



FEASIBILITY STUDY FOR THE REDD+ MECHANISM IN CHIAPAS

EXECUTIVE SUMMARY



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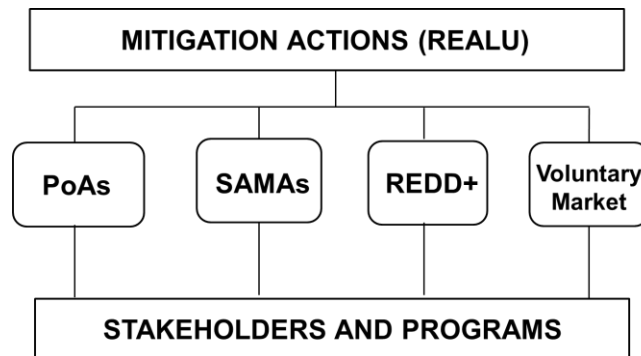
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Programa Mexicano del Carbono

EXECUTIVE SUMMARY

The Feasibility Study for the REDD+ mechanism in Chiapas aims to contribute to the development of the REDD+ strategy in the State by providing elements, submitting schemes, identifying opportunities and gaps, quantifying the REDD+ potential and submitting a road map for a successful implementation of this type of mechanisms in the State. The Study features reference scenarios, carbon dynamics models, economic and financial analysis of intervention activities, abatement curves and mitigation scenarios of REDD+ in the State as well as an analysis of the juridical-legal framework, the identification and analysis of barriers for safeguard establishment and monitoring and a market analysis. Analysis scales used were state, region, and municipality.

According to the PACCC (Program of Actions on Climate Change in Chiapas), in 2008 a 76 percent of the emissions come from the rural sector. The diagnosis of the current status of REDD+ in Chiapas indicates that the main direct causes of deforestation are the transformation of vegetation cover to be used for agricultural and livestock purposes (basically grassland areas for cattle raising) and forest fires (those related to agricultural and livestock purposes represent a 60 percent). As a general rule, degradation is related to a non-regulated extraction of forest products, mostly timber and firewood/charcoal, as well as cattle grazing in the forest and low-intensity fire. REDD+ mechanisms or projects to be developed must take into consideration, consequently, the adoption of good farming practices aimed at an improved use of space and a better yield by producers, reducing at the same time pressures in the forestry sector.

For REDD+ (and REALU: Reduction of Emission from All Land Uses, in a territorial approach of the agricultural sector, forestry and other soil uses) in Chiapas, a general implementation scheme of mitigation actions in Chiapas has been proposed:



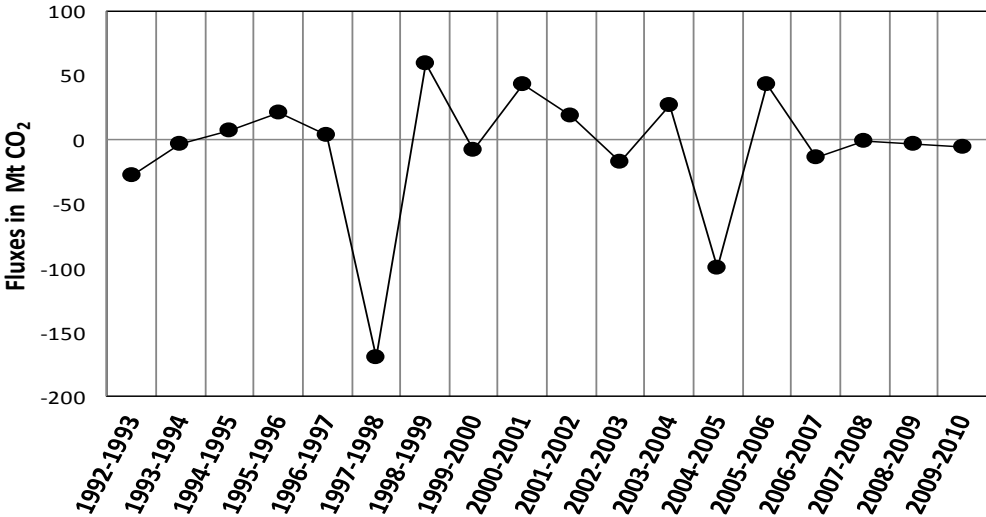
General implementation scheme proposed for mitigation actions in Chiapas were PoAs are programs of activities considered in the clean development mechanism or CDM and SAMAs are state appropriated mitigation actions.

