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Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

What are the Challenges in the Implementation of REDD/REDD+ in Colombia?

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Abstract: Reducing emissions by avoiding deforestation became a major topic in the recent climate change mitigation debate. Within the structures of the United Nations Framework Convention on Climate Change (UNFCCC) the REDD+ scheme (Reduced Greenhouse Gas Emissions from Deforestation and Forest Degradation in Developing Countries) aims to compensate developing countries for not cutting their forests. Colombia has already started with activities to implement REDD+ projects. As a country with large areas of forests, but problems with low intensity armed conflicts, poverty, and weak law enforcement it can serve as a good example for the investigation of the challenges and difficulties in the implementation of REDD+ projects.

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1. Introduction

Forests play an increasing role in the climate change mitigation debate. The recognition of the importance of forests as carbon sinks and providers of other ecosystem services explains the international attention which the REDD (Reduced Emissions from Deforestation and Forest Degradation in Developing Countries) initiative attracts. 80 % of the aboveground and 40 % of the below ground terrestrial carbon stock is captured in forests (Nakakaawa et al., 2010, p. 1). According to the IPCC report 17.4 % of the 49 GtCO₂ eq¹ of global anthropogenic greenhouse gas emissions in 2004 can be related to the forestry sector what also includes deforestation. This share is larger than the emissions by all cars, ships and airplanes together (IPCC, 2007, p. 36). The data show the large potential of forest conservation in reducing emissions. Estimates of the mitigation potential of REDD range from 2.6 GtCO₂ to 3.3 GtCO₂ per year by 2030 (Streck, 2010, p. 391). Avoided deforestation not only reduces emissions but additionally reduces the CO₂ concentration in the atmosphere. Almost 5 billion tons of CO₂ are absorbed annually by tropical forests worldwide (Campbell et al., 2010, p. 7). In addition to the important role as carbon sinks, intact forests also provide other ecosystem services especially in the water cycle, erosion control and self-purification processes. Estimates of the environmental costs of deforestation run to \$ 3 – 5 trillion US (Brink et al., 2008, cited in Campbell et al., 2010, p. 7).

Due to unresolved issues, in the Kyoto protocol only afforestation and reforestation projects qualify as Clean Development Mechanism (CDM) projects. Financial incentives are provided for the planting of new trees, but protecting existing ones is not rewarded (Dudley, 2009, p. 54). Of the 2,909 proposed and registered CDM projects² less than 1 % deal with reforestation. Factors that discourage the implementation of such projects are to be found in the administrative obstacles in the accreditation process and the high transaction costs for registration and monitoring. In many cases the income from the offsets is not sufficient to cover the costs of planting trees, particularly in small-scale projects (Dargusch et al., 2010, p. 400). The mechanisms under the Kyoto Protocol, therefore, were not sufficient to translate the high emission reduction potential of forests effectively into the regulated carbon market system.

To fill the gap between the mitigation potential of forests and the limitations of the Kyoto Protocol, but also due to the difficulties in reaching agreements on other issues related to climate change mitigation REDD and REDD+ have become a central topic in international

¹ The emissions of the main greenhouse gases, namely CH₄, N₂O, HFCs, PFCs and SF₆ are converted to CO₂ equivalents (CO₂ eq), according to their Global Warming Potential.

² 2845 CDM projects are registered, 64 are requesting registration as at February 2011 (<http://cdm.unfccc.int/Statistics/index.html>)

climate negotiations. However, while initial projects are being planned and implemented several issues are still being discussed. And as the challenges disclose, so do the weaknesses. Taking Colombia as a model for a nation with high potential for REDD projects I will show where the critical elements of the system become apparent.

In the following I briefly outline the development of the REDD initiative in the past seven years. In the third part I briefly describe the environmental and political situation in Colombia. Thereafter I describe in detail the implementation of REDD, the state of affairs and difficulties in Colombia. I conclude that REDD projects are an opportunity for Colombia to protect its forests, but that they should not be the only measures to effectively enforce conservation.

