analysis of the social dimension of deforestation: traditions, cultural factors, individual and collective behaviours underpinning deforestation and degradation.

**UNDERSTANDING THE MECHANISMS BEHIND THE DRIVERS**

Analyzing the drivers shall ultimately help design effective, efficient and equitable policies, actions and measures. It requires an understanding of the economic and social interactions at work behind the observed drivers, as well as a proper assessment of the social and economic costs and benefits of the drivers. For instance, subsistence agriculture has limited economic benefits but critical social and welfare implications. Conversely, commercial and mechanized agriculture can have large economic benefits (employment, profits), but in some cases more limited welfare potential.

Analyzing the drivers shall not only serve to identify them but also to compare them according to their potential for reduced deforestation.

Four indicators are key to comparing drivers:
• The amount deforested or degraded for a unit of a particular driver, such as an increase in the price of agricultural output (i.e. palm oil)
• The benefits (social/economic/environmental) for a unit of a particular driver
• The costs (social/economic/environmental) for a unit of a particular driver
• Availability of REDD-compatible alternatives.

These indicators need to be assessed over the life time of the drivers to account for their short-term and long-term impacts, as well as benefits and costs. Comparing these indicators across the different drivers will help highlight the drivers that should be prioritized by PAMs. Since each driver might have a different unit of measurement, it is common to “normalize” them by reporting their value over a defined period of time. Value is often calculated in monetary terms but other metrics can be used instead, such as an overall livelihood index, or an ecosystem performance indicator. The aim of normalization is to provide a common scale to measure and compare drivers that are intrinsically different in nature and impact, and ultimately help decision-makers select areas of intervention:

• One hectare of palm oil plantation in Indonesia has an estimated financial opportunity cost of US$6,000 over its 30-year lifetime.
• The same hectare of palm oil plantation has however associated costs and risks pertaining to the destruction of local ecosystems providing critical environmental services: food, raw material, access to water, pest and disease control, the difficulty being to measure these services accurately.
• One hectare of low-productivity subsistence crops is valued as the cost of equivalent produce that would have to be bought at a local market minus the cost of production. Possible costs and risks derived from the activity are the depletion of soil nutrients, increased prevalence of uncontrolled fires, shrinking underground aquifers.

Numbers obtained from this normalization will represent the minimum value derived from each driver. Negative value represents a net cost, positive value a net gain. These normalized “true” prices for the different drivers can then be compared and prioritized according to the overall value (economic, social, environmental) they create or destroy.

Finally, it is also important to look at the political/social acceptability of addressing the driver. It is essential to also recognize the importance of additional external factors that might influence the impact and inherent dynamic of the drivers. The normalized monetary value, if analyzed in isolation, might imperfectly reflect the other social dimensions that make up the drivers’ total value. This is why drivers should in principle not only be compared on the basis of their economic costs and benefits but also include their social costs and benefits. As an example, it might be important to include in any analysis of drivers the possible influence of illegality, non-compliance and corruption to understand how these factors might interfere with PAMs and limit their effectiveness.

**Reflection Point**

Why is it so important to consider the social costs and benefits when considering drivers?

**How to rank the drivers?**

There are several criteria that can be used to rank the drivers depending on the objectives and strategies being pursued. The choice of indicator is critical to ensure that the analysis of drivers informs the overall objectives and strategies pursued.

The ranking can be based on the amount deforested if the only goal is the deforestation performance: e.g. commercial agriculture might be prioritized. The ranking could rather focus on the “cheapest” drivers (drivers with the lowest net benefits): e.g. inefficient and low-productivity agriculture (subsistence), or equity,
highlighting activities with unequal distribution of benefits and costs: e.g. mining. Of course, it could also use a combination of other indicators: environmental integrity, biodiversity, CO₂ absorption potential. Once again, it is important to highlight the political feasibility or acceptability of addressing particular drivers.

There are challenges in this analysis, though. Fine-grained analysis of the mechanisms at play might be too expensive to be carried out for each driver, or data might be missing for some drivers and the implication for Policies and Measures (PAMs) should therefore be explicit. A lack of data might also justify increased efforts to collect data on drivers that represent prioritized areas of intervention. However, in case of a “no-regret” option, which is expected to serve multiple benefits and carry low risk, a government would not have to wait for complete data before acting.

