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DELIVERING REDD+ INCENTIVES TO LOCAL STAKEHOLDERS: LESSONS FROM FOREST CARBON FRAMEWORKS IN DEVELOPED COUNTRIES

Mariana Deheza¹ and Valentin Bellassen²

Reducing CO₂ emissions from forests was slow to get off the ground as a subject of international climate negotiations, but it has picked up considerable momentum since 2005. In particular, agreement has been reached on the urgency to set up a global REDD+ mechanism. The mechanism aims to provide developing countries with incentives to reduce emissions from deforestation and forest degradation and to increase forest carbon stocks through appropriate forestry practices or through planting. Agreement has also been reached that REDD+ incentives should be result-based and ultimately awarded at the national level.

Nevertheless, local initiatives are a useful mean of tackling deforestation. However, when carbon incentives depend on national performance, linking them to local initiatives is a technical and financial challenge. Technically, the national accounting framework must be able to track emissions-reduction initiatives at the sub-national level (regional, local or projet level). Financially, investors are likely to be scared away if their reward depends on deforestation occurring outside the area of their investment. Ultimately, the issue of transferring national incentives coming from supranational agreements to the local level can be reduced to a political decision on risk sharing between the State and private stakeholders.

Industrialized countries have already faced this issue during the first commitment period under the Kyoto protocol and they have often found it difficult to develop satisfactory solutions. Two notable exceptions are New Zealand, which included its forest sector in its emissions trading scheme, and Australia, which is developing a 'Carbon Farming Initiative' for forestry and agricultural offsets. This study draws lessons from a comparison of the treatment of the Land Use, Land Use Change and Forestry (LULUCF) sector in industrialized countries during the first Kyoto protocol commitment period and the current discussions and initiatives on the architecture of a future REDD+ mechanism. Two opposite alternatives are identified: a State guarantee that project developers are rewarded based on the success of their project no matter the national performance, as in New Zealand; and a carbon incentive for project developpers which is scaled down in proportion of the national performance, as it has been discussed in France.

Beyond the political decision concerning the risk sharing, three technical keys to a successful transfer of carbon incentives to local actors are presented through the analysis of a number of case studies: (1) a consistent set of baselines; (2) a monitoring system which includes both emissions reductions and the causes behind them; and (3) a clear regulatory framework. The variety of approaches to including project reference baselines in the national reference level is analyzed based on experiences in the European Union, Guyana and Peru. Regarding monitoring, building on national GHG inventories from Annex 1 countries and Brazil's experience in monitoring deforestation could help leapfrog the technical challenges posed by Monitoring, Reporting and Verification (MRV) in REDD+. Lastly, the study explores the progress made by Colombia in setting up a national regulatory framework and by the state of Acre in Brazil in building an institutional framework for REDD+ at a regional level.

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INTRODUCTION

The question of how to include forests and their role in climate change mitigation took more time than other sectors in making its mark on international negotiations conducted within the United Nations Framework Convention on Climate Change (UNFCCC). However since 2005, the implementation of a mechanism designed to tackle deforestation and degradation of tropical forests (known as the REDD+ mechanism) has been making better progress than other sectors or mechanisms. At the Cancun conference in December 2010, agreement was reached on implementing the mechanism at the national level. During what is referred to as an “interim”³ period, countries have the option to put in place pilot and demonstrative initiatives at a sub-national level.

Hence, it is very likely that the initial recipients of remuneration for reduced deforestation will eventually be the national governments in developing countries. It is equally likely that no penalty will be imposed upon countries which perform badly compared to their baseline. These two points raise the issue of how to pass these incentives on to local actors directly involved in forestry. What technical conditions must exist to allow this transfer to take place, particularly as regards the development of a national Monitoring, Reporting and Verification (MRV) system of emission reductions? How might the risk of under-performance at national level be shared between the state and local actors (despite an individual positive performance of projects, there could be less-than-expected or even no remuneration for projects if the host country as a whole performs badly, for example in areas uncovered by REDD+ projects)? How can the system evolve from one where several isolated and individual projects exist into a regional or national system?

The simplest option would be for countries to forego project-level action and rely only on national-level policies. This may prove difficult for countries with limited capacities and levels of governance at the national level. In any case, reducing deforestation will be a more difficult task if restrictions are imposed on the range of policy tools available.

This Climate Report draws lessons from concrete case studies, comparing the treatment of forests by Annex 1 countries to the REDD+ initiatives currently being rolled out in developing countries. It begins by explaining why national accounting may be incompatible with the transfer of incentives to stakeholders at the local level. It then assesses the various options for *risk-sharing* between national governments and local actors. Finally, it sets out the prerequisites for the implementation of an incentive transfer system: compatibility of the accounting systems used at the different levels, creation of a robust MRV system and a clearly-defined legal and regulatory framework.

I. FOREST CARBON ACCOUNTING IN THE KYOTO PROTOCOL, REDD+, AND THE LEVEL OF INCENTIVES FOR CLIMATE MITIGATION

A. Forest carbon accounting in Annex I countries

During the first Kyoto protocol commitment period (2008-2012), targets on stabilizing or reducing emissions of anthropogenic greenhouse gases (GHGs) were set for Annex I countries. Each country received a number of carbon credits or Assigned Amount Units (AAUs) corresponding to its emissions target (excluding the forest sector). Each country then submits an annual national GHG emissions inventory. At the end of the period, countries are required to return the number of AAUs corresponding to the cumulative amount of emissions in their inventory. In order to do so, they may: (1) reduce their emissions to their target level; (2) buy AAUs from other countries; (3) invest in emissions-reduction projects through the CDM or JI; (4) under certain circumstances, countries may issue Removal Units (RMUs) on the basis of their forest and agricultural sectors.

Where the fourth option is concerned, the allocation of carbon credits is governed by two articles in the Kyoto protocol and complemented by the Marrakesh agreements:

³ *i.e.*, before a national REDD+ strategy has been finalised in developing countries.

- Article 3.3, which is mandatory, requires countries to calculate the balance of emissions and sequestration linked to afforestation and deforestation giving rise to a change in land use. The net change in carbon stock linked to land which has changed use since 1990 is the “3.3 balance.”
- Article 3.4 offers Annex I countries the option to include emissions and sequestration resulting from forest management in their national inventories. In practice, this refers to changes in carbon stocks from land that has remained forested since 1990. In order to reduce windfall profits arising from forests’ normal ageing processes and from growth resulting from climate change, the number of Removal Units (RMUs) that a country can receive as a result of a positive “3.4 balance” is capped. In France’s case, the cap is set at 3.2 MtCO₂ a year, which compares with a “3.4 balance” of around 70 MtCO₂ per year. A country with a negative Article 3.3 balance can also make up the difference using the article 3.4 balance up to a maximum of 33 MtCO₂/year.

The outcome of these calculations – the balance under each article and the decision made in regard to Article 3.4 – affects the strength of the incentive to improve the carbon balance of the forest sector at the national level and the ease of transferring incentives to the local level.

If a country’s Article 3.3 balance is negative⁴ but offset by a large surplus from the “3.4 balance,” an afforestation project that could reduce the deficit would have no effect on the country’s Land Use, Land-use change and Forestry (LULUCF) carbon account, which would thus remain at zero. The risk of this occurring explains why it is difficult to use traditional carbon incentives such as the national government transferring carbon credits to local actors. If the “3.3 balance” is zero the government does not receive Removal Units and cannot pass them on to landowners who have carried out afforestation actions on their lands (Deheza and Bellassen, 2010).