2. Development of REDD and REDD+

The Stern Report³, published in 2006, described deforestation not only as one of the main causes of anthropogenic greenhouse gas emissions, but also identified the relatively cheap (low agricultural rent) and quick (not cutting trees) mitigation potential compared to other emission sources (Stern, 2006, p. 14). He proposed policy actions in countries with forests but also recognized the responsibility of the international community, understanding that benefits do not remain within national borders. To reduce this approach to practice, Stern recommended the integration of the costs for avoiding deforestation in existing carbon markets (Stern, 2006, p. 25f). The Stern Report put the REDD initiative on the international agenda.

The decision to take action within the framework of UNFCCC to reduce emissions from avoided deforestation and forest degradations was made at the 13th Conference of the Parties in Bali in December 2007. Decision 2 sets up the framework for the voluntary REDD scheme and encourages all involved parties to support and facilitate all the necessary steps for implementation (UNFCCC, 2008, p. 8). REDD was developed as a multilevel system of payments for ecosystem services. Forest nations, especially tropical forest nations, are to be financially compensated for voluntarily keeping their forests intact.

In economic terms the fundamental cause of deforestation and forest degradation is market failure. The costs do not appear in the prices of products that drive this development. REDD payments, therefore, are intended to internalize this externality. An underlying principle is common but differentiated responsibility, meaning that no constraints to economic

³ The "Stern Review: The Economics of Climate Change" commissioned by the British government examines the impacts of climate change on the world economy and analyses the challenges to mitigate and adapt to global climate change.

development should be imposed on developing nations by any climate change mitigation policy (Dargusch et al., 2010, p. 399).

Parallel to the Bali Conference the FAO, UNEP and UNDP announced the creation of a systematic approach to incentivize reduced carbon emissions from deforestation and forest degradation. Prompted by stakeholders from the developed and developing countries the World Bank initiated the creation of the “Forest Carbon Partnership Facility” (Cerbu et al., 2010, p. 2). Its objective is capacity building within developing countries and the testing of the REDD approach in pilot projects⁴.

In response to the outcomes of the first efforts to develop methodologies for a REDD system, the incentives to reduce emissions were extended to sustainable management of forests and the enhancement of carbon stocks (REDD+) in the Bali Action Plan in 2008 (UNFCCC, 2008, p. 8f). REDD+ takes into account increasing carbon stocks from a wider range of forest management; practices such as improved logging, forest fire prevention and sustainable forest management are included (Blom et al., 2010, p. 166f).

Despite the disappointing outcome of the COP 15 in Copenhagen (altogether only 13 decisions could be reached), the member states agreed on the need for implementing the REDD+ mechanism. An entity for financing related activities in developing countries (Decision 2) was established. In addition mutual consensus on the methodological issues of REDD+ was reached (Decision 4) (UNFCCC, 2009, p. 11).

The latest COP in Cancun did not bring any substantial progress to the REDD+ development. Many unresolved issues remain. Nevertheless one agreement encourages all countries to take action to reduce human pressure on forests. This emphasizes once again that not only the developing countries are responsible for the protection of their forests but also companies and consumers of developed nations.

The implementation of REDD+ consists of three steps. In a first phase a national REDD+ strategy is developed and core capacities are initiated to be built up. A second phase is reached when measures and the formulated strategy are being implemented. Financing up to this point comes from the public sector or from international funding. Only in the third phase are the results of the projects compensated and links to carbon markets become possible (Streck, 2010, p. 390f and Purdon, 2010, p. 1040). There is not yet a consensus as to which carbon market emission reduction from REDD+ will be traded on.

Regulated carbon markets, such as the European Union Emission Trading Scheme, are markets where offsets from CDM or Joint Implementation (JI) projects are sold in a

⁴ So far 37 countries have been selected in the partnership (<http://www.forestcarbonpartnership.org/fcp/node/12>)

framework set by governments. Firms have a choice on how to meet their emission caps (buying permits e. g. at auctions, improving their environmental performance or acquiring offsets on the market). Implementing REDD+ projects and finally selling the emission reduction on the market might result in a radical decrease in carbon prices. Trading of emission reduction units on the certified emission reduction (CER) market would cause prices to fall and would make REDD+ and other carbon capture and sequestration projects less attractive. Low prices would also prevent firms from implementing CO₂ reduction measures in their own production line but rather buy credits to meet their emission caps (Dudley, 2009, p. 67).

