Are existing programs for community based forest management and conservation suitable REDD strategies? A case study from Mexico.

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1. Introduction

Worldwide, people involved in the promotion of sustainable forest management and forest conservation have high expectations of the possible inclusion of REDD (Reduction of Emission from Deforestation and Forest Degradation) in the international climate convention to be signed this year in Copenhagen (Parker et al. 2008). Ongoing discussions and research have paid considerable attention to the design of methodologies enabling countries to quantify carbon stocks, carbon sequestration and emission reductions. Involved parties have requested the inclusion of regulations that guarantee environmental integrity, biodiversity conservation, indigenous rights, and poverty reduction (among others) (Seymour 2008). Less attention has been paid to the strategies individual countries can apply to reach the desired reduction in deforestation and forest degradation. Countries interested to participate in future REDD schemes are expected to become "REDD-ready" and to draw up their own strategies as considered appropriate under local circumstances. Some researchers question the capacity of national governments to influence deforestation rates in the first place. Deforestation is often triggered by macro-economic factors that are difficult to influence and not all governments have the capacity to implement intervention programs. Decision making by national governments is moreover influenced by multiple actors, interest and processes and not only based on economic arguments as is implicitly assumed in market-based REDD proposals (Karsenty 2008).

Mexico differs from most developing countries in the sense that property rights over land and forests are secure and most of the land (estimates range between 53 and 80%) is owned by indigenous and agrarian (ejidos) communities (Klooster 2003; CONAFOR 2008). To reduce deforestation and forest degradation Mexico has to consider local people's interest and capacities. Moreover Mexico has a relatively well established institutional capacity (Kaimowitz 2008) and considerable experience implementing forestry programs.

Mexico has been actively involved in discussions on REDD, participates in the Forest Carbon Partnership Facility (FCPF) of the World Bank and is currently elaborating a REDD readiness plan. A readiness plan includes the development of a baseline reference scenario, the definition of strategies to reduce emissions from deforestation and forest degradation, and the design of monitoring, reporting and verifying systems to determine emission reductions. To reduce carbon emissions Mexico proposes, among other things to continue with existing government programs aimed at the improvement of forest management practices, the enhancement of forest stock and the conservation of national forest areas (De Jong et al. 2008).

The objective of this paper is to analyze whether three of the forestry programs implemented by the Mexican Forest Service (CONAFOR) are suitable to reach REDD objectives in Mexico and what lessons can be drawn from these experiences in the way forward.

2. Deforestation in Mexico

Historically, Mexico has been relatively unsuccessful in promoting sustainable forest management and conservation. The country's deforestation rate for the period 1976–2000 has been estimated at an average of 545,000 ha/year for all ecosystem types. This situates the country amongst the most deforested in the world (Bray et al. 2005). Deforestation is said

to be driven mainly by forest conversion for pasture and agriculture (82%); degradation is said to be caused by over-exploitation, illegal logging, forest fires, grazing, shifting agriculture, fuel wood collection and forest pathogens (Parker et al. 2008).

Taylor and Zabin (2000) mention that the Mexican forests are home to 17 million poor indigenous and mestizo peasants who's economic needs have an important impact on the health of the forest. Despite being the legal owners of the forest Mexico's peasants have struggled to gain genuine control over their forest resources. Over time, the forestry sector has been dominated by state and private timber enterprises that were subsidized by public investments and protected from foreign competition. Since the seventies and eighties, communities have taken more and more control over their forest resources and today thousands of communities have established some kind of community forest enterprises for commercial timber production (Klooster 2003; Bray et al. 2007). As 25% of the population of Mexico lives in poverty, new policies try to ensure that the poor rural population somehow benefits from new policies on agriculture, green markets and payments for environmental services (Martinez 2008).

3. REDD

There is not yet an international agreement about a global REDD scheme. Based on current developments it is expected that governments of Annex I countries (development countries) that would choose to participate in REDD may develop their own strategies to reduce forest related GHG emissions. To qualify for REDD payments they would have to comply with a set of requirements such as the establishment of a base line of carbon stock fluctuations over time and the establishment of methodologies to measure and monitor fluctuations in carbon stocks to trustworthily assess the effects of their strategies on GHG emissions.

During the negotiations on how REDD should be implemented, several methodological concerns have been raised such as additionality, leakage and non-permanence. The concept of additionality addresses the question of whether emission reductions / carbon sequestration would also have happened without payments for carbon credits. Only carbon credits from projects that are "additional to" the business-as-usual scenario represent a net environmental benefit. Leakage occurs when there is an increase in carbon dioxide emissions in one region or country as a result of an emissions reduction by a second region or country. Whereas international leakage is difficuilt to prevent by national governments, at least within the countries or within certain regions countries will have to demontrate that reducing deforestation in one area does not cause additional deforestation in another area. Non-permanence involves the risk that emission removals by sinks are reversed, because forests are cut down or destroyed by natural disaster. All concepts mentioned have been discussed extensively in the literature and it is beyond the scope of this paper to further discuss them here (Angelsen and Wertz-Kanounnikoff 2008). The mentioned concepts will be used to analyze the suitability of the discussed forestry programs as REDD strategies.