As such, Article 3.4 does not provide strong incentives. For example, in France forest management is included in accounting for the 2008-2012 period. As such, France will receive from the UNFCCC a number of RMUs corresponding to the number of tonnes of CO₂e in its “3.4 balance,” up to a ceiling of 3.2 million tonnes of CO₂ per year.⁵ In 2009, however, the French “3.4 balance” was around 70 million tonnes of CO₂e, which is considerably higher than the amount for which they could be credited for. Since this figure is unlikely to change significantly over the 2008-2012 period, the French state has no incentive to foster improvements in forest management either for state-owned or privately-owned forests. A project which increases sequestration from French forests would not change the 3.2 million RMUs per year that France receives under Article 3.4.

B. Decisions on REDD+ at the UNFCCC level: national level implementation and a three-phased approach

Implementing a REDD+ mechanism has been a key part of global post-Kyoto climate arrangements since the advent of the Bali Road Map in 2007⁶.

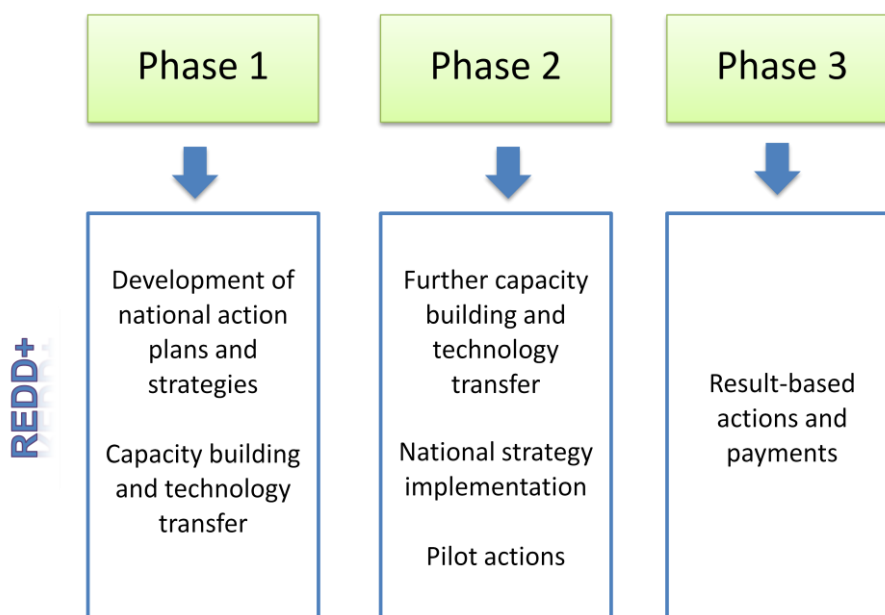
Decisions regarding REDD+ were reached as a result of the work of the Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) of the Conference of the Parties. Decision 1/CP.16 was adopted under the Cancun agreements in 2010 and set out a three-phased approach for developing countries to enter the mechanism (see Figure 1).

⁴ A negative balance implies that the net change in GHG emissions by sources and removals by sinks accounted by article 3.3 results as a net source of emissions.

⁵ This cap was agreed by all Annex I countries (Decision 16/CMP.1).

⁶ REDD+ refers to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

Figure 1 – The three stages of REDD+ mechanism implementation



Source: CDC Climat Recherche from decision 1/CP.16.

Decision 1/CP.16 also established the level at which the mechanism is to be applied, providing for implementation at both national and sub-national levels for an “interim” period. This choice was made primarily to avoid the risk of emissions leakage, *i.e.*, reductions in emissions in one part of a country alongside relocation of the emissions to another part of the country.

Pedroni *et al.* (2010) argue that a “*nested approach*” is required during a transitional period until the governments of developing countries have time to finalise their national frameworks. This raises the question of how to ensure that the local incentives which are already in place today are compatible with future systems of incentives and with national commitments. Pedroni *et al.* (2010) consider that allowing developing countries to set up activities at levels that are more appropriate to their capacities and levels of governance (project, local or regional) in the short and medium term, will help them raise the private and public funds needed to scale up to the national level.

Whether or not the “*nested approach*” is adopted, performance assessment and, hence, the distribution of incentives, is likely to take place at the national level in the long term. This raises the question of whether this distribution will be compatible with local action. The future REDD+ mechanism is unlikely to impose sanctions: credits are awarded when a country’s deforestation rates are below those of a reference scenario but, if this is not achieved, no penalty is imposed upon the country in question. Therefore, the availability of economic incentives arising from the delivery of forestry credits depends on the performance of the country in question: if the country performs poorly as a whole, it will have no credits to distribute, even to a minority of actors or regions which may have performed well.

The Verified Carbon Standard (VCS) organisation, currently the leading certifying organisation for REDD+ projects on the voluntary market, recognises the need for transitional stages. It is working on establishing a methodological framework which takes account of this need. The draft VCS’s *Jurisdictional and Nested REDD Initiative* was released for public consultation in May 2012, with hopes that it will help the VCS to be accepted on future compliance markets. The details of its approach in terms of risk-sharing are presented in Part II of this study. The jurisdictional working group of the Governors’ Climate & Forests Task Force (GCF) is taking a similar approach⁷.

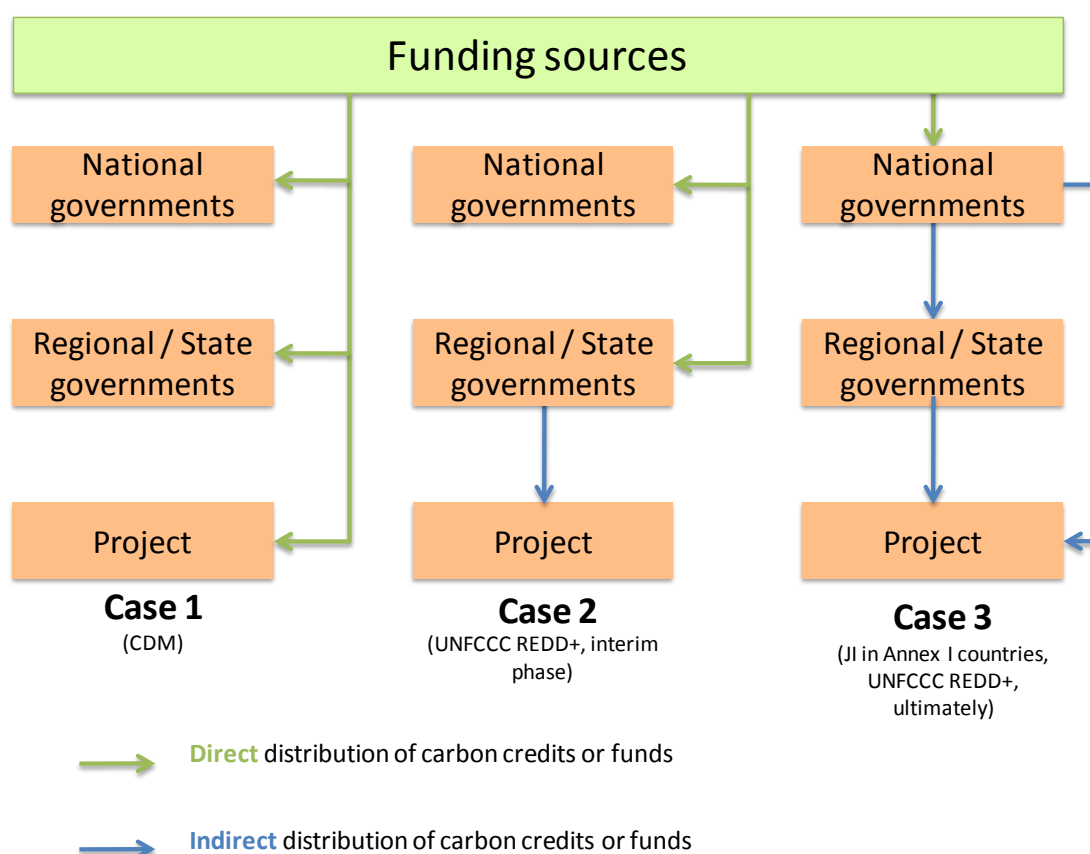
⁷ Governors Climate & Forests Task Force (GCF) is a network of 16 states and provinces in Brazil, Indonesia, Mexico, Niger, Peru and the United States which are involved in developing the rules and capacities required to generate carbon assets from REDD+ programmes and projects.