For the sake of clearness in the REDD+ implementation process, it is essential to define the responsibility levels of the different stakeholders(government, civil society, owners, etc.) as well as the implementation scale (government policies) and intervention (local actions). A proposal has been made to use the BGSA scale (basic geostatistical areas defined by the INEGI), which would be subordinated to the municipal scale; as far as intervention is concerned, land plots and communities are suggested. With respect to co-benefits, natural scales must be considered (i.e. watersheds for hydrological services) associated to the specific ecosystem service. In addition, it is essential to carry out *ex situ* actions coordinated to a scale greater than that of intervention. It is also proposed to use the ecologic and territorial laws and regulations as central core of REDD+ under two points of view: public policies (state and municipal) and territorial laws and regulations

at a local scale (land properties and/or communities). For purposes of securing aggregation at different scales, it is proposed to take into consideration generic components in reference scenarios: maintenance of carbon sinks (conservation) and carbon sink and sources changes. In addition, the carbon MRV (monitoring, reporting and verification) system (and co-benefits) must take into consideration a multiple-scale report associated to forest governance.

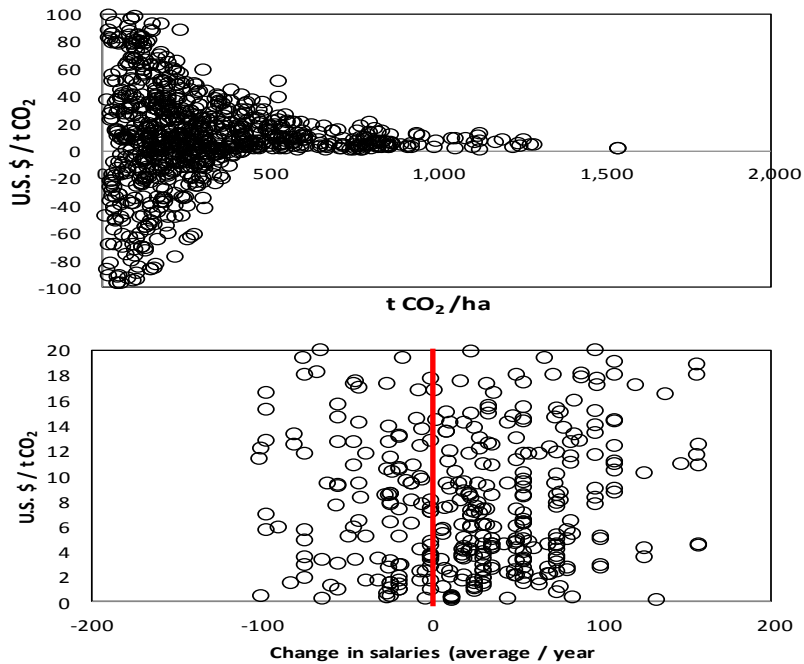
The legal framework analysis of the State of Chiapas consisted of assessing whether the Government of Chiapas (including its municipalities) relies on an adequate legal and institutional framework for the stage of preparation and implementation of REDD+. The results obtained indicate that the State of Chiapas relies on a legal and institutional framework which, notwithstanding being disjointed, contains orderly and systematized strategic elements that give an opportunity to implement and develop the REDD+ within the State, in consistency with its sustainable rural development in the short and long run.

The generation of reference scenarios (by using Landsat satellite images and forest inventory data) departed from total carbon estimates (live biomass and soil) into a scale of land properties and analyzed multi-temporal changes at scales of: municipalities, sub-basins and state. In generated reference scenarios, specifically those at a state scale, the effect of extreme events (fires in 1988 and the hurricane Stan in 2005) may be clearly appreciated and show the vulnerability of REDD+ in the presence of impacts beyond human control:



