



How do CDM projects contribute to sustainable development?

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June 2004

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Tyndall Centre Technical Report No. 16

June 2004

This is the final report from Tyndall research project IT1.13 (Evaluating Policy Options for the Clean Development Mechanism: A Stakeholder Multi-criteria Approach). The following researchers worked on this project:

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Acronyms

AMEXTRA – Asociación Mexicana de Transformación

AOSIS – Association of Small Island States

CDM – Clean Development Mechanism

CEPCO - Coordinadora Estatal de Productores de Café de Oaxaca

CIFOR – Centre for International Forestry Research

CODESSMAC - Consejo para el Desarrollo Sustentable de la Selva Marqués de Comillas

ECCM – Edinburgh Centre for Carbon Management

ECOSUR – El Colegio de la Frontera Sur

INE – Instituto Nacional de Ecología, Government of Mexico

MCA – Multi-Criteria Analysis

NGOs – Non-Governmental Organisations

PACT – Belize Protected Areas Conservation Trust

PAJAL – Union de Crédito Pajal Ya’Kactic

PfB – Programme for Belize

RBCMA – Rio Bravo Conservation and Management Area

SEDESOL – Secretaría de Desarrollo Social, Government of Mexico

SEMARNAT – Secretaría de Medio Ambiente y Recursos Naturales, Government of Mexico

SENER – Secretaría de Energía, Government of Mexico

SPR – Sociedad de Producción Rural

UCAI – Unidad Coordinadora de Asuntos Internacionales, Government of Mexico

UELC – Unión de Ejidos Lucha Campesina

UNAM – Universidad Nacional Autónoma de Mexico

UNDP – United Nations Development Programme

UNFCCC – United Nations Framework Convention on Climate Change

UREAFA - Unión Regional de Ejidatarios Agropecuarios, Forestales y de Agroindustria de los pueblos Zoque y Tzotzil del Estado de Chiapas

1. Overview of project work and outcomes

Non-technical summary

In the run up to the second commitment period of the UNFCCC (post-2012) it is crucial that developing countries engage in policy processes and that different options for climate change mitigation are advanced. The Clean Development Mechanism (CDM) has been one of the key policy initiatives implemented to facilitate the participation of developing countries, to provide incentives and innovations for mitigation, and to transfer technology and resources necessary for 'cleaner' – i.e., less greenhouse gas intensive - development. However, there is still much uncertainty concerning the sustainability of these initiatives. Whilst CDM projects explicitly aim to bring dual benefits, in terms of climate mitigation and development in their recipient country, the development benefits are often more hypothetical than real. In fact, the idea and definition of what constitutes development itself is contested.

One of most controversial areas within the UNFCCC policy framework is the enhancement of land use and forestry related carbon sinks. A number of such projects have already been initiated as pilot jointly implemented activities. Within these projects there are clear trade-offs between carbon sequestration, local social development, economic well-being and access to resources, and other aspects of the environment. Land-use related CDM projects are being developed at a time when international interest in market-based policy mechanisms centred on environmental services is at a height. A critical evaluation of the impacts of these projects and the priorities of different stakeholders involved in their development and implementation is therefore extremely timely. Furthermore with policy moving rapidly, if rather haphazardly, information to support the development of clear guidelines and criteria is also necessary. This research aims to provide such information which will help to ensure that the benefits of investments in CDM and similar projects are more equitably shared between stakeholders at local, national, regional and international levels, and that the trade-offs between social, economic and environmental criteria can be rigorously assessed.

This project has adopted a case study approach and utilised a multi-disciplinary, primarily qualitative methodology to address these issues. Preliminary research in Bolivia and Brazil was used to identify a set of key questions and criteria which were then applied to projects in Mexico and Belize.

Objectives

1. To develop a framework for evaluating CDM forestry options, with special reference to local development perspectives and North-South issues;
2. To explore the interests of those stakeholders involved in the development of the CDM-forestry policy framework within and across developing nations;
3. To strengthen major NGO and international research institute partnerships (Centre for International Forestry Research, ProNatura Mexico and El Colegio de la Frontera Sur).

Work undertaken

1. Stakeholder analysis of local, national and international actors in forestry CDM projects in Bolivia, Brazil, Belize and Mexico.
2. Development of a multi-criteria analysis model of stakeholder priorities for social development, environmental and carbon sequestration criteria. The criteria were developed through expert

judgement and extensive stakeholder consultations including a workshop in the UK. Scenarios of land use sequestration projects included reduced deforestation, afforestation and forest conservation activities. The novel trade-off analysis methods, first developed by the project team in coastal management, were applied through the weighting of the carbon, social and environmental criteria by direct and secondary stakeholders.

3. A series of in-depth interviews and group interviews with project participants to elucidate their experiences and perception of project and its costs and benefits.
4. Analysis of the evolving institutional arrangements to support CDM and the development of markets in environmental services.

Results

1. Benefits of carbon forestry projects

Our analysis of empirical results indicates that the costs and benefits of these projects are not necessarily equitably distributed. Projects are drawn to communities where local land managers and farmers are well organised, in some cases with robust local collective action institutions. Clear property rights to land and other productive resources are necessary. Women are often marginalised from key aspects of projects. This implies that relatively well-off farmers who have private or individual property rights to forest are more likely to be beneficiaries. However even these farmers are likely to be poorly informed and receive only small increase in incomes. The emphasis of projects has shifted over time, in particular moving towards a more exclusive focus on carbon markets rather than a broader range of social and economic development oriented activities.

2. Stakeholder priorities for forest carbon project

Trade-off analysis techniques were used to assess development benefits simultaneously with other objectives, primarily those of carbon sequestration. Our investigations show that different stakeholders have different priorities in terms of carbon, environmental and development criteria. Within these criteria, different indicators are identified; for example many stakeholders put an emphasis on income generation as the key 'development' indicator, whereas other aspects such as property rights are highlighted by local stakeholders. Our research highlights the different dimensions, particularly of the development component of these projects, and reiterates the importance of local property rights to resources, and timing of investments and returns.

3. Institutions

The development of institutions to negotiate, manage and support projects such as CDM and forest carbon is evolving rapidly, but is highly problematic. Our analysis highlights the conflicts and challenges to develop effective institutions. In one respect much interest and enthusiasm has been generated about the opportunities offered by CDM and other instruments, but at the same time, government officials are sceptical about the possibility of realising real, substantial and lasting benefits. As the potential market for CDM projects is relatively small, Mexico is setting up national level institutions which will consider a wide range of environmental service markets. However, the development of new cross-sectoral institutions is often slow and difficult. Furthermore, robust cross-scale institutional frameworks are necessary to ensure that objectives for equity and sustainable development are met and that already marginalised sectors of society are not excluded. However, the ability of land use carbon projects to provide real benefits for sustainable development may ultimately be constrained by the nature of the market itself.

4. Development of the carbon economy

The examination of forestry carbon projects has wider implications for the development of market-based mechanisms for environmental services. Access to carbon markets and to their benefits depends on a variety of factors across scales, and at local level it critically depends on clear and well-defined property rights and on organisational responses. Some sectors of society depend on less formal rights to access forest resources. This is especially true of poor households and women-headed households. Access to carbon markets is thus socially differentiated in a number of ways. There are indications from Mexico that middle-income communities and producers may be favoured in setting up forest carbon markets. Global and national institutions have created carbon markets and this may involve changing property rights, often overturning long-established traditional management resource rights regimes. In the case of forest carbon projects this change may impact on local peoples' access to valuable resources, including environmental services, subsistence and marketed products. This is important for both local livelihoods and sustainable development.

Relevance to Tyndall Centre aims

This project provides dual benefits for the Tyndall Decarbonisation Theme. First, the research confirms that market-based instruments such as the Clean Development Mechanism may be efficient in theory, but that they are limited in implementation because of the exchange relations within the market. Markets are generally not good at simultaneously meeting societal objectives along with allocation of resources and therefore markets for carbon may not readily deliver the 'development' element of the CDM. In these cases, the long term sustainability of land use projects as a decarbonisation strategy is in question and could be excluded from the Decarbonisation Scenarios being developed under Theme 2.

Second, the project provides novel development of the stakeholder-driven multi-criteria analysis methods in this area. The project adopted the 'trade-off analysis' framework previously developed in the context of coastal resources and presently guiding the work under the UK coastal vulnerability study (Tyndall Project T2.42). Thus there is synergy and convergence between methods used for decarbonisation and adaptation research across themes in Tyndall. Further, the multi-criteria results and data could ultimately be shared with Theme 2 project examining the social, technical, and environmental aspects of geological sequestration (Tyndall Project T2.21). Although geological sequestration involves a significantly different market structure and large scale infrastructure implementation, the methods and results in terms of the potentially excluded decision-makers is an important common theme.

Possibilities for further research

A number of lines of inquiry have emerged and are currently being developed by researchers on this project and in collaboration with others. These include examination of carbon sequestration in agriculture in developing countries (new PhD project), and research linking mitigation and adaptation at community level. In particular the School of Development Studies has established a critical mass of researchers researching mitigation and adaptation issues from inter-disciplinary perspectives across a range of different countries. Tyndall Project T2.42 is already developing methods of Trade-off Analysis to examine adaptation options in UK coastal communities. Esteve Corbera, the funded researcher in this project, is currently completing his PhD thesis based on the research conducted in Mexico. A series of papers and further dissemination of the research findings are planned.

Outputs

Brown, K. and Corbera, E. (2003) Exploring equity and development in the new carbon economy *Climate Policy* 3. Suppl:41-56.

Brown, K. (2003) Integrating conservation and development: A case of institutional misfit, *Frontiers in Ecology and the Environment* 1.9: 479-487.

Brown, K. and Corbera, E. (2003) A Multi-Criteria Assessment Framework for Carbon Mitigation Projects: Putting development in the centre of decision-making. Tyndall Working Paper Series, number 29, March 2003.

Corbera, E., Brown, K and Adger, W.N. (2004) Trade-off Analysis in Carbon Forestry Policy and Projects: A case study from Mexico. Paper to be presented at the International Society for Ecological Economics Conference, Montreal, Canada. July 2004. For submission to *Ecological Economics*.

Corbera, E., Adger, W. N. and Brown, K. (2004) The equity and legitimacy of markets for ecosystem services: Carbon forestry activities in Chiapas, Mexico. Paper to be presented at the International Association for the Study of Common Property 2004 Conference. Oaxaca, Mexico. August, 2004. For submission to *World Development*.

Boyd, E. (2002) The Noel Kempff project in Bolivia: gender, power and decision-making in climate mitigation. *Gender and Development* 10 (2): 70-77.

Boyd, E. (2004) Environmental services and social development: The realities of “win-win” solutions in Brown (ed) *Adaptive institutions for conservation and development: Innovations in Amazonia*. Edited book for Columbia University Press. In preparation.

PhD theses supported by this project:

Boyd, E. *Forests Post-Kyoto: Global Priorities and Local Realities*. University of East Anglia, submitted 2003, examined February 2004.

Corbera, E. *Putting Development into Carbon Forestry: a case study from Chiapas, Mexico*. University of East Anglia, in preparation.

Papers and presentations of this project were given at the International Society Ecological Economics conference (2002), the European Society Ecological Economics conference (2003), and at the Universitat Autònoma de Barcelona (2003).

2. Technical Report

2.1. Research background

Early political negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) made clear that cost-effective mitigation strategies were required for both developed and developing countries in order to reduce global greenhouse gas emissions. The Kyoto Protocol, main instrument of the Convention, set up the Clean Development Mechanism (CDM) as a cost-effective mechanism which allows investors to receive carbon credits in exchange for greenhouse gas emission reductions in developing countries, whilst the host country receives investment, which aims to be in line with its sustainable development principles. The CDM has become a key part of the Protocol and the Convention, along with other mechanisms for North-South transfers, including the recently created Least Developed Country and the Special Climate Change funds (Dessai 2003).

At present, a number of factors and uncertainties limit investment in CDM activities. These factors include the perceived high transactions costs that reduce the range of project activities which are verifiable and produce a net cost saving. A review of joint implementation and Prototype Carbon Fund pilot projects indicates that low marginal abatement costs tend to be characteristic of large energy projects such as gas power plants, energy efficiency in large industries and wind power. Projects with greater local development benefits may be less attractive to investors due to higher transaction costs per ton of CO₂ reduced (Michaelowa et al. 2003). Some analysts argue that CDM investments may distort development priorities and may also lead to the situation where the only domestic mitigation measures remaining are higher cost activities (Karp and Liu 2000).

These arguments about the opportunities and pitfalls of the CDM are amplified in the area of carbon sink enhancement activities in forestry and land use. Some authors suggest that larger scale sink projects may have lowest abatement costs and therefore may restrict potential CDM investments to the energy sector (Kolshus et al. 2001). Others, on the contrary, highlight that forestry may encounter higher transactions costs and long-term commitments to sink enhancement may foreclose agricultural or other development strategies (Brown and Adger 1994). In global environmental terms, the ability of terrestrial ecosystems to capture carbon seems uncontested but its potential is contingent on several factors, including latitude and past and present forest management (The Royal Society 2001; Houghton 2002). Moreover, there is increasing evidence on the limits to sink enhancement activities in particular contexts (Watson 2002). For example, forest projects where new stands replace old growth forests would lead to net emissions to the atmosphere (Schulze et al. 2000); or any increase in forestry in high latitudes may increase climate change through feedbacks on land surface albedo (Betts 2000). Thus the likely adoption of CDM in forestry and land use depends on the identification and realisation of 'development' benefits to developing countries.

This research explores the development perspective of forest carbon projects. Chomitz (2000) has highlighted the need to identify both the level and the distribution of direct financial benefits that result from forest projects. But no comprehensive assessment of the development benefits nor their distribution within potential CDM projects has ever been undertaken. Some research on forest-based projects has suggested sets of guidelines for monitoring, evaluation and verification of the carbon fluxes associated with land-use CDM projects (e.g. MERVC guidelines developed by LBNL (Vine et al. 2001). In the MERVC guidelines, evaluators and project developers, in the absence of socio-economic guidelines, have noted that:

'Evaluators should collect some minimal information on potential impacts via surveys and interviewing with key stakeholders. The evaluator should also check to see if any proposed mitigation efforts were implemented and whether expected positive benefits ever materialised' (Vine et al. 2001: 109).

The need to account for the environmental and development impacts of CDM forestry projects has been acknowledged by policy makers. Decision 17/CP.7 to the Marrakech Accords prompted the Subsidiary Body for Technical and Scientific Advice (SBSTA) “to develop definitions and modalities for including afforestation and reforestation project activities under the clean development mechanism in the first commitment period, taking into account the issues of non-permanence, additionality, leakage, uncertainties and *socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems...* with the aim of adopting a decision on these definitions and modalities at the ninth session of the Conference of the Parties” (article 10.b; *our emphasis in italics*). The Decision also introduced compromises and restrictions to the development of forestry projects under the CDM, leaving aside conservation activities and limiting the amount of carbon that could be credited through these activities (it shall not exceed 1% of base-year emissions of the claiming Party, times five, for the first commitment period).

Findings of this research come at a very crucial stage of negotiations on climate change policy, in which the development aspects of CDM-forestry are subject of debate and project guidelines under discussion. This research undertakes a theoretical and empirical analysis of the implications of the CDM in developing countries. In particular, it critically analyses the development dimensions of potential policy options and forestry projects under the CDM, something so far omitted from analyses. In order to move beyond market-based and cost-benefit analysis of forestry projects under the mechanism (Jung 2003), we develop a methodology for assessing CDM-forestry projects and CDM-policy scenarios using a stakeholder multi-criteria approach (MCA), which is applied to an empirical case study.

2.2. Conceptual framework

2.2.1. Research objectives

The research objectives are:

1. To develop a framework for evaluating CDM forestry options, with special reference to local development perspectives and North-South issues;
2. To explore the interests of those stakeholders involved in the development of the CDM-forestry policy framework within and across developing nations;
3. To strengthen major NGO and international research institute partnerships (Centre for International Forestry Research, ProNatura Mexico and El Colegio de la Frontera Sur).

2.2.2. Methods

The project employs a number of research methods. The framework it uses is a multi-stakeholder analysis employing elements of multi-criteria analysis, similar to that developed by Brown et al. (2001). This framework allows the first two research objectives to be reached. Principle techniques included key informant interviews, various group interviews and workshops. The key instruments are included in **Box 1** and the techniques are explained in more detail below.

Stakeholder analysis

Stakeholder analysis has been applied in social science research and, particularly, in the field of natural resource management and conservation and development (ODA 1995; Brown 1998; Salafsky and Wollenberg 2000; Brown et al. 2001). It has also been proposed as a valuable tool for policy analysis and formulation in order to support conventional methods such as cost-benefit analysis (Munasinghe et al. 1995; Grimble and Wellard 1997). The interest in stakeholder analysis goes in hand with the application of participatory methods for project design, management and evaluation, which include participatory rural appraisal and other similar techniques. Stakeholder analysis recognises that conflicts and competing interests are prominent among stakeholders and that such interests must be accommodated and acknowledged (Grimble and Chan 1995: 115).

Grimble and Chan (*ibid.*) have defined “stakeholders” as ‘those who affect, and/or are affected by, the policies, decisions and actions of the system; they can be individuals, communities, social groups or institutions of any size, aggregation or level in society. The term thus includes policy makers, planners and administrators in government and other organizations, as well as commercial and subsistence user groups’ (*ibid.*: 114).

In this research, we use several strategies to identify stakeholders in climate change policy and to identify those interested or involved in the development of forestry carbon projects. In early stages of the research process, we asked knowledgeable individuals in the countries of concern to identify those groups they believe had a stake in forestry and climate change policy. As the research progressed, we also asked relevant stakeholder groups to identify those individuals and institutions that had important relationships with them in respect to climate policy and project development.

Box 1: Research framework key terminology

- **Stakeholders analysis** is a system for collecting information about groups or individuals who are affected by decisions, categorising that information, and explaining the possible conflicts that may exist between important groups, and areas where trade-offs may be possible.
- **Multi-criteria analysis** is a method of choosing between a set of alternative scenarios on the basis of a set of defined evaluation criteria. It can support decisions where there are conflicting management objectives and conflicting stakeholder preferences.
- **Scenarios** refer to possible management and future options to be considered by the stakeholders. They have to be:
 - Understandable;
 - Distinct from each other;
 - Possible, realistic and clear;
 - Substantiated by existing information if possible.
- **Criteria** represent the dimensions in which the project may have an impact (e.g. environmental, economical, social); **Sub-criteria** represent either qualitative or quantitative indicators to characterise these impacts (e.g. water pollution, income, participation). Criteria and sub-criteria are discussed and compiled through discussion with specialists and people affected by the environmental or development initiative. Sub-criteria should meet the following conditions:
 - Describe the main issues of concern to the decision maker and the primary stakeholders;
 - Will not be exact descriptions of the criteria but reflect general changes as a result of alternative management decisions;
 - Each criterion should vary across the scenarios;
 - A short list reduces complexity when presenting and developing the exercise with stakeholders.
- An **Effects Table** shows the scenarios displayed as column headings and the criteria displayed as row headings. It contains values in different units of measurement, which aim to explain theoretically each scenario according to existing quantitative and qualitative

In climate change policy, sets of different actors can be found to operate at different scales and all of them hold different expectations in present and future climate policy outcomes. Disagreements have been common in international negotiations as the priorities of developed and developing countries have differed on significant issues (Najam et al. 2003). However, the existing divergences within and across developing nations in relation to the current climate policy framework have been rarely examined. Therefore this project studies the interests and expectations of a variety of developing country stakeholders in relation to the CDM and its carbon forestry component. Using pilot projects for carbon mitigation in two countries (Mexico and Belize), and informed by previous work of the authors in two other countries (Bolivia and Brazil), the research analyses the aspirations of local communities, and what actions are necessary to strengthen the sustainable development component of these projects. Thus the research aims to clarify the means and ends of every stakeholder, including local communities participating in carbon projects, in climate policy and forestry mitigation.

Semi-structured interviews

Stakeholder analysis relies on in-depth, semi-structured interviews and focus group discussions, together with document and policy analysis. Topics addressed in the interviews covered a variety of

themes identified in **Table 1**. Five different interview templates were designed according to the institutional setting of the interviewee (governments, non-governmental organisations, academics, project developers and communities). English language versions are included as **Appendix A**.

Table 1: Interview themes in Mexico

Themes	Sub-themes	Theme key-topics and concepts	Stakeholders interviewed
The UNFCCC process	Climate change	Climate change and global equity Public information Activities implemented jointly Mitigation <i>versus</i> adaptation Forestry and policy options	Government Agencies, Non-Governmental Organisations, Academics, Pilot project developers
	Negotiations		
	Forestry		
Activities Implemented Jointly	Cooperation with the investment sector	AIJ overall view Government role in the AIJ National initiatives under the AIJ Private sector interests in funding activities Local and international NGOs involvement Pilot projects approval and monitoring Pilot projects successes and constraints	Government Agencies, Non-Governmental Organisations, Academics, Pilot project developers
	Cooperation with NGOs		
	Knowledge about the in-country pilot forestry project		
The Clean Development Mechanism (CDM)	National Authority and legal implementation framework	CDM National Authority CDM investment and bilateral and multilateral negotiations World Bank carbon funds Interests of local and international NGOs Projects validation and verification Design of sustainable development criteria Stakeholder consultation Carbon projects' opportunities and constraints Property rights and social property Voluntary <i>versus</i> obligatory carbon forestry contracts	Government Agencies, Non-Governmental Organisations, Academics, Pilot project developers
	Investment mechanisms		
	CDM and other organisations		
	CDM projects and sustainable development		
Pilot forestry project	Project set-up	Project success Stakeholders' functions CDM policy framework knowledge across involved stakeholders Funding problems and new funding strategies Farmers' economic benefits and opportunity costs Carbon-forestry management strategies Project impacts on land management and land tenure Seedlings acquisition and planting Diverse plantation systems and community forest needs Gender impacts Intra-community conflicts	Project developers, some academics that participated in the project in the past
	Local institutional responses in early stages of the project		
	Communication interface between project developers and communities		
	Project economics		
	Communities, conflict and land management		
	Project technical drawbacks		
	Property rights and collaborative agreements		
	Gender impacts		
Communities analysis	Community historical perspective	Communities' history Population and land use change Production dynamics (agrarian, husbandry, forestry-related) Socio-political-religious organisations Historical internal conflicts	Communities
	Natural resources management		
	Community and institutions		

	Climate change	Engagement with the carbon project CDM policy framework knowledge	
	Project engagement	Hectares under reforestation Carbon payments	
	Land rights, autonomy and internal organisations	Project induced conflicts Participants' duties and rights in the project framework Frequency of community meetings and most commonly discussed issues Women participation	

Multi-Criteria analysis

Multi-Criteria Analysis (MCA) is a technique to transform complex information about a development or environmental initiative so that it can be evaluated by different stakeholders. MCA first came to prominence in the 1970s when the environmental externalities lying outside conventional cost-benefit analysis were recognised (Munasinghe et al. 1995: 61). MCA enables policy-makers to be informed not about the “best option” for the development or environmental intervention but about “a set of different plausible options”. If a stakeholder approach to MCA is adopted, the technique is potentially able to strengthen public engagement in decisions and become a platform for consensus building on project priorities, investment and management strategies.

Tompkins (2003) has reviewed the challenges to the robustness of MCA research. MCA relies on utility theory and assumes that individuals' preferences can be represented in the form of a utility function and that an individual maximises his consumption levels by trading-off consumption between different combinations of goods and services. These theoretical roots have been criticised from philosophical and theoretical grounds by arguing that it is not morally right to include environmental issues in the bundle of goods and services that are available to a consumer trade-off or by arguing that markets for such goods and services do not exist in practice and, therefore, trade-offs cannot be made on economic terms.

Methodologically, Tompkins highlights that the main problems associated with MCA and other decision analysis techniques stem from the aggregation of individual preferences, which has traditionally been a contested issue in social sciences. By aggregating preferences one inevitably assumes whose preference count (e.g. particular stakeholder groups and future generations excluded) and also assumes that participating people attribute to the unit of measurement the same real value (*ibid.*). Finally, if it is assumed that preferences are constructed through information and discussion, this raises questions about when someone is ready for elicitation and whether such elicitation would change considerably over time.

The combination of stakeholder analysis and multi-criteria analysis (MCA) has been applied in the context of protected area management and forest planning (Brown et al. 2001). In climate change, MCA has been applied in the field of global carbon emissions risk assessment (Munasinghe et al. 1995) and in assessing options for technological development for carbon mitigation. Such techniques have been suggested to evaluate and appraise JI and CDM options (Jackson et al. 2001; Markandya and Halsnaes 2002). There have been some attempts to elaborate complex lists of criteria for forestry project evaluation (Kolshus et al. 2001), including a recent proposal made by Kueppers et al. (2001) suggesting the use of a multi-attribute decision matrix to evaluate land-use projects. However, these studies are essentially theoretical and lack empirical data and testing. Therefore, our research constitutes a valuable advance in knowledge by adapting and applying MCA in the context of carbon forest projects.

This research conducted the MCA exercises after holding in-depth interviews with participants. In this way, their opinions about the criteria were better formed and were expressed after a dialogue between

the participant and the interviewer. In fact, as shown by our emphasis on stakeholder analysis, we suggest that multi-criteria decision processes should not exclusively inform policy-making. There is a need to complement the MCA outputs with further qualitative data derived from in-depth interviews with other individuals and organisations.

2.3. Mexico Results

2.3.1. Country context

The population of Mexico was 97.48 million people in the year 2000 with a 1.4% annual growth rate. The population is ethnically diverse, including indigenous groups and the Mestizo population, who are the most populous across the country. Mexico is one of the most biodiverse countries in the world, with a variety of landscapes including volcanic mountains, deserts, floodplains, and both temperate and tropical forests. Forests in rural Mexico play a key role in providing direct goods to local populations and to the national forest industry. Products extracted from forests include timber, rubber and other non-timber forest products associated with local or regional markets, such as medicinal plants or forest organic soil. Present unregulated use of some of these activities, illegal logging, induced and natural fires, and general land-use change for agriculture, pasture or urbanisation, are the main threats to forests. Recent estimates of land-use change indicate an annual change rate of 700000 hectares per year (Comite Intersecretarial sobre Cambio Climatico 2001: 113). As a signatory of the Convention on Biological Diversity and the UNFCCC, the government has established a new fund to pay for forest conservation and watershed management, which together with traditional forestry and development policies, is expected to protect forests and improve the livelihoods of communities living within or around them.

The involvement of the Mexican government in the UNFCCC policy process has increased in the last decade. Between 1990 and 1993, the US Country Studies Programme funded the Social Development Secretariat (SEDESOL) and the National Autonomous University of Mexico (UNAM) to develop national emission inventories based on 1990 data and develop plans for vulnerability and adaptation to climate change for several strategic policy sectors. In 1994, the Environment and Natural Resources Secretariat (SEMARNAT) was created, absorbing the former Secretariat for Urban Planning and Ecology (SEDUE). SEMARNAT created an internal body named the National Institute of Ecology (INE), which had the responsibility to produce environmental policy and technical recommendations to both SEMARNAT and the President of the Republic. As a government official put it, "INE was created with the idea to become the national environmental protection agency".

A Climate Change Directorate was created within INE and strong institutional linkages with the International Affairs Unit (UCAI) at SEMARNAT were developed. The Climate Change Directorate and UCAI analysed and compiled the early studies by SEDESOL and UNAM and aimed to promote climate change research. They produced national emission inventories and started the design, in cooperation with other government secretariats, in particular the Energy Secretariat (SENER), a national policy on climate change. At that time, the Climate Change Directorate and UCAI, the Foreign Affairs Secretariat and SENER were in charge of formulating the Mexican negotiating position in the UNFCCC.

The involvement in the UNFCCC process and the creation of the Climate Change Directorate helped to establish climate change as one of the most important international issues on the Mexican environmental agenda. However, internal institutional disputes between 1996 and 1998 frustrated the process and many highly-skilled individuals in climate change policy left INE, returning to their original jobs in the private sector and academia. After these changes, the climate change agenda became fragmented across a large number of actors within INE and other areas of SEMARNAT and lost consistency (UCAI-SEMARNAT government officer, *pers.comm.*, 2003).

The new government administration that came to power in 2000 transformed INE into a separate agency from SEMARNAT. The former Climate Change Directorate became a research unit within the Directorate for Research in Urban, Regional and Global Pollution and focused its activities on coordinating the National Communications on Climate Change and researching energy and forestry related issues. At present, new lines of research are being developed on adaptation to climate change.

Climate change policy has been concentrated within UCAI and the sub-Secretariat for Environmental Planning, also at SEMARNAT. This shared responsibility has sometimes compromised the efficiency of policy formulation and has involved difficult decisions over who should be responsible for what and when. According to fieldwork observations and documentation review, UCAI has assumed in practice all substantive policy formulation and the sub-Secretariat oversees what is being done. Currently, from a CDM standpoint, the objective of the Mexican administration is to support any initiative that could broaden the opportunities for or potentially attract foreign investment.

In order to address present and future UNFCCC negotiation issues, several working groups have been created in SEMARNAT under UCAI coordination. Through their collaborative work, a stronger negotiating position is expected at future UNFCCC meetings. These working groups will share their outputs with other government secretariats in the context of the Mexican inter-Secretariat Committee on Climate Change, which meets at least twice a year to agree country position documents and inter-sectoral climate change policy issues. In addition to this internal government process, public stakeholder consultations on climate change have been carried out during the last four or five years in order to bring NGOs and other civil groups into the UNFCCC process. However, according to some government officials, these consultations have rarely been fruitful in terms of policy-making due to the complexity of the international climate change agenda and the lack of skills and capacity of NGOs, which inhibits them from constructively participating in the negotiation process.

2.3.2. Interviews and stakeholders identification

Stakeholders were identified through desk-based literature review and a fieldwork visit conducted in April and May 2002. Key informants in the government agencies and in the pilot carbon forestry project in Chiapas were asked to identify other relevant individuals, organisations and interest groups within climate change policy, the CDM-forestry framework or the Chiapas project itself. From such analysis, stakeholders were classified according to their scale of influence in decision-making and their interests in CDM-forestry and project development (see **Table 2**). Between October 2002 and July 2003, a total of 64 interviews and 9 informal discussions were held, accounting for more than 80 individuals representing more than 45 organisations and 7 institutional settings (government, NGOs, development agencies, academia, consultancies, project developers, representatives of project organisations, local regional administrations, and community groups) (see **Appendix B**).

The interview structure was adapted according to the position and experience held by the interviewee. For example, those government actors who did not play a role in past or present international negotiations on climate change were interviewed in less detail regarding negotiation issues. As a result, the interview focused on Mexican forestry development and the current CDM framework. If the individual was an expert in Mexican climate change negotiations, the interview deepened in the international and national negotiations context. For project developers, questions focused on project management issues and for community members the discussions focused on engagement in the project, its strengths and weaknesses, and their expectations in the project context.