C. The level at which incentives are provided and their effectiveness

In theory, incentives to reduce emissions or increase carbon sequestration through forests can be offered at three levels (Figure 2): national, sub-national/provincial or project level.

For Annex I countries, Kyoto Protocol incentives are distributed at the national level. National governments account for the emissions produced on their territories and manage their Kyoto quotas. They then have the option to transfer a portion of the incentives to project developers through the Joint Implementation mechanism as depicted on Figure 2 (case 3). In the case of LULUCF, this possibility has not been very effective so far, partly because the complexity of accounting rules for sinks have limited the interest of developed countries in transferring these incentives (see part I.A).

Figure 2 – Incentive allocation options: the case of the REDD+ mechanism



Source: Pedroni et al. (2010)

In the case of REDD+, three options for allocating the funds could be considered. A mechanism remunerating projects directly, similar to the Clean Development Mechanism (CDM) (case 1). Instead, it seems that the REDD+ mechanism is moving towards indirect remuneration for projects, with credits being allocated to regional/provincial or national governments (cases 2 and 3). As previously mentioned, the Cancun decision supports this approach, as do the working groups on jurisdictional integration set up by the Verified Carbon Standard and the regional structure of the Governors Climate & Forests Task Force (GCF).

The complementary nature of macro- and micro-economic tools

A number of instruments at both macro- and micro-economic level (such as project-level instruments in the latter case) can be used by governments to incentivize reductions in deforestation rates or the increase of forest-carbon stocks through improved forest management or reforestation. These policy options require coordination among actors at different governance levels, including international

organisations and donors, national governments, subnational authorities, local stakeholders and private investors.

In the case of reducing deforestation, past experiences of macroeconomic policies applied in developing countries have been surveyed by Pfaff *et al.*(2010) (see Box 1). REDD+ -type funding for public policy has the potential to increase its impact and make it more effective. The main reason for this belief is that REDD+ funding would be awarded on the basis of performance. In addition, further coordination among donors and lenders is to be expected from a REDD+ scheme, as the MRV system would track the allocation of funds and their impact on deforestation (see part III.B). This should help increase the overall impact of funds by improving the allocation of resources. Fragmentation of funds and the lack of coordination among donors make funding less effective and lead to duplication of efforts (Bigsten, 2006).

Box 1 – Overview of macroeconomic policies historically applied by international, national, regional, and local policymakers

At the international level, policies linked to development aid vehicles and trade regulations are in the process of including clauses aiming at reducing tropical deforestation or increasing and maintaining carbon sinks in forests. Among these, one can mention:

- **Conditional loans:** beneficiaries (national governments) only receive funds when they put in place policies to improve forest governance, to extend national parks or when they apply certain economic policies.
- **Debt relief programs:** some lenders trade a reduction in debt for forests protection. One example of this kind of policy is the Tropical Forest Conservation Act (TFCA) launched by the United States in 1998. This policy offered developing countries a cut in their debt with the US government in exchange for allocating money to funds dedicated to the conservation of tropical forests.
- **Demand-side control measures** such as the restrictions that developed countries may impose on illegal imports of wood: the FLEGT in Europe, and sustainable forestry certification schemes (FSC, PEFC).
- **The establishment of grants and technical assistance programs.**

While at the national and regional level, a number of public policies set up by central governments and regional authorities affect forests either directly or indirectly:

- **Direct effect policies:** the establishment or extension of protected conservation areas; the establishment of systems of payment for the environmental services (PES) provided by forests (such as the PES program in Costa Rica); changes in forest concession regimes that introduce further regulation to control the forest management practices of industrial concessionaries; decentralisation of forest management to local governments; funds or subsidies for afforestation or reforestation, such as the former *Fonds Forestier National*, which operated in France between 1946 and 2000 and subsidized the reforestation of around two millions hectares of private lands.
- **Indirect effect:** non-forestry policies such as infrastructure policy (road and highway building), agricultural policy (such as policies affecting commodity prices, technology and volumes), policies on land ownership and fighting corruption often have an indirect effect on forest carbon stocks.

Source : Pfaff et al.(2010) and CDC Climat Research.

However, the macro-economic level is not the only level at which action can be taken to reduce deforestation. Pfaff *et al.*(2010) highlight that national public policy alone is generally not sufficiently effective in reducing deforestation. Indeed, local action can be equally effective and complementary. At the micro-economic level, carbon offsetting projects are an example of local emissions reductions often led and financed by private actors, in some cases with funding or co-financing from public bodies. Private players are attracted to these projects because they are smaller in scope and the risk of failure is, therefore, easier to control and manage (EPRI, 2010).

Forestry carbon projects are currently funded either by development grants or by market-based mechanisms which offer credits in exchange for carbon sequestration. In practice, these two sources of funding are limited. Official Development Aid (ODA) dedicated to forest projects reaches around 340 millions of euros/year (Bellassen *et al.*, 2008), and the incentive provided by carbon finance, although potentially larger, is currently constrained by the tiny share of forestry credits in the total demand for carbon

credits on carbon markets. Forests are indeed barely present in the carbon compliance markets – those which arise as a result of regulatory constraints such as those of the European Union’s Emission Trading Scheme EU ETS – due to restrictions on the use of forestry credits. More recent and smaller compliance markets implemented in New Zealand, Australia, California and Quebec are exceptions as they give a predominant position to land based credits.

Forestry projects do, however, play a dominant role on voluntary markets, where they accounted for 23 % of credits traded in 2011 (that is more than 21 millions tonnes of CO₂e). Voluntary frameworks offer, however, lower levels of incentive than regulatory frameworks: prices have historically been lower, the market is less liquid and not as deep, etc. In 2011, the voluntary market traded only 93 MtCO₂e valued at 430 million euros (Peters-Stanley and Hamilton, 2012), that is sixty times less than the compliance market in terms of value. The primary and secondary CDM and JI markets traded 2,102 MtCO₂e worth 17 billion euros in 2011 (Kosoy and Guigon, 2012).

The information available on other projects than carbon offset projects, such as projects supported by ODA or other kinds of environmental sponsorship, is patchier and less transparent.

In order to make the most of projects as a tool for achieving the objective aimed at, incentives must be available at project level in the form of payments to the project developer. In a framework where incentives are to be offered in exchange for national performance, it will be necessary to ensure compatibility between the level where incentives are generated (at national level) and the level where the incentives are needed in order to create action (at local level).

II. RISK SHARING WHEN THE ISSUANCE OF CREDITS DEPENDS ON NATIONAL PERFORMANCE

The rules governing forest carbon accounting both in Annex I countries and in the REDD+ framework make the economic incentive to reduce emissions dependent on national performance.

A country could be at risk of a negative balance as a result of the risk of under-performance at two levels:

- at **the project level** due to the risks inherent to forestry investment, to events beyond the control of the project developer, to technical problems that may become apparent at the design, development or implementation stage of the project concerned;
- at **the national level** for reasons linked to the performance of public programmes, to government policy (regulatory risks) or to breaches of contract.

The analysis of approaches adopted by a number of Annex I countries during the first Kyoto protocol commitment period reveals two options for risk sharing explored below.