Coordination is also required between ministries to minimize the risk of focusing too much on forest-based drivers and missing key non-forest (e.g. agricultural) drivers.

**COMMON PITFALLS IN ANALYZING DRIVERS**

- Analyzing historical trends only without looking at potential future scenarios;
- Omitting an analysis of indirect drivers;
- Reductionist approaches that neglect non-forestry sectors and their plans for the future;
- Not separating the drivers of deforestation from the drivers of forest degradation, as they are usually not the same;
- Being fixated on particular solutions (e.g. community forestry) before a driver and barrier analysis even starts.

**NEXT STEPS**

Once the analysis of drivers has been completed, it can inform, among other sources of information, the following:

- The national vision for REDD+;
- The national REDD+ strategy and/or action plan with clear priorities, or support the refinement or modification of existing plans or strategies (see Module 4: National Strategy (NS) or Action Plan (AP));
- Agreement on and development of on Policies and Measures (PAMs) to address the key drivers (see Module 8: Policies and Measures).

As new issues arise, such as changes in commodity prices and exchange rates (which can have significant impact) and modifications to incentive systems and/or laws and regulations, any driver analysis must undergo a reality check from time to time.

**CASE STUDY**

**KENYA**

**ISSUE**

Fuelwood is an important driver of deforestation in many developing countries, with nearly 3 billion people relying on biomass fuels such as wood, charcoal and dung for cooking. Considering the growing population with growing energy needs, fuelwood is expected to remain a significant source of energy many countries in the years to come.

Production at scale of quality cookstoves at an affordable price for households, businesses and institutions remains extremely challenging following usual production models involving small producers. According to a

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study from GTZ⁷, as soon as one out of two households owns an improved cookstoves, they become a “must have” for other households.

BURN Manufacturing Company (BMC) is a C-Corporation, social enterprise with manufacturing operations in Kenya. BMC was created to address the enormous need for high-efficiency cookstoves. In Kenya, for example, wood gathering has contributed to the destruction of 94% of the original native forest. The country consumes 3.5 million tons of firewood every year, more than double the estimated annual sustainable yield of 1.5 million tons. Urban households currently spend up to $365 for charcoal each year. Many of these households have the ability and a strong financial incentive to purchase a $20 stove that can reduce fuel consumption by 50%.

**ACTION**

The needs of these consumers are largely unmet as 97% of all biomass consumers rely on traditional and inefficient cooking technologies. In order to fill this need, BMC will manufacture and sell 3 million stoves in East Africa by 2022. BMC intends to raise $3.8 million to establish a modern continuous flow manufacturing facility in Kenya and satellite assembly plants in Rwanda, Tanzania and Uganda.

Currently users have two stove purchase options, both that do not fulfill their needs: locally produced, ‘artisan’ stoves or stoves imported from India or China. Artisan produced stoves are of mixed quality and cannot be manufactured in the volumes required to meet market needs. Imported stoves are typically more expensive due to tariffs and shipping costs. In addition, they also are not designed specifically for the East African market’s unique needs. Chinese-made Envirofit stoves and Indian-made Prakti stoves have made small forays into the East African market but they are currently hampered by the challenges noted above.

BMC’s solution will provide stoves that are designed for, and produced in, the East African market at a price and quality that none of our competition can match. BMC will enter the market with two stove products.

**IMPACT**

Unknown

**EXERCISES**

1. True or False?
   The fact that livelihoods may depend on activities related to drivers of deforestation and degradation is addressed by the Warsaw Framework Decision on DDFD.

2. This module has introduced the importance of good analysis of the DDFD. Which of the following are made more likely from an analysis of drivers?

| Agreement on a national vision for REDD+ | Reduction in use of fossil fuels | Clear justification for the selection of particular REDD+ activities |

<table>
<thead>
<tr>
<th><strong>Initiation of a safeguards and Safeguards Information System (SIS) work stream</strong></th>
<th><strong>Formulation of a prioritized national REDD+ strategy and/or action plan</strong></th>
<th><strong>Better understanding of the link between changes in forest area and a specific economic activities</strong></th>
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<td><img src="image2.jpg" alt="Image" /></td>
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