Table 2: Stakeholders in Forest Carbon projects in Mexico

Stakeholder	(Potential) Role in the CDM framework or in project implementation	Influence in the CDM-forestry framework or pilot project decision-making	Interests in pilot project development and CDM-forestry
Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT)	Promote carbon sequestration projects to reduce GHG emissions and promote biodiversity conservation	HIGH. Focal Secretariat for the CDM National Authority, which is still under negotiation between SEMARNAT and other governmental agencies but expected to be presented at COP9 (December, 2003)	Capture foreign direct investment through the CDM investment window
Comisión Nacional Forestal (CONAFOR)	Promote carbon projects through the current pilot scheme for environmental services payment – Mexican Forestry Fund -	HIGH. It has recently established the Mexican Forestry Fund, which aims to combine private and public funds to finance environmental services projects, among others. In the future, there are possibilities to have in place a well-developed framework to conduct unilateral CDM-forestry	Promotion of ecological services as a complement to other forestry development programmes; Capture foreign direct investment
Instituto Nacional de Ecología (INE)	Promote and conduct research in environmental services payments; Generate scientific country-data (emission trends, regional sectoral baselines) to help the government prepare UNFCCC meetings Assess government environmental public policy	HIGH. Advise the government in the use of the climate change related scientific information and its implication over UNFCCC negotiation issues; Advise the government in legal and economic policy development for the promotion of a national system for ecological services payments	Develop innovative research policies
NGOs (CCMSS, ERA, FORO Chiapas, SAO)	Promote and develop carbon projects; Some will be interested in becoming local partners of Designated Operational Entities for projects validation and certification	MODERATE-LOW. Some have more power than others due to having been key actors in Mexican forestry policy, conducting certification and monitoring activities or lobbying for policy reforms	Develop CDM capacity building programmes in their organisations; Capture CDM-investment for projects implementation
Academia (UNAM, COLMEX, UAEM, UIA, ECOSUR and others)	Academics have been co-developers of carbon projects as ECOSUR for the case of <i>Fondo Bioclimatico</i> in Chiapas; They have also been active policy advisors through climate change related academic reports and providing direct information to INE and advice to government officials	MODERATE. Their influence in projects development may decrease as capacities grow in the government and the NGO sectors. However, their scientific role may still be important as the CDM develops, particularly in the areas of baselines development, carbon sequestration potential for forestry systems or projects' institutional analyses	Capture funds for new research activities in CDM-related activities or environmental services valuation and implementation frameworks

Multilateral lending agencies (World Bank, UNDP, USAID, Ford Foundation)	Support inter-governmental cooperation through private financial flows and new investment frameworks	HIGH. Their investment levels in the next years are likely to determine the possibilities to kick-start sustainable carbon projects with high social benefits at the local level	Promote environment and development sound investment; Promote cross-scale capacity building programmes
National investment sector	It will increasingly play a more dominant role, particularly if Mexico adopts mitigation commitments in the near future or specific companies envision competitive advantages by earlier engaging in the CDM framework	LOW-MODERATE. National financial institutions may act as financial intermediaries between international investors and local CDM-project developers and strengthen the economic and institutional viability of projects. From the national emitters' perspective, they may progressively participate in carbon-trading national schemes or may adhere to existing pilot carbon-trading tenders (e.g. an oil governmental corporation has started to support forestry projects and to experiment with emissions trading); Energy or forestry consulting national companies may be interested in becoming CDM Designated Operational Entities	Economic opportunities, pioneers in national carbon trading schemes, increase environmental performance
Pilot carbon forestry project in Chiapas			
AMBIO	Project management (monitoring and accounting activities)	Increasingly HIGH in project management; LOWER in negotiating carbon price	Promote carbon sequestration and local development; Consolidate the organisation as a key reference for environmental services management at both local and national levels; Promote cross-scale capacity building in the country by sharing its experience
Edinburgh Centre for Carbon Management	Project broker and developer	HIGH between 1996-2001 in both project management and project brokering (negotiation of carbon prices with investors); Progressively LOWER in management aspects since 2002	International publicity and organisation consolidation
El Colegio de la Frontera Sur	Catalytic role in establishing and developing the project	HIGH between 1994-1998; Progressively LOWER since 1998	Promote research in the field of environmental services payments; Enhancement of existing linkages between ECOSUR researchers and some of project involved organisations

<p>Project rural-based organisations (PAJAL, UREAFA, CODESSMAC, CEPCO, AMEXTRA)</p>	<p>Intermediate agents between project developers and producers affiliated to the project</p>	<p>LOW influence in project decision-making when related to investment and administrative management; MODERATE-HIGH influence over management and monitoring activities</p>	<p>Interest differs according to the organisation. They generally aim to promote community-based projects whilst establishing themselves as the pioneers in the growing arena of environmental services payments</p>
<p>Community producers</p>	<p>“Carbon suppliers”</p>	<p>Influence over project decision-making and monitoring activities is dependent on the relationship between them and their organisation</p>	<p>They aim to increase their income from forestry-based activities as well as improve forest management; Other non-tangible benefits are also recognised such as improved organisation and technical capacity</p>

Government views on carbon forestry

The Mexican government has always been supportive of including all type of forestry activities under the CDM. This position persists across government departments. It relates to the fact that the Mexican forestry sector is primarily characterised by small landholders who undertake diverse agricultural and forest production on family plots and communally owned land. There exists a broad consensus on the need to expand the set of viable funding opportunities for these people, coinciding with views expressed by other researchers and organisations involved in promoting forestry sequestration (Pagiola et al. 2002; Wilson et al. 2002).

As a result, Mexico in the UNFCCC context has always been a “pro-sinks” Party. In the running up to Kyoto, however, the government was “more worried not to be obliged by the US and other developed countries to commit to emissions reductions, regarding that Mexico was a country in the OECD since 1992, than entering the forestry debate” (former Mexican negotiator, *pers.comm.*, 2003). In the aftermath of Kyoto, the Mexican delegation has increasingly been involved in lobbying against the “anti-sinks” position held by some international environmental NGOs and Parties, such as the European Union, India or China.

The structure of land tenure that characterises the Mexican forests and landscape is seen as a disadvantage, preventing investors from funding CDM-forestry projects in Mexico. Most government officials agree that carbon funding can strengthen community organisations and enhance their sustainable development. However, they also acknowledge that the communal rights prevailing in the Mexican countryside will not allow for large afforestation schemes to develop. Consequently, the Mexican government has urged all interested Parties at negotiations to approve fast track guidelines and modalities for small-scale forestry projects that could be bundled regionally or nationally to reduce transaction costs. They are also concerned that, if such modalities are not well-defined and agreed, CDM forestry will not be an economically and socially viable option in Mexico.

A representative of the private sector and a USAID official expressed similar views about this issue. They see that the existence of a transparent land tenure legal framework might facilitate land renting by investors interested in setting up carbon contracts with local organisations and communities. As an example, the USAID official mentioned that General Motors and American Electric Power wanted to invest more than US\$ 10 million in a carbon project in 2000 and they explored the potential of an area in southeast Mexico. However, the uncertainty about land tenure and the difficulties in negotiating carbon contracts with local institutions became a main reason behind the companies’ final decision to invest in Brazil, and where they helped a local NGO to purchase, through the brokerage of The Nature Conservancy, 16800 hectares of degraded land in the state of Paraná.

In the light of these adverse experiences, government expectations of carbon forestry have been encouraging the development of voluntary carbon markets, such as those evolving from the Kyoto non-compliant windows of the Bio-Carbon Fund in the World Bank. A former senior government official acknowledged that “not much can be expected from the CDM... and we should consider the fact that some sectors in policy-making and civil society still remain sceptical and unwilling to engage in any CDM-type investments... Moreover, the CDM rules in place imply an excessive bureaucratisation of the process with the involvement of certification agencies, intermediary groups, and so on” (former SEMARNAT official, *pers.comm.*, 2003)

The ability of SEMARNAT to broker forestry carbon projects has not been tested and to date no pilot forestry project are being promoted. According to government officers this is a result of the inability of civil society groups to contact investors and broker these types of projects. For example, a climate change officer noted that only one Mexican NGO regularly attends the international negotiations. Furthermore, the officer observed that although the CDM framework would allow international civil society to comment on projects around the world, there was no apparent involvement of Mexican NGOs in these consultations. In addition, it could be argued that the uncertainties surrounding the

Kyoto Protocol and CDM-forestry opportunities impede rapid development of projects by private sector or civil society actors.

Mexican CDM National Authority

A prerequisite for the development of CDM projects in a developing country is the existence of a CDM National Authority which has to confirm that CDM activities assist the country in achieving sustainable development and that all stakeholders participate on a voluntary basis. The authority has to revise CDM projects monitoring and verification reports and will be the official linkage between the country and the CDM Executive Board. The authority may also develop activities for CDM project promotion, brokerage and technical and legal advice across stakeholders and scales.

The Climate Change Directorate in INE released endorsement letters to joint implementation projects under the Activities Implemented Jointly pilot phase during 1997 and 1999. It also had a short list of principles and criteria to take into account in project evaluation, which were defined in collaboration with other departments within INE and SEMARNAT. Between 2000 and 2003, government internal discussions took place to decide upon the location of the authority, either in SEMARNAT or in SENER, and to define its operational mechanism. Some officials argue that the slow pace of creating the National Authority or the clear establishment of a climate change policy focal point in the country has impeded pilot CDM-investment in the country. Others argue that this has not proved to be a problem as demonstrated by the fact that there were more than five Mexican CDM-type energy projects being screened by the Prototype Carbon Fund and the CERUPT tenders (SENER senior official, *pers.comm.*, 2003). At the time of writing, the detailed design of the authority, including its membership and its functions, is being drawn up by UCAI and the proposal is being discussed with the sub-Secretariat on Environmental Planning and is expected to be submitted for revision to SENER and other members of the Inter-Secretariat Committee on Climate Change. The authority will be located in SEMARNAT and is expected to be inaugurated prior to COP9 and be fully operational in January 2004.

Among government officials and other stakeholders there is confusion over the authority's functions. On the one hand, some officials state that the authority might engage in the CDM legal process, providing letters of endorsement and overview of project monitoring. Yet it is unlikely to play any greater role due to lack of resources and skilled personnel. On the other hand, other officials stress the authority's potential role in facilitating contacts between stakeholders and in brokering project agreements. Some NGOs expect the authority to incorporate civil society in consultations prior to releasing letters of endorsement, as well as to include them in the revision of monitoring plans from ongoing projects (even though the latter is something already provided for in the CDM project cycle at the "Project preparation" and "Validation" stages).

NGOs views on carbon forestry

Mexican NGOs have high expectations in carbon forestry. Those NGOs that have traditionally worked in agroforestry development support the development of CDM agroforestry projects because they believe it is the option most likely to benefit poorest farmers. NGOs highlight the social benefits expected from projects engaging with social property and locally based institutions, although they recognise that they will inevitably incur higher transaction costs. They suggest that initial funding would be required to put in place a well-functioning forestry scheme that could be ecological and economically sustainable, as well as socially equitable. Some NGOs acknowledge that the CDM "is a way for rich countries to escape from their obligations to mitigate climate change seriously and through domestic action" and recognise that there exist contrasting views about the CDM within their own organisations and their personnel.

Conservation-based organisations criticise the fact that avoided deforestation has been excluded as an eligible forestry activity under the CDM. They expect to develop carbon projects within a more integrated framework of environmental services payments (ecotourism, watershed management, biodiversity conservation, carbon sequestration). They aim to receive financial support from existing multilateral investment frameworks, such as the Global Environment Facility, or private development and environment foundations, like the Rockefeller or the Ford Foundation. The director of a conservationist NGO mentioned that CDM projects are likely to be short-time investments and to represent a small window of opportunity, which may be too short-term to support real and effective development at community levels. Other international NGOs operating in the country, such as Greenpeace and World Wildlife Fund, maintain a critical stand against forestry mitigation, in line with the policy formulated by head office and they are resistant to play any active role in promoting CDM-related investment in the country.

Although NGOs in both conservation and forest management are increasingly including carbon sequestration projects as part of their portfolio of activities, their capacity to develop carbon projects remains weak. For example, hardly any of those interviewed in the NGO sector have reviewed the principles of carbon trading and project development (e.g. carbon contracting, insurance, market expectations, brokerage, baselines or social and environmental additionality). They cite lack of economic resources and human capacity to follow Kyoto-related negotiations or the evolution of the World Bank Bio-Carbon and Community-development carbon funds and other CDM tenders (e.g. the Netherlands' CDM funding programme -CERUPT).

2.3.3. Fondo Bioclimatico: a carbon forestry project in Chiapas

One of the world's best-known pilot joint implementation carbon forestry initiatives is the *Fondo Bioclimatico* project in the Mexican State of Chiapas. Its origins can be traced back to 1994 and 1995 when researchers from the Edinburgh Centre for Carbon Management (ECCM, University of Edinburgh), El Colegio de la Frontera Sur (ECOSUR) and the local credit union "Unión de Crédito Pajal Ya kac'tic" (PAJAL) conducted economic and social feasibility studies in eight indigenous and *mestizo* communities of the Chiapas central highlands. The Mexican National Ecology Institute (INE) and the Overseas Development Administration Forestry Research Programme of the British government funded these early studies. Through participatory workshops and interviews they explored the interest of producers affiliated to PAJAL in a project that had to provide technical assistance and financial incentives to shift from agriculture to agroforestry, convert pastures to plantations, restore degraded forest, and manage natural forests. The carbon sequestration potential of the agroforestry activities preferred by local farmers, and the potential to sell carbon was also investigated (de Jong and Montoya 1994; de Jong et al. 1995; Montoya et al. 1995).

In 1997, the project was registered under the United States Initiative for Joint Implementation (USIJI) under the name of "Scolel Te", meaning "growing trees" in the Tzeltal indigenous language, and involved an array of individuals and organisations. The International Automobile Federation (IAF) was committed to purchase 5500 tons of carbon per year at a price of US\$12-10 dollars per ton over the next 30 years. The price paid per ton of carbon sequestered aimed to cover the costs incurred by producers and to generate funds for project management. It varies according to whether the carbon sequestered derives from agroforestry-reforestation activities (higher price) or conservation and management of existing forest stocks (lower price). This is so because investors consider that, if at some point the project is validated under the CDM, carbon from reforestation may be eligible for trading. The other important project investor has been the UK-based organisation Future Forests, which purchases carbon derived from reforestation activities also at a price of US\$12 per ton of carbon. In order to manage and administer carbon investments, a trust fund named "Fondo Bioclimatico" was created. In early 1998, some of the original researchers established a professional organisation, AMBIO, to promote the project across the region, train community technicians, and deal with administrative and monitoring procedures.

During the last five years the project has grown from an initial group of 47 farmers from six of the surveyed communities, to more than 450 farmers from 20 communities across the region, including some in the neighbouring Mexican state of Oaxaca. All of them are subsistence or semi-subsistence farmers relying upon maize and bean cultivation, coffee, and some cattle production. They belong to either PAJAL or four other local organisations that have joined the project in recent years: the “Unión Regional de Ejidatarios Agropecuarios, Forestales y de Agroindustria de los pueblos Zoque y Tzotzil del Estado de Chiapas” (UREAFA), the “Consejo para el Desarrollo Sustentable de la Selva Marqués de Comillas” (CODESSMAC), the “Coordinadora Estatal de Productores de Café de Oaxaca” (CEPCO) and the “Asociación Mexicana de Transformación” (AMEXTRA).

Every producer or community involved has their own forest-management strategy, a “Plan Vivo”, which defines a number of agroforestry, reforestation or conservation activities to be carried out in either individual or communal holdings. The “Plan” is designed according to the specific geographical, physical and ecological conditions of the area (Soto-Pinto et al. 2001; Tipper 2002). Producers’ participation in the project differs according to the organisation they belong to and their history of land tenure and community organisation. Where the majority of community members belong to an external organisation involved in the project or they show a considerable level of social cohesion independently from any organisational affiliation, then developing management plans in their communal forest land is possible. But the majority of producers are involved on an individual basis and they develop carbon activities on private plots.

Once the *Plan Vivo*, either collective or individual, is established and approved by project developers, participants receive an up-front payment as a source of initial working capital, which represents about the 20 per cent of the carbon expected to accrue from the individual or community management plan. Farmers receive the 60 percent of the sale price per ton of carbon sequestered, and the remaining 40 percent is set aside to cover the costs of technical support for farmers, administrative costs, monitoring and reporting. The income has been variable according to the producer’s level of compliance, and to the characteristics of the management area. Some have experienced higher mortality rates or lower growth rates than expected. Producers’ maximum income gain has been estimated at around US\$700 over 10 years (Tipper 2002).

From interviews undertaken with local project developers, including academics at ECOSUR and AMBIO members, it became clear that running a carbon project has high transaction costs associated with information-sharing across project stakeholders and communities, and associated with monitoring activities of the agroforestry and reforestation schemes. Project developers feel there is a lack of human and financial resources to deal with all the communities involved in the way that would be desired. However, project developers have developed capacity building programmes across participant communities and monitoring activities are relatively less costly as project advances due to an increase in local capacities and understanding of the project. Project developers have been actively facilitating participants’ involvement in free forestry training programmes delivered by other technical organisations in the region.

Regarding the CDM framework, AMBIO project developers state that they could hardly follow the state of negotiations and their views in this respect are limited. They emphasise the importance of including all types of forest management activities under the CDM, including avoided deforestation, because it would immediately broaden the opportunities to capture more funding. They acknowledge that project financial management and brokerage remains under control of the international research project broker, the Edinburgh Centre for Carbon Management. In the future, it would be important for them to deal with investors and negotiate carbon prices.

AMBIO members and two representatives of the peasant organisations involved recognise that the project was initially set up with a wider development orientation, aiming to improve carbon sequestration whilst developing home gardens or promoting women’s participation in decision-making, among other objectives. However, as the initial funding from the former UK Overseas

Development Administration (now Department for International Development) was spent, project developers had to restrict their activities to improve forest management and the efficiency and transparency of payments to local producers. By doing so, local confidence was stimulated, local capacities to deal with forest fires and seedlings acquisition were developed, and the number of participating villages increased in order to meet the investors' demand for carbon. Nelson and de Jong (2003) review these changes in funding and mainstream activities and they highlight that the project has suffered a transition from a social fund to a carbon bank. They note that project developers used to see the carbon project as a potential vehicle for 'community well-being and sound environmental practices' but has been transformed into a project in which 'farmers can contract to deposit carbon and withdraw payments' (ibid.: 25-26)..

Drawing on these authors as well as our findings, we can explain this shift as a result of several factors. The end of additional funding programmes at the end of the 1990s, such as those coming from the UK administration, compromised the ability of project developers to meet wider community needs. Key individuals who had gained the communities' trust in the early years had to leave. Paradoxically, these individuals left when the number of participant communities was increasing, which made the remaining project managers unable to work closely with all local farmers. This resulted in a reduction of field-based technical support and increasing attention to accounting and monitoring procedures. The development of other CDM pilot projects across the world, as well as the clarification of CDM operational rules under the Kyoto Protocol, contributed to the project managers' belief that the scope for forestry conservation and non-carbon development related activities was limited, as investors would not be willing to pay a higher price for any of these endeavours. In fact, the development potential of carbon forestry projects may be limited by the market nature of the CDM itself (Brown and Corbera 2003).

Communities and carbon forestry

This research conducted empirical work in two communities involved in the carbon project. It examines evolving micro-institutional arrangements of the project and defines how interests do not only differ within the level of project management institutions (AMBIO, ECOSUR, ECCM and peasant organisations) but also at community level. We suggest that gaining knowledge about how the project develops at community level and about the micro-politics conditioning such development is important to delineate local people's interests. Farmers and communities cannot be seen as a homogeneous group that participates fully, benefits equally, and shares the same interests in the carbon project. We suggest that among participants and communities there exist historical divergences that affect how they interact with it. Such differences and dynamics are often neglected by desk-based reviews or project management scale surveys.

We chose two villages to develop such empirical analysis. They were selected on the basis of their longer involvement with the project and the fact that they have responded to the project in two contrasting ways. The first village develops the "Plan Vivo" on individually owned family plots whilst the second village develops it on communal forest land. The reason for that springs from their particular histories, their common institutions, the distribution of land and resource access rights, and other social and political external factors. Both communities were supportive of the research process and several discussion groups and interviews were held (see **Appendix B**). We used discussion groups to talk about the carbon sequestration project, following the set of topics outlined in **Table 1** of the conceptual framework section.

The historical departure point to understand our sites of study was their constitution as *ejidos*. After the 1910-17 Mexican Revolution, the *ejido* was the legal term to define a productive group of people with land given by the government for common ownership. These people abide to certain norms and procedures which determine the way in which *ejido* land rights and socio-political institutions are established. Selected members of the group (called *ejidatarios*) receive access to an individual parcel

of land, which remains under communal ownership, with no rental or sales of land allowed. *Ejidatarios* can only bequeath their rights of access to their parcel of land to a single descendant, which in practice implies that *ejidos* have several members with no formal land access rights. *Ejidos* have usually set apart an area of communally owned forests and pastures, to which all *ejidatarios* hold formal access. The majority of non-right holders have *de facto* access to the family land endowment and to the communally owned area. The *ejido* political and social life is regulated through the *ejido* assembly, in which *ejidatarios* and community members meet to discuss the management of collective resources and other issues concerning the social and political life within the *ejido*. At present, a great number of *ejidos* across the country are changing their socio-political and property configuration as a result of a 1992 constitutional reform which gave *ejidos* the freedom of reallocating land between common property and individual parcels, as well as of incorporating new members (Muñoz-Piña et al. 2003: 131).

- Individually owned carbon

The *mestizo ejido* of *Yalumá-Villahermosa*, is located in the south eastern part of the state. It was constituted in 1954 by families who bought their land from local *finqueros*¹. Before the *ejido* constitution, those who had more economic power were able to acquire more land and fence it to legitimate their property and exclude others from access it. Even after the *ejido* constitution, land was not internally redistributed, fenced property remained, and only an area of communally owned forest was established to meet timber and fuel wood for inhabitants' needs. At present, the community has 2170 inhabitants, 556 families, and further parcelling of family properties seems non-viable. The latter has made the community assembly to agree on the division of communal forests in the near future, which will be distributed in the benefit of landless families. These circumstances, together with other context specific facts that are analysed below, explain why the carbon project developed on individually owned agricultural plots².

In 1997, only some of the *Yalumá* inhabitants, who belonged to a regional rural organisation named "Unión de Ejidos Lucha Campesina" (UELC) engaged in the project. UELC received political guidance and financial support from PAJAL, its umbrella organisation, and it was through the latter that they received information about the pilot carbon project in its early years (1994-1997). From the outset then not everyone in the community supported the project. For example, members of UELC and PAJAL did not support the project because they lacked confidence in PAJAL leaders or they did not trust and understand the objectives of the carbon project. The project was not accepted in other UELC groups belonging to neighbouring *ejidos*.

Current project representatives in *Yalumá* reported that there were conflicts between those belonging to UELC and those who do not, the latter representing the vast majority in the community assembly. This partly explains why the *ejido* assembly never agreed to participate fully in the project or, for example, never accepted a forest management plan on their communally owned forestlands. Such internal conflict between UELC members and their own community institutions has its historical roots in the 1970s when a number of families organised themselves to promote local development initiatives and started a collective transport system, which would enable them to trade their goods and access the market in the two most important cities in the region. In the past, conflict between UELC members and other members of the community was acute and sometimes even violent, but nowadays the conflict has lessened. As the carbon project leader put it, 'there is total freedom for us to work apart from the general interest of the community assembly'.

¹ *Finqueros* used to have large tracks of land (*finca*) in which indigenous and *mestizo* people used to work in exchange of basic goods, the permission to build their houses in the *finca*, and the *finqueros*' military protection.

² Legally speaking, the community owns all *ejido* land and the *ejidatarios* hold only rights of access to their plots. *Ejidatarios* have *de facto* rights to utilise their plots as they please and, even if the *ejido* assembly has not agreed on undertaking the provisions of the 1992 constitutional reform due to internal land disputes, *ejidatarios* have been historically selling and buying land amongst each other and to other community members.

In 1997, *Yalumá* had only 45 families affiliated to the UELC and only 22 decided to engage in the project by developing their “Plan Vivo” in their family owned plots (1 hectare each family). However, after two years, most of them dropped out because they considered the relationship “reforestation workload *versus* carbon payments” detrimental to their interests. The carbon project representative became then a key individual in promoting the project to other community members. In 1999, he left UELC and this had a positive effect on the number of people participating in the carbon project. Between 1999 and 2002 the project has registered more than 65 participants in this community.

However, critical voices remain active in the village. The project leader and others expressed in different ways that “there are still some people who think we are selling our land to foreigners”. The reasons for such negative views and the lack of support from community-based institutions are diverse. The most obvious reason is the conflict between those governing the assembly and the group of families involved in the project. The conflict has its roots in long-standing organisational and political differences. Recently, the community catholic catechists have been receiving information from an activist political organisation operating in Chiapas about the negative aspects of carbon sequestration (low payments from rich countries to maintain their standards of life and control the resources of the poor). They explain these ideas in their church sermons and this influences peoples’ confidence in the project and also generates doubts for project participants.

Another important reason for limited participation in the project is the unequal land holdings within the community. Historically, some families are endowed with bigger landholdings and therefore they have more opportunities to change land use or conduct reforestation in one or two hectares of their property. Other families have less land and they need to dedicate all of it to subsistence activities, the cultivation of maize and beans. The community still has a communally owned area of degraded pine forest. However, as noted before, the community assembly has already decided to harvest the remaining valuable timber and distribute the communal land holding to younger families without land.

For people in *Yalumá*, the main motivation for participation in carbon forestry has been to increase household income. Additional income is then spent in a number of different ways, such as food, house improvements or agricultural production related products and tools (e.g. fertilisers or herbicides). We did not conduct a detailed survey of the 65 participating households but these were the most common aspects mentioned by all the interviewees. Most of the current producers did not participate in the project in its early years, when it was supporting other household development based activities, such as improved cook stoves and home gardens.

As producers get involved in the project their interests shift over time. For example, it is clear from fieldwork visits that in the initial years, biodiversity was not of local concern. Producers planted only pine and cedar with the objective to produce timber that would deliver high economic revenues in the future. However, because all cedar seedlings died due to soil characteristics and dry conditions, producers are now more interested in planting non-timber species, such as those used for fuel wood or for posting and fencing along their property boundaries. They are now certain that an increase in the diversity of species planted depends on their own ability to organise themselves, collect local seeds, and come to an agreement with project developers and state government agencies to design a suitable framework for the production and distribution of seedlings through state-based regional nurseries.

In *Yalumá*, the project representative and other participants have shown strong local leadership by creating a local society for rural production (SPR-Alianza *Yalumá*) and forging political allegiances with the state administration. Under the SPR, project participants have been able to complement the carbon revenues with a nationally based reforestation programme. They are also starting to negotiate collecting local seeds and using the state nurseries to produce their own seedlings. For some of the participants, the fact that planting for carbon sequestration has been accompanied by payments from a government-based reforestation development scheme is what has made the project economically worthwhile.

In many interviews and focus groups, specific comments were made about how additional activities would contribute to the global carbon cycle. Participants acknowledge that they are sequestering carbon but they cannot explain what this means. They only refer to the importance of planting trees to increase local rainfall and leave an environmental legacy to their children. For participants, increasing their knowledge about the carbon project is a priority despite the fact that they acknowledge that it would take some time for them to learn the complexities of the project. This came together with suggestions of rotating project leadership in the community in order to give other participants the chance to visit the project offices and interact more regularly with AMBIO members.

All these facts indicate that the project knowledge dissemination system remains underdeveloped and its potential to enhance local capacities and confidence has not been properly evaluated. We recognize that project developers lack financial resources to conduct more briefing sessions. Gaining knowledge about carbon projects and carbon markets may be an important step to enable local people to better articulate their needs, consider their rights and have a clear notion of why they are participating in the project and which benefits accrue from the project at local, national and global scales.

- *Rincón Chamula*

The *Tzotzil*³ community of *Rincón Chamula* is located in the north western part of the state and holds a different pattern of creation and distribution of land resources. The *ejido* was not created by individual families working for *finqueros* but by indigenous migrants establishing themselves over state-owned property and unexploited *fincas*. According to local testimonies, the community was founded between 1915 and 1920, when groups of indigenous families from the state central highlands migrated to the northern region due to political conflicts and land scarcity in their communities of origin. The *ejido* was legally constituted in 1952 and land was distributed across four neighbourhoods but neither these areas nor the family allocations were or are currently fenced. According to people interviewed, this had to do with lack of financial resources and the ethnic origin of the inhabitants, which limits internal family properties through historical, socially and natural recognised boundaries.

At present, the community has 5525 inhabitants, 1141 families, and productive land is scarce. Nonetheless, the community still maintains its forest commons, which are governed by strong rules of access and management, despite social population dynamics may threaten their future existence. The stability of the common institutions explains why the carbon project could develop in communally owned land. Local authorities are constituted by a representative of each neighbourhood and organise their collective works and assemblies in a very efficient manner. For the case of the carbon project, this has helped project developers to deal directly with community authorities. The latter have been in charge of communicating the carbon project information to community members. As the discussion that follows shows this authority-centralised system of carbon information delivery and management has some drawbacks when, for example, gender and forest management aspects are considered.

The carbon project started operating in the community through a rural-political organisation, UREAFA, created in 1992 with the objective to develop productive projects in those areas claimed back from private and state ownership and recovered by a national political organisation named CIOAC in the northern part of the State. Two community representatives from UREAFA participated in a workshop for agroforestry and carbon sequestration held in Oaxaca in 1996. ECOSUR researchers presented the pilot carbon project to UREAFA directors in 1998. Their objective was to use the organisation in the same way that PAJAL was being used to promote the project across its areas and groups of influence. Effectively, UREAFA contacted its leaders and affiliated members in *Rincón*

³ *Tzotziles* are an indigenous Mayan group in Chiapas. They have predominantly occupied the state highlands but, as their population has grown in number during the last century, land became scarce, and internal religious conflicts spread within *Tzotzil* communities, some groups migrated to the north of the state. Unfortunately, these migrations are not very well documented in the local literature and we have had to rely strongly on local testimonies and few written resources.

Chamula and local authorities immediately engaged with ECOSUR researchers to develop a forest local inventory and identify suitable reforestation areas.

Despite the fact that not all members of the community were affiliated to CIOAC or in lesser number affiliated to UREAFA, the community assembly agreed to start participating in the project through a reforestation scheme in the communally owned forest area in 1998. However, project implementation did not start until 2001 because the contact between UREAFA and the community assembly broke down between 1998-2000 when the local leader left the area. Besides, this was combined with the lack of interest in the carbon project from the community authorities at that time. When communication was lost, the carbon project managers decided to deal with the community authorities by passing UREAFA. In 2001, eleven hectares of their 180 hectares of communally managed land were planted with pine. In 2003, another 30 hectares were reforested.