It is equally important to take into consideration a new provision included in the Durban decisions that will allow Annex I countries to exempt the accounting of large emissions resulting from natural disturbances if the magnitude of emissions is outside a predefined statistical range. This means that the country would be partly protected against some risks, though it is not clear how this protection would be extended to regional or project levels.

A. Option 1: the State only issues credits if the country achieves a positive balance

Within this option, projects or initiatives undertaken at sub-national level are only rewarded if the country as a whole achieves a surplus. The risk of “national under-performance” is, therefore, borne by all project developers, often from the private sector.

Whilst private investors are used to managing risks linked to the performance of their projects or to the market, the above-mentioned approach would involve managing a risk which is primarily linked to the governments’ ability to reduce deforestation outside of the perimeter over which they invest. This type of “political” risk is particularly difficult for investors to manage because they generally have no influence

over it. This cumbersome issue arises in other funding instruments such as crediting NAMAs⁸, as there is no ex-ante mechanism for allocating credits based on the actions' performance.

As described above, France faces a risk of a negative balance in Article 3.3 for the 2008-2012 period. The State thus faces the risk of receiving no RMUs even if successful and additional Joint Implementation (JI) reforestation projects are implemented which require it to distribute carbon credits in the form of ERUs to project developers. During the design of its "domestic offset project framework", the option of scaling the number of ERUs awarded to the national Article 3.3 balance was the first choice of France.

Since the regulatory framework has not yet been determined, it is impossible to draw any conclusions on how France will eventually decide to share this risk of incompatibility. Given the complexities of implementation of such approach, France is likely, in the end, to choose option 2, which is described below.

B. Option 2: the State guarantees the credits regardless of the national balance

In this second option, the government provides credits or financial compensation to well functioning project developers, regardless of the national balance. It is the government, therefore, which takes the risk of remunerating projects from its own budget in the event that the national balance does not allow the country to obtain credits. Such a situation could prove delicate for countries with budget difficulties.

New Zealand has chosen to take this risk, thus remunerating forest owners who joined their Emission Trading System (NZ ETS), whether voluntarily or compulsorily according to the age of the forest as described below. As such, the government has transferred the economic incentive inherited from the Kyoto Protocol to local players through their inclusion in the national emission trading scheme (Sartor *et al.*, 2010). This transfer occurs at two levels:

- As New Zealand's Article 3.3 balance would be improved by the additional carbon sequestration from forests planted after 1989: their owners can become voluntary members of the NZ ETS in order to receive the credits for all the improvements in the carbon sequestered by their forests. The credits received can be purchased by companies in New Zealand subject to the NZ ETS for their compliance or can be converted into AAUs tradable on the international Kyoto market. In return, forest owners assume the liability of the future carbon stocks of their forests: in the case of a decrease in the carbon stocks, a proportional amount of credits has to be handed back to the State.
- It is compulsory for the owners of pre-1990 forests to join the system, with a few exceptions⁹. As the government is ultimately responsible for the carbon-stock losses that result from the conversion of these forests (also via Article 3.3), it has transferred this liability to forest owners by requiring them to return allowances in proportion to carbon losses if the land is converted to another use. In order to make this carbon responsibility more palatable for forest owners and to compensate them for the loss in value of their land, the New Zealand government has freely allocated part of the surplus expected under Article 3.3. The accounting rules of Article 3.4 are more complex, making it considerably more difficult to transfer forest management incentives to the private sector (except conversion). New Zealand has found a way around this problem by simply choosing not to account for Article 3.4 activities. This is linked to the fact that the projected balance of Article 3.4 for New Zealand will be negative for the first commitment period, as many forests are becoming mature and are ready for harvesting (Baisden *et al.*, 2011).

During the last Durban negotiations, agreement was reached to require mandatory accounting for forest management under Article 3.4 with a new set of rules, including provisions for natural disturbances and the accounting of harvested wood products. New Zealand may choose to rectify its scheme in order to devolve this new responsibility to pre-1990 owners.

⁸ National Appropriate Mitigation Actions

⁹ Three types of forest are exempt from this requirement: Forests of less than 2 hectares, forest owners with less than 50 hectares in total, and trees classed as such as certain conifers.

A complementary instrument put in place by the New Zealand government is the *Permanent Forest Sink Initiative* (PFSI) that allows for the a direct crediting of AAUs to projects promoting the establishment of permanent forests on previously unforested land. To be credited, PFSI participants enter a covenant with the Crown which is registered against their land titles. This covenant is in perpetuity by default, although they have the right to terminate it after a minimum term of 50 years. During this period, limited harvesting is allowed on a continuous-cover forestry regime. The objective of the covenant is to perform as a legal agreement ensuring that the carbon removed from the atmosphere by growing forests is stored permanently, partially ensuring that the credits bought are permanent. This scheme that has registered more than 7,000 hectares throughout New Zealand has gone under review recently. While one of the options considered was merging it to the ETS. The scheme's review panel considered that merging the NZ ETS and the PFSI could downgrade the value of carbon units issued by the PFSI. The government then determined to keep it as a separate scheme at least until international climate change negotiations on the post-2012 conclude and New Zealand's situation becomes apparent.

New Zealand has chosen to use these various approaches in order to associate the private sector with efforts to increase the forest sink and in the reduction of the risk of increased emissions through deforestation and land-use change. In this case, the government is the ultimate bearer of the risk of incompatibility between the ultimate national result and project level emission reductions, even if the country's forest situation and the decision not to apply Article 3.4 significantly reduce this risk compared to the French situation.

These two approaches to risk-sharing taken by Annex 1 countries unsurprisingly indicated that when the governments shoulders the accounting risk, projects are more easily developed. However, assessing if a developing country has a low accounting risk (as New Zealand) or a larger one (as France) in its implementation of REDD+ will be difficult. As such, estimating the potential cost to the State in the case of stemming from an overrun in the national balance is not easy to assess.

C. Risk management tools for the public and private sectors

Table 1 gives an overview of a number of instruments that can be used by governments and the private sector to manage the risk of underperformance. *Buffer accounts* were first developed by the VCS as a manner to manage the risk of reversals from individual projects. It consists in setting aside a small amount of credits of individual projets in a common pool reserve account which is tapped into when the risk materializes. The draft VCS's *Jurisdictional and Nested REDD Initiative* relyies on this approach to address the risk that credits obtained at the national level amount to less than the sum of credits claimed by individual projects. Two different types of buffers are therefore mandated: the traditional project level buffer, for individual projects, and a jurisdictional buffer account that will hold non-tradable buffer credits to cover the non-permanence risk associated with jurisdictional programs and nested REDD+ projects.

Other approaches, currently under developpement by private insurers such as the British insurance company ForestRe, include *commercial insurance mechanisms*, or *public guarantees* set up by central governments for projects hosted in their territories.

One last type of instrument is the guarantees proposed by multilateral agencies to help cover private lenders against the risk of a gouvernement failing to perform its obligations with respect to an individual project. For example, the World Bank proposes:

- *Partial Risk Guarantees (PRG)* that only cover so-called "political" risks relating to government performance. However, PRGs do not cover commercial or project risks.
- *MIGA¹⁰-type Guarantees* insure foreign private investors against the political risks of projects such as the non-convertibility of currencies and transfer restrictions, expropriations, armed conflicts and civil unrest, including terrorism, the rupture of contracts and the non-respect of financial obligations by states.

¹⁰ Multilateral Investment Guarantee Agency, a World Bank agency.