Voluntary carbon markets on the other hand rely on corporate responsibility. Already existing voluntary carbon markets trade offsets of all kinds, to the value of approximately 500 million US\$ in 2008 (Dargusch et al., 2010, p. 400). A widely used system is the Voluntary Carbon Standard (VCS). This system is currently used by many airlines. The worldwide first CO₂ offsets from a REDD+ project in Kenya were being issued under the VCS program in February 2011 (VCS, 2011). Another market place for carbon credits is the Chicago Climate Exchange (CCX), where members set their own emission reduction targets and agree to a set of rules set up by the exchange. Directly traded offsets also play an important role, especially for small scale forest projects. Buyers of offsets often prefer a specific kind of project to demonstrate corporate responsibility to their stakeholders. These so called over-the-counter trades are found to be mainly interesting for non-profit-organizations (Dargusch et al., 2010, p. 400).

3. Colombia's potential

Of Colombia's 114 million ha land, 55 million ha are covered by forest. On the global scale this means that Colombia's territory accounts for 0.7 % of the earth's continental surface and hosts 1.5 % of the worldwide forest cover.

Colombia contributes 0.37 % of the world's total greenhouse gas emissions. 14.5 % of Colombia's total greenhouse gas emissions are generated by land-use, land-use change and forestry (IDEAM, 2010, p. 17).

Also in terms of biodiversity Colombia's forests play an important role. It has second place with reference to the number of plant and reptile species and has the highest number of bird and amphibian species of all countries worldwide. Studies on the impact of climate change on Colombia, conducted by the Instituto de Investigaciones Marinas y Costeras (INVEMAR) and the Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM) show the

country's vulnerability. 17 % of the area of the island San Andres is threatened by rising sea level. Further consequences of climate change will be the salinisation of many aquifers currently used as sources of drinking water in the region of the Caribbean coast; 75 % - 90 % of the Páramos⁵ will disappear; glaciers are estimated to be completely melted by 2050 and rainfall patterns are likely to change in such a way that the highest populated area of the Andean region will suffer from 15 % less precipitation (Ortega et al., 2010, p. 9).

In the 1990s the government of Colombia started establishing natural reserves, nature parks and reserves for Indigenous and Afro Colombians (Becerra, 2009, p. 7f). The new Constitution of 1991 contains more than 50 articles related to the environment and sustainable development (Becerra, April 2009, p. 22). Article 8 describes the legal obligation of both the state and its citizens to protect the cultural and natural wealth of the nation. Article 79 obliges the state to guarantee public participation in all decisions affecting the environment (Ponce de León Chaux, 2008, p. 2). In 1993 the Environmental Ministry was founded. On the regional level the Corporaciones Autónomas Regionales (CAR) as environmental authorities were empowered and new ones were formed. However, this period of greening the state was followed by a period of declining influence of conservation structures under President Uribe (2002-2010)⁶. In recent years the enforcement of environmental laws has become weaker and is being set aside in favor of economic development and the battle against armed groups and guerillas.

Whereas the Amazonian and Chocó region are relatively undisturbed by human activity, the Andean and Caribbean region are greatly impacted by deforestation and forest degradation (Becerra, 2009, p. 2). The largest share of Colombia's forests are within the territories of the Indigenous communities (more than 31 million ha or 48 % of the national forests). 28 % of all forests are natural reserves or other areas under governmental protection. 17 % or 10 million ha are national parks, 6 % are private properties and 1.6 % (1 million ha) are territories of the Afro Colombian communities (Ortega et al., 2010, p. 15).

Reasons for deforestation and forest degradation are diverse. One of the foremost causes is the expansion of agriculture. The commodities mainly responsible for deforestation are cattle, coffee and palm oil plantations (Motel et al., 2008, p. 684). Further causes are the development of infrastructure and forest fires. Also the mining of gold, emeralds and fossil

⁵ Páramos are biomes in the tropics. They can be found in humid climates above the tree line, especially in the Andean region. Páramos play an important role in the water cycle because they retain and store vast amounts of fresh water.

⁶ President Uribe is for example known to have granted endless numbers of mining concessions, also in Páramos where the 1991 Constitution prohibits any mining activity.

fuels cause immense areas to be degraded. Armed conflict as well as illicit coca plantations⁷ also put pressure on Colombia's forested areas.