From the interviews and discussion groups it became clear that project participants welcomed the project. They worked collectively to enhance the plantation every year and payments were received by the community authorities, who then discussed what to do with them in the community assembly. In 2002, carbon revenues were used to pay the *ejido* land tax and, in 2001, carbon revenues were distributed across the four neighbourhoods, who collectively decided what to do with them. They used it for a variety of things including the improvement of roads, the purchase of a microphone for community meetings, and the purchase of spades and wheelbarrows. However, participants feel that carbon revenues are low and some members are still concerned about why payments for the conservation of their 1800 hectares of montane rain forest have not yet arrived. During the development of the carbon sequestration studies in 1998, the community was told about the possibility of getting paid for conservation. Obviously, as the project evolved and investors became unwilling to pay for conservation due to the outcomes of international negotiations, project managers never had access to these funds.

In contrast to the other case study, we took a more gendered approach to understanding project management in this community. According to local fieldwork observations and research undertaken in the village concerning the use of forest resources (Silva 2002), it is clear that women play a key role in the management of common forest resources, particularly for the collection of fuel wood and animal grazing. This is in fact a key element of *Tzotziles'* societal organisation and mode of production. However, when men attending discussion groups were prompted about women's participation, they acknowledged that women had not explicitly participated in any decision regarding the carbon project. One is aware that the patriarchal and authoritarian decision-making system prevalent in indigenous Mayan groups may severely constrain project managers' ability to induce a change in the codes of practice of local and traditional institutions. However, if carbon projects attempt to make any claim to sustainable development, they should address the needs of local women.

Women's needs have been classified in two categories, practical and strategic (Regmi and Fawcett 1999). The former include perceived necessities that women lack in a specific context, such as for example, a health post, vegetable gardens or a water pump. The latter include necessities that would enable women to change their subordination status in society in relation to land ownership, equal wages, or fight against domestic violence, among others. In the beginning of this section, we have acknowledged the diverse factors constraining project managers' ability to meet community needs across an increasingly diverse spectrum of participating communities. However, if forests constitute an environmental space in which women conduct a set of important activities for the community's functioning, it seems compelling to expect that their practical needs in relation to forest management would at least be considered. It would be important to identify which species are more important for accommodating their household needs. In relation to carbon income expenditure, women should also have the chance, as inhabitants and direct forest resource users, to decide whether carbon payments can be better used in any other activity than those decided by men.

Several interviewees acknowledge that the only people with detailed knowledge of the carbon project are the UREAFA local leaders who presented the project to the community in 1998. Moreover, rather

than explanations on carbon as an asset to be traded, the following quote from an interviewee illustrates how, at local level, the project was understood as an investment designed to improve productive resources and environmental conditions: “carbon sequestration is when trees are preserved, leaves fall and good soil is formed... carbon sequestration is better for rainfall and more birds can be heard in the forest” (Rincón Chamula farmer, *pers.comm.*, 2003). In several individual interviews and discussion groups, we had to clarify where the money came from and make explicit that the money was coming neither from the government nor from project managers.

Regularly, project managers explain to local villagers how the project is organised in both economic and managerial terms. However, illiteracy, idiomatic problems, and communities’ prioritisation of short-term local revenues may explain why concepts are not fully learnt and integrated in people’s minds. Therefore, as in the case of *Yalumá*, we maintain that informative sessions and knowledge building constitute a vital element to bring about sustainable development in local communities, linking environmental enhancement to knowledge building and social change.

Women’s integration in decision-making or the level of general knowledge may not directly affect the sustainability of the carbon project. But the level of commitment of local authorities to the project and the community’s ability to manage its internal conflicts in relation to land demands may threaten a project’s viability in the medium and long-term. *Ejido* community authorities change every three years and, in the case of *Rincón Chamula*, neighbourhood representatives, who act in support of the authorities, change every year. If local authorities change and support for collective management and conservation diminishes, an internal process of land redistribution may take place and affect the carbon plantation. According to several testimonies, there are an increasing number of families that cannot access more land and therefore have asked the community assembly to distribute the collective forest area. To date, the current authorities have not accepted this proposal because of the importance that the area plays for the whole community (e.g. people bring their animals to graze when their plots are cultivated during the rainy season or they make a rational and regulated use of timber extraction – no more than two trees/family/year).

One of the carbon project representatives suggests that the way the project is currently set up constitutes a risk for project sustainability and also affects local leadership. “The way in which the project is currently set up has a disadvantage because the authorities only last for three years and the neighbourhood agents only last a year. Every year I have to explain the new neighbourhood agents what carbon sequestration means. Every year knowledge is lost” (carbon project community leader, *pers.comm.*, 2003). This leader proposes to create a local committee responsible for the community’s forestry practices, in which authorities, agents and those who have decision-making power in the *ejido* can be periodically brought together to discuss internal and external threats for the carbon project and the conservation of common resources.

We argue that the formation of an alternative institutional set-up for managing the carbon project would entail advantages and disadvantages. It could make the relationship between project managers and the community more efficient, and knowledge may be potentially condensed in a body of people rather than just a few individuals. But the committee would have to ensure that any decision regarding the carbon project or forest management is made with transparency and the agreement of the community assembly. Committee members would have to hold their positions longer than authorities but they would also have to rotate. It would have to incorporate women’s practical needs. In addition, it could help to enhance confidence in community authorities’ management of the carbon revenues. In a more negative sense, the committee could become nothing more than a platform for internal power politics in which the views of some may continuously be given weight above those of others.

- *Communities’ key summary*

The contrasting historical configuration and distribution of land resources in *Yalumá* and *Rincón Chamula*, together with the evolution of their institutions for resource collective management, have

determined the way in which the carbon project has been set up and developed. Responses, interests and expectations about the project share commonalities and differences:

- Generally speaking, participating farmers welcome the carbon project as it offers the opportunity to get some funding to make reforestation profitable. However, all participants consider that carbon revenues are low and hardly compensate for the cost of planting and maintaining the plantation.
- Despite the fact that project developers regularly carry out community meetings for information delivery, most project participants in both communities still do not understand who is funding the project and why. Some participants believe that the project is entirely funded by government agencies whilst just a few know that the money is coming from private companies in richer countries. A regular and substantial number of informative meetings may help to clarify these issues and strengthen confidence between participants, as well as minimise intra-community conflicts.
- In *Yalumá* there is opposition to the carbon project by several families: opponents fear that participants are selling *ejido* lands to foreigners. These opponents are also embroiled in historical and political rivalries with participating families. In *Rincón Chamula*, there are no apparent critical views of the carbon project itself, but there are families who propose the abolition of community-based conservation and forest management rules in order to redistribute the community forestlands to those requiring them.
- Both communities welcome any project managers' attempt to meet their development needs. These needs may change during the lifetime of the project and therefore it is important to establish flexible project management options with additional financial strategies in place to assist these shifting needs.
- In *Rincón Chamula* expectations are twofold: an increase in the amount of carbon payments and an increase in information flows from project managers to the community and from the authorities to the neighbourhoods. In contrast, farmers' expectations in *Yalumá* are more diverse and include issues of information flow, leadership sharing, as well as diversifying planting or production demands, such as agricultural tillage improvement or fruit trees planting.
- In both villages, women are excluded from open discussions regarding the carbon sequestration projects, which is not uncommon in the patriarchal system that dominates community decision-making in rural Mexico. However, project developers should put more emphasis on such inclusion, particularly in *Rincón Chamula*, where indigenous women play an active role in forest management and fuel wood collection.

Our findings in these communities suggest that farmers are interested in carbon payments but these are still not understood in the framework of a carbon market, in which up-front payments are unlikely. We show how important it is for both villages to receive payments immediately after their reforestation work. Moreover, for local villagers in *Yalumá* it could be important to maintain the right to abandon the project, especially in times of contingency when they use the reforestation land or sell it to generate cash income. For this reason, we believe that the voluntary contractual terms of the Chiapas project –any farmer or organisation involved can drop out from the project at any time with the only ultimate effect of payment withdrawal- have favoured the growth of the project in this community and in others. This means that if carbon contracts in the CDM market put farmers or communities at risk of losing their ability to decide their land management practices at any time, it is likely that the interest of rural communities in carbon projects would decline.

2.3.4. Multi-Criteria Analysis

A sub-sample of 18 individuals from the 64 interviewed engaged in the multi-criteria analysis exercises. There is at least one representative of each of the major stakeholders' groups except the multilateral donor agencies. The names of the participants have been left out of this report for confidentiality, and there is only reference to the participants' institutional affiliations. From our previous experience in developing MCA research (Brown et al. 2001), we were aware of the fact that MCA is a time consuming research technique, particularly for participants. It was difficult to meet with them more than once and meet a second time for the re-assessment of their initial weightings. Bearing in mind such a problem, we held a preliminary interview with them and discussed CDM-forestry related issues prior to the elicitation of weightings. In this way, we expected their weightings to be influenced by previous discussions and by their experience in other types of forestry-development investment initiatives (e.g. sustainable forest management projects, conservation/ecotourism projects).

A set of criteria, sub-criteria and indicators for carbon projects was defined through expert-based inputs and through a participatory workshop held in London in February 2002. Policy scenarios were also discussed and defined (see **List** below). In the research process, the criteria list was applied with a sub-sample of the interviewees in Mexico in order to test its potential to facilitate discussion and evaluate projects, as well as in order to capture stakeholders' perspectives on carbon forestry projects in more detail. As the Mexico results section shows below, the preliminary list of criteria was modified as it was tested and discussions with Mexican stakeholders followed (see **Appendix C**).

Criteria, sub-criteria and Scenarios for the selection and evaluation of carbon forestry projects

A. Carbon Criteria

Sub-criteria	Indicators
Carbon impact	Net carbon sequestered (tC/ha): it indicates the amount of vegetal carbon that can be fixed per hectare according to the project's forestry or agroforestry system. Planted species would capture different amount of carbon during their lifetime but a mean average per hectare can be estimated.
Cost-effectiveness	Increase in project's internal rate of return (%): it indicates the project's relative cost in comparison with another project developed to reduce the same amount of GHG emissions.
Carbon risk	Risk of leakage and natural hazard combined (high, moderate, low): leakage refers to the indirect impact that a targeted LULUCF activity in a certain place at a certain time has on carbon storage at another place or time. Leakage can occur at different spatial and temporal scales. Analysing land-use change patterns, migration rates, economic trends and development policies in the area can qualitatively assess leakage risk. The risk of having the project's area affected by an extreme weather event that could damage the plantation can also be estimated according to project's location and past frequency of climate extreme events (droughts, hurricanes, flooding).
Policy impact	Project's eligibility under the Clean Development Mechanism (yes/no): it indicates the project's eligibility under the CDM, according to the applied forest management system and also its design and methodological guidelines. Non-eligibility compromises the project's ability to participate in international carbon trading under the Kyoto Protocol at least in this first commitment period.

B. Ecological Criteria

Sub-criteria	Indicators
Biodiversity	<p>Increase in local/regional ecosystems connectivity due to project activities (high, moderate, low): the project's ability to connect currently separated forest patches or avoid the conversion of the natural environment can be qualitatively assessed by providing maps or satellite images of the interconnected or preserved areas.</p> <p>Maintenance/increase in the area's species richness due to project activities (tree species/ha): if estimates of the project area's regional biodiversity already exist, the project's ability to maintain or increase such biodiversity can be assessed through the applied forest management system and the number of diverse species planted per hectare.</p> <p>Project's contribution to preserve forest biodiversity and ecosystems conservation in national biodiversity priority regions (yes/no): from a national perspective, this criterion would assess the project's contribution to conservation and enhancement of forestry activities in those areas that have been nationally prioritised due to their level of endemic species or endangered and biodiverse ecosystems.</p>
Water quantity and quality	<p>Maintenance/increase of water quantity in the correspondent watershed (high, moderate, low): qualitative data (mapping, satellite imagery) on project's location in the context of local and regional hydrological basins can be provided and, therefore, the project's contribution to water conservation can be qualitatively assessed.</p> <p>Reduction of erosive processes in both slopes and water streams (tons of forest soil/mm of annual aggregate rainfall in the project's region): this criterion reflects the project's ability to stop erosion through tree cover, water interception or soil fixation.</p>
Soil quality	<p>On-site increase in soil fertility (% of organic carbon per soil cubic decimetre): the contribution of the project to on-site fertility can be estimated by conducting regular soil assessment at different sites and at different times of the year. Qualitative estimates can be done according to the species planted and their theoretical ability to enrich soil through root-based processes (soil nitrification) or leave fall (incorporation of organic matter into the soil system).</p>

C. Social criteria

Sub-criteria	Indicators
Economic benefits	<p>Income change per household due to project activities (US\$/household/year-): this criterion captures the economic impact of project activities on participating households.</p>
Institutional development	<p>Clarification of local property rights promoted by project activities (yes/no): this criterion indicates the ability of CDM forestry projects to engage with local communities, authorities and governments and define the rights over land and forest resources. In doing so, project feasibility may be ensured, local people may feel empowered and local conflictual views of the impacts on land rights may be resolved.</p> <p>Enhancement of poorest households' access to forest resources promoted by project activities (yes/no): does the project affect poorest households' access to forest resources, particularly in times of contingency and independently of the direct participation of these households in planting or management activities?</p> <p>Involvement of community-based formal and non-formal organisations in</p>

	project design, management and decision-making (high/moderate/low): this criterion indicates the level of participation of local communities and their formal and informal organisations in both the design and management of the project; participation is understood as the full engagement of local people in decision-making structures and procedures (project management committees, project board meetings, etc.).
Local equity	Number of local people who know about the project, are involved in project activities and perceive benefits (% of resource users): this criterion reflects the ability of the project to integrate as many local people as possible in the carbon sequestration scheme. Even if not all local people are interested in participating, it is important that project developers inform all community members with the aim to minimise intra-community conflicts arising due to a lack of understanding and internal relations of mistrust. Project investment in education, health services and capacity building (US\$/per capita/year): this indicator makes special reference to the economic contribution to non-forestry related investments, through which local development becomes enhanced.

Policy Scenarios

Afforestation and Reforestation	This policy scenario refers to increasing carbon stocks by planting trees in areas that have been denuded of forestry cover for at least 10 years ago. Definitions of what constitutes a forest will be presumably defined in the rules and procedures of their National Authorities and communicated to the UNFCCC Executive Board.
Conservation	This policy scenario refers to the preservation of existing forest stocks. This option was recently excluded under the Clean Development Mechanism but some stakeholder groups and researchers still regard it as important as a strategy to avoid land-use change and prevent greenhouse gas emissions from forest burning.
Community agroforestry	This policy scenario refers to enhancing agroforestry systems and landscape management and will be eligible under the more general definitions of afforestation and reforestation. The difference with the afforestation and reforestation scenarios lies in the complexity of the forested system being put in place.

Multi-Criteria Analysis Results

Appendix D shows the participants' ratings for the three criteria components, carbon, ecological and social, and the carbon forestry criteria disaggregated. The results presented here constitute a detailed picture of individual preferences but do not constitute the final MCA analysis results. Further analysis is currently underway. In the meantime, analysis of the weightings reveals important information on different stakeholders perspectives preferences and priorities.

The first nine multi-criteria exercises were conducted using a list of criteria that evolved by incorporating participants' comments and reflections. This explains why **Table D.2** has missing data for particular individuals. The fact that it was impossible to meet with these individuals to make them reconsider their weightings has made us re-calculate their weightings by adjusting the missing data with the values of those individuals that had the rating complete and showed a closer correlation to every specific individual (see **Tables D.3 to D.6**). **Table D.1** and **Table D.7** show the final results for the participants' elicitation of criteria, policy scenarios and indicators. The following bullet points offer a preliminary analysis of these results:

- There are contrasting priorities and views of the relative importance of criteria and scenarios among participants (**Table D.1**). Carbon criteria ratings ranged from 70 points to 5 points, whilst the ecological and social criteria seemed to have a more balanced attribution of weightings. However, disparity was more acute in the weightings of the scenarios. Here, afforestation ranged from 60 to 5 points, conservation ranged from 70 to 10 points and agroforestry ranged from 60 to 10 points.
- Government officials differed substantially in the weights assigned to the carbon criteria. For example, an individual gave 70 points whilst another gave only 5 points. Consequently, these individuals weighted the social criteria considerably differently, one giving 10 points to it and the other 70 points. These represent two contrasting government views on how a carbon project should be thought-through: the one who rated the carbon criteria 70 and the social criteria 10 was a high-level research government policy adviser; the one who gave 10 points to the carbon criteria and 60 to the social criteria was a State government officer who has participated in a carbon project in the past. Regarding the rest of the government officials, weighting was far more balanced across criteria, being the ecological ones those receiving lesser points than carbon and social criteria.
- Regarding scenarios rating, there was not consensus about the preferred policy option among government officials. Afforestation weightings ranged from 60 to 5 points, conservation from 70 to 15 points and agroforestry from 60 to 10 points. Individuals did not seem to make any correlation between criteria and policy scenarios. Some gave their higher rating to the carbon criteria but then differed on whether this outcome would be best achieved through a conservation framework (Gov1) or through an agroforestry framework (Gov4). Seemingly, other individuals gave their highest rating to the social criteria but then differed on whether this would be best achieved through a conservation scenario (Gov3) or through an agroforestry one (Gov6).
- NGO members had more similar weightings across criteria than government officials. All participants except one gave the lower score to the carbon criteria. Disagreement existed on whether the ecological or the social criteria had to receive the highest score; representatives of conservation-oriented organisations (NGO3 and NGO4) attributed their highest scores to the ecological criteria whilst socially oriented organisations (NGO1 and NGO2) attributed their highest scores to the social criteria. The preference of conservation-oriented organisations over ecological criteria was translated into a higher preference for the conservation policy scenario over the others. The other NGO members did not agree on whether the appropriate policy scenario to best project social criteria was agroforestry (NGO1 and NGO5) or afforestation (NGO2). The representative of the Mexican academic community, a leading expert in environmental services payments, gave the highest score to the carbon criteria and considered that an agroforestry system was the best policy scenario to attain both carbon and social objectives.
- Project developers weighted criteria more equally. Their preferences tended to favour ecological and social criteria, except for one case (Proj.dev.1). They showed a greater disparity in assigning their preferred policy scenario. There was one individual who weighted carbon as the highest component with 60 points and considered agroforestry to be the best policy preferred scenario (Proj.dev.1). Those who gave highest scores to the social criteria differed although not considerably in their most preferred policy scenario (Proj.dev.3 and Proj.dev.4).
- As expected, there were also very different weightings allocated across the 16 indicators (**Table D.7**). Across government officials, there is a great disparity on indicators weighting. For example, a high-level government researcher and policy maker (Gov.1) attributed more than 60 out of 100 points to four indicators, net carbon sequestered, leakage risk, CDM eligibility and household income; This view contrasts with another member of the government who only gave 16 points to the same indicators (Gov.6). For the ecological and social indicators, government officials showed

more consistency and social considerations became relatively more important than ecological ones. The highest weightings were attributed to three social indicators (household income, clarification of property rights promoted by project activities and enhancement of poorest households' access to forest resources).

- NGO representatives gave lower scores to carbon indicators than government officials or project developers and most of their highest ratings were awarded to social and ecological indicators. This coincided with their views on the prioritisation of criteria –the social and ecological criteria are nearly equal and much less important carbon. They attributed more importance to communities being benefiting economically and being involved in the project in its possible various forms: institutional participation in decision-making and equity in knowledge and benefit sharing. In the NGO group, more consistency was shown in the valuation of the importance of water quality, erosion reduction, involvement of local organisations and project investment in other development-related activities.
- The academic representative assigned high scores to the carbon criteria. He showed a strong pro-poor social bias by weighting the enhancement of poorest households' access to forest resources and the project investment in other development related aspects highly. He did not assign high weights to either household income or local institutional participation.
- Again, project developers presented a more balanced valuation of the 16 indicators. This balance was explicit for most of the participants except for one individual who rated the social indicators considerably high. This may be explained by the fact that their involvement in the pilot carbon project has made them conscious of what is desirable in ecological and social terms without neglecting the importance of the carbon indicators, particularly the importance of maximising carbon sequestration. This consideration does not apply for the 5 participants as one of them attributed only 14 points to the carbon indicators.

From this broad picture of individual preferences across criteria, scenarios and indicators, it seems clear that perspectives and expectations of carbon projects differ considerably. Generally speaking, the carbon and social criteria and indicators have been prioritised over the ecological. Whilst most government officials are more strongly concerned about the projects carbon component, NGO groups and project developers do not want investment to be channelled exclusively to carbon. They would rather like projects to focus on the ecological and social dimensions. But, as the evolution of the Chiapas case study has shown, it is difficult in practice to meet social criteria without compromising carbon sequestration.

The stakeholder category does not per se determine these interests and expectations. There is certainly some more coherence across project developers probably due to their involvement in an ongoing project and their higher level of involvement with what happens on the ground in projects. In government and NGOs, the interests of each individual are intimately linked to personal or organisational vested interests. These vested interests also influence the individuals' identification of the preferred policy scenario. Finally, in weighting criteria, government officials make their trade-offs through the ecological criteria. NGOs trade-off through the carbon criteria, whilst project developers trade-off accordingly to their specific role in project management.

2.3.5. CDM-forestry workshop

As part of the research process, an international workshop on CDM-forestry was held in Mexico City on the 23rd of July 2003 in cooperation with the Mexican National Institute of Ecology. The workshop aimed to complement the research framework by bringing stakeholders together to discuss the importance of sustainable development criteria within carbon projects, and outline the implications of their inclusion in CDM projects and other carbon-based forestry initiatives. Speakers in the morning

included a climate change officer from the Mexican government, an international consultant from a climate policy and projects advisory firm, two members of auditing and verification international firms and three local NGO members developing on-site voluntary carbon projects. The workshop presented a valuable opportunity to further investigate the interests of the participants in CDM-forestry, as well as identify competing values through the valuation of a specific set of sustainable development criteria.

The afternoon consisted of a working session with participants classified according to their institutional settings (multilateral investment agencies, government, NGOs and academia). Discussion was facilitated through a multi-criteria matrix, in which the groups had to express their preferences for the prioritisation of some criteria over others by assigning 100 points across the criteria, and following a similar methodology than the one outlined in the section above. However, the criteria used were those outlined in the SBSTA negotiation text regarding land use, land use change and forestry activities under the CDM, which are expected to be discussed in COP9 (FCCC/SBSTA/2003/L.13).

By using such multi-criteria rating exercise, we stimulated internal discussions in the stakeholder groups and views were exchanged among participants. In this process, we were also opening the SBSTA decision text to further scrutiny by a wider audience. A complete report of the workshop was written and disseminated through electronic sources by the end of July. The report can be downloaded from the Tyndall Centre or INE websites (www.tyndall.ac.uk & www.ine.gob.mx) and it is also included in **Appendix E** of this document. In the following sub-section, we include the main findings derived from the workshop.

Workshop results and outputs

In general, participants welcomed the use of multi-criteria rating as a technique to facilitate discussion. It helped them to structure the discussion and obtain clearer views about participants' concerns. All the groups agreed that the current criteria in the SBSTA text required further indicators. Ensuring gender equality, promote traditional resource access and define clear participatory procedures, together with dispute resolution mechanisms, are some of the aspects that should be urgently incorporated. This thinking is in line with recent analyses of the sustainable development dimension of the CDM framework (Troni et al. 2001; Brown and Corbera 2003) and with concerns raised by some of the environmental groups and developing country negotiators at COP8 (CAN 2002; ENB 2002).

In discussing proposals for present and future negotiations, participants were less innovative. Most participants agreed that avoided reforestation projects would have to be included in the second commitment period of the Kyoto Protocol. Some argued though that these options would be hardly taken into account in the future, particularly in the light of the contentious debate that their possible inclusion has generated in the past. Participants noted that the Kyoto Protocol, and particularly the CDM, was biased against developing countries and that the interests of the European Union and its environmental NGOs prevailed over those of the organisations working in developing countries. In relation to current negotiations on sinks, such as the credit insurance debate or the reforestation baseline year, participants were reticent to position themselves.

During the plenary session and following discussions arising within the NGO group, Mexican negotiators presented the existing contradiction in the sustainable development dimension of the CDM from a negotiation text perspective. Whilst article 12 of the Kyoto Protocol affirms that it is the host country's prerogative to decide whether a CDM activity assists the country in achieving sustainable development, there is a push by the European Union to put forward a standard list of criteria for environmental and socio-economic assessments of projects. This list would increase projects planning, verification and monitoring costs and would make them non-competitive compared with of energy-based ones. It was said that forestry CDM projects already had enough rules in terms of additionality, permanence and credit issuance. An international NGO agreed that sustainable development criteria

should not be seen as a project burden but rather as an opportunity to engage with those companies willing to invest in carbon and other environmental services, such as biodiversity or ecotourism. These companies may be less concerned with the recognition of the project's carbon benefits in the Kyoto framework than with the green development image that the company could portray.

NGOs representatives accepted that a standard list of criteria may be required to guarantee the social and environmental integrity of projects but argued that criteria should be defined on a project basis. They observed that countries such as Mexico (and most developing countries) are diverse in environmental, social and cultural terms and, therefore, the standardisation of criteria can be counter-productive. They argued that some regions might need a stronger emphasis on biodiversity criteria, therefore increasing monitoring expenses in this direction, whilst other regions may need a stronger emphasis on social criteria and major inputs in the projects' local organisational aspects (distributive justice, gender equality or income increase and diversification).

Policy recommendations derived from the workshop

Stakeholders maintained that if any standard list of sustainable development criteria were agreed at COP9 it should only be indicative for project managers but never used as a measure for projects approval. In this sense, responsibility to judge whether every project accomplishes its sustainable development objectives should lie with the host country National Authority and the Designated Operational Entity. In other words, a minimum set of international environmental and socio-economic standards could be appropriate only if there is flexibility in the way in which the host government can adjust them to its particular conditions and every project developer can adjust the project design document and monitoring plan according to project context. National Authorities could also promote local and national discussions fora to discuss with other stakeholders the level of projects' sustainable development compliance.

These observations and suggestions have several implications for international negotiators and other carbon-forestry initiatives outside Kyoto:

- Sustainable development criteria are needed to ensure the ecological and social quality of projects. However, the best way to operationalise these is not a set of top-down standardised criteria list but rather a set of guidelines for project developers, who can adopt them to context-specific realities. In its current form, the Appendix E requires better definitional and explanatory framing. Further clarification of what is meant by concepts such as "stakeholders" or "participation", and a more indicative list of potential sub-criteria or indicators which can serve as guidelines for project design and monitoring, including gender equality and resource use patterns aspects are required.
- Host countries National Authorities and Designated Operational Entities shall be ultimately responsible for project approval in sustainable development terms. However, it would be important that to hold *at least* one consultative session for discussing the contribution of CDM projects to sustainable development with a wider national audience. This session should invite a limited number of people, including members from academia and other national NGOs specialised in forestry and development issues. Outputs would help the Authority to either reject or accept the project. If rejection applies, project developers may be urged to expand the project considered criteria or conduct more analysis and information gathering of their selected sustainable development criteria. If the project is approved, the National Authority may release a letter of endorsement to the Executive Board annexing the report on the consultative session.
- Carbon-based forestry initiatives *outside* Kyoto may do well in incorporating a strong methodology for sustainable development planning and evaluation, including a list of considered criteria and sub-criteria for each project. Those projects would have positive effects in a greater number of aspects, not only carbon sequestration but also biodiversity conservation, soil stability,

local participation, and more participatory and inclusionary decision-making. They would be more expensive for carbon investors but local acceptance and project permanence would also be enhanced.

2.3.6. Mexico case study summary of findings

Activities related to climate change research and policy development have increased in Mexico in the last decade, due in part to the establishment of INE and, more recently, to more active involvement of government departments through UCAI. However, defining responsibilities for issues such as the CDM National Authority has proved slow. According to sources from the government, international agencies and the private sector, the main difficulty that Mexico faces in developing carbon forestry projects is the current system of land tenure. This view is not shared by NGOs, who support collective land tenure as an element in strengthening compliance with carbon contracts. However, they acknowledge that creating a beneficial institutional framework for carbon projects may be time consuming and incur high transaction costs.

Results from the MCA exercise show that government stakeholders prioritise carbon criteria and make weighting trade-offs against the ecological criteria. NGOs prioritise ecological and social criteria, making trade-offs with the carbon criteria. Project developers assign their priorities accordingly to their role in project management.

Local communities understand the carbon market as an opportunity not to buy and sell carbon, but as an economic incentive for reforestation. Their expectations are strongly related to the specific local context, and also change over time. People feel that they lack access to knowledge and information. In Yalumá the equitable participation of the whole community is constrained by internal politics and historic conflicts in the community. In both case studies, gender equity is overlooked.

The research framework developed in this project has made explicit how stakeholders' expectations in CDM-forestry differ considerably in different contexts and institutional settings. Government stakeholders are concerned about carbon credit pricing and how to implement the international CDM legal framework. However, the perspectives of project developers and local communities suggest that current carbon revenues are unlikely to meet communities' expectations.

Appendix F contains a Scientific Journal Paper that has been published based in these findings.

2.4 Belize Results

2.4.1. Country overview

Belize is located in the Central America and Caribbean region, bordering with the Caribbean Sea, Guatemala and Mexico. It occupies a land area of 22806 square kilometres. Its climate is tropical, very hot and humid, characterised by a dry season between February to May and a wet season between May to November, which can carry devastating hurricanes and coastal flooding. Belize is a party to the Convention on Biological Diversity and more than 40 percent of its territory is designated as some kind of protected area.

It has been suggested that the country is rapidly degrading its forests (Lopez and Scoseria 1996). Commercial agriculture and cattle ranching are considered to be the major sources of deforestation. This is accompanied by encroachment in forested areas due to the arrival of Central American immigrants along the western frontiers and the increasing subsistence needs of resident farmers. The latter is caused by lack of other sources of income, inadequate land titling, lack of access to technologies and the biased price-incentive structure that promotes land-intensive crops such as maize and less the intensification and diversification of production (*ibid.*). Belize has a multi-ethnic population of approximately 250000 in Mestizo groups, Creole groups, Garifuna and other⁴. Among the population, levels of literacy are around seventy percent with no significant differences among gender. However, 33 percent of the population lives below poverty line, concentrated in the rural areas (Belize Government 2002; United Nations Development Programme 2002).

Belize ratified the UNFCCC in 1994, released its First National Communication to the UNFCCC in January 2000 (Belize Government 2000), and ratified the Kyoto Protocol in September 2003. The present ratification shows the country's commitment to benefit and participate from the Protocol provisions, particularly accessing technical and financial support for implementing climate change mitigation and adaptation strategies. The country's key focal point for climate policy is the National Meteorological Service within the Ministry of Natural Resources and regular communication exists between the Service and other departments within the Ministry, such as the Forestry Department, or the Ministry of Public Utilities, Energy and Communication. Such allocation of responsibilities is stated in the National Communication, where it is also acknowledged that the development of CDM or other climate change projects may require of a body specifically dedicated to climate change issues (*ibid.*: xiii).