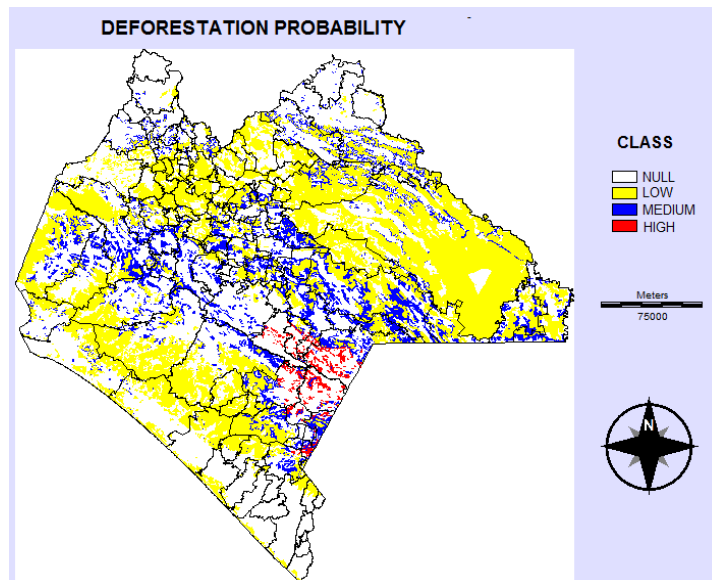
CO₂ fluxes of the State of Chiapas for sinks and sources, live biomass and soil

Unit costs abatement curves for REDD+ in Chiapas, 30-years financial projections (with different interest rates or IR) in terms of the net present value of productive activities by state regions and carbon dynamic models parameterized with regional information, reflect the existence of different components of REDD+ with similar opportunity costs but different potential associated to the reduction of emissions. The curves also show that many transitions (changes in activity or land use) generate job losses so this criterion must be taken into consideration in the assessment of mitigation scenarios.



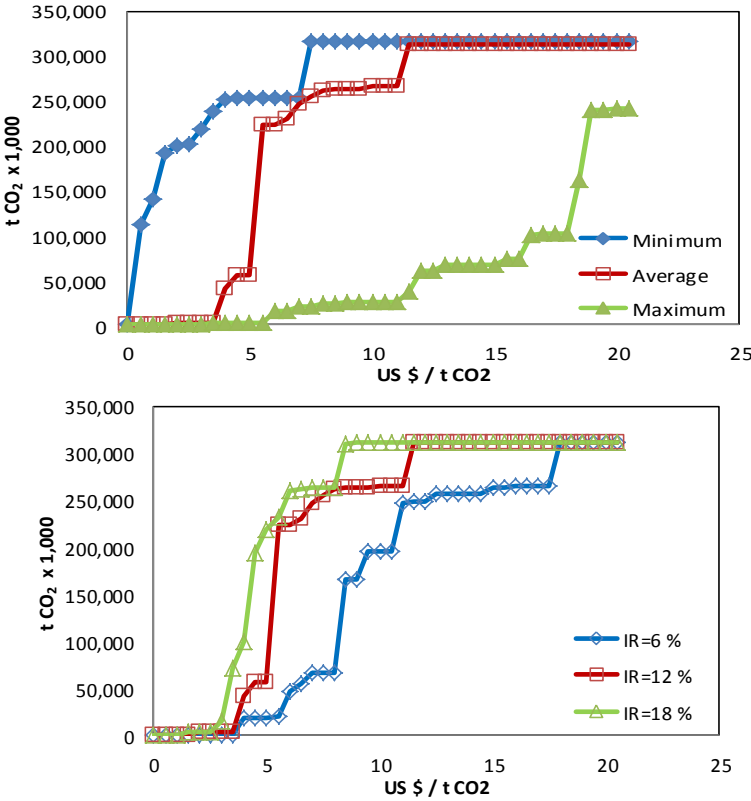
Curve of unit abatement costs (above) for REDD+ (all components) and changes in salaries (below) produced by a transition between activity changes related to unit opportunity costs; subsidized cases and a TIR = 12 percent for the State of Chiapas.

The generation of mitigation scenarios took into consideration global scenarios (all areas and land uses) as well as scenarios on areas at risk from deforestation/degradation (figure below). On both cases, scenarios with positive and negative opportunity costs were differentiated. Scenarios with positive opportunity costs define an analysis of the sensitivity of different conditions for potential REDD+ implementation policies.