Table 1 - Instruments for managing risk for private investors and states

Instrument	Description	Type of risk to cover	Previous experiences
Buffer accounts	A percentage of the credits produced at the project or country level are set aside	Loss of carbon stocks due to extreme events (storms, fires, pests)	Buffer accounts are commonly used by the voluntary carbon standards (VCS was the pioneer) for forestry projects and plans to set a buffer at the jurisdiction level
Guarantees	Unconditional or limited guarantees on performance, which can be provided by multilateral agencies or by governments	Under-performance of public programmes None-respect of contracts by governments	Partial risk guarantees from the World Bank MIGA-type guarantees
Insurance	Financial mechanisms of private actors (insurers) and/or governments	Under-performance of projects and/or governments	Forest insurance has not yet been widely experimented by agricultural insurers Private players: Forest RE

Source: Adapted and completed by CDC Climat Research from Olander et al. (2011).

III. THREE NECESSARY CONDITIONS FOR PROVIDING ECONOMIC INCENTIVES AT A LOCAL SCALE TO REDUCE FORESTRY EMISSIONS

Once the decision on risk-sharing and risk-management instruments has been taken, we identify three necessary conditions to deliver a successful transfer of incentives to local initiatives: reference levels consistent between scales; a robust monitoring, reporting and verification procedure; and a clearly defined regulatory framework. These conditions are elaborated upon in this section, based on literature review and case studies.

A. Consistent reference levels

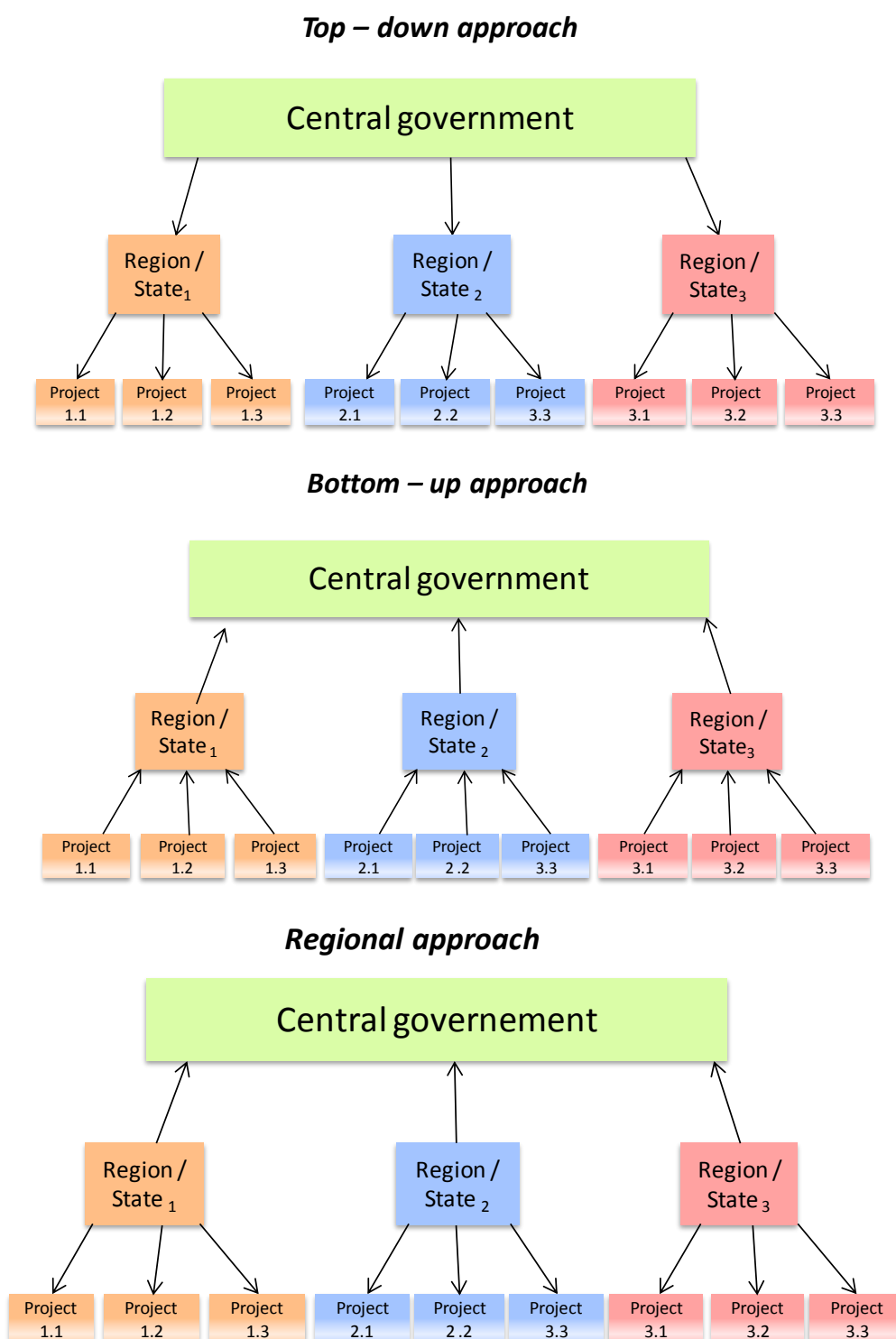
From a technical perspective, the definition of a deforestation reference level is a complex subject. This complexity stems from the difficulty in modelling future deforestation trends (projected scenario) based on numerous variables such as population growth, land property type, agricultural and forest production, the development of infrastructures, etc. The subject becomes even more complex when sub-national initiatives are included in the national mechanism via an indirect or direct transfer of incentives (Figure 2). To minimise the risk of incompatibility, reference scenarios at the national, regional and project level can be drawn up in parallel in order to guarantee the two following conditions (Nepstad, 2011):

$$\sum \text{baseline emissions at the project level} \leq \text{regional baseline emissions}$$

$$\sum \text{regional baseline emissions} \leq \text{national baseline emissions}$$

The various approaches for integrating project or regional baselines to the national reference level have been analyzed by Pedroni *et al.*(2010) and are presented in Figure 3.

Figure 3 – Options for integrating the project-reference level into the national-reference level



Source : CDC Climat Recherche from Pedroni *et al.*(2010) and Olander *et al.* (2011)

The top-down approach

In the top-down approach, the central government defines the reference scenario at the national level, based on specifications defined, for example, by a technical body of the UNFCCC. At a later stage, this reference scenario is applied to the regional level.

This is the type of approach that has been applied by most European countries, which were required to submit a reference scenario for forest management following the Cancun Agreements (2010). Within this framework, 14 out of 27 countries have opted for the generic model of the Joint Research Center (JRC)¹¹.

In terms of developing countries, Guyana has built a national level reference scenario using a 'combined methodology.' This methodology combines the historical data on average deforestation levels in Guyana between 2000 and 2009 and average deforestation in developing countries between 2005 and 2009. This work is in line with the stipulations of the country's agreement with Norway, signed in September 2011. The Scandinavian country may pay Guyana up to 250 million dollars between 2010 and 2015, on the principle of results-based payments. Until the reference level is finalized, the country's annual deforestation rate for 2010 is used to define these payments: if Guyana exceeds it, the Norwegian payments will be reduced accordingly and could even be nil.

Having predefined reference scenarios available at the national level can facilitate the work of project developers (by saving them the effort of designing them) and it can also increase the overall effectiveness of the system by economies of scale. In a multilateral framework, this can also facilitate the comparability of scenarios if they have been designed following the same principles and using the same tools. This is the case of the European countries, most of which used the JRC model. However this approach also has its limits. Firstly, excessive centralisation can give rise to local appeals against the scenario in question. Secondly, the cost of developing the reference scenario and its application is borne by the central government, which can result in delaying its implementation.

The bottom-up approach

In this approach, the data is collected at the sub-national level then gradually aggregated to design the baseline at the national level. The definition of a reference scenario at the project level is currently applied within the framework of the VCS: the methodologies approved by the VCS provide guidelines for drawing up a baseline at the project level.