Being a member of the Association of Small Island States (AOSIS) to the UNFCCC, Belize's climate change political focus has been on adaptation. Its coastal location makes the country vulnerable to an increase in the frequency of extreme weather events, such as tornados, changes in rainfall variability, and sea level rise. Since 1995, Belize has participated in a regional adaptation project funded by the Global Environment Facility and executed through the Organisation of American States. The project known as *Caribbean Planning for Adaptation to Climate Change* has aimed 'to cope with the adverse effects of global climate change (GCC), particularly sea level rise, in coastal and marine areas through vulnerability assessments, adaptation planning, and capacity building linked to adaptation planning' (www.cpacc.org).

The implementation components of the project were various and included the establishment of automatic weather stations in the participating countries, the creation of a database, an inventory of coastal resources, the establishment of a generic policy framework for integrated coastal zone management and the periodic monitoring of coral reefs. When CPACC finished, Belizean government

⁴ Mestizo people are descendents of Mayan populations from the Yucatan or other Mexican indigenous tribes mixed with Spanish descendents; Creole inhabitants are descendents from African slaves mixed with the white colonising population; Garifuna are descendents from the Bay islands of Honduras and the other groups include the Mennonites communities and immigrants from other Central American countries such as Nicaragua or El Salvador.

and consultants engaged in another adaptation project funded by the Canadian International Development Agency, which also built on the institutional issues already built up by CPACC. Recently, in April 2003, the second phase of the CPACC project was approved by the GEF under the name of *Mainstreaming Adaptation to Climate Change* (MACC). Its main objectives do not differ strongly from the CPACC initiative, as it is also focused on capacity building, vulnerability assessments and identification of adaptation strategies for most economic sectors and for each of the participating Caribbean countries. The final outcomes of the project will design multi-sectoral adaptation strategies accompanied by resource mobilisation plans and public outreach programmes (The World Bank 2003).

MACC funds are likely to make operational the *Caribbean Community Climate Change Center*, an institutional body to be located in Belize that the Caribbean Common Market (CARICOM) member Parties established in 2002 with the objective to coordinate climate change projects at regional level and become the focal point for the implementation of CDM projects in the region. The Center is expected to be a self-sustaining resource mobilisation organisation and it is likely to have a small core staff that will contract external consultants in the region to implement projects. It attempts to act as a more active conduit for projects development by having a faster and more flexible interaction with the private sector and the civil society. In parallel, a high government official recently submitted a proposal to the government cabinet, which outlined recommendations about where the Belizean National Authority should be allocated, preferably under the Finance Ministry in order to maximise its political backup. At the time of writing, neither the Center nor the CDM National Authority have been formally established.

Belize has been undertaking major reforms to its energy sector, particularly by developing regional and local hydropower stations. The UNDP country office has engaged for the past year with the government's Public Utilities Commission to draft a national energy plan to give some kind of macro-direction to where the energy Belizean sector should go, with special reference to the challenges and opportunities embedded in climate change as a problem and as a policy framework (UNDP country official, *pers.comm.*, 2003). The expectations of the Kyoto Protocol for mitigation action relate to the transfer of appropriate technology and the development of renewable energy. In contrast with Mexico, a country that received three pilot projects during the Activities Implemented Jointly pilot phase, Belize only got one pilot project in the forestry sector and none in the energy sector. According to the chief meteorological officer, 'at that time, there was no people on the ground in Belize to pursue a collaboration with foreign the investment sector. You have to have a mutual interest... there have to be some catalysts' (*pers.comm.*, 2003).

In fact, interviews with government officials made clear that human and financial catalysts are still lacking in order to deal with all the negotiatory and practical issues evolving from the UNFCCC. As in Mexico, those responsible for the UNFCCC in Belize are also responsible for a variety of international environmental agreements. This situation is common in developing countries and compromises their ability to articulate their interests in the negotiation process and to come to agreements with developed countries' investors. The chief meteorological officer complained about the fact that the UNFCCC only funds one person from each developing country to attend the negotiations. This leaves the poorest countries in a weaker position in comparison with the extensive negotiating teams from developed countries. In this sense, climate change capacity-building programmes promoted by UN bodies are starting to play an important role to inform developing countries' negotiators and experts. However, capacities may be lost if developing countries do not create stable negotiatory groups and engage with local experts, as well as with those companies in their private sector interested in climate change policy and action. Addressing these concerns is fundamental for a more equitable UNFCCC negotiatory framework (Richards 2001; Najam et al. 2003).

During 1995 and 1996, Belize received support from a US Country Studies Programme to assess the vulnerability of three particular sectors, agriculture, costal zone and water resources, to climate change. In July 1998, Belize started to implement a UNDP funded project to assist the country preparing its first National Communication to the UNFCCC. The main written output of such project

is the National Communication itself. In the process of its preparations, workshops were conducted in 1998 and 1999 to raise public awareness, local scientists were trained in methodologies for preparing the greenhouse gas inventories, a national climate change website was set up and vulnerability studies for different sectors were conducted. The project's review and the following National Communication suggested that emphasis in Belize had to be put in public awareness and mainstreaming climate change policy across policy-making sectors. In addition, the review also noted that more funding had to be directed towards building an effective Climate Change Office within the National Meteorological Service so that Belize can effectively exploit the opportunities being offered by international climate change mechanisms (Belize Government and United Nations Development Programme 2000).

2.4.2. Interviews and stakeholders identification

A fieldwork visit was conducted to Belize in April 2002, with the objective to identify the main stakeholders involved in climate policy and visit the pilot carbon forestry project in the country, where preliminary interviews were conducted with project managers. At that time, two interviews with the carbon forestry project coordinator were carried out and several project reports collected. In June 2003, a two-weeks visit was conducted and 16 interviews were held with members from the government, the civil society and multilateral agencies. Three email questionnaires were sent and responded by those interviewees that could not set up their agenda for interviewing. With another individual the interview was held on the telephone. The interview topics covered the same as those explored in Mexico (see **Appendix A**). The list of interviewees is outlined in **Appendix G**.

Government views on carbon forestry

Belize's AOSIS membership has put the country in an ambiguous negotiatory position in terms of CDM-forestry. As the country's senior climate change negotiator put it, 'Belize was in two camps. AOSIS was against forestry for obvious reasons. They said "we want developed countries to cut emissions" so we were defending such position but we had also to defend our national position. We had good forests that we wanted to preserve and maintain, so we had to look at it from this point of view also. So for us, it was always a very tricky negotiating scheme. When we were in the Alliance we did not discuss this issue' (National Chief Meteorologist, *pers.comm.*, 2003).

The exclusion of conservation-related projects from the CDM framework reduced the opportunities for Belize to engage in projects. 'One of the weaknesses of the CDM under Kyoto is that, for a country like Belize that has most of its territory under some kind of protection, there is little scope for us to benefit' (Forestry department official, *pers.comm.*, 2003). The country has 42 percent of its territory under some kind of protection but there are problems in maintaining and managing them effectively. Institutional frameworks, such as the Belize Protected Areas Conservation Trust (PACT) and co-management plans between governments and NGOs for the management of protected areas, have developed in recent years. PACT attempts 'to fund governmental and non-governmental organisations to conduct work on conservation, which could be research, infrastructure development, environmental education programmes or also it can involve promotional and marketing activities' (PACT executive director, *pers.comm.*, 2003). Co-management programmes aim to make local NGOs and community-based organisations become the effective managers and stewards of the protected area whilst the government covers part of the organisation administrative costs and provides technical assistance to monitor the national protected area sustainability. Co-management programmes have become important in the southern and western part of the country where encroachment by Guatemalan migrants is frequent.

The Belizean forest environment is either state property in the form of nature reserves and national parks or under private ownership. Rural communities, particularly the Mayan communities in the

south, still have parcels of forested land set aside as village commons. This land use context has positive and negative implications for the development of CDM-forestry. On the one hand, the system of protected areas and private property, together with the existing professional conservationist NGOs, may be a guarantee to conduct efficient CDM projects from an investor's perspective and a biodiversity conservation standpoint. On the other hand, the Climate Change National Communication stresses that Belize is a net sink for greenhouse gas emissions due to the current land-use change practices: public conservation areas, sustainable forest management in private protected areas and conversion of crop agriculture into fruit tree orchards (Belize Government 2000: 21-22). The country's sink condition was also mentioned by two of the government officials interviewed, who acknowledged that Belize is disadvantaged compared to neighbouring countries in terms of its ability to attract investment in CDM-forestry projects. Belize, compared to Guatemala or Mexico, has low population pressure on forests.

A recent project funded by the Netherlands government and commissioned through the Central American Commission on Environment and Development has assessed the ability of the countries in the Central America region to mitigate global emissions through forestry. The Belize final country study report indicates that in Belize there is only a total of 19,106 hectares suitable for the development of CDM projects, mainly located in the southern part of the country where the soil conditions do not excessively favour agricultural production and under the assumption that local populations, which show 'high poverty levels, low density population and low educational levels' would be more welcoming of CDM projects (Herrera 2003: xii). In addition, the study indicates that as the country had only 10 percent of its forestland deforested prior to 1989, its potential involvement in the CDM is relatively small. These deforested areas are currently dedicated to permanent or perennial crops to satisfy national agro industries and, therefore, only a collapse of this productive sector will open the opportunities to larger forestry investments under the CDM. The study also points out that small-scale CDM-forestry projects could be developed involving local communities in the south (*ibid.*: xiv).

In spite of these adverse circumstances for CDM-forestry investment, government stakeholders show a strong interest pursuing of CDM-forestry funding. The officials interviewed mentioned that the government would be supportive of any initiative that private actors could develop to raise funds for forestry activities under the CDM. They acknowledge that CDM-forestry projects need to incorporate local communities into their management strategy and that the projects should focus on sustainable ecological management (e.g. reduction of induced fires and cattle ranching development) and on climate change awareness programmes and environmental education. An important point that arose in several interviews with government officials and multilateral agencies is that the private entrepreneurship shaping CDM-forestry projects could compromise the social development concerns of local forest dwellers as it could only pursue the maximisation of carbon sequestration.

NGOs views on carbon forestry

In Belize, there are not many active organisations in the forestry-environment field according to our research and other literature sources (Miller and Miller Ltd 1993). Most environmental organisations are concerned with management of protected areas. We interviewed representatives of four of the major environmental NGOs and three of the major development NGOs in the country. Development NGOs are not knowledgeable of climate change policy and the environmental organisations clearly lack expertise in relation to climate change policy and implementation strategies. In-depth knowledge is found only in few individuals associated with government departments and private consultancies. As in Mexico, Belizean NGOs envision the CDM-forestry window as an opportunity to diversify their activities and access foreign funds to enhance conservation activities or develop forest management and land-use planning programmes that currently lack funding and personnel. All organisations are aware of the pilot carbon forestry project in the north west of the country. They comment positively on the project and stress its ability to enhance biodiversity conservation and capitalise the NGO in charge.

Two NGOs located in the southern districts of the country are keen to develop community-based carbon projects. They would do so by developing reforestation plans in Mayan villages' forest commons, and thereby reinforcing conservation-based activities in the protected areas surrounding these villages, which are currently managed under a co-management strategy with community-based organisations. One of the organisations is seeking funding to develop carbon sequestration feasibility studies in the area.

Most NGOs, however, have similar views to those outlined by government officials in relation to the CDM-forestry potential. They agree that the conservationist record of the country limits the opportunity to develop carbon projects and prove their environmental additionality. From a socio-economic perspective, carbon projects are viewed as an opportunity in those areas with low agricultural potential (see also Herrera 2003). NGOs struggle to acquire resources and personnel to establish agreements with international organisations that would serve as a liaison between them and the investors. Even the organisation that is developing the pilot carbon sequestration project does not have anyone devoted to follow climate change negotiations and promote their carbon project at the national and international levels. For the development of CDM-forestry projects, Belizean environmental organisations are dependent on their major international partners and funding bodies, such as The Nature Conservancy, Conservation International, the World Conservation Society or the UNDP-GEF small grants programme.

One of these international NGOs has been fundamental in the set-up and management of the only pilot carbon project located in Belize. The Nature Conservancy played a key role in reaching a financial agreement with investors and, from a technical perspective, it was also important to increase local skills for establishing and monitoring carbon stocks. 'The Nature Conservancy were the best-structured organisation and they were able to get the key investors into these particular projects. I think that without their active participation we would not have been able to put this project together... they were brokers that enabled this project to come on stream' (Belizean environmental NGO technical coordinator, *pers.comm.*, 2003).

2.4.3. The forestry pilot carbon project

The property and land-use history of the carbon project site, located in the north-western part of the country within the Rio Bravo Conservation and Management Area, was characterised by the historic struggle of established residents with private logging companies, interested on obtaining access to forest resources. Several attacks and resistance episodes of Icaiche Maya residents against logging settlements were reported between 1847 and 1866, which responded to the intent of logging companies to extract valuable resources without compensating local inhabitants. It seems that an agreement to compensate the Icaiche inhabitants with an annual royalty was agreed in 1853. During the 1860s, however, Mayan residents were resettled near Orange Walk and the only permanent settlements remaining were those maintained for logging or rubber tapping operations (Programme for Belize 1996: 18).

Logging companies operated in the area during the nineteenth century and conducted major timber operations concentrating upon mahogany, Mexican cedar and Caribbean pine. The other important land use activity in the area was rubber harvesting. The rubber trade dates back to late nineteenth century reaching its zenith in 1939, when it was the second most important country export after mahogany timber. Rubber extraction was organized on the basis of concessions subcontracted to gangs of rubber tappers, operating from camps in the forest during the wet season. By the early 1980s, logging was substantially moribund and a Belizean businessman purchased the entire property. Shortly thereafter, this property was sold in three parts with the businessman retaining the southern part as Gallon Jug Agroindustries, and two other areas which went in hand of the Yalbac Ranch and Cattle Company and the Coca-Cola Foods Inc. The latter intended to establish citrus cultivation and donated

its surplus land to the Government of Belize, which allocated part of it for timber extraction and the other part for redistribution amongst the local population for smallholding agriculture. Another tract of land was sold to the Blue Creek Mennonite Community, which had settled in the area during the 1950s and had developed mechanised agriculture. A similar arrangement was made with New River Enterprises (NRE), a timber company based in Orange walk.

At the end of the 1980s, Coca-Cola Foods Inc. discarded the idea of citrus production and decided to donate 16968 hectares to the United States conservationist organisation Massachusetts Audubon Society, which was interested in creating a tropical reserve for over wintering migrant birds. This was the initial stimulus for the creation of Programme for Belize, a Belizean conservationist NGO, and the Rio Bravo Conservation and Management Area (RBCMA). The area expanded through the acquisition of another 44440 hectares from the Belizean businessman and finally Coca-Cola Foods Inc. passed the rest of its land, another 20200 hectares to The Nature Conservancy, which bypassed it to Programme for Belize. All these tracts of land became united through the purchasing of another 10827 hectares from New River Enterprises. The World Land Trust funded some of these property transactions.

The RBCMA thus expanded within a five-year period between 1990 and 1995 to cover approximately 92435 hectares, with Programme for Belize holding title to the entire property (Programme for Belize, 1996: 20). The RBCMA is of considerable national and regional importance for biodiversity conservation. It is the second largest conservation area in Belize and contains a whole diversity of ecosystems (tropical upland forests, pine savannah, swamp forests, herbaceous and riverine systems) and endangered species of birds and mammals⁵. Furthermore, the area results a contribution for the conservation of the Mayan rainforest and serves as a connection between other protected areas contemplated in the Mesoamerican Biological Corridor initiative.

More recently, between 1995 and 1997, international funds for carbon sequestration have helped to purchase another 13309 hectares of more land from New River Enterprises in the eastern and southern part of the area, which was threatened of being converted into farmland (United States Initiative for Joint Implementation 1995). Therefore, since its establishment in 1989, Programme for Belize has not only taken the property under its management but it has also become a well capitalised organisation, employing at some point more than 60 staff members, and holding an annual budget of 1.7 million US\$, raised through ecotourism, research activities and international funds for conservation and carbon sequestration.

Located within the RBCMA, the Rio Bravo pilot forestry carbon project has the objective to demonstrate an optimal balance between cost-effective carbon sequestration, economically sustainable forest yield, and environmental protection. It was developed under the United States Initiative for Joint Implementation of the UNFCCC and has involved several international organisations (The Nature Conservancy, Winrock International), including a funding consortium of US and Canada based energy utilities (Wisconsin Electric Power Company, The Detroit Edison Company, Cinergy Services, Inc. PacifiCorp, Utilitree, McConnelville and Suncor Energy, Inc.) (United States Initiative for Joint Implementation 1995).

The project is expected to sequester approximately 10 million tonnes of CO₂ in the next 40 years, which signifies an estimated cost of 2.2 US\$ per ton of carbon sequestered. The funding will last until 2005-2007 and will have represented an investment of US\$ 2.5 million including land purchasing (US\$ 1.3 million) and management expenses. The sequestration area has been divided into two components: a first component, which is entirely dedicated to conservation (14000 hectares approx.), and a second component (39000 hectares approx.), which is allocated for sustainable timber extraction and community development projects. Emphasis on the importance of strengthening socio-economic development of neighbouring communities is noted as a priority in the two recent management plans of the RBCMA (Programme for Belize 1996; 2000).

⁵ The project will secure a habitat for a wide range of species, including nine mammals listed on CITES *Appendix 1* or classed as threatened under the U.S. Endangered Species Act, and over 341 bird species.

A second phase for expansion of the project was estimated to cost US\$ 3.0 million, including new land acquisition (US\$ 2.1 million) and management actions (US\$ 0.9 million) but, according to the interviews conducted, investors have not so far committed to fund this second phase. The latter suggests that investors were interested in the project under mere speculative terms for carbon credits and from an image greening perspective. The technical coordinator of the project recognises the fact that the exclusion of conservation as a CDM eligible activity has retreated investors from future economic involvement. When project funding ends in 2007, both the organisation and the project are likely to suffer from re-structuring. Few years ago the organisation employed 60 people including administrative and field-based staff. Staff has now been reduced to 25 members.

The carbon project fund manager is The Nature Conservancy and Programme for Belize acts as the project's manager. The project management framework is defined and revised by a board of directors, which includes members of the investment companies, The Nature Conservancy and Programme for Belize. There are distinct categories or components in the project budget and the amount of money under each component adjusts accordingly to project developers' needs. However, as the project has developed, transaction costs have increased and the effectiveness of some project components, particularly the community outreach and education component has weakened. According to the project's technical coordinator, 'what we have seen is that we would really need is to at least triple what we have annually in order for us to be at least even 50 or 60 percent effective in terms of community outreach and education' (*pers.comm.*, 2003).

Conflicts over resource use and access

There are several communities surrounding the RBCMA and consequently the carbon sequestration areas. This research has not been able to conduct community-based research work and it has relied on documentation and interviews with project managers, government officials and NGO members to analyse the carbon project social development outputs. Conflicts over resource use and access have been common and motivated by the communities' slash and burn practices⁶ close to the reserve boundaries and regular timber and fish theft. This is not an uncommon situation but rather frequently described in the conservation and development field (Ghimire and Pimbert 2000).

A rural development officer from the project put it this way: 'communities will tell you that we are the bad and rich guys helped by the Americans. They will also tell you that they are poor and they don't have anything to eat. However, what has happened is that they have degraded their resources and that they have not accepted that the age of logging is over' (Programme for Belize rural development officer, *pers.comm.*, 2002). The carbon project technical coordinator also highlights that 'people constantly go into the area to go hunting, to do fishing, to do illegal logging. As a private land owner we have to protect the resource, we have a mission to carry out. These actions increase the pressure on our resources and what we have is pressure from all the nearby communities and from a number of reasons.... in the savannahs we have human-induced fires... others practice free-range cattle ranching...' (*pers.comm.*, 2003).

⁶ Slash and burn agriculture is framed upon a rotation cycle of subsequent stages, in which cropping areas are combined with vegetation patches of different growth. "Area A" would consist of an area that becomes deforested through an induced fire, timber exploited for commercialisation or subsistence, and then cultivated for a period of years. When productivity would decrease, "Area A" would be left under fallow and a new area –"Area B"- would then be burnt and cultivated. When "Area B" would get exhausted, it would also be left for fallow and another area –"Area C"- would be open. When this third area would get exhausted, the farmer would move again to burn "Area A" and would cultivate it again. Or he would move to open another area, and so on. The number of years that areas remain under cultivation or fallow would vary according to the ecological characteristics of the ecosystem, land availability, cultural practices and so on. Slash and burn practices are common in vast areas of the developing world but, as population grew and land became scarce, continuing with these agricultural practices has become difficult and environmentally counter-productive.

Local histories play a key role in understanding the context under which the carbon project has developed. Surrounding communities used to live from logging and hunting and they used to have free access to forest resources, despite the fact that these resources were in hands of private owners. As the rules governing such access changed due to the transfer of the property rights to the conservationist NGO, communities were strictly denied access and no-alternatives were provided to them. The RBCMA managers' approach to resolve the conflict does not seem to have been adequate. A former on-field researcher and manager in the RBCMA noted that the denial of access would have had to be done in different terms, with the objective to build a good communication relationship with local communities, even if it is at the expense of losing some environmental resources. Such strategy would have presumably reduced conflicts and ensure the long-term sustainability of the area.

Program managers mentioned that environmental education programmes were conducted and pilot projects for local crafts production and agroforestry schemes were also implemented during the early 1990s in order to enhance local development in the buffer zones of the reserve (Programme for Belize 1994; 1996; United Nations Development Programme 1996). This outreach programme aimed to bridge the management objectives of the organisation with those of the communities. However, project sustainability was compromised by the lack of financial resources and the lack of tourists, who might have been willing to buy crafts and stay in the surrounding villages.

Within the carbon project, development activities have continued to focus on education, trying to sensitise local people to the importance of Programme for Belize activities for national and global interests in terms of climate change mitigation and biodiversity conservation. But when it has come to understand local development dynamics or diversify development opportunities for the surrounding communities, the carbon project has not allocated enough financial and human resources. In order to counteract this lack of resources, the NGO recently tried to link its efforts with other government departments with the objective to gain more credibility, legitimacy and get more local support. In practice, such institutional cooperation has not delivered the expected benefits and the financial resources have continued to be the most important limiting factor.

Evidence of ongoing conflict suggests that these outreach projects have not constituted real alternatives for local development as pilot community-based projects either finished or weakened over the years. The carbon sequestration initiative could have become an opportunity to enhance the community outreach programme of the RBCMA but neither did it integrate surrounding communities nor included them in the management of carbon forest plots. Carbon funds have somehow provided employment to some community members as reserve guards or forest managers but according to the comments of those employed, salaries are low and most people in the villages are unwilling to engage in patrolling the reserve.

In the light of these findings, we suggest that addressing these issues would require of a radical transformation in the way that the carbon pilot project is operating. There are compelling reasons to engage with local stakeholders and spent more financial and human resources to develop the social dimension of the carbon-forestry initiative. A preliminary step would be to explore the needs in forest resource use and access for those organisations and interest groups in the surrounding communities. Secondly, it would be necessary to promote a system of collective resource management, which could rely on access and extraction permits and be implemented through a community-based institution, including local representatives, resource users and local managers.

2.4.4. Case study summary of findings

The government of Belize is focused on adaptation programmes and measures, and less involved in the exploration of the Clean Development Mechanism. They expect the CDM-energy window to provide funding to very specific sectors, particularly the development of renewable energy sources. The access to such investment would entirely depend on the country's private stakeholders and the

Ministry of Public Utilities, Energy and Communications abilities to broker agreements with foreign investors. The Climate Change Caribbean Community Center is expected to act as a facilitator of such enterprise.

In spite of the existence of the Rio Bravo carbon forestry project, government officials remain sceptical about the possibilities of accessing CDM-forestry funds. Firstly, Belize land use structure, with a high percentage of land under protection, is a constraint for CDM-forestry investment. Secondly, the country's relative low population density undermines the environmental and social additionality required for developing CDM projects. Knowledge about climate policy is sparse in most Belizean NGOs and their ability to develop future projects is likely to depend on their international funding partners. Their interests on CDM-forestry lie in the opportunity to diversify their activities and access international funds to develop community-based agroforestry or conservation-based programmes.

The Rio Bravo pilot carbon project became a real opportunity for a local NGO to expand their privately owned protected area, and enhance biodiversity conservation in the region and the country. In addition, the carbon project enabled the local organisation personnel to develop important technical skills for carbon sequestration monitoring and assessment, as well as contributed to raise awareness about climate change within the organisation.

However, changes in rules governing access to forest resources have been controversial for surrounding communities and local practices have been overridden. Conflict in relation to forest resource use existed since the establishment of the protected area but the carbon project has not been successful in minimising such conflicts. Its social development component has been limited to informative sessions and economically unsustainable pilot projects in the communities. Lack of funds and personnel at both the organisation and the government levels have constrained the possibilities of sustained action. At present, in order to secure carbon stocks and biodiversity, the borders of the reserve still require of intensive patrolling to avoid induced fires and the communities' use of forest resources. In the short future, a possible way forward would be to strengthen the development component of the project, work closely with local communities, and put in place system of sustainable timber extraction.

3. Conclusion

This research has been successful and innovative in applying a framework for Stakeholder and Trade-off analysis in the context of pilot carbon forestry and to inform the development of the CDM in developing countries. Our investigations show how different stakeholders have different priorities over the development of CDM forestry projects. We argue that the development of institutions to negotiate, manage and support projects such as CDM and forest carbon is evolving rapidly, but is highly problematic.

Both Mexico and Belize lack human and financial resources to be fully active and up to date with on international negotiations in climate change. In Mexico, the government, the private sector and civil society are relatively knowledgeable about climate change international policy, as demonstrated by their engagement in research studies and pilot implementation projects during 1995 and 2000. In Belize, such involvement has been relatively less in terms of the number of organisations and people involved, and they have focused on vulnerability and adaptation to climate change since 1995. All stakeholders in both countries are fairly sceptical about the amount of funds that can be channelled through CDM investments. The ability of civil society organisations and the private sector to broker agreements with international investors and consultancies will ultimately determine who gains from the relatively low investment that can be expected.

Expectations of CDM-forestry are high in Mexico but low in Belize. Belize has focused on adaptation in coastal areas, and much of its forests are in no imminent risk of deforestation. The exclusion of conservation activities from the CDM-framework may have undermined Belize's opportunities to receive CDM-forestry investment. In Mexico, the future fulfilment of their expectations in CDM-forestry may be determined by the ability of government, civil society organisations and the private sector to increase human and financial resources in order to more fully and effectively engage in the UNFCCC and the CDM negotiation processes.

At the local scale, we have found that none of the pilot projects under study have delivered substantial improvements to their participating or surrounding rural villages, neither in terms of income nor in terms of diversification of production and other environmental or development considerations, such as biodiversity conservation or gender equality. Reforestation and afforestation schemes, particularly if they are based on agroforestry and community engagement, are more likely to satisfy the development component of carbon projects. Conservation-based projects however are less likely to enhance local development process in surrounding populations.

The ability of CDM-forestry framework to strengthen rather than inhibit local development depends on local contexts, history and social and political relations, particularly over land use tenure and access to forest resources. For community-based carbon projects, such as the Mexico case study, the micro-politics that govern forest resource use and explain land tenure distribution are key to understand the real potential of carbon sequestration to promote local development. These factors determine the equitable distribution of carbon benefits and minimise ongoing or potential conflicts within the community and the participants in the project. In the case of carbon conservation-based projects such as the Belize case study, the denial of community access to forest resources through an exclusionary approach has not supported local development. Critically, the evidence presented shows how the two case studies have moved towards a more exclusive focus on carbon activities rather than a broader range of social and economic development orientated activities.

A number of lines of inquiry have emerged and are currently being developed by researchers on this project and in collaboration with others. These include the former development of the Trade-off analysis, and a closer look at the local development aspects of carbon projects. We maintain that one of the main challenges of present and future carbon forestry projects is finding the appropriate means and resources to work closely with local organisations and to understand local social, environmental

and political histories. We suggest that carbon projects require robust and flexible institutional frameworks, which allow project developers and participants to cooperate and fairly negotiate new rules governing resource use, in which rights and duties on all parts should be made clear and agreed. If funding to developing countries through the UNFCCC, Kyoto Protocol and other international channels is to bring meaningful benefits, then further research is necessarily on the politics, legitimacy and institutions which enable and disable different actors to reap benefits.

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Appendix A

English Interview Templates for Mexico and Belize Case Studies

Questions addressed to:

- Government Agencies
- Non-Governmental Organisations
- Academics and
- Pilot project developers

The UNFCCC Process

General comments

- What does your ["agency"/"NGO name"/"project developers' organisation name"] think could be the impacts of climate change for the economic, social and environmental development of Mexico?
- Which does your ["agency"/"NGO name"/"project developers' organisation name"] think that will be the impacts of climate change on the Mexican poorest groups?
- Which public informative processes have been put in place to inform the national population about the phenomena of climate change and the international negotiations?

Negotiations under the UNFCCC

- Which does your ["agency"/"NGO name"/"project developers' organisation name"] believe have been the most important contributions of the Mexican government to the overall UNFCCC process, in pre and post-Kyoto negotiations?
- Which was the position of your ["agency"/"NGO name"/"project developers' organisation name"] in such negotiations and particularly in the establishment of developed countries' emission caps and the Clean Development Mechanism framework?
- For developing countries, what does your ["agency"/"NGO name"/"project developers' organisation name"] think should be prioritised in the short term "to adapt" or "to mitigate" climate change?
- Does your ["agency"/"NGO name"/"project developers' organisation name"] think that global climate change policy has been generally biased against developing countries? Which general proposals would you made for future negotiations?

Forestry under the UNFCCC

- Which is the potential that your ["agency"/"NGO name"/"project developers' organisation name"] attributes to the forestry sector to mitigate climate change?
- Which does your ["agency"/"NGO name"/"project developers' organisation name"] think have been the main implications of excluding conservation and agroforestry management activities from the CDM framework?
- Why does your ["agency"/"NGO name"/"project developers' organisation name"] think that such exclusion took place and whose interests were represented?
- Does your ["agency"/"NGO name"/"project developers' organisation name"] think that conservation and agroforestry projects had to be included in the UNFCCC framework in the future?

Key words: climate change, global equity, public information, activities implemented jointly, Kyoto (caps and CDM), mitigation *versus* adaptation, forestry and policy options.

The Activities Implemented Jointly Pilot Phase

General comments

- What is your ["agency"/"NGO name"/"project developers' organisation name"] perspective on these seven years of AIJ pilot phase investment in economic and development terms?
- Which Mexican AIJ initiatives under implementation does your ["agency"/"NGO name"/"project developers' organisation name"] know and which ones does it know that were planned but not executed?

Cooperation with the investment sector

- Which has been the interaction between your ["agency"/"NGO name"/"project developers' organisation name"] and the private investment sector involved in these pilot projects?
- Which do you think has been the main interest of the private sector behind funding AIJ initiatives?