Deforestation probabilities en Chiapas, wherein classes are defined by the following ranks: Null = 0.0, Low = 0.0-0.2, Medium = 0.2-0.4, High = 0.4-0.6

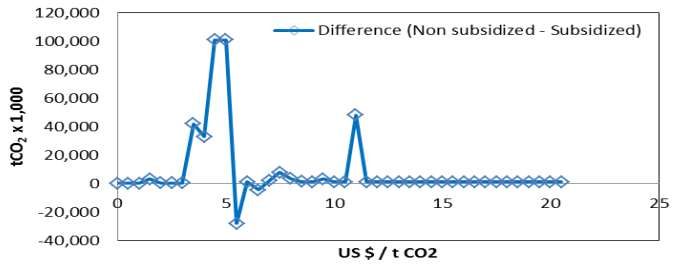
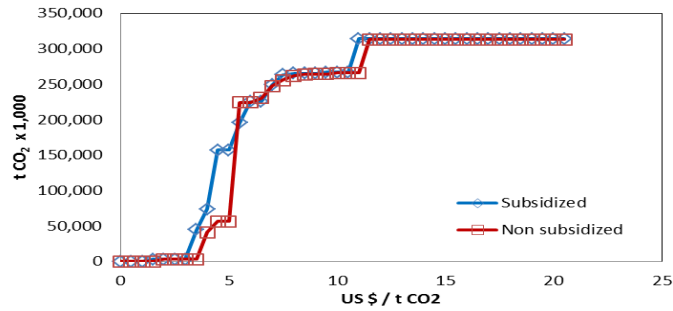
Mitigation scenarios associated to areas at risk from deforestation/degradation were based on maximum, average and minimum opportunity costs of changes in evaluated activities. An analysis of the effect interest rates also made considering average opportunity costs.



Mitigation scenarios (positive opportunity costs) for no job losses, non-credit case, a case derived from use of statistics used (IR = 12 percent) (above) and a case of IR effect (average costs) (below) in areas at risk from deforestation/degradation in Chiapas.

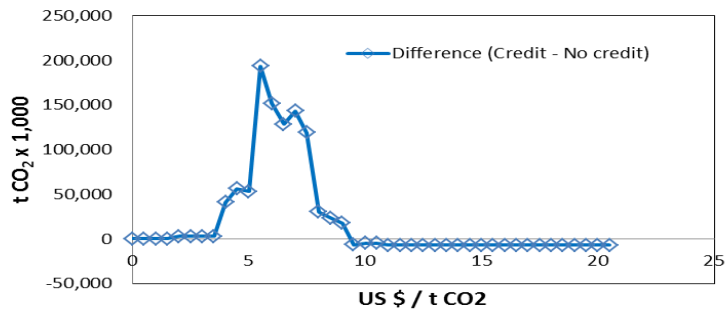
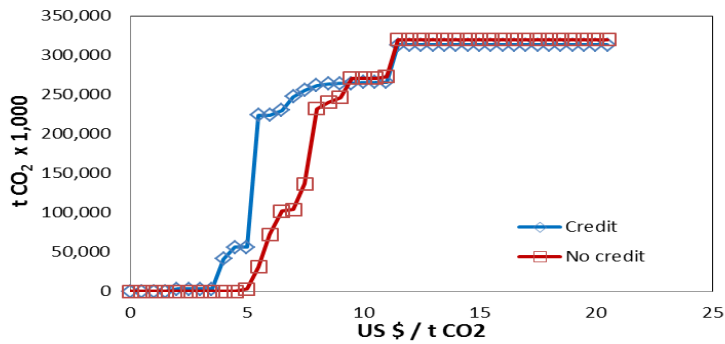
From the above figure it follows that at an opportunity cost of 1 US \$ / tCO₂, the emission reduction potential is 200 million tCO₂ for those cases in which minimum cost activities are contemplated. For average costs, this reduction potential has a cost of 7.5 US \$ / tCO₂ and 19 US \$ / tCO₂ for maximum costs activities. In addition, and in reference to the same figure, for an emission reduction potential of 200 million tCO₂, it follows that the cost is 6 US \$ / tCO₂ for 6 percent interest rate, 7.5 US \$ / tCO₂ for a 12 interest and 12.5 US \$ / tCO₂ for an interest rate of 18 percent, showing the time value of money.

The analysis of subsidized programs (SAGARPA's PROCAMPO and PROGAN programs and CONAFOR's PSA program) was reviewed by using the difference between emission reductions (subsidized case – non subsidized case). The results showed that for opportunity costs between 2.5 and 5.0 U.S. \$ / tCO₂, a subsidy implies a reduction potential loss of approximately 100 million tCO₂. For values above 5.0 U.S. \$ / tCO₂, this negative effect is practically reduced to zero; there is a small jump around the 11 U.S. / tCO₂ category (activities designed to avoid forest degradation).