The advantage of this process is the ease with which it can be implemented as long as it remains at a sub-national level (so-called "interim" phase" in the case of the REDD+ mechanism).

The downside of this approach is the risk of incoherence between the hypotheses chosen for the construction of the various reference scenarios defined at the project level, a risk that is aggravated for projects with overlapping perimeters. Ensuring their coherence can be expensive and complex, as it requires the creation of a review process, validation and registration of these scenarios, which can delay the individual implementation of projects. Furthermore, it is likely that each project sees the risk of deforestation "on its doorstep" and over-estimates it slightly. A slight over-estimation, if repeated for each project, may result in a large over-estimation at the national level. The high transaction costs individual project developers have to bear represents another weakness of this approach.

With regards to the review process involved in consolidating reference levels at project scale into a national level, the review process of reference levels for forest management submitted Annex 1 countries is a useful example. As required by the Cancun Decision 2/CMP.6, Annex 1 parties had to submit forest management reference levels (in tCO₂) which had to meet a pre-established set of criteria in their justification. These criteria included, for example:

¹¹ The projections made by the Joint Research Center (JRC) of the European Commission are based on the compilation of the results of independent modelling groups within the EU, coordinated by the International Institute for Applied Systems Analysis (IIASA). The models used to project GHG emissions links to forest management are G4M from IIASA and EFISCEN of the European Forest Institute, EFI.

- the submission of a precise set of historical figures such as area under forest management, forest characteristics (age class structure, increment, rotation length, ...), harvesting rates, disturbances, etc.;
- the description of the methods, models, and assumptions used in elaborating the reference level, and their consistency with the most recent national inventory;
- the exclusion of the expected effects of policies implemented after December 2009;
- the compliance of all submitted information to the general IPCC criteria on transparency, accuracy, consistency, completeness and comparability (TACCC).

The review, that is the assessment of the compliance of submissions with the above-mentioned criteria, is then conducted by UNFCCC accredited experts on national inventories, with the support of the UNFCCC Secretariat.

The regional approach

This approach includes the preparation of baselines at the regional level in the first instance. These scenarios can then be combined to form the national reference level and be applied at the project level.

Peru is one of the countries to have adopted this approach, in accordance with a national decentralisation policy. Regional reference levels will be combined based on a standard methodological framework which will be developed by the country in order to obtain a robust national reference level. One of the four regions that is making the most progress on this subject is Saint Martin, which currently estimates its existing carbon stocks using a sampling method and is working on developing the historical and projected levels for 2010 to 2020¹².

The main advantage is the increase in precision compared to the definition of a reference level at the national level, due to the fact that regional specificities are more easily taken into account. This process could also represent economies of scale for project developers at the local level.

The downside of this approach is the development time which is generally longer than for a *bottom-up* approach. In the case where projects cover more than one region, technical problems can also emerge.

Whatever the preferred approach is, the coherence between the accounting scales is an essential condition for the transfer of the economic incentive to the sub-national level. Combined with an effective monitoring system, it is this coherence that will allow the actors who have encouraged emissions reductions to be accurately remunerated (or remunerated in proportion to the national result) as described in section III.B.

How are countries dealing with this challenge?

Developing countries that are in the process of integrating the REDD+ system have shown various degrees of progress in drawing-up their reference levels (Table 2). The most popular approaches are the top-down and the regional approaches.

¹² Summary of the presentation by Lucio Pedroni in the discussion Forum: "Exploring reference levels and monitoring for REDD+: Early country pilot activities" on Forest Day 5, 4 December 2011.

Table 2 – Method chosen and current progress in drawing up the REDD+ reference levels in developing countries participating in the FCPF¹³

Country	Progress/Status	Approach Chosen	Source
Ghana	Carbon baseline map drawn up for the country Specifications for drawing up reference levels have been defined	“Regional”: Accounting at the sub-national level, combined at a later date to form the national scenario	Ghana FCPF Progress Fact Sheet (October 2011)
Guyana	Data made available: Satellite images, forest inventories from 1970, 1990 and 2000	“Top-down”: The reference level will be a combination of historical and projected data based on the various scenarios A combined methodology is used at an interim stage	Guyana FCPF Progress Fact Sheet (October 2011)
Colombia	Information and data is limited and fragmented The country is currently identifying priority data to be collected and has presented an action plan for drawing up reference levels at a regional scale	“Regional”	Colombia R-PP, Version 4. FCPF (September 2011)
Guatemala	Action plan for drawing up reference levels for 5 REDD+ regions has been defined in a participative manner	“Regional”	Guatemala Draft R-PP, FCPF (September 2011)
Indonesia	Satellite images and data from the national forest inventory are available (inventory is currently being re-done)	“Top-down”: Drawing up the reference level at the national level and subsequent application at a regional level based on the historical deforestation rates between 1990 and 2009	Indonesia’s presentation – Technical Workshop on National Reference Levels for REDD+ (November 2011)
Peru	Action plan submitted to the FCPF in order to draw up regional reference scenarios	“Regional”: Application at the project level is already included in the action plan	Peru’s presentation – Technical Workshop on National Reference Levels for REDD+ (November 2011) Peru FCPF Progress Fact Sheet (October 2011)

Source: CDC Climat Research based on FCPF.

B. A robust system of Monitoring, Reporting and Verification

Specifications of the monitoring system

In the framework of REDD+, the monitoring of “physical” carbon stocks must be accompanied by a more qualitative monitoring of activities put in place within countries and their individual performances. Such a system would make it possible to attribute emissions reductions to each action and to identify the associated stakeholders. This traceability is essential if one is to determine the level of remuneration for actions and the stakeholders who initiate them.

In order to avoid the double-counting of emissions reductions, monitoring, reporting and verification (MRV) systems must also rely on a registry that allocates them a unique serial number. So far, the registries developed for compliance markets¹⁴ and voluntary markets¹⁵ only allowed the carbon units (allowances and credits) to be tracked. EPRI (2010) and Olander *et al.* (2011) identify the additional information to be included in a REDD+ registry:

- information on projects that precede the establishment of a national or sub-national REDD+ system (known as “Early Action Measures”);
- information proving that the specifications of the chosen standard or protocol have been met;

¹³ The Forest Carbon Partnership Facility (FCPF) is managed by the World Bank and finances capacity building and emissions reductions from deforestation at national level.

¹⁴ For compliance markets, the *Community Independent Transaction Log* (CITL) collates the national registries of countries and the transactions of the EU Emissions Trading System (EU-ETS). This registry communicates with the International Transaction Log (ITL) created by the UNFCCC under the Kyoto Protocol.

¹⁵ For voluntary markets, a number of registries exist for tracking carbon units including but not limited to Markit and APX.