Cooperation with NGOs

- Does your ["agency"/"NGO name"/"project developers' organisation name"] consider important that local and international NGOs played a dominant role in setting and developing up AIJ projects across the developing world?
- Has your ["agency"/"NGO name"/"project developers' organisation name"] interacted with those local and international NGOs to design and develop AIJ initiatives?

The pilot forestry project

- Which was the role, if any, played by your ["agency"/"NGO name"/"project developers' organisation name"] in setting up and approving the pilot forestry project in ...?
- Has your ["agency"/"NGO name"/"project developers' organisation name"] been involved in any monitoring of the project?
- Has your ["agency"/"NGO name"/"project developers' organisation name"] been informed about the actual project's achievements on carbon sequestration and local development through publications and project reports?
- What would your ["agency"/"NGO name"/"project developers' organisation name"] appoint as the main factors explaining the carbon forestry project success in involving more producers across the Chiapas region?
- What would your ["agency"/"NGO name"/"project developers' organisation name"] appoint as the main strengths and weaknesses of the project in carbon, environmental and social terms?
- Does your ["agency"/"NGO name"/"project developers' organisation name"] consider the possibility of co-funding this initiative or other AIJ projects in order to help them meeting their development commitments?

Key words: AIJ overall view, government role in the AIJ, initiatives under the AIJ, government and private sector, private sector interests, government and local and international NGOs involvement, pilot projects' approval and monitoring, pilot projects' successes and constraints.

The Clean Development Mechanism

CDM National Authority

- Do you think that the CDM political process at the international level is stimulating the development of the CDM framework in your country?
- Who are or are likely to be the members of the CDM National Authority?
- Which role would your ["agency"/"NGO name"/"project developers' organisation name"] assign to the CDM authority?
- Which CDM projects are currently being proposed or are waiting to be developed? Which of these are forestry projects? Who are the stakeholders involved in the projects?

CDM and investment mechanisms

- How relevant does your ["agency"/"NGO name"/"project developers' organisation name"] envision the opportunities for investment under the CDM or non-Kyoto markets?
- Does your ["agency"/"NGO name"/"project developers' organisation name"] consider the carbon market price as a limitation for CDM projects' ability to promote environmental conservation and socio-economic development of local populations?
- Which does your ["agency"/"NGO name"/"project developers' organisation name"] consider to be the main objectives beyond investment under the CDM?
- Are bilateral or multilateral negotiations taking place with developed countries' governments to define the basis of CDM funding schemes?
- Is the World Bank playing any significant role in helping to set up CDM projects in your country through its Prototype Carbon Fund, BioCarbon Fund or the Community Development Carbon Fund?
- Which is the current status of elaborating a national strategy for environmental services payments?

CDM and other organisations

- Which roles does your ["agency"/"NGO name"/"project developers' organisation name"] attribute to national and international NGOs in the CDM national framework?
- Is there any regulatory process for establishing certification rules for CDM projects in your country?
- Which role does your ["agency"/"NGO name"/"project developers' organisation name"] attribute to international auditing firms for CDM projects' development?

CDM projects and sustainable development

- How does your ["agency"/"NGO name"/"project developers' organisation name"] understand that "the host country has retained the responsibility to assess CDM projects' contribution to national (and local) sustainable development"?
- Are general sustainable development criteria for the approval and evaluation of projects being designed at the government level?
- If so, which stakeholders have been involved in the definition of such criteria?
- How does your ["agency"/"NGO name"/"project developers' organisation name"] think that sustainable development criteria will be assessed in specific projects? Which stakeholders are likely to be involved?
- To which extent does your ["agency"/"NGO name"/"project developers' organisation name"] think that CDM projects or national systems for environmental services payments can contribute to stimulate economic development and alleviate poverty at the local and national level?
- Which impediments does your ["agency"/"NGO name"/"project developers' organisation name"] consider that exist for such socio-economic development to occur?
- Which mechanisms does your ["agency"/"NGO name"/"project developers' organisation name"] believe that should be put in place at the government and project management level to meet projects' development objectives?
- In which way does your ["agency"/"NGO name"/"project developers' organisation name"] think that carbon sequestration projects will affect property rights regimes in rural communities?
- Will property rights regimes determine the way in which carbon projects are set-up?

- Which challenges would face a carbon sequestration project combining individual and social property to ensure an equitable distribution of the economic and social benefits promoted through the project?
- Which importance does your ["agency"/"NGO name"/"project developers' organisation name"] attribute to the establishment of carbon contracts with community organisations and/or individual producers?

Key words: CDM authority, CDM investment, bilateral and multilateral negotiations, World Bank, environmental services, local and international NGOs, certification, design of sustainable development criteria, participation, carbon projects' opportunities and constraints, property rights and social property, voluntary *versus* obligatory carbon forestry contracts.

Questions addressed only to:

- Carbon forestry pilot project developers

Theme 4: pilot project general aspects

Project set-up

- Which do you believe have been the main factors explaining the success of your project?
- Would you please identify the functions of past and present key stakeholders?
- Have been local/regional or federal government institutions involved in some way in the project?
- How was the project initially presented to the communities? Which was their previous knowledge about the notion of carbon sequestration?

Communication interface between project developers and communities

- Which are the communication strategies established between project developers and communities?
- How frequently meetings are held?
- Which is the ability of participants to grasp climate change concepts and put forward their expectations in the project?

Project economics

- Did the project receive any up-front funding to kick-start it? Which are the general conditions of the contracts with the current funding organisations (price per ton of carbon, amount paid so far, etcetera)?
- Do you think that up-front funding is fundamental to promote these projects?
- Which funding strategies is your organisation seeking to consolidate the project?
- How important becomes for the project to link project funding to other state-based development and forestry programmes?
- Are the payments delivered to local farmers enough to compensate their labour and opportunity costs?
- Have you been able to follow how the producers make use of their payments and which roles the producers' wife, sons and daughters play in managing the plot and benefiting from payments?

Communities, conflict and land management

- Which were the fundamental intra-community conflicts when the project was presented and started operating?
- Are there substantial differences (ecological management, productive practices, political situation and allegiances, culture...) among all the communities and producers involved so far?
- Which is the ecological management and conservation status of the collective spaces within the involved communities? And which was the status of the family farming units before project implementation?
- Is there any quantitative limitation to the land that each producer or community dedicates to carbon sequestration?
- Have you identified contrasting discourses at the community level regarding the importance of forests for local people? Which is their main understanding of individual and common forestland (productive, conservationist)?

Project technical drawbacks

- Where does the project obtain the seedlings? Are there problems in obtaining them and delivering them to local communities?
- How many different species are planted? Do they meet communities' expectations in diverse forestry development?
- Are there any significant environmental constraints for ensuring good survival rates?
- Which changes have you perceived in terms of aggregate deforestation and biodiversity conservation in the plots of the involved producers?

Property rights and collaborative agreements

- Which are the terms of project “collaborative agreements” (duties and rights of every signatory)?
- Did all producers understand the terms of contracts?
- In which way have carbon collaborative agreements affected life in the communities?
- Has the project interfered with property rights relationships within the community and the household?

Gender impacts

- Have women participated in the project’s origins? If so, at which stages and to which purpose?
- Are women currently involved in project’s decision-making meetings?
- Do women play an important role in the region’s forest subsistence economy? If so, which are women’s most important resource management tasks and which species are more important to meet their household needs?
- Is the project addressing other gender-based community development needs (e.g. enhancing the household economy by reinforcing backyard tree planting)?

Final comment

- If you had to mention three strengths and weaknesses of the project to meet sustainable development objectives (carbon sequestration, environmental conservation, social development), which ones would it be?

Key words: project success, stakeholders’ functions, carbon knowledge, funding problems and new funding strategies, farmers’ economic benefits and opportunity costs, resource management strategies, project’s impacts on land management, intra-community conflicts, seedlings acquisition and planting, diverse plantation and community forest needs, project impact’s over land tenure, gender impacts.

Questions addressed only to:

- Local communities

Theme 5: communities' project analysis

Communities' historical perspective

- Where did the community original inhabitants come from?
- How many years have you been living in the community?
- How many people (families) live nowadays?
- Has the number of families changed and has the landscape change in last decades?
- Do you remember (or know) how the community obtained its land?
- Were all families entitled originally with the same amount of land?
- Nowadays, are there substantial differences between land holdings in the community?
- How many farmers entitled to the land are there? Are you one of them? And your children?
- Are there differences between those entitled to the land and those who are not in relation to land and forest resources?

Natural resources management

- Which are the traditional agricultural productive activities?
- Which are the traditional husbandry productive activities?
- Did exist or exists forestry production-related activities?
- What is the role of women regarding forest resources?
- Are there still common areas of forestland?
- If so, which is their current management and conservation status? Explain.
- How many hectares does your family have and under which productive use?

Community and institutions

- How many social or productive organisations do exist in the community?
- Do you participate or are you a member of any local social or productive organisation?
- What is the role of the organisation?
- How are the relations between the organisations co-existing in the community? Are there conflicts due to political, religious or social reasons? Are they historical or recently new?
- How does the community or its different organisations relate to the local/state government?
- Which are the current problems discussed in the community assembly? Which are the roots of existing differences?
- Would you appoint the current problems in the day-to-day life in the community?

The climate change forestry project

- Do you know what climate change is about?
- Do you think that climate change is affecting or it will affect your current life or your children's life?
- If so, in which way do you think it could affect them?
- Which is the relation between climate change and the project's organisation?
- Do you know who is financing the project and why?
- Do you know if there are other projects like yours here in your country or in the world?

Project engagement

- How did you and the community know about the project?
- Why did you decide to participate in it?
- How many children of yours are participating? All your children are ejidatarios?
- When did you start participating and with how many hectares?
- Have you increased or reduced the number of hectares under reforestation along these years? Why did you do so?
- Would you have participated in the project if you would have had less hectares? Why?

- Do you receive any extra payments for your forest planting apart from those of the carbon project? If so, where do they come from? Would you have participated in the carbon project if you had had the other funding?

Land rights, conflicts and internal organisation

- Which are for you the most important aspects of reforestation and preserving the forest (future forestry production, conservation of animals and other vegetal species, water conservation, community cultural heritage)?
- Which do you think are your obligations as a participant and those of the project's organisation?
- If it would be the case that you could not stop reforestation whenever you would decide so, would you have participated from the project? Explain.
- Why do you think that not all community producers are participating in the project?
- Why do you think that it was impossible to develop the project in the commonly owned plots?
- Are there conflicts among those entitled to the land and other members of the community due to the carbon project? If so, why? Are the conflicts generated just by the project itself or there are other motives (historical, political or organisational differences)?
- What do you think that should be done to eliminate such conflicts?
- How is the personal relation between the families and producers participating in the project? Do you meet periodically? Who prepares the meetings and which aspects are discussed?
- Who deals with the relations with the project's organisation and other information related to other development projects?

Social development

- Are women participating in the project in any manner?
- Is the project contributing to improve any aspect of your day-to-day life? If so, which ones?
- How much do you earn approximately with each carbon payment? Which is the frequency of each payment?
- Has your wife participated in deciding what to do with the income? How have you spent it?
- Which aspects do you think that could be improved from the project?
- Do you think that other aspects beyond reforestation should be incorporated to the project (e.g. cooking stoves, female productive cooperatives, etc.)?

Key words: community's history, population and land use change, production dynamics (agrarian, husbandry, forestry-related), social-political-religious organisations, internal conflicts, climate change information, project funding and motives, project engagement, hectares under reforestation, payments, project induced conflicts, producers' duties and rights in the project framework, relations between participants, community meetings, women's participation, project's aspects to be improved.

Appendix B

Institutions and individuals interviewed in Mexico

Institutions	Interviewee Professional Position	Date of Interview/MCA
National Institute of Ecology (INE)	General Director for Research in Environmental Policy and Economics	3/10/2002 (in-depth interview) 9-14/10/2002 (MCA) 27/01/2003 (meeting for workshop planning I) 18/03/2003 (meeting for workshop planning II)
	Climate Change Research Unit Director	01/05/2002 (interview) 29/11/2002 (in-depth interview)
	General Director for Research in Urban, Regional and Global Pollution	24/03/2003 (in-depth interview)
Forestry National Commission (CONAFOR)	Director of the Cooperation and Funding Unit	9/10/2002 and 23/07/2003 (informal talks)
	Cooperation and Funding Unit. Assistant to the General Director	23/10/2002 (informal talk + MCA)
	Research and Technological Development General Director	23/10/2002 (brief talk)
	Silviculture and Forest Management General Director	25/10/2002 (in-depth interview)
	Forestry Development Director	5/12/2003 (MCA)
	Regional Director for Mexico DF and Tlaxcala	30/04/2002 (in-depth interview) 11/10/2002 (in-depth interview)
	General Director of the Conservation and Forest Resources Sustainable Management Project	9/10/2002 (in-depth interview) 30/10/2002 (MCA)
Secretariat for the Environment and Natural Resources (SEMARNAT)	International Affairs Unit. Climate Change Officer	14/11/2002 (in-depth interview + MCA) 27/03/2003 (in-depth interview)
	Unit for Planning and Coordination. Assistant to the General Director	28/09/2003 (in-depth interview)
	General Directorate for Forest Management and Soil Services. General Director.	29/11/2002 (in-depth interview)
	General Directorate for Forest Management and Soil Services. Forestry Evaluation Officer	26/03/2003 (in-depth interview)
	Unit for Social Participation and Transparency. General Director	24/03/2003 (interview)
	Centre of Capacity Building and Environmental Education for Sustainable Development. General Director	26/03/2003 (in-depth interview)
	Chiapas State Delegate for Natural Resources Management	14/07/2003 (in-depth interview)
SEMARNAT – UNDP	Integrated management of ecosystems in three ecoregions and Sierra Gorda Project. Project Manager	28/11/2002 (in-depth interview)
Mexico City Government	Executive Directorate for Institutional Coordination and Policy Integration, Government of Mexico City. Policy officer	12/03/2003 (in-depth interview) 24/03/2003 (in-depth interview + MCA)
Energy Secretariat	Information Research and the Environment Unit. General Director	27/03/2003 (in-depth interview)

Foreign Affairs Secretariat	Global Themes Unit. General Director	24/07/2003 (in-depth interview)
GEA	Director	22/10/2002 (in-depth interview)
	Environmental Services Expert	17/03/2003 (in-depth interview)
FORO para el Desarrollo Sustentable, A.C.	General Director	12/12/2002 (interview) 28-04-2003 (interview) 7-07-2003 (MCA)
	Researcher	04/07/2003 (in-depth interview)
GAIA y SAO Oaxaca	Researcher	13/01/2003 (informal talk)
Estudios Rurales y Asesoría Campesina, A.C.	Director	April 2002 (interview)
Pronatura, A.C.	Mexico D.F. Director	28/03/2003 (in-depth interview + MCA)
	Pronatura-Chiapas Director	23-04-2003 (in-depth interview) 30/05/2003 MCA
Bioplaneta, A.C.	Directorate of Diagnosis and Capacity Building	26/03/2003 (in-depth interview + MCA)
Conservation International - Mexico	General Director	14/07/2003 (in-depth interview)
The Nature Conservancy - Mexico	Climate Change Director	7/07/2003 (comments received by email)
	Chiapas Programme Manager	22/07/2003 interview
Consejo Civil Mexicano para la Silvicultura Sostenible, A.C.	Director	07/11/2002 (in-depth interview)
	Public Policy Expert	07/11/2002 (informal talk) 14/03/2003 (in-depth interview)
	Carbon Sequestration Coordinator	2/12/2002 (in-depth interview + MCA)
	Legal Issues Expert	31/10/2002 (in-depth interview)
Union de Grupos Ambientalistas de Mexico, A.C.	Research Associate	24/07/2003 in-depth interview
The World Bank	Environmental Expert	31/01/2003 (in-depth interview)
UNDP	GEF-PNUD Coordinator and Programme Officer	08/11/2002 (in-depth interview)

	Climate Change Programme Officer	08/11/2002 (informal talk)
USAID	Climate Change Director in Mexico	28/03/2003 (in-depth interview)
Ford Foundation	Environmental and Development Programme Manager for Mexico and Central America	15/07/2003 (comments received by email)
Universidad Autonoma del Estado de Mexico (UAEM)	Lecturer at the Centro de Investigacion en Ciencias Agropecuarias	27/11/2002 (interview)
	Lecturer and Researcher	27/11/2002 (interview)
Colegio de Mexico (COLMEX)	Research Associates Programme Director	14/11/2002 (in-depth interview)
Universidad Iberoamericana (UIA)	Economics Division Lecturer	22/10/2002 (MCA)
		31/10/2002 (in-depth interview)
Centro de Investigaciones y Docencia Economicas (CIDE)	Economics Division Lecturer	27/10/2002 (in-depth interview)
Universidad Nacional Autonoma de Mexico (UNAM)	Institute of Ecology. Energy Division Director	23/07/2003 (informal talk)
	Atmospheric Sciences Centre General Director	20/03/2003 (in-depth interview)
	International Environmental Consultant and Lecturer	25/03/2003 (in-depth interview)
	Institute for Social Research. Lecturer	18/03/2003 (in-depth interview)
Universidad Autonoma Metropolitana (UAM)	Economics Department	14/03/2003 (in-depth interview)
Instituto Tecnologico Agropecuario de Jalisco	Director	25/10/2002 (in-depth interview)
Plant Health Care Consulting	General Director	22/10/2002 (in-depth interview)
Centro de Transporte Sustentable de la Ciudad de Mexico	Director	28/10/2002 (in-depth interview + MCA)
Independent consultant	Environmental Services national legal framework Expert	20/03/2003 (in-depth interview)
Grupo DARUM	International Consultant	27/03/2003 (interview)
CESPEDES	General Director	25/03/2003 (in-depth interview)
El Colegio de la Frontera Sur (ECOSUR)	Agroecology Senior Lecturer	9-10/04/2002 (interview)
		4-5/12/2002 (in-depth interview + MCA)
	Agroforestry Systems Lecturer	15/04/2002 (interview) 9-17/12/2002 (in-depth interview + MCA)
	Regional Management of Natural Resources Lecturer	16/04/2002 (interview) 15/01/2003 (in-depth interview + MCA)

	Regional Management of Natural Resources Lecturer	15/01/2003 (in-depth interview + MCA)
AMBIO	Project Managers	15/04/2002 (interview) 11/12/2002 (preliminary interview) 18/01/2003 (semester project meeting) 23/01/2003 (in-depth interview + MCA with Tito Vargas) 27/04/2003 (informal talk with Sotero Quechulpa) 02/05/2003 (informal talk with Elsa Esquivel)
Centro de Estudios para Mesoamerica y el Caribe	Research Associate	30/05/2003 (interview)
Unión de Crédito Pajal Ya kac'tic	Organisation Leader	16/05/2003 (in-depth interview) 10/06/2003 (in-depth interview)
Unión Regional de Ejidatarios Agropecuarios, Forestales y de Agroindustria de los pueblos Zoque y Tzotzil del Estado de Chiapas	President	29/04/2003 (preliminary interview) 17/07/2003 (in-depth interview)
Secretaría de Desarrollo Rural del Estado de Chiapas (delegación Comitán)	Production Development Officer	25/04/2003 (interview)
	Forestry Development Officer	2/05/2003 (interview)
	Regional Delegate	19/05/2003 (in-depth interview)
Delegacion Procuraduria Agraria Comitán de Dominguez	Public Officer	06/05/2003 (interview) 11/07/2003 (in-depth interview)
Presidencia Municipal de Comitán	Technical Secretariat Director Rural Development Officer	06/05/2003 (informal comments) 11/07/2003 (interview)
Diocesis de San Cristobal de las Casas	Archbishop's assistant	02/06/2003 (interview)
Comitán de Dominguez Librarian	Historian and Researcher	09/05/2003 (interview)

Community A – Yalumá

In-depth interviews

- Mr. Fernando López, 07/04/2003 (in-depth interview) / recorded
- 23/04/2003 (informal comments and analysis)
- 04/05/2003 (informal comments and analysis)
- 07/05/2003 (in-depth interview about PROCEDE and land rights distribution)
- 11/05/2003 (in-depth interview together with Alberto Lopez about community history, land rights and organisations) / recorded
- 15/05/2003 (informal comments and analysis)
- 19/05/2003 (informal comments and analysis)
- 20/05/2003 (informal comments and analysis)
- Oscar y Alfredo López, 08/04/2003 (in-depth interview)
- Alberto López, 23/04/2003 (in-depth interview)
- Elías Aguilar, 24/04/2003 (in-depth interview)
- Siro Lopez Aguilar, 05/05/2003 (in-depth interview)
- Bartolo Aguilar, 07/05/2003 and 08/05/2003 (in-depth interview)
- Armando Garcia, 07/05/2003 (in-depth interview)
- Antonio Perez Aguilar, 07/05/2003 (in-depth interview)
- Alfonso Lopez Aguilar, 09/05/2003 (in-depth interview)
- Ernesto Aguilar Morales, 09-05-2003 (in-depth interview)
- Refugio Gomez Aguilar, 11/05/2003 (in-depth interview)
- Aurelino Aguilar Lopez, 11/05/2003 (in-depth interview)
- Trinidad Lopez Garcia, 15/05/2003 (in-depth interview)
- Domingo Aguilar, 15/05/2003 (in-depth interview)
- Antonio Ruiz, 18/05/2003 (in-depth interview)
- Oscar Lopez, 20/05/2003 (informal conversation during walking trip)
- Ruben Garcia Diaz, 20/05/2003 (in-depth interview)
- Ventura Morales, 10/07/2003 (in-depth interview)
- Pedro Garcia, 10/07/2003 (in-depth interview)

Discussion Groups

- Elias Aguilar, Joel Lopez, Fernando Lopez, Antonio Perez, Antonio Ruiz and Alfonso Aguilar, 14/04/2003 (Discussion Group)
- Aguilar's brothers (Humberto, Artemio, José Luis and Lucas), 23/04/2003 (Discussion Group)
- Rapid Rural Appraisal with 30 project producers, 04/05/2003
- Guadalupe Lopez Lopez, Rogelio Lopez Lopez, Genaro Morales Hernandez and Fernando Hernandez Lopez, 15/05/2003 (Discussion Group)
- Luis Aguilar Lopez, Humberto Aguilar Lopez, Bartolo Aguilar Lopez, Artemio Aguilar Lopez, Antonio Lopez Perez, Caralampio Aguilar Perez, Gavino Perez Alfaro, Alfonso Aguilar Lopez, Sebastian Guillen Gomez, Ismael Gordillo Perez, Caralampia Aguilar Garcia, Refugio Gomez, 20/05/2003 (Discussion Group)

Other

- AMBIO Information Meeting, 19/05/2003

Community B – Rincón Chamula

In-depth interviews

- Miguel Gonzalez Hernández, 29/04/2003 (in-depth interview)
- Pedro Bautista Aguilar, 3/06/2003 and 7/06/2003 (in-depth interview)
- Juan Bautista and Marcos Hernandez, 4/06/2003 (field visit and interview)
- Rosendo de la Cruz and Manuel Gomez Teltic, 05/06/2003 (field visit and interview)
- Dionisio Ruiz Hernandez, Diego Ruiz Ruiz and Mariano Hernandez Ruiz, 05/06/2003 (field visit and interview)
- Ricardo Sanchez, 07/06/2003 (in-depth interview)
- Agustin Perez, 07/06/2003 (in-depth interview)

Discussion groups

- Marcos Hernandez, Domingo Hernandez, Juan Bautista, Marcos Perez 04/06/2003 (Discussion Group in Rincon Centro neighbourhood)
- Marcos Lopez Bautista, Pedro Lopez Lopez, Salvador Bautista Gomez, Mario Diaz Perez, Domingo Bautista Hernandez, Lorenzo Jimenez Sanchez, Antonio Bautista Lopez, Marcos Jimenez Sanchez, Carmen Jimenez Sanchez, Carmen Gomez Gomez, Manuel Bautista de la Cruz, Raul Diaz Perez, Rosendo de la Cruz, Manuel Gomez, 04/06/2003 (Discussion Group in Tejeria neighbourhood)
- Dionisio Ruiz Hernandez, Eliseo Gomez Hernandez, Lorenzo Hernandez Hernandez, Diego Ruiz Ruiz, Juan Ruiz Rojas, Marcos Perez Gomez, Manuel Hernandez Hernandez, Dionisio Gomez Rojas, Mariano Hernandez Ruiz, Belisario Ruiz Ruiz, Manuel Hernandez Gomez, Adolfo Hernandez Ruiz, Humberto Hernandez Ruiz, Lorenzo Lopez Gomez, Andrez Lopez Hernandez, Abraham Ruiz Ruiz, Mario Hernandez Ruiz, Rubencio Hernandez Ruiz, 05/06/2003 (Discussion Group in San Jose neighbourhood)
- Mariano Giron Bautista, Andres Gomez Jimenez, Manuel de la Cruz Jimenez, Agustin Hernandez Aguilar, Juan Lopez Sanchez, Mariano Lopez Hernandez, Victor Jimenez Lopez, Salvador Aguilar Lopez, Salvador Lopez Lopez, Andres Lopez Sanchez, Domingo Bautista de la Cruz, Domingo Sanchez Hernandez, Salvador Jimenez Gomez, Manuela Bautista Bautista, Guadalupe Gomez Ruiz, Genaro Gomez Cruz, Hilario Rodriguez Sanchez, Teofilo Bautista Gomez, Moises Giron Gomez, Lorenzo Sanchez Gomez, Mariano Bautista Hernandez, Dionisio Bautista Lopez, Mariano Jimenez Lopez, 07/06/2003 (Discussion Group in Tierra Nacional neighbourhood)

Other

- Meetings for Agrarian Reforms, July 2003. Held by CIOAC-UREAFA in Jitotol, Chiapas (assistance and notes to understand organisation mission and objectives)

Appendix C

Criteria for carbon forestry projects

Research process time frame. Subsequent changes in the lists are highlighted in *italic*

Component	Sub-criteria	Initial list -March 2002-	Second list -October 2002-	Third list -November 2002-	Final list -December 2002-
Carbon	Carbon impact	Net carbon sequestered (quantitative -tC/ha-)	Net carbon sequestered (quantitative -tC/ha-)	Net carbon sequestered (quantitative -tC/ha-)	Net carbon sequestered (quantitative -tC/ha-)
	Cost-effectiveness	Change in project's internal rate of return -relative cost in comparison with another project to reduce the same amount of emissions- (quantitative -%-)	<i>Increase</i> in project's internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions) (quantitative -%-)	Increase in project's internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions) (quantitative -%-)	Increase in project's internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions) (quantitative -%-)
	Carbon risk	Risk of leakage and natural hazard combined (qualitative - high, moderate, low-)	Risk of leakage and natural hazard combined (qualitative - high, moderate, low-)	Risk of leakage and natural hazard combined (qualitative - high, moderate, low-)	Risk of leakage and natural hazard combined (qualitative - high, moderate, low-)
	Policy impact	Eligibility under the CDM compliance regime (qualitative - yes/no-)	Eligibility under the CDM compliance regime (qualitative - yes/no-)	Eligibility under the CDM compliance regime (qualitative - yes/no-)	Eligibility under the CDM compliance regime (qualitative - yes/no-)
Ecological	Biodiversity	Change in local/regional ecosystems connectivity (qualitative)	<i>Maintenance/increase</i> in local/regional ecosystems connectivity <i>due to project activities</i> (qualitative)	Maintenance/increase in local/regional ecosystems connectivity due to project activities (qualitative)	Maintenance/increase in local/regional ecosystems connectivity due to project activities (qualitative)
		Change in the area's species richness (qualitative/quantitative –single species/ha-)	<i>Maintenance/increase</i> in the area's species richness <i>due to project activities</i> (qualitative/quantitative –single species/ha-)	Maintenance/increase in the area's species richness due to project activities (qualitative/quantitative –single species/ha-)	Maintenance/increase in the area's species richness due to project activities (qualitative/quantitative –single species/ha-)
					<i>Ecological value of the project's region, according to national priorities</i> (qualitative)
	Water quality and quantity	Change in water quantity available for farmers and other users (qualitative/quantitative – cubic meters/year)	<i>Maintenance/increase</i> in water quantity available for farmers and other users <i>due to project activities</i> (qualitative/quantitative –cubic meters/year)	Maintenance/increase in water quantity available for farmers and other users due to project activities (qualitative/quantitative –cubic meters/year)	Maintenance/increase of water quantity <i>in the correspondent watershed</i> (qualitative/quantitative –cubic meters/year)

		Change in nitrates and phosphates concentration in both surface and groundwater (qualitative/quantitative –mg/l-)	<i>Reduction of</i> nitrates and phosphates concentration in both surface and groundwater due to project activities (qualitative/quantitative – NO ₂ , NO ₃ , PO ₄ mg/l-)	Reduction of nitrates and phosphates concentration in both surface and groundwater due to project activities (qualitative/quantitative –NO ₂ , NO ₃ , PO ₄ mg/l-)	<i>Reduction of erosive processes in both slopes and water streams (qualitative)</i>
	Soil quality	Change in soil organic carbon (quantitative -% of organic carbon per soil cubic decimetre-)	<i>Maintenance/increase</i> in soil organic carbon (quantitative -% of organic carbon per soil cubic decimetre-)	Maintenance/increase in soil organic carbon (quantitative -% of organic carbon per soil cubic decimetre-)	<i>On-site increase in soil fertility (quantitative -% of organic carbon per soil cubic decimetre-)</i>
Social	Economic benefits	Income change per household due to project activities (quantitative - US\$/household/year-)	Income change per household due to project activities (quantitative - US\$/household/year-)	Income change per household due to project activities (quantitative - US\$/household/year-)	Income change per household due to project activities (quantitative - US\$/household/year-)
	Institutional development	Change in access to resources by poorest households (qualitative)	<i>Clarification of local property rights</i> and enhancement of poorest households' access to forest resources <i>promoted by project activities</i> (qualitative)	Clarification of local property rights promoted by project activities (qualitative)	Clarification of local property rights promoted by project activities (qualitative)
				Enhancement of poorest households' access to forest resources promoted by project activities (qualitative)	Enhancement of poorest households' access to forest resources promoted by project activities (qualitative)
		Involvement of community-based formal and non-formal organisations in project design, management and decision-making (qualitative)	Involvement of community-based formal and non-formal organisations in project design, management and decision-making (qualitative)	Involvement of community-based formal and non-formal organisations in project design, management and decision-making (qualitative)	Involvement of community-based formal and non-formal organisations in project design, management and decision-making (qualitative)
	Local equity	Number of local people who know about the project, are involved in project activities and perceive benefits (qualitative/quantitative -% of resource users-)	Number of local people who know about the project, are involved in project activities and perceive benefits (qualitative/quantitative -% of resource users-)	Number of local people who know about the project, are involved in project activities and perceive benefits (qualitative/quantitative -% of resource users-)	Number of local people who know about the project, are involved in project activities and perceive benefits (qualitative/quantitative -% of resource users-)
		Project investment in education, health services and capacity building (quantitative -US\$/per capita/year-)	Project investment in education, health services and capacity building (quantitative -US\$/per capita/year-)	Project investment in education, health services and capacity building (quantitative -US\$/per capita/year-)	Project investment in education, health services and capacity building (quantitative -US\$/per capita/year-)

The criteria list was modified as the research proceeded due to a variety of factors. These included difficulties in understanding the indicators' linguistic formulation of the first list, but also due to the importance of including the stakeholders' suggestions on the inadequacy of the initial criteria or on their determination of other potential indicators that could improve the list. In the former sense, some indicators were linguistically reformulated by substituting the notion of "change" by the notion of "maintenance or increase". In the latter sense, the "water quality" quantitative indicators was substituted by a more qualitative one based on "erosive processes" because of the high cost that would imply to measure water quality and establish a cause-effect relationship between the project's use of fertilisers and downstream pollution. In addition to the first list of criteria, the "project's ability to clarify property rights" and the "ecological value of the region were the project develops, according to national priorities" were added.