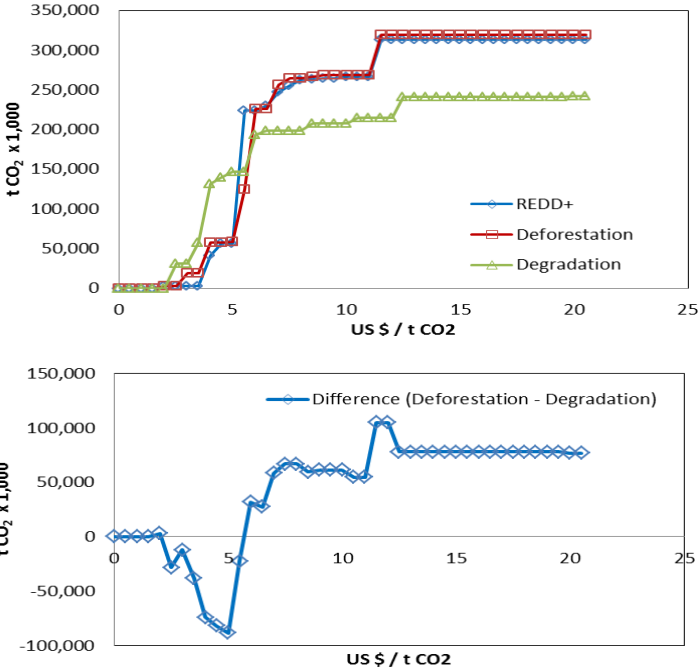
Effect of subsidies on mitigation scenarios (positive average opportunity costs, with no job losses, no credits and an IR = 12 percent) in areas at risk from deforestation/degradation in Chiapas.

For an adequate visualization of the effect of credit for financing of improved production practices or activity changes in mitigation potentials and their associated opportunity costs, an analysis was made of the emission reduction difference (credit versus non-credit cases). The results show that for opportunity costs between 3.5 and 5.0 US \$ / TCO₂, the lack of credit implies a loss of reduction potential of 200 million tCO₂. For values from 5.0 US \$ / tCO₂ to 10.0 US \$ / tCO₂ this negative effect is practically reduced to zero.



The effect of credit on mitigation scenarios (unsubsidized positive average opportunity costs, without job losses and an IR = 12 percent) in areas at risk from deforestation/degradation in Chiapas.

Although a majority of the analyses of this Study was associated to deforestation activities, it is essential to review the impact derived from forest degradation in REDD+. Accordingly, the differential of emission reductions derived from excluding forest degradation related to the REDD+ deforestation component, it was observed that differentials are significant (potential losses around 90 million tCO₂) within the 2.0 - 5.0 US \$ / tCO₂ range. These effects are reversed after 5.0 US \$ / t CO₂.



Effect of the exclusion of forest degradation related to deforestation in mitigation scenarios (unsubsidized positive average opportunity costs, without job losses and a IR = 12 percent) in areas at risk from deforestation/degradation in Chiapas.

In the case of negative opportunity costs, the emission reduction potential is significant.

Scenarios associated to negative opportunity costs s (TIR = 12 percent)

Scenario	Statistical	t CO ₂ (thousands)
No restrictions	Minimum	81,890.88
	Average	132,945.40
	Maximum	158,190.40
No job losses, Credits	Minimum	81,117.91
	Average	87,743.89
	Maximum	102,267.30
No job losses, No credits	Minimum	29,071.01
	Average	58,867.93
	Maximum	91,122.98

Negative opportunity costs allow the analysis of the redirection of public policies aimed at promoting activity changes at no additional costs in order to have an idea of government commitments that may be accomplished in a relatively simple manner (modification of the operating rules of federal and state programs, orientation of credit policies, etc.) that may become the accreditation reference scenario in Chiapas.

In regional terms, the Mayan Rainforest region (encompassing the Lacandonian Rainforest) and the Chiapas Highlands offer the best option to focus on public policies aimed at taking advantage of negative opportunity costs.