The position Colombia takes in the climate mitigation discussion is consistent with the position of most other developing countries. Since the developed world is the main contributor to greenhouse gas emissions they are also perceived as responsible for current climatic changes and therefore obligated to first substantially reduce their own emissions (Becerra and Mance, 2007, p. 52).

Colombia will not accept obligatory emission reductions. Additionally Colombia seeks to be recognized as a nation with high vulnerability to climatic change in order to receive international funds for adaptation measures.

4. Challenges in the implementation

4.1 Measuring carbon stock and setting a baseline

REDD+ is a service provided by forest owners. To adequately compensate them, the actual (lower) CO₂ emissions must be compared to a business-as-usual scenario. The emission reduction can be calculated as the difference between two variables: a reference level, or baseline for the emissions and the actual emissions over the same period of time (Angelsen, 2010, p.1). For the measurement of the emissions, the carbon stock at the beginning and the end of a defined period can be used. However, carbon stock measurements can be very demanding. Data from satellite images and remote sensing can be used to detect land-use and land-use changes. Depending on the type of land cover, e. g. commercial agriculture or natural vegetation different carbon stocks can be applied. Difficulties arise in areas with frequent cloud cover. Collection of field data is consequently necessary to obtain reliable data. Especially developing countries lack these data making carbon stock measurement a costly activity. Difficulties also arise because with remote sensing technique the differences between an old secondary forest and a primary forest cannot be detected. The carbon stock above ground between the two types of forest can be estimated as equal, but the soil carbon content is much higher in mature primary forest (Geoghegan et al., 2010, p. 249).

A next challenge is to agree on a baseline – a counterfactual value - to ensure that a certain project really produces emission reduction. It must be calculated how much forest would exist in a certain region without a REDD+ project. Two different approaches are currently under discussion. The business-as-usual scenario predicts the carbon emissions or reduction of carbon stock that would happen if no REDD+ project were implemented. This approach

⁷ It is estimated that 1 ha of coca plantation causes 2 – 2.5 ha forest loss

ensures additionality, a key criterion for valuing carbon stocks. However a great deal of research data and good information about land-use in the individual regions are needed. Moreover, for a realistic baseline, the causes of deforestation and forest degradation must be known and taken into account. The asymmetric information about the real plans holds the danger that forest owners do not reveal their true plans. This would raise the costs for the investor and payments to forest owners would as a consequence be much higher (Angelsen, 2010, p.2).

Another possible method would be a negotiated emission quota, where an agreement must be reached to keep emissions below a set threshold. Negotiations about thresholds could end up in a political power play and thus miss the goal of actually reducing emissions efficiently. The latter approach holds the danger that reference levels are too generously set, increasing payments but reducing additionality.

So far an agreement has only been reached on the incorporation of historical deforestation rates and national circumstances in the reference level (Angelsen, 2010, p.2f).

Another proposition is based on political effort to reduce deforestation. It attempts to avoid the possible errors of the above mentioned methods and improve their weaknesses. It is criticized that estimates can never be reliable since commodity prices and external factors are not predictable and negotiated targets are too much controlled by political influence (Motel et al., 2008, p. 681). According to this approach, payments should be made to governments for their efforts to reduce deforestation and forest degradation through implementation of public policies and measures. This sounds appealing as it guarantees a certain degree of sustainability and endurance by involving political structures and including domestic bureaucracy and administration. However, weak law enforcement and corruption in many developing countries may hinder this approach to effectively reduce emissions.

For the implementation of REDD+ and the necessary preparation processes, Colombia especially needs assistance in technical and human capacity building (Ortega et al., 2010, p. 43). Preparation activities for REDD+ began in the country in 2009. The project “Scientific and Technical Institutional Training to Support REDD Projects” was founded. It is financed by the Gordon & Betty Moore Foundation and organized by IDEAM. The administrative resources are provided by the Fundacion Natura Colombia. The project is responsible for establishing a baseline study of deforestation activities by developing protocols for analyses of satellite images. With the obtained data, maps are created which show nationwide changes in forest cover. Further activities are the identification of areas suitable for the implementation of REDD+ projects (Ortega et al., 2010, p. 40). In Colombia there exist various sources of

data from remote sensing, but especially in the Pacific region permanent cloud cover restricts the availability of necessary information. To obtain better and cheaper information about land-use and land-use changes, it is planned to improve the capacity of the “Sistemas de Información Geográfica” to analyze data. In addition, data from field trips is necessary. Considering the size of the country as well as the problems with the various armed groups, field trips will consume large funds. It is recognized but not yet implemented that cooperation with Indigenous and Afro Colombian communities could help to provide data (Ortega et al., 2010, p. 33).