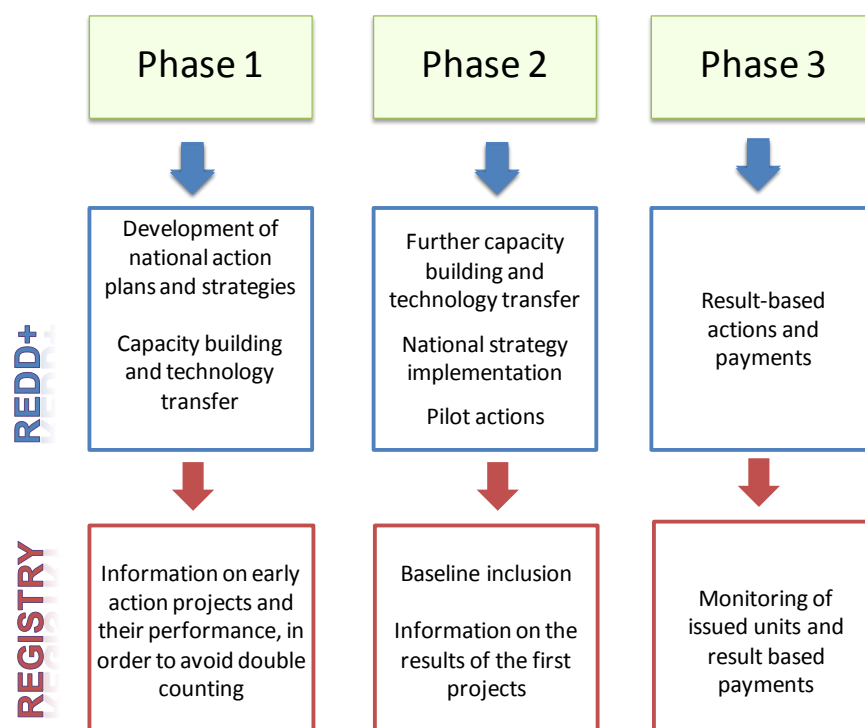
- monitoring of project performance, payments made and units delivered;
- monitoring of unit transactions (in the event that they are exchangeable);
- data on land-use and average carbon stocks according to the different types of land as well as estimates of deforestation rates per region;
- information on land and carbon rights, as well as any carbon rights transfer that may occur;
- differentiation between credits according to the financing source (public or private);
- information regarding the specific legal framework of each country or state.

Managing this data is a complex task, whether it takes the form of a single database including a variety of categories of information (legal, technical, spatial, etc.) or a number of interconnected databases.

Interestingly, the forestry sections of the national GHG inventories of the Annex 1 countries carried out under the Kyoto Protocol already contain much of this information: under Article 3.3 for example, states are required to use the data from their inventory to prove that their afforestation and deforestation are of anthropogenic origin. In addition, over the years, the IPCC and the secretariat of the UNFCCC have developed and refined the guidelines and tools that facilitate and harmonise the creation of these inventories. The experience accumulated over the years in Annex 1 countries on the MRV of forest carbon could therefore help leapfrogging the technical challenges MRV in REDD+.

In a similar way to the 3-phase approach of REDD+, this registry could be implemented progressively (Figure 4).

Figure 4 – Gradual approach to the construction of a REDD+ registry



Source: CDC Climat Research.

Gradually aligning projects and the national inventory

The national inventory is the tool for the quantification of GHG at the country level. When the incentive is provided at the national level, it is essential for project developers that the emissions reductions they achieve appear in the national inventory. Joint Implementation projects have demonstrated that emissions reductions are not always detected by the national inventory and that aligning projects and the national inventory is often a gradual process (Shishlov and Bellassen, 2012).

Simple (“ideal”) alignment occurs when a project has a direct impact on the variables used in the inventory, most often an emission factor and an activity data.¹⁶

Unfortunately, alignment is often more complicated, particularly in the following cases:

- An incomplete inventory where the source of emissions in which the project has an action within a sector that has been left out of the inventory. In this case, the only solution is to add this source of emissions before quantifying its reduction.
- A blind inventory, where the inventory methodology is too rough, and does not show emission reductions achieved by a project using a more refined methodology.
- An inventory that is not precise enough, one whose statistical granularity does not allow it to detect a project generating a low volume of emissions reductions.¹⁷

Progress made by countries in the construction of a REDD+ monitoring system

The Brazilian system *Terra Amazon*, developed by the National Institute for Space Research (INPE *Instituto Nacional de Pesquisas Espaciais*) is unquestionably the most pioneering deforestation monitoring system in the world. Since 1988, the INPE has been publishing a yearly estimate of the deforestation rate in Brazil, with an uncertainty of less than 10%, based on the analysis of medium-resolution satellite images (LANDSAT). In parallel, the DETER information system based on low resolution images (MODIS) makes it possible to detect deforestation event on surfaces of less than 25 ha on a monthly basis. This tool is used by the Brazilian authorities to enforce the forestry code¹⁸.

The INPE and the Food and Agriculture Organisation (FAO) provide technical support on satellite-derived monitoring systems to the Democratic Republic of Congo (DRC), Mexico, Gabon, Guyana, Papua New Guinea, Mozambique, Angola, Venezuela, Bolivia, Peru, Colombia, Ecuador and Vietnam. Annex 1 countries also have decades of experience in conducting national forest inventories and in complying with IPCC requirements for the LULUCF part of national greenhouse gas inventories. Most of these inventories make use of satellite imagery for land-use and land-use change, in combination with other statistical sources.

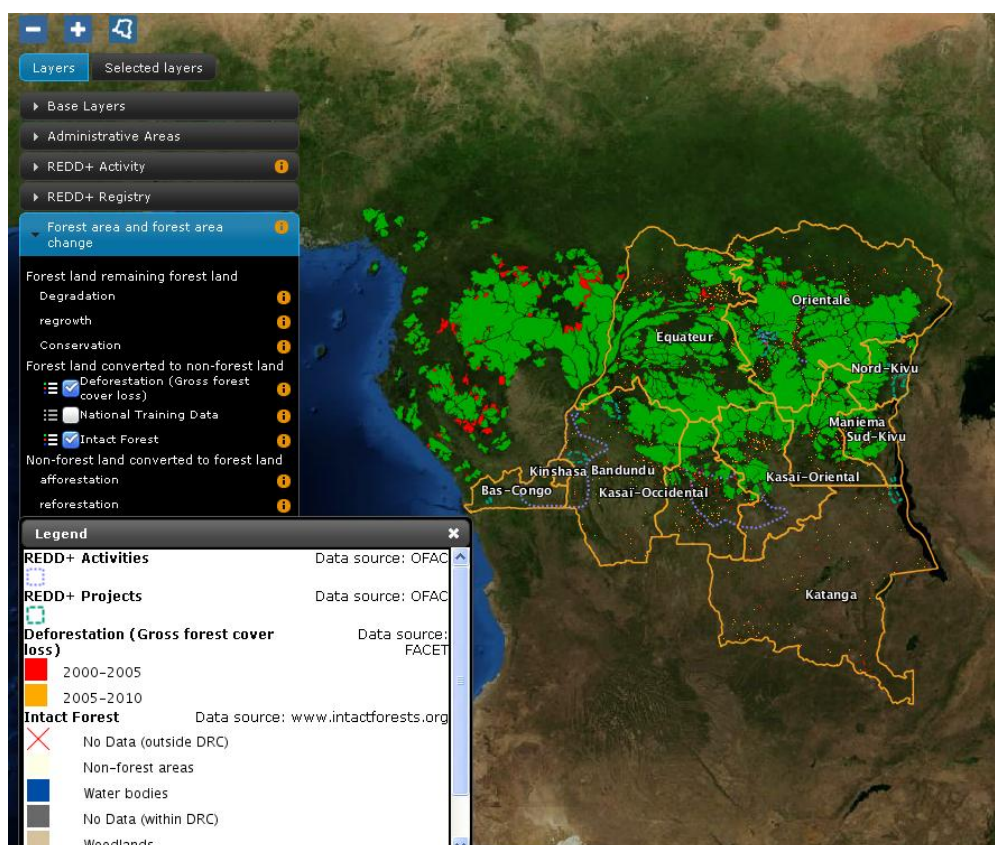
This South-South technology transfer has allowed the DRC to make rapid progress towards the establishment of a MRV system that is greatly inspired by the Brazilian system. During the Durban conference, the DRC presented its National Forest Monitoring System. It is an online system which allows all actors to access updated information on the level of deforestation and also about the initiatives and REDD+ projects in place in the various regions of the country (Figure 5). Being an online platform, the system should allow users to flag up errors or inaccuracies in the deforestation zones and statistics included on the site. Data is currently being entered into the system and combines national data with tools and algorithms adapted to the country’s requirements. In addition, it will allow other aspects to be monitored such as the application of the forest code.