Scenarios associated to negative opportunity costs (IR = 12 percent) by region in Chiapas

Region	Negative O.C. (tCO₂ x 1,000)	5-6 U.S. \$ / tCO₂ (t CO₂ x 1,000)	6-7 U.S. \$ / tCO₂ (t CO₂ x 1,000)
Mayan Rainforest	2,914	43,924	65,990
Zoque Rainforest	5,028	15,069	15,069
Soconusco	1,288	5,405	5,405
Coastal Plain	2,657	7,579	7,579
Central Depression	0	18,570	18,579
North	1,512	3,988	4,128
Highlands	6,383	30,130	41,721
Sierra Madre	6,473	11,390	23,539

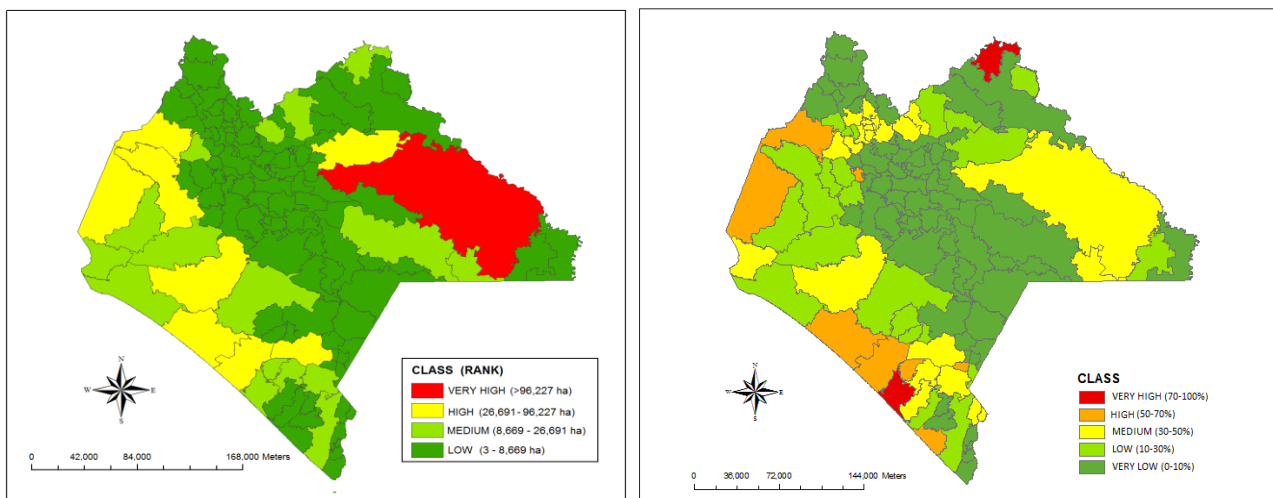
From the mitigation potentials presented it follows that a market such as the Californian may be met in full with a minimum cost and that a zone of land properties supported by the Government of Chiapas in the Lacandonian Rainforest would be sufficient for this market.

In general terms, an opportunity cost of 4-6 US \$/t CO₂ appears to suffice for a good portion of the mitigation potential of GEI in Chiapas.

On the other hand, the non-credit condition would be equivalent to considering, on a reasonable basis, that implementation costs are zero. In any such case, it may be concluded that REDD+ costs are basically associated to opportunity costs only. Finally, it is estimated that transaction costs associated to the implementation of REDD+ would be equivalent to opportunity costs plus an additional 10 percent associated to MRV and technical assistance, the above under the consideration of economies of scale, and the use by the Government of Chiapas of its infrastructure to facilitate the REDD+ implementation process. Otherwise, from past implementation experiences in regional voluntary markets, the additional cost would be from 20 to 30 percent.

In order to prioritize the municipalities of major interest for implementation of the REDD+ actions, a composite indicator has been constructed to prioritize biological interest areas (biodiversity corridors, natural protected areas, etc.) and their risks of disturbance, as well as municipalities with the greatest poverty/marginalization/human development and the indigenous peoples of Chiapas. The expected average biological interest area (EABIA), constructed indicator, takes into consideration mitigation potentials, co-benefits (biodiversity basically), safeguards (indigenous populations and vulnerable groups of society), besides from social and economic aspects of

sustainable rural development. The EABIA divided by the forest area at the municipality level define intervention priorities in municipalites.



(a) Municipal distribution of the general expected average biologic interest area (EABIA) indicator divided into the total surface of rainforest, in percentage, in Chiapas, and (b) EABIA divided by the forest area, in percentage, In Chiapas.