4. Mexican REDD strategy

Mexico proposes to reduce forest related emissions by incorporating the REDD program in the existing forest program. Together these programs (such as: National Protected Areas, Wildlife Management Units, Sustainable Forest Management, Payment for Ecological Services and Forest Pest Control) are expected to reduce deforestation with 310.100 ha. between 2007 and 2012 (De Jong et al. 2008). Communities or private forest owners are invited to participate in the program but participation is voluntary. Contracts between the forest owners and CONAFOR will establish the activities to be implemented and payment conditions. According to CONAFOR (2008), the amount paid for REDD activities needs to be attractive enough to compete with alternative land uses and pay for the activities needed to implement the project.

The authors have analyzed the following CONAFOR programs to assess their suitability to be included as part of a possible REDD strategy: (1) community forestry program (PROCYMAF), (2) payments for hydrological services program (PSAH) and (3) payments for carbon sequestration program (CABSA-carbon). In 2006, PSAH and CABSA have been joined in a general program for payments for environmental services (PSA).

The 'Community Forestry-Program' assists communities to organize, plan land-use options and implement activities that bring economic benefits to the communities. Activities often built on to existing management activities. Communities sell timber and other products on the market. Regulations on forest use guarantee sustainable use and conservation of the forest (CONAFOR 2003; Bray et al. 2007). The 'Payments for Hydrological Services-Program' pays landowners, mostly communities, for the water services provided by the forest on their land. People are paid a fixed amount per hectare. Communities commit to leave the forest intact and protect it from illegal logging and forest fires. Contracts have been signed for 5 years after which the communities will have to find alternative buyers for the services provided by the forest (Gonzáles Guillén 2008). The 'Payments for Carbon Sequestration-Program' pays landowners to develop a carbon sequestration project to sell these services on the market. Initially the government also paid for the carbon sequestrated by the projects. Initially farmers were very interested but most project have been rejected and when CDM regulations had to be complied with as of 2006, no carbon projects have been implemented anymore (Corbera et al. 2009).

5. Can programs contribute to REDD objectives?

To what extent can the programs for community forestry, payments for hydrological services and carbon sequestration contribute to the objectives formulated under REDD++: avoid deforestation, reduce forest degradation and increase carbon stock inside and outside the forest. Table 1 summarizes the contribution of the different programs on the different objectives under REDD.

Community forestry has been widely recognized to have contributed significantly to the management and conservation of communal forest areas in Mexico. According to Bray and Klepeis (2005, p214): "the institutional development that corresponds to reduced deforestation rates is rooted in community-managed lands that receive environmental NGO and federal support". Durán-Medina et al (2007) and De Jong et al (2008) show that deforestation rates in communities and ejidos with forest management activities are lower than in unmanaged areas. The 'Community Forestry- Program has contributed significantly to the strengthening of existing community forest management institutions and has promoted the creation of these institutions where they did not exist previously. These actions have lead to a decrease of pressure on the communal forest areas for alternative land uses. There are no studies that have evaluated the effect of community forest management on forest degradation or carbon stock. Karky (2008) and Murdiyarso and Skutsch (2006) have shown that carbon stock in community managed forests have the potential to increase over the years. Under the 'Community Forestry-Program' in Mexico, however, communities are encouraged to extract and sell forest products. Carbon stock enhancement may therefore smaller in Mexican community forests than in community forest areas in countries where forest use is more restricted.

The payments for water services program (PSAH) is relatively new and has targeted communities and ejidos with communal forests that had at least 80% crown cover as these forests contribute more to the provision of water downstream. Most communities thus already conserved their forest and initially payments have been made mainly to forest areas assigned to conservation purposes. Brana Vegana (2007) showed that from 2003 to 2006 PSAH allocated respectively 4, 11, 7 and 6 % of the payments to areas with high deforestation risk. PSAH has thus contributed only limitedly to the reduction of deforestation.

The effect of the PSAH program on forest degradation may also be limited as most payments are allocated to areas with minimum degree of forest degradation (Gonzáles Guillén 2008). Communities have complied with conservation objectives though as less than 0.01% of the nearly 300 thousand hectares paid by the program was deforested between 2003 and 2005. These areas were lost mainly due to forest fires and not intentional land use changes (Karousakis 2007). It can be expected that the management activities carried out by the ejidos and communities such as fire prevention and control of illegal loggers do have a positive effect on forest carbon stock. There are no studies to confirm this.