Appendix D Components, Criteria and Indicators Ratings

Table D.1: Components and Scenarios rating

Stakeholders	Individuals	Components			Scenarios		
		Carbon	Ecological	Social	Afforestation	Conservation	Agroforestry
Government	Gov. 1	70	20	10	10	70	20
	Gov. 2	40	25	35	40	35	25
	Gov. 3	40	10	50	40	50	10
	Gov. 4	50	20	30	60	15	25
	Gov. 5	20	40	40	10	80	20
	Gov. 6	5	35	60	5	35	60
	Gov. 7	40	10	50	50	25	25
NGOs	NGO 1	10	20	70	35	15	50
	NGO 2	20	40	40	60	10	30
	NGO 3	25	50	25	15	70	15
	NGO 4	30	40	30	25	40	35
	NGO 5	34	33	33	30	20	50
Academia	Acad. 1	50	15	35	30	20	45
Project Developers	Proj.dev. 1	60	15	35	20	30	50
	Proj.dev. 2	33.3	33.3	33.3	50	25	25
	Proj.dev. 3	25	35	40	40	10	50
	Proj.dev. 4	20	30	50	40	20	40
	Proj.dev. 5	33	33	34	33	35	32

Table D.2: Criteria rating –blank cells denote missing data-

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS																Total Sum
		Carbon				Ecological						Social						
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity			Water quality and quantity		Soil quality	Economic benefits	Institutional development			Local Equity		
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Ecological value of the project's region, according to national priorities	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	Reduction of erosive processes in both slope and water streams	On-site increase in soil fertility	Household Income change due to project activities	Clarification of property rights promoted by project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services	
Government	Gov. 1	35.00	1.00	15.00	10.00		4.00	4.00	4.00		10.00	8.00		1.00	5.00	1.00	1.00	99.00
	Gov. 2	15.00	10.00	3.00	5.00		7.00	7.00	3.00		3.00	10.00		10.00	10.00	7.00	8.00	98.00
	Gov. 3	15.00	20.00	5.00	15.00		1.00	2.00	2.00		5.00	20.00		5.00	2.00	5.00	1.00	98.00
	Gov. 4	15.00	10.00	6.00	5.00		3.00	6.00	9.00		6.00	10.00		7.00	9.00	7.00	3.00	96.00
	Gov. 5	5.00	3.00	5.00	5.00		10.00	11.00	10.00		5.00	10.00	5.00	11.00	5.00	5.00	5.00	95.00
	Gov. 6	2.00	1.00	1.00	1.00	5.00	5.00	8.00	6.00	5.00	5.00	12.00	1.00	12.00	12.00	12.00	12.00	100.00
	Gov. 7	9.00	5.00	4.00	4.00		5.00	5.00	4.00		5.00	10.00	8.00	9.00	9.00	9.00	9.00	95.00
NGOs	NGO 1	0.00	15.00	5.00	5.00		3.00	3.00	8.00		0.00	11.00	9.00	15.00	8.00	8.00	5.00	95.00
	NGO 2	2.00	4.00	1.00	1.00	12.00	4.00	3.00	10.00	7.00	5.00	10.00	9.00	8.00	6.00	11.00	7.00	100.00
	NGO 3	4.00	5.00	5.00	4.00	7.00	8.00	10.00	7.00	7.00	5.00	7.00	3.00	7.00	8.00	6.00	7.00	100.00
	NGO 4	9.00	5.00	6.00	5.00	6.00	8.00	9.00	5.00	5.00	5.00	6.00	7.00	5.00	7.00	7.00	5.00	100.00
	NGO 5	12.00	0.00	3.00	2.00	7.00	5.00	9.00	7.00	5.00	5.00	12.00	6.00	9.00	9.00	4.00	5.00	100.00
Academia	Acad. 1	20.00	12.00	10.00	18.00		2.00	2.00	2.00		7.00	3.00		15.00	2.00	5.00	8.00	106.00
Academia + Proj.Dev.	Proj.dev. 1	15.00	3.00	2.00	3.00		4.00	10.00	5.00		8.00	10.00	7.00	8.00	10.00	5.00	5.00	95.00
	Proj.dev. 2	10.00	5.00	5.00	5.00	5.00	5.00	5.00	7.50	7.50	5.00	15.00	5.00	5.00	5.00	5.00	5.00	100.00
	Proj.dev. 3	10.00	5.00	7.00	2.00	10.00	5.00	5.00	3.00	3.00	3.00	10.00	2.00	15.00	5.00	10.00	5.00	100.00
	Proj.dev. 4	3.00	5.00	3.00	3.00	5.00	5.00	5.00	5.00	3.00	3.00	12.50	5.00	12.50	12.50	12.50	5.00	100.00
	Proj.dev. 5	10.00	10.00	11.00	6.00	3.00	3.00	5.00	3.00	3.00	3.00	9.00	6.00	7.00	12.00	7.00	2.00	100.00

Table D.3: Criteria rating over 13 indicators –no missing data-

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS													Total Sum
		Carbon				Ecological				Social					
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity		Water quality and quantity	Soil quality	Economic benefits	Institutional development		Local Equity		
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	On-site increase in soil fertility	Household Income change due to project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services	
Government	Gov. 1	35.000	1.000	15.000	10.000	4.000	4.000	4.000	10.000	8.000	1.000	5.000	1.000	1.000	99
	Gov. 2	15.000	10.000	3.000	5.000	7.000	7.000	3.000	3.000	10.000	10.000	10.000	7.000	8.000	98
	Gov. 3	15.000	20.000	5.000	15.000	1.000	2.000	2.000	5.000	20.000	5.000	2.000	5.000	1.000	98
	Gov. 4	15.000	10.000	6.000	5.000	3.000	6.000	9.000	6.000	10.000	7.000	9.000	7.000	3.000	96
	Gov. 5	5.000	3.000	5.000	5.000	10.000	11.000	10.000	5.000	10.000	11.000	5.000	5.000	5.000	90
	Gov. 6	2.000	1.000	1.000	1.000	5.000	8.000	6.000	5.000	12.000	12.000	12.000	12.000	12.000	89
	Gov. 7	9.000	5.000	4.000	4.000	5.000	5.000	4.000	5.000	10.000	9.000	9.000	9.000	9.000	87
NGOs	NGO 1	0.000	15.000	5.000	5.000	3.000	3.000	8.000	0.000	11.000	15.000	8.000	8.000	5.000	86
	NGO 2	2.000	4.000	1.000	1.000	4.000	3.000	10.000	5.000	10.000	8.000	6.000	11.000	7.000	72
	NGO 3	4.000	5.000	5.000	4.000	8.000	10.000	7.000	5.000	7.000	7.000	8.000	6.000	7.000	83
	NGO 4	9.000	5.000	6.000	5.000	8.000	9.000	5.000	5.000	6.000	5.000	7.000	7.000	5.000	82
	NGO 5	12.000	0.000	3.000	2.000	5.000	9.000	7.000	5.000	12.000	9.000	9.000	4.000	5.000	82
Academia	Acad. 1	20.000	12.000	10.000	18.000	2.000	2.000	2.000	7.000	3.000	15.000	2.000	5.000	8.000	106
Academia + Proj.Dev.	Proj.dev. 1	15.000	3.000	2.000	3.000	4.000	10.000	5.000	8.000	10.000	8.000	10.000	5.000	5.000	88
	Proj.dev. 2	10.000	5.000	5.000	5.000	5.000	5.000	7.500	5.000	15.000	5.000	5.000	5.000	5.000	83
	Proj.dev. 3	10.000	5.000	7.000	2.000	5.000	5.000	3.000	3.000	10.000	15.000	5.000	10.000	5.000	85
	Proj.dev. 4	3.000	5.000	3.000	3.000	5.000	5.000	5.000	3.000	12.500	12.500	12.500	12.500	5.000	87
	Proj.dev. 5	10.000	10.000	11.000	6.000	3.000	5.000	3.000	3.000	9.000	7.000	12.000	7.000	2.000	88

Table D.4: Table D.3 Data Normalised

Government	Gov1	3534	1010	15152	10101	4040	4040	4040	10101	8081	1010	5051	1010	1010	100
	Gov2	15306	10204	3061	5102	7143	7143	3061	3061	10204	10204	10204	7143	8163	100
	Gov3	15306	20408	5102	15306	1020	2041	2041	5102	20408	5102	2041	5102	1020	100
	Gov4	15625	10417	6250	5208	3125	6250	9375	6250	10417	7292	9375	7292	3125	100
	Gov5	5556	3333	5556	5556	11111	12222	11111	5556	11111	12222	5556	5556	5556	100
	Gov6	2247	1124	1124	1124	5618	8989	6742	5618	13483	13483	13483	13483	13483	100
	Gov7	10345	5747	4598	4598	5747	5747	4598	5747	11494	10345	10345	10345	10345	100
NGO	NGO1	0000	17442	5814	5814	3488	3488	9302	0000	12791	17442	9302	9302	5814	100
	NGO2	2778	5556	1389	1389	5556	4167	13889	6944	13889	11111	8333	15278	9722	100
	NGO3	4819	6024	6024	4819	9639	12048	8434	6024	8434	8434	9639	7229	8434	100
	NGO4	10976	6098	7317	6098	9756	10976	6098	6098	7317	6098	8537	8537	6098	100
	NGO5	14634	0000	3659	2439	6098	10976	8537	6098	14634	10976	10976	4878	6098	100
Academia	Acad1	18868	11321	9434	16981	1887	1887	1887	6604	2830	14151	1887	4717	7547	100
Academia+ Proj.Dev.	Proj.dev1	17045	3409	2273	3409	4545	11364	5682	9091	11364	9091	11364	5682	5682	100
	Proj.dev2	12121	6061	6061	6061	6061	6061	9091	6061	18182	6061	6061	6061	6061	100
	Proj.dev3	11765	5882	8235	2353	5882	5882	3529	3529	11765	17647	5882	11765	5882	100
	Proj.dev4	3448	5747	3448	3448	5747	5747	5747	3448	14368	14368	14368	14368	5747	100
	Proj.dev5	11364	11364	12500	6818	3409	5682	3409	3409	10227	7955	13636	7955	2273	100

Table D.5: Correlations between those individuals that have missing data in Table D.2 and those that have not - the participant that has a higher correlation with the individual of study is highlighted in bold-

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS														Correlation mean	Correlation normalised
		Carbon				Ecological				Social							
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity		Water quality and quantity	Soil quality	Economic benefits	Institutional development		Local Equity				
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	On-site increase in soil fertility	Household Income change due to project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services			
Correlations for Gov.1	Gov.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Gov.6	15.732	0.899	13.485	8.990	0.719	0.449	0.599	1.798	0.599	0.075	0.375	0.075	0.075	3.375	0.211	
	NGO2	12.727	0.182	10.909	7.273	0.727	0.970	0.291	1.455	0.582	0.091	0.606	0.066	0.104	2.768	0.213	
	NGO3	7.336	0.168	2.515	2.096	0.419	0.335	0.479	1.677	0.958	0.120	0.524	0.140	0.120	1.299	0.163	
	NGO4	3.221	0.166	2.071	1.657	0.414	0.368	0.663	1.657	1.104	0.166	0.592	0.118	0.166	0.951	0.268	
	NGO5	2.416	0.000	4.141	4.141	0.663	0.368	0.473	1.657	0.552	0.092	0.460	0.207	0.166	1.180	0.285	
	Proj.dev.2	2.917	0.167	2.500	1.667	0.667	0.667	0.444	1.667	0.444	0.167	0.833	0.167	0.167	0.959	0.288	
	Proj.dev.3	2.975	0.170	1.821	4.250	0.680	0.680	1.133	2.833	0.680	0.057	0.850	0.085	0.170	1.260	0.282	
	Proj.dev.4	10.150	0.174	4.350	2.900	0.696	0.696	0.696	2.900	0.557	0.070	0.348	0.070	0.174	1.829	0.411	
Proj.dev.5	3.080	0.088	1.200	1.467	1.173	0.704	1.173	2.933	0.782	0.126	0.367	0.126	0.440	1.051	0.313		
Correlations for Gov.2	Gov.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	6.811	9.082	2.724	4.541	1.271	0.795	0.454	0.545	0.757	0.757	0.757	0.530	0.605	2.279	0.212	
	NGO2	5.510	1.837	2.204	3.673	1.286	1.714	0.220	0.441	0.735	0.918	1.224	0.468	0.840	1.621	0.265	
	NGO3	3.176	1.694	0.508	1.059	0.741	0.593	0.363	0.508	1.210	1.210	1.059	0.988	0.968	1.083	0.256	
	NGO4	0.403	0.269	0.081	0.134	0.188	0.188	0.081	0.081	0.269	0.269	0.269	0.188	0.215	0.202	0.378	
	NGO5	1.046	0.000	0.837	2.092	1.171	0.651	0.359	0.502	0.697	0.930	0.930	1.464	1.339	0.924	0.442	
	Proj.dev.2	1.263	1.684	0.505	0.842	1.179	1.179	0.337	0.505	0.561	1.684	1.684	1.179	1.347	1.073	0.546	
	Proj.dev.3	1.301	1.735	0.372	2.168	1.214	1.214	0.867	0.867	0.867	0.578	1.735	0.607	1.388	1.147	0.569	
	Proj.dev.4	4.439	1.776	0.888	1.480	1.243	1.243	0.533	0.888	0.710	0.710	0.710	0.497	1.420	1.272	0.189	
Proj.dev.5	1.347	0.898	0.245	0.748	2.095	1.257	0.898	0.898	0.998	1.283	0.748	0.898	3.592	1.223	0.292		

Table D.5 (cont)

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS														Correlation mean	Correlation normalised
		Carbon				Ecological				Social							
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity		Water quality and quantity	Soil quality	Economic benefits	Institutional development		Local Equity				
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	On-site increase in soil fertility	Household Income change due to project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services			
Correlations for Gov.3	Gov.3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	6.811	18.163	4.541	13.622	0.182	0.227	0.303	0.908	1.514	0.378	0.151	0.378	0.076	3.635	0.197	
	NGO2	5.510	3.673	3.673	11.020	0.184	0.490	0.147	0.735	1.469	0.459	0.245	0.334	0.105	2.157	0.188	
	NGO3	3.176	3.388	0.847	3.176	0.106	0.169	0.242	0.847	2.420	0.605	0.212	0.706	0.121	1.232	0.343	
	NGO4	1.395	3.347	0.697	2.510	0.105	0.186	0.335	0.837	2.789	0.837	0.239	0.598	0.167	1.080	0.301	
	NGO5	1.046	0.000	1.395	6.276	0.167	0.186	0.239	0.837	1.395	0.465	0.186	1.046	0.167	1.031	0.164	
	Proj.dev.2	1.263	3.367	0.842	2.526	0.168	0.337	0.224	0.842	1.122	0.842	0.337	0.842	0.168	0.991	0.257	
	Proj.dev.3	1.301	3.469	0.620	6.505	0.173	0.347	0.578	1.446	1.735	0.289	0.347	0.434	0.173	1.340	0.184	
	Proj.dev.4	4.439	3.551	1.480	4.439	0.178	0.355	0.355	1.480	1.420	0.355	0.142	0.355	0.178	1.440	0.302	
Proj.dev.5	1.347	1.796	0.408	2.245	0.299	0.359	0.599	1.497	1.995	0.641	0.150	0.641	0.449	0.956	0.490		
Correlations for Gov.4	Gov.4	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	6.953	9.271	5.563	4.635	0.556	0.695	1.391	1.113	0.773	0.541	0.695	0.541	0.232	2.535	0.255	
	NGO2	5.625	1.875	4.500	3.750	0.563	1.500	0.675	0.900	0.750	0.656	1.125	0.477	0.321	1.747	0.269	
	NGO3	3.242	1.729	1.038	1.081	0.324	0.519	1.112	1.038	1.235	0.865	0.973	1.009	0.371	1.118	0.272	
	NGO4	1.424	1.708	0.854	0.854	0.320	0.569	1.538	1.025	1.424	1.196	1.098	0.854	0.513	1.029	0.511	
	NGO5	1.068	0.000	1.708	2.135	0.513	0.569	1.098	1.025	0.712	0.664	0.854	1.495	0.513	0.950	0.445	
	Proj.dev.2	1.289	1.719	1.031	0.859	0.516	1.031	1.031	1.031	0.573	1.203	1.547	1.203	0.516	1.042	0.438	
	Proj.dev.3	1.328	1.771	0.759	2.214	0.531	1.063	2.656	1.771	0.885	0.413	1.594	0.620	0.531	1.241	0.460	
	Proj.dev.4	4.531	1.813	1.813	1.510	0.544	1.088	1.631	1.813	0.725	0.508	0.653	0.508	0.544	1.360	0.212	
Proj.dev.5	1.375	0.917	0.500	0.764	0.917	1.100	2.750	1.833	1.019	0.917	0.688	0.917	1.375	1.159	0.293		

Table D.5 (cont)

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS														Correlation mean	Correlation normalised
		Carbon				Ecological				Social							
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity		Water quality and quantity	Soil quality	Economic benefits	Institutional development		Local Equity				
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	On-site increase in soil fertility	Household Income change due to project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services			
Correlations for Gov.5	Gov.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	2.472	2.967	4.944	4.944	1.978	1.360	1.648	0.989	0.824	0.906	0.412	0.412	0.412	1.867	0.321	
	NGO2	2.000	0.600	4.000	4.000	2.000	2.933	0.800	0.800	0.800	1.100	0.667	0.364	0.571	1.587	0.296	
	NGO3	1.153	0.553	0.922	1.153	1.153	1.014	1.317	0.922	1.317	1.449	0.576	0.769	0.659	0.997	0.495	
	NGO4	0.506	0.547	0.759	0.911	1.139	1.114	1.822	0.911	1.519	2.004	0.651	0.651	0.911	1.034	0.352	
	NGO5	0.380	0.000	1.519	2.278	1.822	1.114	1.302	0.911	0.759	1.114	0.506	1.139	0.911	1.058	0.464	
	Proj.dev.2	0.458	0.550	0.917	0.917	1.833	2.017	1.222	0.917	0.611	2.017	0.917	0.917	0.917	1.093	0.407	
	Proj.dev.3	0.472	0.567	0.675	2.361	1.889	2.078	3.148	1.574	0.944	0.693	0.944	0.472	0.944	1.289	0.305	
	Proj.dev.4	1.611	0.580	1.611	1.611	1.933	2.127	1.933	1.611	0.773	0.851	0.387	0.387	0.967	1.260	0.502	
Proj.dev.5	0.489	0.293	0.444	0.815	3.259	2.151	3.259	1.630	1.086	1.537	0.407	0.698	2.444	1.424	0.526		
Correlations for Gov.7	Gov.7	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	4.603	5.115	4.092	4.092	1.023	0.639	0.682	1.023	0.852	0.767	0.767	0.767	0.767	1.938	0.290	
	NGO2	3.724	1.034	3.310	3.310	1.034	1.379	0.331	0.828	0.828	0.931	1.241	0.677	1.064	1.515	0.349	
	NGO3	2.147	0.954	0.763	0.954	0.596	0.477	0.545	0.954	1.363	1.227	1.073	1.431	1.227	1.055	0.346	
	NGO4	0.943	0.943	0.628	0.754	0.589	0.524	0.754	0.943	1.571	1.697	1.212	1.212	1.697	1.036	0.437	
	NGO5	0.707	0.000	1.257	1.885	0.943	0.524	0.539	0.943	0.785	0.943	0.943	2.121	1.697	1.022	0.482	
	Proj.dev.2	0.853	0.948	0.759	0.759	0.948	0.948	0.506	0.948	0.632	1.707	1.707	1.707	1.707	1.087	0.484	
	Proj.dev.3	0.879	0.977	0.558	1.954	0.977	0.977	1.303	1.628	0.977	0.586	1.759	0.879	1.759	1.170	0.438	
	Proj.dev.4	3.000	1.000	1.333	1.333	1.000	1.000	0.800	1.667	0.800	0.720	0.720	0.720	1.800	1.223	0.192	
Proj.dev.5	0.910	0.506	0.368	0.674	1.686	1.011	1.349	1.686	1.124	1.300	0.759	1.300	4.552	1.325	0.229		

Table D.5 (cont)

Stakeholders	Individuals	CRITERIA, SUB-CRITERIA AND INDICATORS														Correlation mean	Correlation normalised
		Carbon				Ecological				Social							
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity		Water quality and quantity	Soil quality	Economic benefits	Institutional development		Local Equity				
						Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities				Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building education or health services			
Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime			Maintenance/increase in water quantity in the correspondent watershed	On-site increase in soil fertility	Household Income change due to project activities									
Correlations for NGO1	NGO1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	0.000	15.523	5.174	5.174	0.621	0.388	1.380	0.000	0.949	1.294	0.690	0.690	0.431	2.486	0.160	
	NGO2	0.000	3.140	4.186	4.186	0.628	0.837	0.670	0.000	0.921	1.570	1.116	0.609	0.598	1.420	0.339	
	NGO3	0.000	2.895	0.965	1.206	0.362	0.290	1.103	0.000	1.517	2.068	0.965	1.287	0.689	1.027	0.355	
	NGO4	0.000	2.860	0.795	0.953	0.358	0.318	1.526	0.000	1.748	2.860	1.090	1.090	0.953	1.119	0.391	
	NGO5	0.000	0.000	1.589	2.384	0.572	0.318	1.090	0.000	0.874	1.589	0.848	1.907	0.953	0.933	0.391	
	Proj.dev.2	0.000	2.878	0.959	0.959	0.576	0.576	1.023	0.000	0.703	2.878	1.535	1.535	0.959	1.122	0.390	
	Proj.dev.3	0.000	2.965	0.706	2.471	0.593	0.593	2.636	0.000	1.087	0.988	1.581	0.791	0.988	1.185	0.400	
	Proj.dev.4	0.000	3.035	1.686	1.686	0.607	0.607	1.619	0.000	0.890	1.214	0.647	0.647	1.012	1.050	0.346	
Proj.dev.5	0.000	1.535	0.465	0.853	1.023	0.614	2.729	0.000	1.251	2.193	0.682	1.169	2.558	1.159	0.529		
Correlations for Acad.1	Acad.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	8.396	10.075	8.396	15.113	0.336	0.210	0.280	1.175	0.210	1.050	0.140	0.350	0.560	3.561	0.340	
	NGO2	6.792	2.038	6.792	12.226	0.340	0.453	0.136	0.951	0.204	1.274	0.226	0.309	0.776	2.501	0.196	
	NGO3	3.915	1.879	1.566	3.524	0.196	0.157	0.224	1.096	0.336	1.678	0.196	0.653	0.895	1.255	0.285	
	NGO4	1.719	1.857	1.289	2.785	0.193	0.172	0.309	1.083	0.387	2.321	0.221	0.553	1.238	1.087	0.350	
	NGO5	1.289	0.000	2.579	6.962	0.309	0.172	0.221	1.083	0.193	1.289	0.172	0.967	1.238	1.267	0.182	
	Proj.dev.2	1.557	1.868	1.557	2.802	0.311	0.311	0.208	1.090	0.156	2.335	0.311	0.778	1.245	1.118	0.363	
	Proj.dev.3	1.604	1.925	1.146	7.217	0.321	0.321	0.535	1.871	0.241	0.802	0.321	0.401	1.283	1.383	0.164	
	Proj.dev.4	5.472	1.970	2.736	4.925	0.328	0.328	0.328	1.915	0.197	0.985	0.131	0.328	1.313	1.612	0.277	
Proj.dev.5	1.660	0.996	0.755	2.491	0.553	0.332	0.553	1.937	0.277	1.779	0.138	0.593	3.321	1.184	0.328		
Correlations for Proj.dev.1	Proj.dev.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
	Gov.6	7.585	3.034	2.023	3.034	0.809	1.264	0.843	1.618	0.843	0.674	0.843	0.421	0.421	1.801	0.193	
	NGO2	6.136	0.614	1.636	2.455	0.818	2.727	0.409	1.309	0.818	0.818	1.364	0.372	0.584	1.543	0.203	
	NGO3	3.537	0.566	0.377	0.707	0.472	0.943	0.674	1.509	1.347	1.078	1.179	0.786	0.674	1.065	0.218	
	NGO4	1.553	0.559	0.311	0.559	0.466	1.035	0.932	1.491	1.553	1.491	1.331	0.666	0.932	0.991	0.547	
	NGO5	1.165	0.000	0.621	1.398	0.745	1.035	0.666	1.491	0.777	0.828	1.035	1.165	0.932	0.912	0.335	
	Proj.dev.2	1.406	0.563	0.375	0.563	0.750	1.875	0.625	1.500	0.625	1.500	1.875	0.938	0.938	1.041	0.444	
	Proj.dev.3	1.449	0.580	0.276	1.449	0.773	1.932	1.610	2.576	0.966	0.515	1.932	0.483	0.966	1.193	0.399	
	Proj.dev.4	4.943	0.593	0.659	0.989	0.791	1.977	0.989	2.636	0.791	0.633	0.791	0.395	0.989	1.321	0.204	
Proj.dev.5	1.500	0.300	0.182	0.500	1.333	2.000	1.667	2.667	1.111	1.143	0.833	0.714	2.500	1.265	0.467		

Table D.6: Criteria rating –missing data adjusted through results from Table D.5-

Stakeholders	Individuals	Criteria, Sub-criteria and Indicators															
		Carbon				Environmental						Social					
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity			Water quality and quantity		Soil quality	Economic benefits	Institutional development			Local Equity	
Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Ecological richness of the project's region, according to national priorities	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	Reduction of erosive processes in both slope and water streams	On-site increase in soil fertility	Household Income change due to project activities	Clarification of property rights promoted by project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services		
Government	Gov. 1	35.00	1.00	15.00	10.00	5.00	4.00	4.00	4.00	3.00	10.00	8.00	5.00	1.00	5.00	1.00	1.00
	Gov. 2	15.00	10.00	3.00	5.00	10.00	7.00	7.00	3.00	3.00	3.00	10.00	5.00	10.00	10.00	7.00	8.00
	Gov. 3	15.00	20.00	5.00	15.00	3.00	1.00	2.00	2.00	3.00	5.00	20.00	6.00	5.00	2.00	5.00	1.00
	Gov. 4	15.00	10.00	6.00	5.00	6.00	3.00	6.00	9.00	5.00	6.00	10.00	7.00	7.00	9.00	7.00	3.00
	Gov. 5	5.00	3.00	5.00	5.00	3.00	10.00	11.00	10.00	3.00	5.00	10.00	5.00	11.00	5.00	5.00	5.00
	Gov. 6	2.00	1.00	1.00	1.00	5.00	5.00	8.00	6.00	5.00	5.00	12.00	1.00	12.00	12.00	12.00	12.00
	Gov. 7	9.00	5.00	4.00	4.00	5.00	5.00	5.00	4.00	7.50	5.00	10.00	8.00	9.00	9.00	9.00	9.00
NGOs	NGO 1	0.00	15.00	5.00	5.00	3.00	3.00	3.00	8.00	3.00	0.00	11.00	9.00	15.00	8.00	8.00	5.00
	NGO 2	2.00	4.00	1.00	1.00	12.00	4.00	3.00	10.00	7.00	5.00	10.00	9.00	8.00	6.00	11.00	7.00
	NGO 3	4.00	5.00	5.00	4.00	7.00	8.00	10.00	7.00	7.00	5.00	7.00	3.00	7.00	8.00	6.00	7.00
	NGO 4	9.00	5.00	6.00	5.00	6.00	8.00	9.00	5.00	5.00	5.00	6.00	7.00	5.00	7.00	7.00	5.00
	NGO 5	12.00	0.00	3.00	2.00	7.00	5.00	9.00	7.00	5.00	5.00	12.00	6.00	9.00	9.00	4.00	5.00
Academia	Acad. 1	20.00	12.00	10.00	18.00	6.00	2.00	2.00	2.00	5.00	7.00	3.00	7.00	15.00	2.00	5.00	8.00
Academia + Proj.Dev.	Proj.dev. 1	15.00	3.00	2.00	3.00	6.00	4.00	10.00	5.00	5.00	8.00	10.00	7.00	8.00	10.00	5.00	5.00
	Proj.dev. 2	10.00	5.00	5.00	5.00	5.00	5.00	5.00	7.50	7.50	5.00	15.00	5.00	5.00	5.00	5.00	5.00
	Proj.dev. 3	10.00	5.00	7.00	2.00	10.00	5.00	5.00	3.00	3.00	3.00	10.00	2.00	15.00	5.00	10.00	5.00
	Proj.dev. 4	3.00	5.00	3.00	3.00	5.00	5.00	5.00	5.00	3.00	3.00	12.50	5.00	12.50	12.50	12.50	5.00
	Proj.dev. 5	10.00	10.00	11.00	6.00	3.00	3.00	5.00	3.00	3.00	3.00	9.00	6.00	7.00	12.00	7.00	2.00

Table D.7: Definitive criteria rating normalised

Stakeholders	Individuals	Criteria, Sub-criteria and Indicators															
		Carbon				Ecological						Social					
		Carbon impact	Cost-effectiveness	Carbon risk	Policy impact	Biodiversity			Water quality and quantity		Soil quality	Economic benefits	Institutional development			Local Equity	
		Net carbon sequestered (tC/ha)	Increase in internal rate of return (relative cost in comparison with another project to reduce the same amount of emissions)	Risk of leakage and natural hazard combined (high, moderate, low)	Eligibility under the CDM compliance regime	Ecological value of the project's region, according to national priorities	Maintenance/increase in local/regional ecosystems connectivity due to project activities	Maintenance/increase in the area's species richness due to project activities	Maintenance/increase in water quantity in the correspondent watershed	Reduction of erosive processes in both slope and water streams	On-site increase in soil fertility	Household Income change due to project activities	Clarification of property rights promoted by project activities	Enhancement of poorest households' access to forest resources promoted by project activities	Involvement of community-based formal and non-formal organisations in project design, management and decision-making	Number of local people who know about the project, are involved in the project activities and perceive benefits	Project investment in capacity building, education or health services
Government	Gov. 1	31.25	0.89	13.39	8.93	4.46	3.57	3.57	3.57	2.68	8.93	7.14	4.46	0.89	4.46	0.89	0.89
	Gov. 2	12.93	8.62	2.59	4.31	8.62	6.03	6.03	2.59	2.59	2.59	8.62	4.31	8.62	8.62	6.03	6.90
	Gov. 3	13.64	18.18	4.55	13.64	2.73	0.91	1.82	1.82	2.73	4.55	18.18	5.45	4.55	1.82	4.55	0.91
	Gov. 4	13.16	8.77	5.26	4.39	5.26	2.63	5.26	7.89	4.39	5.26	8.77	6.14	6.14	7.89	6.14	2.63
	Gov. 5	4.95	2.97	4.95	4.95	2.97	9.90	10.89	9.90	2.97	4.95	9.90	4.95	10.89	4.95	4.95	4.95
	Gov. 6	2.00	1.00	1.00	1.00	5.00	5.00	8.00	6.00	5.00	5.00	12.00	1.00	12.00	12.00	12.00	12.00
	Gov. 7	8.37	4.65	3.72	3.72	4.65	4.65	4.65	3.72	6.98	4.65	9.30	7.44	8.37	8.37	8.37	8.37
NGOs	NGO1	0.00	14.85	4.95	4.95	2.97	2.97	2.97	7.92	2.97	0.00	10.89	8.91	14.85	7.92	7.92	4.95
	NGO2	2.00	4.00	1.00	1.00	12.00	4.00	3.00	10.00	7.00	5.00	10.00	9.00	8.00	6.00	11.00	7.00
	NGO3	4.00	5.00	5.00	4.00	7.00	8.00	10.00	7.00	7.00	5.00	7.00	3.00	7.00	8.00	6.00	7.00
	NGO4	9.00	5.00	6.00	5.00	6.00	8.00	9.00	5.00	5.00	5.00	6.00	7.00	5.00	7.00	7.00	5.00
	NGO5	12.00	0.00	3.00	2.00	7.00	5.00	9.00	7.00	5.00	5.00	12.00	6.00	9.00	9.00	4.00	5.00
Academia	Acad. 1	16.13	9.68	8.06	14.52	4.84	1.61	1.61	1.61	4.03	5.65	2.42	5.65	12.10	1.61	4.03	6.45
Academia + Proj.Dev.	Proj.dev. 1	14.15	2.83	1.89	2.83	5.66	3.77	9.43	4.72	4.72	7.55	9.43	6.60	7.55	9.43	4.72	4.72
	Proj.dev. 2	10.00	5.00	5.00	5.00	5.00	5.00	5.00	7.50	7.50	5.00	15.00	5.00	5.00	5.00	5.00	5.00
	Proj.dev. 3	10.00	5.00	7.00	2.00	10.00	5.00	5.00	3.00	3.00	3.00	10.00	2.00	15.00	5.00	10.00	5.00
	Proj.dev. 4	3.00	5.00	3.00	3.00	5.00	5.00	5.00	5.00	3.00	3.00	12.50	5.00	12.50	12.50	12.50	5.00
	Proj.dev. 5	10.00	10.00	11.00	6.00	3.00	3.00	5.00	3.00	3.00	3.00	9.00	6.00	7.00	12.00	7.00	2.00

Appendix E Workshop Report

Sustainable Development Criteria for Forestry projects operating under Carbon Markets

El Colegio de Mexico, Mexico City, 23rd July 2003

Workshop organised by:

1. The School of Development Studies - University of East Anglia
2. Tyndall Centre for Climate Change Research
3. Instituto Nacional de Ecologia

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Background

The Kyoto Protocol defines three flexibility mechanisms to achieve cost-effective reductions of greenhouse gases. One of them is the so-called Clean Development Mechanism (CDM) defined in article 12 of the Protocol. The CDM enables an industrialised country with greenhouse gases reduction targets to carry out mitigation projects where the cost is lower, such as in a non-Annex I country. The donor receives Certified Emission Reduction units (CERs) in exchange of the achieved greenhouse gas emission reductions whilst the host country receives investment and promotes sustainable development. Modalities and procedures for facilitating the prompt start of CDM projects were agreed in Decision 17/C.P.7 to the Marrakech Accords at the Seventh Conference of the Parties (COP7) and further detailed at COP8. Guidelines on how to develop small-scale energy projects were approved but CDM forestry rules became far more contentious to negotiate.