The barriers or challenges identified for application and monitoring of the safeguards recognized in the COP16 are: the problematic related to the ownership and tenure of land, the lack of organization at local level, the nascent sustainable forest management, the need of creating local capacities in the subject, the large dynamics in land use were agricultural and livestock activities constitute a priority, the social complexity derived from the cultural diversity found in the State and the lack of inter-institutional coordination in the application of several governmental programs and their efficiency. It must be pointed out that the discussion is incipient in this subject at national level and is just beginning, a part of which is presented in this paper.

As regards the REDD+ subject, Chiapas has shown a particular interest in the Californian market. This is so because upon execution of the memorandum of understanding by both states, Chiapas commenced the design of a mechanism for the generation of emission compensation credits for the Californian market under an ongoing jurisdictional and nested scheme.

The cluster of small-scale PoAs (Programs of Activities) constitute a good opportunity inside the CDM to develop projects in the AFOLU sector (Agriculture, Forestry and Other Soil Uses) at local scale and escalate their application. As far as the voluntary market is concerned, the standard Plan Vivo is recommended for projects at community level willing to generate substantial social and environmental benefits by taking advantage of technical specifications previously developed for the Scolel Te Project of Chiapas. The VCS (Verified Carbon Standards) is of interest for projects willing to employ a robust soil carbon accounting methodology, cluster of projects or thinking of REDD+ nested projects. The CCB (Climate, Community and Biodiversity) is widely recommended for ensuring co-benefits in projects that are verified by other carbon accounting standards such as the VCS or the CDM. In addition, nationally appropriated mitigation actions (NAMAs) may be implemented in sectorial terms to take advantage of economies of scale, although NAMAS have been rarely used in the AFOLU sector so far.

The state mitigation and financial incentive potential is clear. For this reason, a road map with the following steps has been suggested to accomplish the operational implementation of REDD+ (and REALU) in Chiapas. It has also been stressed that there are substantial foundations in Chiapas to integrate a cross-sectional, integral REDD+ program articulated with the rural development policy planned for the future with respect to the pronouncements made by México in global conventions and agreements.

The adjustments and new developments required in different spheres are:

- As far as the juridical sphere is concerned, it is essential to: make institutional arrangements for REDD+; establish an articulate public participation state system; foresee a framework for technical assistance and training oriented to promoting an integral and sustainable rural development; analyze the topic of carbon rights; it is also required to conduct an analysis of existing financial mechanisms. In addition, applicable legislation must design criteria and guidelines related to reference levels, set the grounds of a framework for establishment of MRV systems for REDD+ and give compliance to a state system of social and environmental safeguards. As far as state laws are concerned, it is essential to adequate or amend the environmental law, the sustainable forest development law, the planning law, the climate change adaptation and mitigation law, the social participation law and, finally, to meet the need of enacting a state law promoting the activities of civil society organizations.
- As for safeguards, it is required to carry out an in-depth work with the participation of a larger number of stakeholders, especially at a local level. It is also necessary to rely on an agreed upon and understandable safeguard concept. The Mexican Government has not defined yet the methodology or standard to be applied in the development of the National Safeguards System. There is the possibility of applying the SES (Social and Environmental Standards) methodology, but no decision has been taken so far because said methodology only responds to the voluntary market and not the regulated market. The priority of the National Safeguards System is to cover the Cancun safeguards and review the existing Mexican legislation considering that the latter may be fully or partially covered by certain Mexican laws, accordingly, the interesting issue would be to develop the monitoring, evaluation and follow mechanisms for said statutes.
- For purposes of considering REDD+ co-benefits, it is required to develop specific metrics for vegetation diversity and wild life habitats as well as water-related simple and operational modeling schemes.
- It is essential to have in mind the establishment of nested governance systems implying the appropriation of metrics and monitoring at land property scales, the development of participative territorial laws and regulations and multi-scale MRV systems associated to the local governance.
- It is also required to rely on a territorial planning and management system capable of articulating multi-scale public policies with local actions. The REDD+ oriented carbon MRV system must consider the consolidation and expansion of the developments presented in this Study. In addition, in order to have elements to manage financial resources and to minimize the impact of REDD+ associated risks (i.e. fire, hurricanes, defaults, etc.) it is required to develop financial programs and instruments
- One of the greatest challenges for REDD+ is the development of a scheme for benefit distribution in an equitable and inclusive manner. Another topic of great significance is the generation of capacities in a self-managed and solid manner. Finally, the

dissemination of the REDD+ scheme must be carried out by means of an open and participative mechanism (in an understandable language and in local tongues).