An additional initiative to setting up a framework is the “Mesa REDD Colombia”. It consists of members from the Environmental Ministry (MAVDT), WWF Colombia, Fundación Natura, The Nature Conservancy, Conservación Internacional Colombia and USAID. This group was formed to expedite the development of strategies, policies and plans for REDD+ projects which are in line with the rights of the Indigenous and Afro Colombians. Their efforts focus on sharing experience concerning methodologies and technologies, identifying possible financial sources for their projects and facilitating the technical and informational assistance needed (Ortega et al., 2010, p. 40).

Colombia’s representatives are in favor of a flexible and integrated mechanism of REDD+ projects, in which all forest protection activities are taken into account. Under the auspices of the Colombian Ministry of Environment, Housing and Development (MAVDT) and with the help of the above mentioned organizations, data for a baseline are currently being collected. Included are the historical rates of deforestation, the carbon stock of the different land-use regimes and an estimation of socioeconomic characteristics in the region. And as internationally negotiations about the rules of REDD+ implementation go on, Colombia has already started with institutional and technical capacity building, to meet requirements for the development of REDD+ projects.

Two out of the 79 worldwide REDD readiness activities⁸, financed by the World Banks Forest Carbon Partnership Facility, are taking place in Colombia. Furthermore Colombia is currently engaged in four demonstration activities⁹ (Cerbu et al., 2010, p. 5f). The most famous pilot project is in San Nicolás, with the objective to reverse forest degradation. Around 2,500 ha of abandoned pasture are being reforested, and ca. 7,300 ha of forest are being regenerated and not cut down as initially intended. It is estimated that the project will capture between 0.12 and 0.27 Mt CO₂ by 2017. The funds for this project are not only provided for avoided

⁸ Readiness activities determine and fill the gaps between existing social, technical and institutional capacities and those required for participation in REDD mechanism (Johns et al., 2009, p. 4)

⁹ Demonstration activities serve the purpose of installing a basic stock of concrete experiences related to REDD

emission activities (REDD+) but also from payments for other ecosystem services. Its biodiversity and abundant freshwater resources offer Colombia the possibility of funding conservation projects from different sources.

4.2 Permanence

Another unsolved issue is the permanence of the emission reduction. How can it be guaranteed that funded carbon stocks are not cleared after a certain period? And if they are, how can the owner be penalized? If the monitoring is left to domestic officials punishments could be arbitrary as they might turn a blind eye to illicit commercial logging but prosecute local people (Hayes and Persha, 2010, p. 549). REDD+ contracts can only be made for a limited period of time. How can subsequent increased rates of deforestation be avoided? Can we compare this dilemma to efforts to replace fossil fuels? There is no doubt that we will eventually deplete all, and that current efforts are simply prolonging the period. Does slowing down the rate of deforestation also simply extend the time period in which primary forests still exist? The issue of how to guarantee the permanence of avoided deforestation is one of the still open and unresolved questions in the implementation of REDD+. However, these difficulties should not frustrate the people in charge, since the business-as-usual scenario would be a worse alternative.

Another open question concerning permanence is how unforeseen events such as forest fires or typhoons can be handled in a REDD+ system. Forest fires are one mayor cause of deforestation in Colombia (Ortega et al., 2010, p. 23). A difference has to be made regarding the factors causing fire. Human activities or malicious arson should be penalized. Payments already made can be demanded back. However land-owners and beneficiaries of payments for reduced emission must be above suspicion. It is not uncommon in Colombia for commercial organizations to employ criminals to gain power over valuable land. Proving and penalizing these criminal activities will be a challenge for Colombian authorities.

Natural forest fires on the other hand must be treated differently. Reclaiming payments would be unjust; instead, reforestation activities within the REDD+ structures should be promoted and supported.