Relevantly, Decision 17/C.P.7 stated that for the first commitment period (2008-2012) the eligibility of land use, land-use change and forestry project activities is limited to afforestation and reforestation projects and only up to a ceiling of 1% of the fivefold amount of a Party's 1990 emissions. The Decision requested the Subsidiary Body for Technical and Scientific Advice (SBSTA) "to develop definitions and modalities for including afforestation and reforestation project activities under the clean development mechanism in the first commitment period, taking into account the issues of non-permanence, additionality, leakage, uncertainties and socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems... with the aim of adopting a decision on these definitions and modalities at the ninth session of the Conference of the Parties" (article 10.b). SBSTA met in Bonn in June 2003 and drafted a negotiatory text regarding land use, land-use change to discuss at COP9 (FCCC/SBSTA/2003/L.13).

However and for the purpose of this workshop, *the definition of socio-economic and environmental criteria for projects' design and approval, and the extent to which they should influence the decisions made by the developing countries' National Authorities or the CDM Executive Board remain under dispute*. Moreover, the bracketed nature of the SBSTA text indicates there are still several issues to resolve and trade-offs to be made previous to its translation onto the CDM legal framework (e.g. leakage accounting, credits insurance and baseline year for the definition of non-forested land, among

others). Appendix E to the SBSTA document suggests two possible sets of environmental and socio-economic criteria to take into account for the analysis or assessment of impacts of the project activities relevant to projects design, approval and monitoring.

Workshop Objectives and Agenda

The workshop aimed to bring stakeholders together to discuss the importance of sustainable development criteria within carbon projects, and outline the implications of their inclusion in CDM projects or other carbon-based forestry initiatives. Morning key speakers included a climate change officer from the Mexican government, an international consultant from a climate policy and projects advisory firm, two members from auditing and verification international firms and three local NGO members developing on-site voluntary carbon projects. In the afternoon, a working session was held to discuss the first option⁷ of sustainable development criteria proposed in the SBSTA text with the objective to open it to a further scrutiny by a wider audience, which included academic institutions, civil society organisations and multi-lateral agencies. In doing so, discussion over sustainable development criteria was stimulated and views exchanged among participants. Workshop outputs are presented on the following pages and expect to inform CDM policy-makers and to help designing other non-Kyoto compliant carbon-forestry initiatives.

Morning Session

On behalf of the Mexican Government and the Climate Change Office in the Coordination Unit for International Affairs, Manuel Estrada analysed the latest disputes under CDM negotiations on sinks. He emphasised the disjunctive between definitions of the baseline year for what constitutes a deforested area, either land that was deforested prior to 31/12/1989 or prior to 31/12/1999. He stated the importance of including the latest consideration in order to expand the amount of area suitable for afforestation/reforestation projects. He also addressed discussions surrounding carbon permanence (e.g. temporary credits or insured credits), leakage accounting (e.g. only negative leakage or also positive?) or the convenience of setting environmental and socio-economic standards, among others. Analysing the expected carbon market condition, he stressed that Russian hot air will presumably cover all the demand and that the absence of the United States under Kyoto will situate the price of carbon between US\$0.3 and US\$5. Moreover, he believed that CDM projects would become, contrarily than initially expected, the most expensive ones due to high transaction costs and their contribution to the Climate Adaptation Fund and the CDM Executive Board. Even more critically, he signalled the European Union initiative for excluding CDM-forestry based credits under their trading scheme, which will reduce even more the potential demand for such type of projects. Mr. Estrada suggested that a trade-off has to be made between the level of sustainable development criteria evaluation and projects' costs. He stressed the need to strengthen local and national capacities across organisations in order to reduce the costs associated with each project cycle stage (design, validation, verification, monitoring and certification). He finally claimed for the establishment of a broad and orientative set of environmental and socio-economic criteria under sinks, which would not compromise projects' competitiveness.

Robert Tippmann, EcoSecurities Ltd., offered a general overview of the Project Cycle under the CDM and all its steps were presented to the audience (project design, relevant documentation, validation, registration, verification and certification, and issuance of CERs). However, reference was also made to carbon sequestration projects which aim at the GHG markets outside the Kyoto regime. He emphasised the importance of the PDD document as the core document during the project development phase and defined what has to be included: project description and objectives, quantification of GHG benefits elaborated using consistent and transparent methodologies – discounting for risks, uncertainties and leakage-, definition of crediting period and project lifetime,

⁷ The second option was discarded due to the impossibility to discuss it in just a on a one-day workshop.

assessment of environmental and socio-economic impacts, as well as stakeholders' comments. Furthermore, the PDD should include a clear monitoring plan including methodologies to evaluate carbon stocks and flows, methods and measures to address leakage and non-permanence, evaluation of environmental and socio-economic impacts and a description of data storage procedure, amongst other issues relevant to monitoring purposes. Incorporating all stakeholders from early stages of projects' design is important and stakeholders from both national and local levels should be included. He also highlighted the importance to incorporate good forest management principles into projects and take into consideration guidelines from relevant national and international agreements, programmes, and strategies (e.g. other environmental conventions and related national plans and programmes, regional and local development plans and land-use planning, poverty reduction strategies). However, the balance between incorporating such principles and guidelines and project development and transaction costs has to be taken into account as well.

Following on Mr. Estrada presentation, Mr. Tippmann recognized that decisions regarding crucial definitions guiding afforestation and reforestation projects under the CDM, how environmental and socio-economic impacts should be addressed, the crediting period or methods to account for non-permanence have not been made yet. He noticed that projects falling outside Kyoto rules should preferably follow similar procedures than those developed under the CDM with respect to proving additionality, receive independent validation, and they should also present at least a letter of endorsement from the host country to increase their credibility. In particular, community based projects on a smaller scale face the problem to pay the related transaction costs for developing and implementing carbon sequestration projects. Facilities or investment promotion agencies could help to overcome this obstacle by providing the necessary seed capital to such projects.

On behalf of international certifying agencies, Mr. Cesar Berni (Societe Generale de Surveillance) and Mr. Raul Rocha (Det Norske Veritas) shared their experience regarding validation, verification and certification of pilot carbon projects, highlighting the most important problems that these projects face. Main difficulties include the development of consistent baseline scenarios, additionality proof and the establishment of cost-effective monitoring techniques and procedures. Both speakers agreed that negotiations for forestry projects under Kyoto have proved extremely slow and have become a cornerstone for projects' development. Moreover, they urged negotiators to agree upon accounting procedures for addressing baselines, non-permanence and other methodological issues at COP9. They considered that modalities and procedures under the CDM may neither accept up-front crediting nor the issuance of temporary credits and such impediments, together with the low price of carbon, would probably impede the economic viability of forestry carbon projects.

Carlos Marcelo Perez from Servicios Ambientales de Oaxaca and Adalberto Vargas from AMBIO (Chiapas) shared their experiences on developing on-site carbon sequestration projects. They referred to the importance of the project location and the need to respect traditional forest management systems implemented by local inhabitants when developing a carbon scheme. Both speakers presented the nature and operational structure of their organisations and in which way the carbon funds are managed and distributed between project operational aspects and direct payments to local producers. They introduced in which ways communities got informed and involved in the carbon project and outlined the strategies for local participation and project appropriation processes by local resource users.

The Chiapas case study was particularly relevant in underscoring the high costs associated with carbon monitoring, particularly if this aims to assess all carbon plots and all the communities involved. The project currently counts with more than 25 communities benefiting from the carbon revenues although the way in which they participate differ according to the community organisational nature. For example, some communities implement reforestation in communally owned lands because wide agreement exists across all community members on the benefits related to the project. In other communities only a small fraction of the community participates and develops their reforestation activities in family owned plots. Both speakers coincided that the success of carbon projects will strongly depend on the ability of project developers to stimulate a forest culture within participating communities and to create local capacities for local technical responses and local leadership.

In the Questions and Answers session, participants asked the key speakers about several issues. Among others, they demanded further explanations about what “consistent” methodologies for measuring baselines and carbon flows or environmental and socio-economic impacts meant in practice. They also demanded clarification about whether development aid could be used to kick-start projects. Multilateral Agencies representatives noted that there are currently some funds available to start projects. Other commentaries were related to the real demand of carbon projects with high development outputs and whether funds such as the BioCarbon Fund or the Chicago Climate Exchange framework will be ultimately committed to these type of projects. Final questions were addressed to the NGO representatives and focused upon projects’ estimations of local opportunity costs and whether the economic benefits represented a real change in communities’ well being.

Afternoon Session

In the afternoon, participants were divided in four groups according to their affiliation:

- Multilateral Agencies and international NGOs
- Academia
- Mexican NGOs
- Mexican Government

This division helped capturing groups’ differences on criteria qualitative and quantitative evaluation and groups’ perspectives on criteria definitional issues and evaluation methods. Every group had a template outlining the SBSTA proposed criteria list and three columns to be completed (see table in Annex I). Methodology was as follows:

Part A (90 minutes) – Environmental and Socio-Economic criteria

Participants read carefully the environmental and socio-economic criteria and, individually, filled-in the table;

Participants discussed in group each participant’s scoring for each criteria and reached a consensus over a final scoring;

Participants discussed plausible restrictions for an effective qualitative/quantitative evaluation of those *3 more important environmental and socio-economic criteria* and indicated, when appropriate, key sub-criteria to be addressed under the defined criterion.

Part B (20 minutes) – Future architecture of sinks projects

Participants debated a set of proposals for present negotiations and the future architecture of sinks under the Protocol’s second commitment period.

Plenary Session (60 minutes)

Every group coordinator had 10 minutes to report back on the group’s views noting the following:

The group’s three most important environmental and socio-economic criteria;

Substantial disagreements among group participants in ranking the criteria and achieving consensus – if any-;

Common restrictions found to consider and evaluate the criteria and proposals made to overcome such restrictions;

New-proposed criteria and justification for their inclusion in international/national guidelines;

Main proposals for current negotiations and the future architecture of land use, land-use change and forestry activities under the second commitment period.

Results

Multilateral Agencies highlighted that it is important to envision carbon projects from an integral perspective, in which biodiversity conservation and the enhancement of local and regional hydrological systems should play an important part of projects' environmental additionality. The group decided that the "species selection and silvicultural techniques" criterion would fall on third place despite forest protection measures had to be seriously taken into account. The promotion of native species and the project's positioning within wider initiatives for ecosystem conservation and connectivity, such as biological corridors, were proposed as key qualitative sub-criteria. They agreed that costs for obtaining data regarding biodiversity and connectivity indexes could be costly and time consuming. The group's internal debate about socio-economic criteria centred upon land tenure aspects because they are important to understand rural projects in Mexico. Precisely, such particularity led the group to agree that such criterion could not be very important for other developing countries in which land tenure is not as disputed. Therefore, the criterion was ranked on second place whilst participation at all project levels was considered the most important. The group emphasised the need to define *what* constitutes participation and *who* participates. Maintaining a registry of participatory project sessions would have to be incorporated as a qualitative sub-criterion.

Academics were critical with the way in which criteria were defined and framed in the SBSTA text. They argued that most of them were complementary to each other and that sustainable development evaluation is highly context-specific. Therefore, standard lists are hardly useful for project developers. They also claimed that criteria translation from English to Spanish (and other UN official languages) could lead to confusion in interpreting their meaning, leading to understanding flaws across project participants. Within the environmental criteria, they rated the "project effects on the hydrological system" as the most important due to the expected positive relationship between groundwater quality and communities' well being. "Forest protection measures" –to ensure permanence- and "species selection..." became the other most important criteria. In this line of thought, qualitative sub-criteria such as projects' exclusion of genetically modified species and inclusion of multi-purpose species adjusted to local subsistence needs had to be introduced. Precisely, in the socio-economic dimension, local needs were considered the most important to be addressed, with a particular focus upon income diversification and project structures to resolve potential project-based conflicts. Again, they insisted on the complementarities that the majority of the outlined socio-economic criteria held among each other and the need to define much better what are the specific aspects that should be locally addressed.

The government group considered the "species selection..." criterion as the most important, followed by the "expected effects on biodiversity" and "on the hydrological system". Under the first criterion, they considered important to protect endemic species within the project area and promote effective mechanisms for seeds collection. If locally developed, collection may help to increase forestry capacities and they suggested establishing project seedlings in either local or state-based nurseries. They acknowledged seeds collection as an important bottleneck in pilot carbon projects to promote planting diversification. Regarding the effects over the hydrological system, the group recognised that data collection is costly and pointed out that the relationship between forests and water cycle remains understudied and causal relationships are difficult to be established. As potential sub-criteria, the underground water table and the quality and use of water by different resource users were appointed. At the socio-economic level, the government group selected land tenure as a very important dimension to bear in mind, with the objective to understand local agrarian histories and resolve potential conflicts whilst guaranteeing projects' success. Participation and benefit-sharing fell as the following most important criteria. The group stressed the importance of establishing internal rules to ensure local peoples' participation, as well as a quantitative indicator to monitor the investment distribution across project participants' categories. Gender equity and local leadership for project acceptance at the micro-level were also emphasised. In terms of future proposals, they urged COP9 delegations to set up modalities and procedures for small-scale afforestation and reforestation projects. The inclusion of avoided deforestation will ideally have to be reconsidered in future commitment periods.

NGOs hotly debated on the socio-economic criteria and left aside the environmental. As noted in their table results, their criteria rating methodology differed from the other three groups: they accounted for all individuals' weightings and divided the total amount by the number of discussants. From an environmental perspective, they had a highest mean average for the "forest protection measures" criterion, followed by expected effects over biodiversity and the hydrological system. From a socio-economic point of view, the "participation" criterion had the highest mean average. They appointed the "percentage of local people that know about the project" and the "quality of information they have about it" as potential sub-criteria. They agreed that land tenure and resource access should be carefully examined in project design and implementation despite high costs associated with acquisition of agrarian information. According to the group scores, their third ranked criterion had to be "the needs of indigenous and forest dwelling peoples". However, they considered the "inclusion of social and cultural impacts of the project, including capacity building, awareness raising and safety of working conditions" the third most important criterion. This was due to the fact that indigenous needs could be understood as a sub-criterion under the latter. Recognition of local languages and local modes of participation and organisation should be taken into account for an effective dissemination of project objectives and management conditions.

Multilateral Agencies and international NGOs

	3 Highest Rated Criteria	Rating (%)	Comments and restrictions for an effective evaluation of the criterion	Suggested sub-criteria	Further comments
Environmental	Expected effects on biodiversity and ecosystem integrity within the project area and adjacent ecosystems	25	Costs for biodiversity monitoring are expected to be high	Ability of the project area to contribute to regional ecosystems connectivity	--
	Expected effects on the hydrological system (e.g. water table, run-off, watershed, reservoir)	20	Actions undertaken to maximise conservation and management of hydrological basins are very important to favour local and regional populations	--	
	Species selection, origin and processing of reproductive material and silvicultural systems envisaged	15	This is particularly important in afforestation and reforestation initiatives. At the same rating level, “forest protection” measures should be considered	Introduction and promotion of native species	
Social	Stakeholders’ involvement and integration in decision and management processes, access to information on the project and public participation	25	There is a need for sound participation in carbon projects. Need to define <i>who</i> are the “stakeholders”	--	Need to integrate in most of the criteria gender needs and those of the most disadvantaged groups Need to define more clearly how you articulate participation across scales within project framework
	Present and expectable evolution of rights on tenure and land use	20	Land rights are traditionally contested and disputed in Mexico. Land rights and resource access rights are not necessarily overlapped. High costs are associated with obtaining such information	Registry and assessment of internal project disputes (within communities’ boundaries and project framework)	
	Effects on local communities and their employment, market access and food production	20	Communities will be ultimately prone to support projects as far as they feel benefited. This criterion goes in hand with project benefit-sharing	--	

Academia

	3 Highest Rated Criteria	Rating (%)	Comments and restrictions for an effective evaluation of the criterion	Suggested sub-criteria	Further comments
Environmental	Expected effects on the hydrological system (e.g. water table, run-off, watershed, reservoir)	20	The hydrological systems are important for local and regional populations. However, there is a lack of data and a long-term evaluation would be costly	Increase in the quality of both running and underground water	Criteria's rating is not considered a very good technique because projects' criteria are context specific. For example, in a pine forest, fire protection measures would become more important than effects over local biodiversity. On the contrary, on a humid mountain forest, biodiversity would be more important than fire protection
	Forest protection (e.g. pest management, fire control)	20	Actions directed to protect the forest increase the possibility of projects' success	--	
	Species selection, origin and processing of reproductive material and silvicultural systems envisaged	20	This aspect is important because CDM projects will only develop under afforestation and reforestation schemes	Use of multi-purpose species; Non-inclusion of genetically modified organisms	
Social	The needs of indigenous and forest-dwelling peoples	30	It is closely related to other criteria on the list, which refer to satisfaction of local needs (benefit-sharing, employment and market access)	Project committees to resolve conflicts within community boundaries and project framework; Satisfaction of local primary needs; Income diversification	Socio-economic criteria should be prioritised over the environmental. It is the social dimension what guarantees projects' permanence on the ground Socio-economic criteria are also context specific and cannot be defined from outside
	Present and expectable evolution of rights on tenure and land use	25	Projects should not undermine local resource access and all groups should benefit from carbon revenues; Information on the agrarian situation of local communities is time consuming and costly	Expected negative (or positive) change on land rights and resource access	Appendix E lists may need to generate wider categories and create better-defined sub-criteria. Formulations are vague and lead to different interpretations Idiomatic problems arise when these criteria are translated to Spanish (or other UNFCCC languages); e.g. need to be more specific about what is meant by "stakeholders"
	Inclusion of social and cultural impacts of the project, including capacity building, awareness raising and safety of working conditions	20	Criterion formulation is again vast and vague. It received the same rating than the criterion "definition of responsibilities among project stakeholders..."	Enhancement of local peoples' quality of life	It would be important to integrate avoided deforestation in the second commitment period

Government

	3 Highest Rated Criteria	Rating (%)	Comments and restrictions for an effective evaluation of the criterion	Suggested sub-criteria	Further comments
Environmental	Species selection, origin and processing of reproductive material and silvicultural systems envisaged	20	Few restrictions; Project planning and implementation need to appropriately decide on seeds selection and plants provision	Maintenance and incorporation of endemic species; Seeds selection processes and origin	The project should not contravene recommendations for the specific project area according to regional and national environmental legislation
	Expected effects on the hydrological system (e.g. water table, run-off, watershed, reservoir)	20	The relationship between forest systems and underground water storage is not clear; Need for costly studies to evaluate such interaction	Underground water table during project lifetime; Consideration of local water demand and water resource use	
	Expected effects on biodiversity and ecosystem integrity within the project area and adjacent ecosystems	15	Evaluation is costly and increases transaction costs if to be done regularly	Presence or incorporation of international and state-based important species	
Social	Present and expectable evolution of rights on tenure and land use	20	Land tenure is contested in Mexico and therefore it has to be carefully taken into account	Non-existence of local agrarian conflicts	Gender equity has to be taken into account at all levels
	Stakeholders' involvement and integration in decision and management processes, access to information on the project and public participation	15	--	Record of stakeholders' meetings; Existence of a clear organisational structure; Existence of project internal rules and procedures to guarantee local peoples' participation	Local leadership within project communities and within project framework is very recommendable to maximise levels of trust between communities and project developers Need to define small-scale forestry projects guidelines in future negotiations; make avoided deforestation eligible in future commitment periods
	Benefit-sharing, taking into consideration local communities	15	--	Distributive percentages of carbon revenues across project stakeholders	

Non-Governmental Organisations

	3 Highest Rated Criteria	Rating (%)	Comments and restrictions for an effective evaluation of the criterion	Suggested sub-criteria	Further comments
Environmental	Forest protection (e.g. pest management, fire control)	20			
	Expected effects on biodiversity and ecosystem integrity within the project area and adjacent ecosystems	17			
	Expected effects on the hydrological system (e.g. water table, run-off, watershed, reservoir)	15.8			
Social	Stakeholders' involvement and integration in decision and management processes, access to information on the project and public participation	20	Need to guarantee that social capital exists where the project takes place	Percentage of community people that know about the project; Quality of the information disseminated to local people by project developers; Level of local people's understanding about the project	The CDM has already three important limitations: a quantitative one, as there is a cap on CERs use, a conceptual one, as it has been defined according to developed countries' interests, and an additionality one, as developed countries can develop sink activities without much social and environmental regulations. Developing countries' sink activities are becoming over regulated
	Present and expectable evolution of rights on tenure and land use	15.45	Formulation unclear and leads to two main interpretations: a positive one, which implies that the project helps to strengthen local rights over land and resource access or, on the contrary, a negative view in which non-implementation of the carbon project leads to degradation of land and unsustainable resource use	Land percentage under communal/private control; Existence or non-existence of land conflicts	Projects should ensure environmental and socio-economic additionality but a standard set of criteria may be seen as something potentially negative due to the increase in costs and international-based evaluation and monitoring procedures. Criteria might be better addressed on a project basis, according to local realities and the interests of all project developers. National Authorities may act as regulators
	Inclusion of social and cultural impacts of the project, including capacity building, awareness raising and safety of working conditions	12.09	Criterion needs further clarification: "the needs of indigenous peoples and forest dwelling peoples" could actually be considered a sub-criterion of this one	Project's ability to promote gender equity; Recognition of local resource use traditions and customary law	

Discussion

In general, participants welcomed the use of multi-criteria rating as a discussion facilitating technique because it helped them to structure their discussion and obtain clearer views about their concerns. All groups found close connections among criteria, particularly those outlined in the socio-economic dimension. They all agreed that it might be recommendable to define a set of specific sub-criteria, which would ultimately address and consider the issues that the current criteria framework does not take into account. Ensuring gender equality, promote traditional resource access and define clear participatory procedures, together with dispute resolution mechanisms, are some of the aspects that would have to be urgently incorporated. This thinking is in line with recent analyses of the sustainable development dimension of the CDM framework (Troni et al. 2001; Brown and Corbera 2003) or with the concerns raised by some of the lobbying groups and developing countries negotiators at COP8 (CAN 2002; ENB 2002). It is worth noting that soil protection measures, soil fertility and infrastructure impacts were left as unimportant for most groups and received the lesser rating valuation in all cases.

In discussing proposals for present and future negotiations, participants were less innovative and proposals were generally poor. They all agreed that avoided reforestation projects would have to be included in the second commitment period of the Kyoto Protocol –if at any point it enters into force and the first commitment period evolves positively-. Some would argue that these options would be hardly taken into account in the future, particularly in the light of the contentious debate that their possible inclusion generated in the past. In the corridors, participants argued that the Kyoto Protocol, and particularly the CDM, was biased against developing countries and that the interests of the European Union and its environmental NGOs prevailed over those of the organisations working in developing countries. In relation to current negotiations on sinks, such as the credits' insurance debate or the reforestation baseline year, participants rarely positioned themselves. This was due to either lack of time to articulate their ideas or the lack of knowledge about CDM procedures and negotiation processes.

During the plenary session and following on discussions arising within the NGO group, Mexican negotiators put forward the existing contradiction in the sustainable development dimension of the CDM from a negotiation text perspective. Whilst the Kyoto Protocol in its article 12 affirms that it is the host country's prerogative to decide whether a CDM activity assists the country in achieving sustainable development, there is a push by the European Union to put forward a standard list of criteria for projects' environmental and socio-economic assessments, which would increase their planning, verification and monitoring costs and would make forestry projects non-competitive in front of energy-based ones. It was said that forestry CDM projects had already enough rules in terms of additionality, permanence and credit issuance. In this sense, an international NGO affirmed that sustainable development criteria should not be seen as a project's development burden but rather as an opportunity to engage with those companies willing to invest in carbon and other environmental services, such as biodiversity or ecotourism. These companies may be less concerned with the recognition of the project's carbon benefits in the Kyoto framework than with the green development image that the company would portray to most developing countries and the world.

Finally, NGOs representatives accepted that a standard list of criteria may be required to guarantee the social and environmental projects' integrity but argued that criteria should be defined on a project basis. They remarked that countries such as Mexico (and most developing countries) are diverse in environmental, social and cultural terms and, therefore, the standardisation of criteria can be counter-productive. They argued that some regions might need a stronger emphasis on biodiversity criteria, therefore increasing monitoring expenses in this direction, whilst other regions may need a stronger emphasis on social criteria and major inputs in the projects' local organisational aspects (distributive justice, gender equality, income increase and diversification, etcetera).

Policy recommendations

The workshop reflected the importance to open the closed discussions held in climate change negotiations to the wider civil society of every country willing to participate in the CDM. The workshop made evident that participants had problems in interpreting what the criteria meant in practice and how language translation could affect the way in which stakeholders evaluate and monitor the criteria in the field. A more careful explanation of each criterion is needed and becomes important to incorporate other aspects that have been left aside, including projects' ability to promote gender equality, participatory processes and mechanisms to control the project's effects over local species, resource use and traditional forest practices. For climate negotiations purposes, these considerations imply to define *explicitly* what is meant by the general criteria and which issues have to be taken into account, including sub-criterion and indicators.

Stakeholders sustained that if any standard list of sustainable development criteria is agreed at COP9 it should only be indicative for project managers but never used as a threshold for projects' approval. In this sense, responsibility should lie upon the host country National Authority to judge whether every project accomplishes its sustainable development responsibilities. Particularly, National Authorities could promote local and national discussions forums to discuss with other stakeholders the level of projects' sustainable development compliance. In other words, a minimum set of international environmental and socio-economic criteria could be appropriate only if there is flexibility on the way in which the host government, in its prerogative to judge whether a project assists in achieving sustainable development, can adjust it to its particular conditions and every project developer can adjust the project design document and monitoring plan according to the environmental and social nature of the project area.

Everything exposed above has several implications for international negotiators and other carbon-forestry initiatives outside Kyoto:

- Sustainable development criteria are needed to ensure the environmental and social quality of projects. However, they need a better definitional and explanatory framing at both the conceptual and linguistic level. Further clarification of what is meant by concepts such as "stakeholders" or "participation", and a more indicative list of potential sub-criteria or indicators which can serve as guidelines for project design and monitoring, including gender equality and resource use patterns aspects are required;
- Forestry CDM criteria should not be understood as a standard against which forestry projects are validated by the CDM Executive Board but rather established as guidelines for the host countries' National Authorities, which should be ultimately responsible for projects' approval in its sustainable development terms; In doing so, developing countries' responsibilities would not be undermined and the role of National Authorities enhanced and national capacities promoted;
- If the paragraph above applies, any decision on sinks under the CDM should include the obligation of National Authorities to hold *at least* one consultative session for discussing each project's sustainable development dimension with a wider national audience. This session should invite a limited number of people –in order to reduce its costs- from the academia and other national NGOs specialised in forestry and development issues. Session outputs should help the Authority to either reject or accept the project. If rejection applies, project developers may be urged to expand the project considered criteria or conduct more analysis and information gathering of their selected sustainable development criteria. If the project is approved, the National Authority may release a letter of endorsement to the Executive Board annexing the report on the consultative session.
- Carbon-based forestry initiatives *outside* Kyoto may do well in incorporating a strong methodology for sustainable development planning and evaluation, including a list of

considered criteria and sub-criteria for each project; Those projects will have positive effects over a higher number of aspects, not only carbon sequestration but also biodiversity conservation, soil stability, local participation, or integral decision-making process. They will be more expensive for carbon investors but local acceptance and project permanence will be ensured.