¹⁶ In their simplest form, the equation estimating emissions in inventories is: emissions = activity data x emission factor.

¹⁷ Presentation by Etienne Mathias, CITEPA, at the 3rd meeting of the Carbon, Forest and Wood Club on 22nd November 2011.

¹⁸ http://www.inpe.br/ingles/news/news.php?Cod_Noticia=269

Figure 5 – DRC National Forest Monitoring System



Source: DRC National Forest Monitoring Portal (<http://www.rdc-snsf.org/>- consulted on 14/06/2012).

C. A clear regulatory framework

A clear regulatory framework is also a key requirement for risk-sharing. It defines the distribution of tasks and responsibilities between the various levels of public authorities and private players. In particular, this regulatory framework must include:

- rules governing the transfer of carbon rights;
- potential restrictions such as a limit on the credits that may be sold to foreign players;
- rules governing the attribution of funding;
- procedures for approving and validating projects including guidelines for sharing profits between stakeholders;
- rules for recognising early action projects;
- the definition of the public body(s) in charge of implementing and monitoring each element. This may be a Ministry, an existing public agency or a new independent entity created for this purpose.

In addition, the coordination of the REDD+ framework with the rest of the country's governance system needs to be ensured.

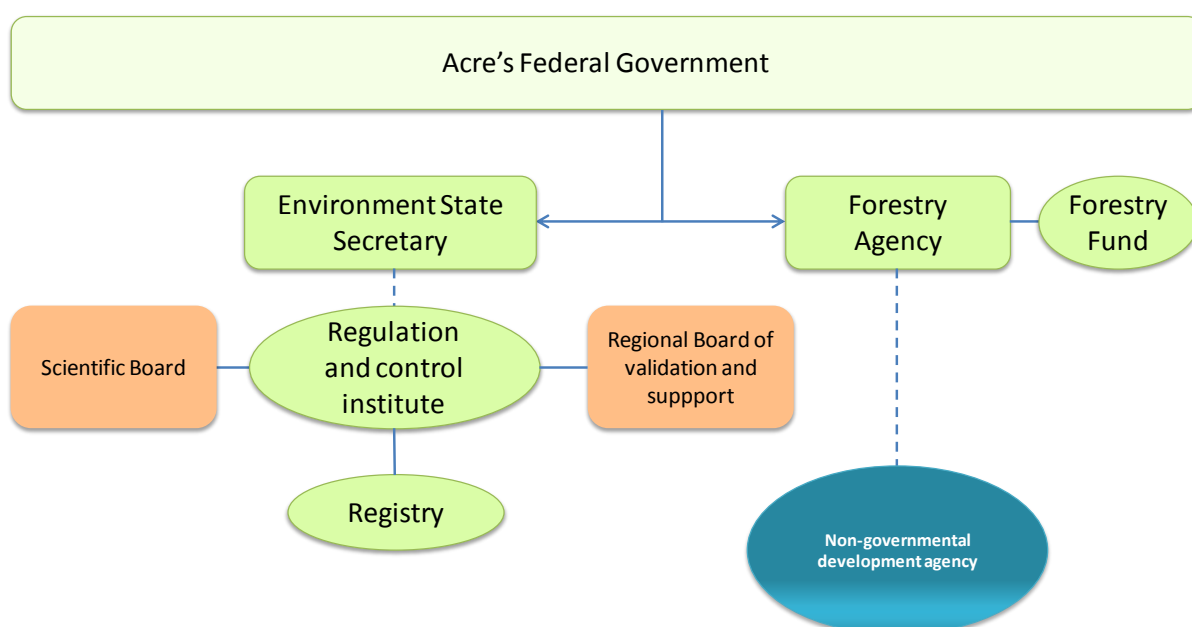
The experience of Annex 1 countries on Joint Implementation provides several examples on the importance of the clarity of the regulatory framework. This is not specific to forestry: the comparison between Ukraine, where a single, well-identified, agency manages the framework, and Russia, where three different public entities with unclear attributions with regards to project selection intervene, is particularly telling (Shishlov and Bellassen, 2012). The Australian Carbon Farming Initiative sets a promising framework for forestry: the regulatory body is unique and identified, the procedure for methodology submission and validation is set, and complementary funding for capacity building will be provided to bring the sector up to speed on offset projects (Patay and Sartor, 2012).

Progress made by countries in defining a regulatory framework

Within the framework of the implementation of their REDD+ strategy, institutional and legal reforms are underway in developing countries. Colombia, for example, has put in place a precise political framework on climate change: a law requires that an institutional structure be created in 2012. This structure will involve a number of Colombian government institutions including the Ministry of National Planning, the Ministry of Agriculture and other public institutions.

In Brazil REDD+ programmes are being structured at a regional level. This is the case in the states of Acre and Amazonas. With Law n.2308 of 22 October 2010, the state of Acre has approved the creation of a regional incentive system for the promotion of environmental services in the region. In particular, this law clarifies the institutional framework relating to the REDD+ in the region (see Figure 6). It includes the development of a regulation and monitoring institute with a scientific committee and an associated registry. This institute is financially independent of the regional government. The state of Amazonas is working on a draft bill that will propose a similar institutional structure to the Acre's.

Figure 6 – Institutional structure of the REDD+ programme in the Brazilian state of Acre



Source: Nepstad. (2011)

IV. CONCLUSION

Finding an effective mechanism that allows the "forest carbon incentive" received by the country to be transferred to local or private stakeholders is a key issue in the framework of REDD+. By drawing on the experience of developed countries, who have had to address the same challenge during the first commitment period of the Kyoto Protocol, this report has reached the following conclusions:

- A number of levers can be used by countries to optimise carbon sequestration in the forestry sector at different scales: multilateral (development agencies for example), national (forestry and non-forest related policies) and local (actions specific to a given region). These levers are complementary and a combination of the three is likely to optimise the carbon balance of the sector;
- The integration of sub-national activities would facilitate the participation of private stakeholders and finance in the scheme, allowing them to increase their effectiveness and at least partially control and reduce risk exposure;

- Achieving perfect compatibility between local- and national-level accounting is difficult if not operationally impossible, especially in a “no-lose” framework where no sanctions are imposed upon an under-performing country. Sharing the risk of incompatibility between the State and the project developers is therefore a necessity. A continuum of options exists between two extreme alternatives: a State guarantee that project developers are rewarded based on the success of their project, no matter the national performance, and a carbon incentive for project developers which is scaled down in proportion of the national performance. In both cases, using insurance-style risk management tools could make the implementation of the system more fluid.
- Amongst Annex 1 countries, New Zealand is an interesting example of the transmission of incentive and carbon responsibility to forest owners. In its Emissions Trading Scheme, it has chosen to remunerate forest owners for the carbon sequestration achieved in their forests while giving them at the same time the responsibility of their carbon stocks. This approach where the State ultimately bears the risk of incompatibility has successfully brought the private sector in. In cases where the risk of incompatibility is higher, as in France, it has been harder to come up with the solution.

Once the risk-sharing decision is taken, three technical conditions for delivering the incentive at the local level have been identified: (i) reference scenarios that are drawn up in coordination at the various levels of accounting and monitoring; (ii) the implementation of a monitoring system that allows the traceability of actions and emissions reductions at all levels, and (iii) a coherent and clear regulatory system. For all these conditions, useful precedents have been identified, both in industrialized and developing countries, that could help leapfrogging the technical challenges: the EU, Guyana and Peru in terms of baselines, national GHG inventories in Annex 1 countries, Brazil and DRC in terms of MRV, and Australia, Columbia and Acre regarding the consistency and clarity of the regulatory framework.



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