4.3 Long-term benefits of forest products

The wider benefits of forest products or products produced after clearing the forest are not considered in payments for avoided deforestation and forest degradation. Not only firms, communities or individuals involved in the activities suffer from financial losses (which are

intended to be compensated by REDD+ payments) but also local and national authorities. Without the production and sale of products from original land-use plans tax revenues decline. This, in turn, lowers the financial capacity of the country or the region to invest in public services such as education, health or energy and water supply. In a worst case scenario those communities previously dependent on forest products will be worse off after the implementation of REDD+ projects especially if funds and payments are allocated outside their reach (Ghazoul et al., 2010, p. 398). Trainings in alternative livelihoods are indispensable to counteract this development.

In Colombia many communities are traditionally bound to their forests, and have special knowledge about trees and plants. Offering them alternatives for earning their living holds the danger of losing this knowledge causing and their way of living to become less sustainable. As mentioned above, the REDD+ concept includes the sustainable management of forests. However, as these communities have lived sustainably with and in the forest for years, there is no difference in emissions between the business-as-usual and the real scenario, and therefore no REDD+ payments are possible.

Another serious problem lies in the occurrence of large deposits of valuable metals and fossil fuels¹⁰. The expected revenues from the mining of these materials exceed by far payments for the conservation of forests. The emerging Colombian economy is hungry for raw materials and international companies compete for mining concessions. Currently around 6000 mines are in operation (Elespectador, 2011). The financial incentives are high enough to break environmental laws and it is highly doubtful that payments from REDD+ funds will offer an attractive alternative. A good example of this dilemma is the case of the gold mine La Colosa. Discovered in 2006 it is estimated to be the largest gold mine worldwide. The regional environmental authority opposes the open cast mining since it would destroy large areas of forest in a natural reserve. Nevertheless AngloGold Ashanti, a South African company gained the concession and even the Ministry of Environment was unable to intervene. The conflict is ongoing but AngloGold Ashanti has already started preparations for the excavation of the gold (Cortolima, 2009).

4.4 Leakage

The problem of how to avoid leakages also remains unsolved. Leakage is one of the main reasons why REDD+ was not included in the Kyoto Protocol (Dargusch et al., 2010, p. 405). The question of how to prevent the implementation of a REDD+ project causing deforestation

¹⁰ Colombia has deposits of precious metals such as gold, silver, platinum, emeralds; industrial metals iron, copper, zinc, mercury, lead and fossil fuels, namely coal and petroleum. In addition uranium and sulfur are mined, and salt and marble are quarried

and forest degradation at another site; thereby reducing the net benefit of the project (Fernside, 2009, p. 558), remains open until today. Internationally leakages may prevent the additionality of REDD+ projects. Countries in the industrialized world depend on commodities from countries like Colombia. 39 % of all exports go to the United States (CIA: The World Factbook). The main export commodities¹¹ all have a potential impact on the forest regions. If due to REDD+ projects commodities can no longer be supplied or become more expensive, the United States will change its supply chain to other countries without REDD+ projects. Hence, even if Colombia reduces its CO₂ emissions, on a global scale it will be a zero sum game because emissions in other countries will rise. This example also exemplifies the indirect costs that a country must pay when implementing REDD+ projects.

Another often neglected issue in many discussions is the fact that the actual demand for commodities, raw materials and food remains the same. Considering world population growth, the future demand for these products will in fact increase substantially. The implementation of REDD+ projects in many developing countries will increase prices for forest products and agricultural commodities on the international market. Countries not involved in REDD+ activities will consequently have a comparative advantage for the production of their raw materials and primary products. In addition higher prices on world markets lead to greater pressure on the forests as the expected revenues of the products increase. This results in a positive correlation between agricultural prices and deforestation (Motel et al., 2008, p. 683). On the other hand it seems only fair that part of the cost for conservation be carried by end-consumers in the industrialized nations. Rising prices for the already poor, who are forced to spend a large share of their income on food represent another critical problem.

Supplying sufficient raw materials and food for the growing world population without expanding the agricultural area is only possible by intensifying production. This goes hand in hand with new environmental problems. The intensification of agriculture leads to immense environmental degradation (e. g. eutrophication due to fertilizer and pesticides) and the breeding of new germs (e.g. H1N1 virus, BSE).