Farmers and communities have shown considerable interest in carbon sequestration projects but few project ideas have been accepted and even less proposals have been financed. The potential of carbon sequestration under the CABSA program has been reduced even more after the introduction of CDM requirements. Due to the limited number of proposals implemented the government program on carbon sequestration can be considered a failure. Other CONAFOR programs that pay farmers for improving and establishing agro-forestry systems have been implemented by more farmers and communities. These schemes could also be used to sequester carbon although they do not comply with CDM regulations either.

Experiences of carbon sequestration projects run by NGOs such as Scolel-Té and SAO show that carbon sequestration can be an interesting income generating activity for farmers and communities. Scaling up theses projects is difficult due to the considerable technical and administrative assistance needed. Moreover, none of the projects have been able to comply with CDM regulations as evaluators consider these projects too risky to invest in due, to the large amount of actors and activities involved (Lövbrand et al. 2009).

Table 1. The (potential) contribution of the different programs to REDD

REDD objectives	Payments for Hydrological Services-Program	Payments for Carbon Sequestration-Program	Community Forestry-Program
Avoided deforestation	+/-	-	+/-
Reduce forest degradation	+	+/-	+
Increase carbon stock in forest	+	+/-	+/-
Increase carbon stock outside the forest	-	+	-

All three programs discussed have the potential to contribute to REDD objectives but none of them has exploited this potential fully up to now. The 'Community Forestry-Program' and the 'Payment for Hydrological Services–Program' have mainly been implemented in communities that conserved their forest anyway. However, the 'Community Forestry-Program' managed to increase the value of the forest to the communities and reduce the pressure on the forest for alternative activities. The 'Payments for Hydrological Services-Program' managed to enhance people's understanding of the value of their forest. This awareness has lead to multiple local and regional negotiations on local payment schemes for water services. The 'Payments for Carbon Sequestration-Program' has hardly had impact on REDD objectives but if adapted to local production systems it might have some potential as shown by other government schemes and NGO run carbon sequestration projects.

6. Can the programs comply with probable REDD requirements?

In this section it will be assessed if the analysed government programs fulfil requirements as additionality, leakage and permanence.

Additionality

Both the 'Community Forestry-Program' and the 'Payment for Hydrological Services Program' specifically target ejidos and communities that have maintained forest cover over time to benefit from the products or services provide by these forests. The fact that the

communities still have forests to submit to these programs means that they have maintained forest stock over time and that the forest are not at immediate risk of being deforested. Studies on the effect of these programs in Mexico confirm that most communities and ejidos would have conserved their forests anyway (Karousakis 2007). According to the 'additionality' principle these communities would thus not be eligible for REDD payments for avoided deforestation.

The 'Community Forestry-Program', the 'Payment for Hydrological Services-Program' and to some extend also the 'Payment for Carbon Sequestration-Program' are more likely to contribute to REDD objectives as reduced forest degradation and increased carbon stock. When additional value is attributed to a forest area through the commercialization of products and services, forest degradation is likely to halt. For now, this is merely an expected achievement because no studies exist on the reversal of degradation processes under these programs. Carbon stock is likely to increase under the 'Payment for Hydrological Services-Program' and the 'Payment for Carbon Sequestration-Program' because people are required to maintain forest cover and protect the forest without having the possibility to extract forest products. As communities would not refrain from extracting forest products and would not actively protect the forest without these payments, increased carbon stocks are additional and most likely eligible for REDD payments. Under the 'Community Forestry-Program' carbon stocks likely to increase less as timber is harvested from the forest on a regular basis (see also: Karky 2008). Carbon sequestration through afforestation and reforestation appears to be the most straightforward activity that additionality can be proven for.

Leakage

In Mexico, neither one of the discussed government programs has specific requirements regarding the avoidance of leakage. Karousakis (2007) claims, however, that to avoid intra-property leakage, in most cases the contracts for payments for environmental services specify that removal of trees from the community's entire forested area, even outside of the area for which payments were being made, constitute a contract violation.

Intra-property leakage does not always occur. In some communities the benefits from timber sales have been invested in activities that omit the use of the forest for productive or extractive activities and promote forest conservation such as the bottling of water or eco-tourism. Other communities are applying the regulations on forest use established under the 'Payments for Hydrological Service-Program' to the entire community forest area as they expect to be rewarded for their conservation efforts under future payment schemes as well. Thus, under certain circumstances communities are given the incentive to preserve and enhance carbon stock in the entire community area. Further research could reveal under what circumstances this is likely to happen.