Besides the leakage on a nation-wide scale it is also possible for a REDD+ project to cause deforestation on another site within the country. The monitoring of Colombia's forests, especially in the Amazonia and Chocó region, is exceedingly difficult due to their size, but also due to armed conflicts.

¹¹ Colombia's main export commodities are petroleum, coffee, coal, nickel emeralds, apparel, bananas and cut flowers (<https://www.cia.gov/library/publications/the-world-factbook/geos/co.html> last access 2/28/11)

4.5 Captured carbon in forest products

It is worth mentioning that products produced from wood also capture carbon. Furniture and building materials are usually produced for long-term use. Taking this into consideration, emission reductions based on the difference between the business-as-usual scenario and the actual avoided emission would be much smaller and therefore, the payments lower. A saturated, mature forest contains around 200 tons of carbon per hectare. Logging the forest but using the wood as building material would therefore produce less than 200 tons of carbon emissions (Dudley, 2009, p. 62f). The difficulties in assessing the amount of carbon actually captured in products and the tentativeness of the carbon captured in the products makes it impracticable to take this into account in future REDD+ projects.

4.6 Financing mechanisms

So far no agreement could be reached regarding financing mechanisms. In particular the implementation phase (data on carbon stock, etc.) is costly. Financial assistance from international funds is needed (see chapter 4.1). However, the international funding of REDD+ projects in an advanced stage once more create a dependency of the developing nations. Financing by carbon markets is currently preferred by the negotiating nations and, as mentioned above, tested for the first time in Kenya. Furthermore, it remains unresolved who receives the payments. They can be made to national REDD+ funds, which transfer the money to the sub-national level or directly to the carbon rights holder (owner of the forest). Instead of national REDD+ funds environmental ministries can serve as distributors of financial incentives. However, weak governments and a lack of institutional capacity in many developing nations constrain the adequate and effective distribution. Funds may also be channeled into other pockets. The fact that countries worldwide are donors to REDD+ initiatives means, however, that pressure on authorities is high to adequately use funds (Angelsen, 2010, p. 3).

To prevent corruption and misuse of REDD+ funds by national governments, a so called “nested approach” is currently under discussion. According to this, the international REDD+ fund pays the carbon rights holder directly. National and local authorities are circumvented.

In order to implement REDD+ projects, Colombia supports a mixture of financing sources (funds and markets). It further favors payments to authorities on the sub-national level and directly to the Indigenous and Afro Colombian communities involved (Ortega et al., 2010, p. 44f). Due to the size of the country and its different social, economical and environmental characteristics this method of financing is considered to be most effective.

4.7 Land tenure, socioeconomic impacts on communities

The identification of the forest owner poses further challenges. Many developing nations face problems with unclear, contested or weakly enforced property rights (Angelsen, 2010, p.2f). Especially Indigenous communities may be affected. It is estimated that worldwide 350 million to 1.2 billion people traditionally live in forests (Schroeder, 2010, p. 2). Their subsistence depends on the services provided by the forests, and their lives take place outside the reach of global financial and market structures. Already economically poor, the top-down imposed REDD+ projects not only threaten their livelihood but could also force them from their traditional inhabited land. In the Copenhagen Accord the Indigenous are not even mentioned. Abandoning deforestation projects not only affects people directly dependent on forest products but also employees from companies involved¹². Finding alternative incomes may be far beyond the scope of REDD+ but this also reduces the appeal of the system for some countries.

At the outset of international negotiations on rules for REDD+, Colombia argued against a baseline based on domestic deforestation rates. Many of the factors driving deforestation cannot be controlled by authorities or REDD+ projects, hence the argument against a baseline. Since more than 50 % of forested territory belongs to communities, the government has no legal rights to impose REDD+ projects. Involving the Indigenous and Afro Colombian communities in decision making and planning processes is, therefore, essential. Most of these communities live from the products the forests provide. Avoiding deforestation and forest degradation must, therefore, go along with providing alternatives to them. One goal is to reduce their dependency on forest products without affecting their livelihood and their traditional customs (Ortega et al., 2010, p. 38). However, even though the “Mesa REDD Colombia” is trying to find ways to involve the traditional communities, none of the participants represents the Indigenous and Afro Colombians. Article 329 of the Colombian Constitution of 1991 guarantees that the territory of the Indigenous and Afro Colombians is non-transferable, collective property (Manrique et al., 2003, p. 19). Setting rules and implementing REDD+ projects without involving these groups not only provokes resistance, but also goes against the Colombian Constitution.