Permanence

The discussed programs do not require long term commitments of the communities. Under the 'Community Forestry-Program', communities receive funds for planning, training and investments and contracts signed to receive these funds are one-year contracts only. The 'Payment for Hydrological Services-Program' and the 'Payment for Carbon Sequestration-Program' require communities to commit to the program for five years. Some communities, possibly those that do not depend on the resources for their livelihood as in Costa Rica (Zbinden and Lee 2005), have requested extension of the program to ensure future payments. Others consider 5 year an appropriate and even maximum commitment period as land requirements for agricultural production can be assessed for a five-year period but not beyond that. Moreover, people perceive that long term contracts may result in the loss of property or user rights over the forest. This fear is not unjustified considering the historical struggle over resources between the government and communities (Klooster 2003). This struggle continues presently when the government decrees protected areas over community

lands, severely limiting people's access to forest resources without their consent. The areas dedicated to carbon projects are generally small and tree products can be harvested. The use of land for carbon sequestration is not as restrictive as dedication of land to the other programs and the investments made may even enhance agricultural production.

7. Discussion

The, possible, main objective of REDD is to reduce deforestation and forest degradation and to increase the carbon stock in biomass both in and outside the forest. From the analysis of three forestry programs on community forestry and payments for environmental services in Mexico, it can be concluded that all analyzed programs have the potential to reduce forest degradation and enhanced carbon stocks inside and outside the forest. However, the potential of these programs to contribute to a reduction of deforestation is considered to be significantly lower. Although forest management activities by rural communities are recognized to have reduced deforestation over time, they are unlikely to be able to demonstrate additionality on a short time span as will probably be required by future REDD schemes. Farmers and communities in Mexico are thus likely to benefit more from payments based on reduced forest degradation and enhanced carbon stock in their forest areas than on reduced deforestation.

Mexico is considering to generate carbon credits at the national level though the implementation of programs for community forestry and payments for environmental services. It has been shown that these programs can contribute to REDD objectives. However, it has also been shown that the programs do not automatically generate carbon credits according to international regulations. The analyzed programs are not in the first place targeted to mitigate carbon emissions or sequester carbon. Rather, the programs are targeted at the management and conservation of remaining forests areas to prevent further deforestation and degradation and to preserve the multitude of environmental services provided by these forests. The unilateral focus on carbon sequestration in the discussions on the design of a REDD scheme, and especially the 'additionality' principle, could severely limit the potential of developing countries to reward rural communities for their past and current forest management and conservation practices.

As mentioned before, communities could receive REDD payments for reduced forest degradation and enhanced forest stock. These payments engender several complicating aspects however. First, to enhance carbon stock in the forest, communities will have to limit the extraction of forest resources they need for survival. As Karky (2008) has shown for Nepal, people will not prefer carbon payments over the use of forest products and are unlikely to be willing to leave the forest unused. Second, the amount of carbon saved through reduced degradation or sequestered through enhanced carbon stock is relatively small. Transaction costs to participate in a REDD program are likely to be high, as for CDM, and may absorb the biggest part of these benefits. The combination of these two aspects may render participation in REDD projects uninteresting for most communities. Third, REDD conditions are expected to demand long term commitments from communities which is not in their interest. Studies on community-enterprise partnerships have shown that communities may profit from partnerships with private enterprises but only when the contracts are short term and can be renegotiated without locking people in unfavourable contracts for a long time (Vermeulen et al. 2003). Lastly, lack of flexibility in decision making on land use reduces local people's capacity to adapt to changing circumstances, such as those caused by climate change itself.

Apart from these arguments, permanence of land use practices that absorb rather than emit carbon, are most likely to be reached by investing in systems that can guarantee livelihoods of local people without them depending on the international carbon market. Power relations between local sellers and international buyers are too big to expect contracts to reflect the interest of both parties equally (Brown and Corbera 2003). Moreover the carbon market

cannot guarantee a fixed or even minimum price for the carbon credits provided by communities which creates additional insecurity for the communities.

8. Conclusion and suggestions

The existing programs for community based forest management and conservation can only be used as a strategy to comply with REDD objectives under certain circumstances. If farmers and communities have to comply with international REDD requirements it is unlikely that communities engaged in the analyzed forest management programs will be eligible for REDD payments. They do not comply with international requirements and it is likely that the CDM experience (no involvement of local people) will be repeated (Brown and Corbera 2003). This picture could change when governments establish a national accounting system for carbon emissions and sequestration. Governments would receive international payments based on a general reduction in emissions and be free to allocate these payments where they consider it most effective, both economically *and* socially. The current programs that contribute to REDD objectives, even though they have difficulty complying with international requirements, could than constitute an effective way to reduce carbon emissions. The task to comply with international standards would be dealt with at the government level. Governments would have to formulate a national payment system to pay for forest conservation and management efforts at the local level. International requirements thus need to be translated into national requirements to enable local people to benefit from REDD payments. This observation is in line with Pokharel and Baral (2009), who urge the Nepalese government to 'Nepalize' their REDD strategy. Whereas the Mexican government is expected to have the will and capacity to do so, this might not always be the case elsewhere and constitutes a major challenge for most developing countries.

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