Another obstacle to REDD+ projects may be the armed conflict and organized crime in Colombia. The FARC¹³, ELN¹⁴ and the Paramilitary are armed groups which still control parts of the country. Financed by the production of drugs, especially cocaine, they contribute in part

¹² In Indonesia 350 000 people are directly employed by firms engaged in deforestation and 3.1 million are indirectly related to that business (Ghazoul et al., 2010, p. 399)

¹³ Fuerzas Armadas Revolucionarias de Colombia (Revolutionary Armed Forces of Colombia)

¹⁴ Ejército de Liberación Nacional (National Liberation Army)

to deforestation and forest degradation in Colombia. It is estimated that around 81,000 ha are used for the cultivation of coca (UNODC, 2009), most of which are in forest areas where the canopy prevents the detection of plantations from the air. Armed groups are also involved in the systematic and forced displacements of farmers, Indigenous and Afro Colombians. In 2010 a criminal case was filed against a palm oil producer who used armed forces to clear the land for his palm oil plantations (Barjai, 2010, p. 1). Considering Colombia's richness in natural resources, and the huge economic benefit they could bring this case is unlikely to be the only one. Thus it is not an absurd thought that REDD+ projects could result in the forced and unlawful displacement of native people in order to benefit from the payments.

4.8 Low deforestation rates

Under the current REDD+ system the nations with high current deforestation rates are the ones which benefit. They can set a higher baseline and be rewarded with higher compensation for avoided deforestations. Nations with already low deforestation rates and effective environmental policies are, therefore, at a disadvantage. REDD+ projects (if possible sites are found at all) can only be implemented under much higher opportunity costs.

Colombia historically has a low deforestation rate compared to other Latin American countries (Becerra and Mance, 2007, p. 52). The Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM) calculated an average rate of deforestation of 101,303 ha forest per year between 1994 and 2001. This translates to an annual reduction of 0.18 % of forest areas each year (Ortega et al., 2010, p. 2). In the areas with the highest potentials for REDD+ projects – the Amazonia and Chocó which are largely covered by primary rainforest – 80 % are occupied by reservations of the Indigenous and Afro Colombian communities (Becerra, 2009, p. 2f). The mere existence of these large areas of primary rainforest already implies a low historical deforestation rate. The communities traditionally manage the forest sustainably. The potential payments for REDD+ projects would therefore be quite low.

5. Conclusion

Despite the data about forests in Colombia, which at first glance sound promising for future REDD+ projects, a look at the national situation and the REDD+ system in detail suggest that success might be limited. There are on the one hand communities which hold the property rights to large areas. Traditionally they live off the products of the forests and have the knowledge to manage their areas sustainably. Even though the REDD+ methodology includes payments for sustainable forest management benefits from payments may be low as the

business-as-usual scenario hardly ever means complete deforestation. It is in fact poverty which drives them to deforestation. Cooperation will not be possible without involving the communities in the planning phase of the REDD+ projects, providing alternative livelihoods and improving public services.

On the other hand precious raw materials pose a threat to many forests. The profits to be made can never be compensated by payments from REDD+ funds nor the carbon market. Even the advanced national environmental laws cannot prevent large scale projects to extract the raw materials. The economic benefits are far too appealing to push through effective law enforcement.

However, a large potential in Colombia lies in combined payments for ecosystem services. Compensation for watershed protection and the conservation of biodiversity combined with payments from avoided deforestation have great potential.

To increase the effectiveness of REDD+ projects international companies dependent on raw materials from forests or agriculture should be forced into responsibility, e. g. by obliging them to publish the carbon footprint of their products. Regarding the inability of industrialized nations to reach agreements on efficient emission reduction and the unwillingness to change unsustainable lifestyles, the responsibility should not be silently shifted to developing countries by paying them to implement REDD+ projects.

REDD+ is a good tool for reducing emissions, but it must be embedded in other activities to ensure effective implementation and long-term benefits.

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