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Annex I. Workshop Methodology Table

Table A. Socio-Economic and Environmental Issues to be addressed in social and environmental assessments of afforestation and reforestation carbon projects [adapted from Appendix-E-Option 1, FCCC/SBSTA/2003/L.13, SBSTA-18 Meeting, June 2003]

	Criteria Rating: distribute 100 points among the environmental criteria first and the socio-economic criteria afterwards	Plausible restrictions for an effective qualitative/quantitative evaluation of the criterion (e.g. access to information, high costs in data collection)	Indicate, when appropriate, key sub-criterion to be addressed under the defined criteria (e.g. under "effects on biodiversity and ecosystem integrity...", we could point out the "introduction of endangered local tree species" as a qualitative sub-criterion) Indicate, when appropriate, key sub-criterion to be addressed under the defined criteria (e.g. under "effects on local communities and their employment...", we could point out the "expected or mean increase in household revenue per year along project lifetime" as a quantitative sub-criterion)
<i>Environmental criteria</i>			
1. Impacts of infrastructure developments (roads, nurseries)			
2. Species selection, origin and processing of reproductive material and silvicultural systems envisaged			
3. Soil protection and measures for soil preparation and fertilization			
4. Forest protection (e.g. pest management, fire control)			
5. Expected effects on the hydrological system (e.g. water table, run-off, watershed, reservoir)			
6. Expected effects on biodiversity and ecosystem integrity within the project area and adjacent ecosystems			
7. Expected effects on the soil system (e.g. erosion, alteration of microfauna and microflora)			
<i>Socio-economic criteria</i>			
1. Present and expectable evolution of rights on tenure and land use			
2. The needs of indigenous and forest-dwelling peoples			
3. Definition of responsibilities including those of primary stakeholders, project developers and host country authorities			
4. Stakeholders' involvement and integration in decision and management processes, access to information on the project and public participation			
5. Benefit-sharing, taking into consideration local communities			
6. Effects on local communities and their employment, market access and food production			
7. Inclusion of social and cultural impacts of the project, including capacity building, awareness raising and safety of working conditions			

Table B. LULUCF under present negotiations and the future architecture of the Kyoto Protocol

Main proposals for present negotiations and the future architecture of the Clean Development Mechanism in the second commitment period regarding land use, land-use change and forestry activities –justify the proposals-

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Appendix F Scientific Journal Paper

Climate Policy

Volume 3, Supplement 1, November 2003, Pages S41-S56

Special Supplement on Climate Change and Sustainable Development

Exploring equity and sustainable development in the new carbon economy

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Available online 21 November 2003.

Abstract

Ambitious claims have been made about the development benefits of market-based policy instruments for climate mitigation. We examine the implications of forest carbon projects for different aspects of equity and sustainable development. We apply a stakeholder multi-criteria assessment to explore the range of stakeholders, their roles, interests and perspectives, to a case study in Mexico. Two elements of equity, access to markets and forests, and legitimacy in decision-making and institutions, are discussed. Robust cross-scale institutional frameworks are necessary to ensure that objectives for equity and sustainable development are met and that already marginalised sectors of society are not excluded. These institutions are still developing and their establishment brings together many different stakeholders from government, private sector and civil society. However, the ability of the "new carbon economy" to provide real benefits for sustainable development may ultimately be constrained by the nature of the market itself.

Author Keywords: Equity; Stakeholders; Institutions; Forest carbon projects; Mexico; Market-based mechanisms

1. Introduction: a new carbon economy?

The "new carbon economy" represents the emerging trade in carbon emissions, along with the series of market-based policy instruments designed to reduce global greenhouse gas (GHG) emissions through the creation of markets for carbon such as the flexibility mechanisms of the Kyoto Protocol. These mechanisms are viewed by market advocates as being economically efficient and as providing incentives for a wide range of resource managers, from local to international level, to comply with environmental agreements such as the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. We investigate the sustainable development and equity dimensions emerging from the implementation of pilot phases of these instruments. Insights from political ecology analyses of global environmental policy in diverse areas indicate that this new carbon economy, based on a discourse of global managerialism, has difficulties in incorporating local ecological and social realities, particularly in terms of losers and winners at the local scale ([Adger et al., 2001]). This is partly because carbon markets do not spontaneously emerge; they are created by global and national institutions. Their creation may involve changing property rights, often overturning long-established traditional management and property rights regimes. In the case of forest carbon projects this change may impact on local peoples' access to valuable resources, including environmental services, subsistence and marketed products. This is important for both local livelihoods and sustainable development.

A critical challenge in the new carbon economy is establishing robust cross-scale institutional frameworks to enable an equitable interaction among stakeholders and, more importantly to deliver sustainable development to local communities. Competing interests over forestry carbon projects have to be acknowledged and accommodated, and local needs have to coalesce with the interests of investors, brokers, national governments and local NGOs. We suggest that most of the studies so far carried out of forest carbon projects have focused on technical issues such as additionality, transaction and opportunity costs, permanence and enforcement, and verification. From an institutional perspective, the emphasis has been on the international and national level rather than the interface between national actors, project developers and local communities. Less emphasis has been on equity in access to markets, forests and decision-making. We develop these arguments in this paper with reference to observations of the development of the carbon economy and a land use related carbon sequestration project in Mexico. Our findings are based on empirical research and analysis of stakeholders and institutions using qualitative techniques. The following section of the paper outlines the policy context and role of land use and forestry in climate mitigation. The next section then discusses how equity and sustainable development are defined in the context of climate mitigation. We review the development of the carbon economy in Mexico and present a stakeholder analysis of the Fondo Bioclimatico carbon project in Chiapas. We analyse stakeholders' perspectives and evaluation of criteria and indicators for carbon forestry projects. We conclude by discussing the implications for equity and sustainable development and the evolution of cross-scale institutions within the new carbon economy.

2. Climate mitigation and forestry

Early political negotiations under the UNFCCC made clear that meeting GHG emission targets would require cost-effective strategies to provide incentives to private sector actors to lower their emissions and comply with national and international policies and targets. Involving the private sector potentially mobilises capital and provides a means of channelling it towards environmentally beneficial activities. In the case of the forestry sector, this funding could be used to support forestry development activities and bring direct benefits to poor people in poor countries, diversifying peoples' income and promoting sustainable forest management. These opportunities are highlighted in studies by environmental economists that find carbon sequestration the most economically valuable ecological service provided by forests, which in turn have inspired widespread optimism about the possibility of mitigating climate change through market-based mechanisms for carbon sequestration and storage in forestry (Pearce, 2000 and Pearce, 2001).

The Activities Implemented Jointly (AIJ) pilot phase was launched at the first Conference of the Parties of the UNFCCC in Berlin in 1995 (Decision 5/CP.1). This was conceived as a learning through practice approach, in which investors from developed countries and organisations from developing countries could jointly implement bilateral projects to offset GHG emissions, including energy-oriented projects such as renewable energy, energy efficiency, fugitive gas capture or fuel switching projects, and, relevant for this paper, land use and forestry projects, comprising agriculture, afforestation, forest conservation and restoration projects. All projects should be "compatible with and supportive of national environment and development priorities and strategies" (Decision 5/CP.1). To date, forest projects under the AIJ have been in the minority (20) compared to energy (137). Thirteen of these 20 are located in Latin America. Forest conservation is the most preferred option, accounting for nine of the 20 projects (UNFCCC, 2001 and UNFCCC, 2002). Some examples of these projects are shown in Table 1.

Table 1. Examples of AIJ forest carbon projects in Latin America



(33K)

Investors in forest AIJ projects have generally transferred funds to a project developer, usually a non-governmental organisation (NGO) or similar organisation, which is responsible for the definition of forest carbon management activities and for delivering payments to local producers and communities.

Commonly, producers have received their payments from a trust fund created and administered by project developers, who may include international research institutions and international NGOs. These international organisations have often played a catalytic role by brokering the agreements between the investors and the local on-site organisations. The so-called voluntary character of the AIJ implies that investors have not received carbon credits but have benefited from good publicity and, in some cases, tax reductions in their home country ([Michaelowa, 2000 and Pagiola et al., 2002]).

The 1997 Kyoto Protocol to the UNFCCC defines three market-based mechanisms to promote carbon trading. The Clean Development Mechanism (CDM), as defined in Article 12 of the Protocol, allows investors to receive carbon credits in exchange for the GHG emission reductions, whilst the host country receives investment, which aims to be in line with the sustainable development principles of the host country. Sustainability becomes then a central tenet of CDM projects and implies that projects should be additional in both environmental and social terms, exceeding the benefits that may have occurred in the absence of the project. Sustainability under the CDM means that projects should avoid the skewed regional distribution characterising earlier AIJ projects if global equity is to be promoted ([Pearce, 2000 and Mitchell and Parson, 2001]).

Modalities and procedures for the CDM were finally agreed in Decision 17/CP.7 to the Marrakesh Accords during the seventh Conference of the Parties in November 2001. The CDM framework is complex in terms of technical procedures but also in terms of participating actors. The host country government plays a more significant role than in the AIJ phase and may act as 'regulatory actors by offering intermediary services linking buyers with sellers' ([Pagiola et al., 2002], p. 275). Private companies from developed countries are likely to be carbon buyers and international NGOs may help to kick-start CDM forestry projects by providing technical and economic advice to local organisations. Local NGOs may provide technical assistance to land users and also act as intermediaries between investors, governments and the community groups or land users (see [Pagiola et al., 2002]). Lastly, the UNFCCC governing bodies of the CDM are responsible for determining if projects are acceptable based on specific criteria, including host country acceptance, and delivering carbon credits to the investors.

The Marrakesh Accords allow only limited development of forestry carbon projects. These have included which types of sequestration if any should be counted towards emission reduction targets, and the extent to which national obligations can be met by financing sequestration or sink enhancement in other countries. Decision 17/CP.7 defines the amount of carbon sinks which can be credited, and states that "for the first commitment period, the total of additions to and subtractions from the assigned amount of a party resulting from eligible land use, land-use change and forestry (LULUCF) activities under Article 12, shall not exceed 1% of base-year emissions of that party, times five" (for activities started after 2000). Not only is the amount of credits limited, but the type of activities is also constrained, and in the CDM eligible sink activities are limited to afforestation and reforestation projects during the first commitment period (2008–2012). Negotiations on rules governing these projects are expected to be finalised at the ninth Conference of the Parties to be held in December 2003 in Milan (Italy). The definition of modalities and methodologies for CDM projects is becoming established and the first CDM projects could be registered towards the end of 2003.

During the negotiations, some parties feared that the inclusion of forestry under the CDM could result in a reduction of technological and financial transfers to developing countries ([Mwandosya, 2000 and Ramakrishna, 2000]) or increase the spread of commercial plantations ([FERN, 2000 and Dutschke, 2001]). Others, however, claimed that these investments could lower the costs of reaching emissions targets, and that synergistic effects were likely. Many scholars supported this view, emphasising the "win-win" opportunities that forest carbon projects could provide to biodiversity conservation and rural development ([Fearnside, 1997 and Klooster and Masera, 2000]). Furthermore, there were critical South–North dimensions to debates about the architecture and implementation of the CDM and the role of sinks ([Mitchell and Parson, 2001, Newell, 2000 and Sokona and Huq, 2002] although forest interests were not necessarily divided along these same lines ([Brown, 2001]).

Although the limitations introduced in Marrakesh make most of the early AII forestry projects non-eligible under the UNFCCC trading framework, it has been suggested that their status could change in the second commitment period of the Kyoto Protocol, once these projects have demonstrated their environmental integrity and development potential and can be verified and evaluated according to CDM guidelines ([Nelson and de Jong, 2003]). As new funding windows and new market-based mechanisms, such as the World Bank Bio-Carbon and Community Development funds or the Chicago Climate Exchange are proposed, the carbon economy develops in both Kyoto and non-Kyoto compliant areas.

3. Equity and sustainable development in the context of climate mitigation

The Kyoto Protocol's market mechanisms also claim to contribute to sustainable development. We focus on equity as a key component of sustainable development. It concerns fairness of outcomes both now and in the future—who benefits and who is included in development actions. Equity is also about inclusion in the processes of decision-making for development. Thus equity is both instrumental and a right, concerned with both distributional and procedural justice. In line with emerging pluralist ideas in decision-making ([Adger et al., 2003]), we propose that equity in the context of the new carbon economy comprises three elements: equity in access, equity and legitimacy in institutions and decision-making at all scales, and equity in outcome. These three elements need to be addressed if instruments such as the Kyoto trading mechanisms can make any claim to sustainability. At a minimum, such initiatives require robust and equitable institutions at the local level and means of distributing financial benefits to the stakeholders who may forego immediate and short-term gains in lieu of longer-term benefits of sustainable development ([Brown and Adger, 1994]).

Equity in access to carbon markets relates to the ways in which different actors in society are able to engage with and participate in the emerging carbon market through these types of projects and initiatives. This access will depend on a range of factors including information, communication and knowledge, and the way institutions operate at different scales. Institutions in this instance means both formal organisations and also 'rules in use'. The ease of access to carbon markets will determine the way in which different stakeholders can participate and benefit from the project outcomes. Equity in access to forest resources is important, particularly for poor people in developing countries who depend on forest resources for basic subsistence ([Byron and Arnold, 1999], p. 789). A complex set of property rights and access rules govern different forest services and goods, enabling multiple actors or stakeholders to use and benefit from them. These systems of governance have often evolved over long periods of time and may be customary or de facto, rather than de jure recognised. Rights to access forests are often contested between stakeholders across different scales ([Humphreys, 1996]). Forest carbon projects may involve changes to sets of property rights. In the AII pilot phase some projects implied a change in de jure land rights, as carbon investment funds were used to buy land for expanding either national or private protected areas to promote carbon sequestration whilst enhancing biodiversity conservation.

Equity in institutions and decision-making concerns the way in which projects and rules operate and whether all stakeholders are able to have a voice in the project. Equity will not only be about participation but about inclusion and negotiation of competing views. At each part of the decision-making process, such as designing, starting or managing a forest carbon project, there will be alternatives to consider as well as uncertainty, for example, concerning the success of tree planting, or security of funding. Stakeholders will have different perspectives on these alternatives. The third element of equity concerns the outcomes of projects and the way they impact the different stakeholders. The impacts will be conditioned and partially determined by access and decision-making, but are primarily about who gains and who loses in terms of the distribution of project costs and benefits. It concerns the post hoc evaluation of the project.

In the following sections, we investigate the first two of these three elements of equity; access and property rights, and institutions and decision-making, within the context of a forest carbon project in Mexico. We undertake a stakeholder multi-criteria analysis which enables the roles and interests and

priorities of different stakeholders to be analysed by adapting conventional decision-analysis techniques in a constructivist approach ([Brown et al., 2002]). The methods are outlined in [Section 5](#) whilst the next section describes the context of the project.

4. The Mexican carbon economy and the Fondo Bioclimatico carbon project

Since the start of climate change negotiations in the late 1980s, Mexico has actively engaged in developing policy on climate change. Mexico ratified the Kyoto Protocol in April 2000, and was the first (and to date only) developing country to submit its Second National Communication on Climate Change to the UNFCCC, presenting a national emissions inventory and the main activities undertaken to reduce GHG emissions in each sector of the economy. These activities include programmes on reforestation, energy efficiency and renewables ([CICCM, 2001]). Mexico has four projects registered under the AIJ pilot phase, one of which we analyse here.

The Mexican Government has been supportive of including all types of forestry activities under the CDM or related carbon trading schemes. The Mexican forestry sector consists of small landholders who practice agriculture and forest management on family plots or communally owned land. About 80% of Mexican forests is legally titled to local communities. Mexico has promoted the need to expand the set of viable funding opportunities under the CDM or voluntary emergent markets. Currently, the National Secretariat for the Environment and Natural Resources (SEMARNAT) and the Energy Secretariat (SENER) are leading the process to establish the CDM National Authority, which will be responsible for approving and assessing CDM forestry projects. The participation and roles of the different government agencies has not yet been agreed and setting up the Authority has proved slow and difficult. SENER has started to promote the development of CDM-energy projects under the Prototype Carbon Fund of the World Bank and SEMARNAT is working on defining operational functions and membership of the Authority. The National Forestry Commission (CONAFOR) recently launched the Mexican Forestry Fund, operational by June 2003 and will initially support projects for water conservation through forest management. The operational rules for projects are being developed and it is still unknown whether the Fund will incorporate carbon projects and whether they will adopt the procedures for evaluation and assessment as the National Authority.

Government capacity to deal with climate change policy has been enhanced in recent years. There is increasing involvement of Mexican academic institutions in climate change issues, as demonstrated by a growing number of specialists and studies (see [Burstein et al., 2002]). However, civil society engagement is less active. Limited numbers of NGOs have participated in international negotiations on climate change, for example there are no Mexican NGOs designated as observers to the UNFCCC negotiations, and relatively few regularly and consistently participate at national level. Mexico has a considerable number of local organisations working in forestry and who therefore have an interest in forest carbon projects.

The Fondo Bioclimatico carbon project is located in the Mexican state of Chiapas. The region has experienced considerable political and social unrest and in the past 20 years there has been rapid population growth rate and widespread degradation of forest resources. It is a biologically diverse and natural resource rich area but farmers are poorer than national average, with livelihoods based on subsistence or near-subsistence production of maize and beans, coffee and in some cases, cattle. Conserving forest cover and associated biological diversity was seen as a priority for the region. The project originated during 1994 and 1995 when researchers from the Edinburgh Centre for Carbon Management (ECCM, University of Edinburgh), El Colegio de la Frontera Sur (ECOSUR, Mexico) and assessors from the local Credit Union "Unión de Crédito Pajal Ya kac'tic" (PAJAL) conducted economic and social feasibility studies in eight indigenous and mestizo communities of the Chiapas central highlands. The Mexican National Ecology Institute (INE) and the UK Overseas Development Administration Forestry Research Programme funded these early feasibility studies. Through participatory workshops and interviews they explored the interest of producers affiliated to PAJAL in a project that would provide technical assistance and financial incentives to shift from agriculture to agroforestry, convert pastures to plantations, restore degraded forest, and manage natural forests. The

carbon sequestration potential of the agroforestry activities preferred by local farmers, and the potential to sell carbon was also investigated ([[de Jong and Montoya, 1994](#), [de Jong et al., 1995](#) and [Montoya et al., 1995](#)]).

In 1997, the project was registered under the United States Initiative for Joint Implementation (USIJI) under the name of "Scolel Te", meaning "growing trees" in the Tzeltal language, involving an array of individuals and organisations. The International Automobile Federation (IAF) committed to purchase 5500 t of carbon per year at a price of US\$ 12–10 t⁻¹ over the next 30 years. The price paid per ton of carbon sequestered aims to cover the costs incurred by producers and to generate funds for project management, and varies according to whether the carbon sequestered derives from agroforestry- reforestation activities (higher) or conservation and management of existing forest stocks (lower). This is so because investors consider that, if at some point the project is validated under the CDM, carbon from reforestation may be eligible for trading. The other important project investor has been Future Forests, a UK-based institution, which purchases carbon derived from reforestation activities also at a price of US\$ 12 t⁻¹ of carbon. In order to manage and administer carbon investments, a trust fund named "Fondo Bioclimatico" was created. In early 1998, some of the original researchers established a professional organisation, AMBIO, to promote the project across the region, train community technicians, and deal with administrative and monitoring procedures.

During the last 5 years the project has grown from an initial group of 47 campesinos from six of the surveyed communities to more than 450 carbon suppliers from 20 communities across the region, including some in the neighbouring state of Oaxaca. They belong to either PAJAL or four other local organisations that have joined the project in recent years. Every producer or community involved has their own forest management strategy, a "Plan Vivo", which defines a number of agroforestry, reforestation or conservation activities to be carried out in either individual or communal holdings, and designed according to the specific geographical, physical and ecological conditions of the area ([[Montoya et al., 1995](#), [Soto-Pinto et al., 2001](#) and [Tipper, 2002](#)]).

Producers' participation in the project differs according to the organisation they belong to and their history of land tenure and community organisation. Where the majority of members of a community are involved in the organisation participating in the project or the community shows social cohesion independently from any organisational affiliation, then developing management plans in their communal forest land is possible. But the majority of producers are involved on an individual basis, developing carbon activities on private plots.

Once the Plan Vivo, either collective or individual, is established and approved by project developers, participants receive an up-front payment of about 20% of the carbon expected to accrue from the plan, as a source of initial working capital. They annually receive 60% of the sale price per tonne of carbon sequestered, and the remaining 40% is set aside to cover the costs of technical support for farmers, administrative costs, monitoring and reporting ([[Tipper, 2002](#)]). So far the extent of carbon land per capita has been restricted to 1–2 ha per producer in order to promote income equality across members and communities. However, the income has been variable according to the producer's level of compliance, and to the characteristics of the management area, and some have experienced higher mortality rates or lower growth rates than expected. The maximum income gain for producers, which is dependent on the forestry management system and its carbon sequestration potential, has been estimated at around US\$ 700 over 10 years, a modest but significant amount relative to local incomes.

5. A stakeholder multi-criteria analysis

Stakeholder analysis has been increasingly applied in social science research and, particularly, in the field of natural resource management or conservation and development issues. A first step in the process is the identification of primary and secondary stakeholders. Stakeholders are all those who affect, and/or are affected by, the policies, decisions and actions of the system; they can be individuals, communities, social groups or institutions of any size, aggregation or level in society. The term thus includes policy makers, planners and administrators in government and other organisations, as well as

commercial and subsistence user groups. We define primary stakeholders as those that directly participate in the Fondo Bioclimatico project, and secondary stakeholders those who lie outside project activities but have an influential role in the new Mexican carbon economy and can thus directly or indirectly affect future project development.

During April and May 2002, key informants in the Fondo Bioclimatico project were interviewed and asked to identify other relevant individuals, organisations and interest groups within the project. Members of organisations and government officials were interviewed to identify organisations and groups with interests in the Mexican carbon economy. During October 2002 and March 2003, more than 50 in-depth interviews were conducted across national and local scales and issues such as the global climate change policy, the CDM and carbon markets, as well as project-related topics, such as decision-making procedures, social development, participation and property rights, were discussed. A preliminary analysis of these interviews inform this paper. [Table 2](#) presents the stakeholders, classified according to their scale of influence in decision-making and their interests in project development and the carbon economy.

Table 2. Stakeholders in the Mexican carbon economy and the Fondo Bioclimatico project



(105K)

We used a multi-criteria analysis framework to assess the perspectives of different stakeholders and their preferences for ecological, carbon sequestration and social development criteria. Multi-criteria techniques have been applied in decision analysis, management systems and planning and have recently been applied in resource management and environmental decision-making ([Brown et al., 2002](#), [Bojorquez-Tapia et al., 1994](#) and [Strijker et al., 2000](#)). Multi-criteria techniques have also been suggested to evaluate and appraise JI ([Jackson et al., 2001](#)) and CDM options ([Markandya and Halsnaes, 2002](#)) but they have not been tested in the context of the new carbon economy. This analytical framework was selected because it allows both quantitative and qualitative criteria to be incorporated and for different stakeholders to weight these criteria. The advantage over techniques such as extended cost-benefit analysis is that it does not require that all criteria be reduced to one unit of measure, but at the same time it provides a more structured framework within which to analyse different priorities and preferences than conventional qualitative approaches ([Brown et al., 2002](#)). Sixteen of the 50 individuals participated in the multi-criteria exercise (five government officials, three NGO members, two academics and five project developers) and were asked to evaluate 16 qualitative and quantitative indicators reflecting carbon sequestration, ecological conservation and social development criteria using a set of qualitative techniques, ranking, qualitative scales and percentage weighting. The indicators and dimensions (see [Table 3](#)) were derived from workshops with specialists in forestry, development and climate change, and interviews with key informants in Mexico. Although other studies develop more complex lists of indicators and criteria, for example for CDM project evaluation ([Kolshus et al., 2001](#)), we suggest that fewer indicators facilitate evaluation by a range of stakeholders with diverse kinds of knowledge. By discussing these criteria and indicators with different stakeholders and seeking their priorities and preferences through scoring and ranking exercises, their interests, views and roles could be explored.

Table 3. Criteria and indicators to assess forest carbon projects



(15K)

6. Stakeholder perspectives on the carbon economy

Our interviews and analysis provide insights into the development of the carbon economy in Mexico. This is widely seen as a strategy to capture foreign investment, either from future CDM projects or other mechanisms such as the various World Bank funds or through voluntary investments. The expectation that marketing carbon sequestration and other ecological services has the potential to broaden the economic opportunities of the poor is tempered by scepticism about the current levels of

investment in the forestry sector. Most interviewees recognise that investments so far have been disappointing, but they still expect the CDM and other voluntary markets to develop rapidly.

The stakeholder multi-criteria exercise reveals differing perspectives on the carbon, ecological and social development criteria. Most government officials gave the carbon criteria, particularly net carbon sequestered, investment rate of return, and eligibility under the CDM, the highest weightings. This wider consensus at government level contrasts with the different weightings attributed to the social development criteria by the non-government stakeholders. Opinions are mixed on ecological and social criteria although only one interviewee from an NGO ranked ecological considerations above social development. Project developers were more balanced in their weightings, although ecological and social development criteria were favoured over carbon. This reveals then that different stakeholders view the importance of development, and the priority it should be given in designing forest carbon projects, rather differently. But there are different aspects of development and the indicators reflect this. Of the different indicators of social development, change in income was seen as most important, then participation in project design, then access to forest resources by the poorest households. Participants cited unclear property rights, low investment levels, and the communities' ability to organise and participate in project decision-making as the most important factors for projects' contribution to poverty alleviation. There was a recognition that communities where clear property rights already exist, and where organisations for forest management and managerial capacity are present, are more likely to be beneficiaries of carbon projects.

Different perspectives clearly exist regarding the opportunities and constraints of the carbon economy. Such perspectives will have to be reconciled, particularly at national scale, where information dissemination and organisations' capacity building are still lacking. This will influence how the operational rules for the National Authority are established. NGOs and academics interviewed are able to find roles as project developers or project certifiers and the emerging carbon market is seen as a potential niche for action and accessing resources. But they have very divergent views of how the various mechanisms should work. The government favours internationally recognised firms as the most credible and experienced institutions to conduct certification of projects. NGOs expect to participate in the decisions and to provide advice to government institutions, but as yet such a role remains to be defined by SEMARNAT.

The evolution of these institutional frameworks in response to the carbon markets is continual and adaptive as shown by our analysis of the Fondo Bioclimatico project. Its early emphasis was on the improvement of traditional productive systems, and the carbon sequestration added value to these systems. Interests were balanced between carbon, ecological and social aspects of management of forest and farming systems, reflected in early studies and assessments ([[Montoya et al., 1995](#) and [Soto-Pinto et al., 2001](#)]). Non-carbon related development activities, such as women's welfare and promotion of fruit trees, were central to the project framework. However, this early focus as a community-development project has shifted towards a carbon bank since 1998, in which the primary goal became to market carbon because the interests of the project broker prevailed over other stakeholders ([[Nelson and de Jong, 2003](#)]). The project broker still remains in control of negotiating carbon prices with international investors although increasingly AMBIO members have gained more control over project activities. They have put substantial efforts into developing accounting procedures and establishing clear collaborative agreements between producers, organisations and the trust fund Fondo Bioclimatico.

Knowledge transfer to local producers and equitable participation in project decision-making is still limited but it is being addressed. Some local producers, particularly those joining the project in recent years, lack a clear understanding of climate change and why international firms are interested in funding their forestry activities. AMBIO could strengthen communication by informing local participants about climate change and the framework of the carbon economy. The involvement of farmers in project decision-making may be strengthened in the future through an advisory farmers committee.

In terms of equity and access to forest resources, the carbon project in Chiapas has been successful in establishing collaborative agreements rather than binding contracts with producers. This gives farmers some degree of flexibility about participating in the project and balancing livelihood needs. But there is always the risk that, in working with individual farmers, the project will be biased in favour of farmers with larger holdings who can afford the risk of setting aside a portion of land for reforestation. In one of the participating communities, the project has exacerbated existing conflicts among farmers and between those who participate and those who do not. It is necessary for the future advisory committee of farmers to address conflict resolution. Finally, AMBIO has started also to play a relevant role as a link between the local and national scales. It has started to negotiate with the state government on the possibility to co-finance project activities such as tree nurseries and capacity building programmes across farmer organisations. In addition, it has networked with other NGOs throughout Mexico and exchanges information on carbon forestry projects.

7. Can the new carbon economy support equitable and sustainable development?

Our analysis has highlighted the diverse range of stakeholders and interests involved in forest carbon projects. The interviews and multi-criteria exercise served as a platform to engage experts, government officials, NGOs and communities in the discussion of indicators for assessing the contribution of projects to sustainable development. All stakeholders' interests have been made explicit and, particularly, those of the local poor that are usually neglected in project planning. Evidence suggests that, in the case of Mexico, establishing regulatory and management frameworks, and defining criteria for projects, has been slow and problematic. The process has exposed conflicts of interest between different institutions and sets of stakeholders. In this sense, the role of NGOs in negotiating and monitoring projects is potentially important.

Access to carbon markets and to their benefits depends on a variety of factors across scales, and at local level it critically depends on clear and well-defined property rights and on organisational responses. This complexity of rights in forestry and their social embeddedness mean that only some rights are legible and fit into formal frameworks imposed by international global regimes and government. Some sectors of society depend on less formal rights to access forest resources. This is especially true of poor households and women-headed households. Access to carbon markets is thus socially differentiated in a number of ways. There are indications from Mexico that middle-income communities and producers may be favoured in setting up forest carbon markets.

Equity in institutional decision-making involves the ways in which different stakeholders can engage in, and influence, decision-making and the extent to which representative and inclusive institutions can be built. In the case of forest carbon projects negotiations take place between diverse stakeholders with different power, knowledge, information and even languages. [Edmunds and Wollenberg, 2001] maintain that it is unreasonable to expect consensus and synergy when the 'partners' are so unmatched in terms of power and access to resources. So far it has proved difficult to establish effective government institutions to mediate these relationships and development criteria and frameworks for negotiation and monitoring of projects. Thus, negotiation processes can easily be dominated by more powerful players. The diversity of interests and organisations makes negotiations cumbersome and potentially excludes less articulate and powerful stakeholders. NGOs could play a key role, but their participation is currently limited. Indications are that the institutional framework, in terms of project decision-making and evaluation, and the interfaces with the state and investors at non-local scales, are evolving. But these developments clearly take time. There are lessons in the literature about setting up robust cross-scale institutions to manage complex natural resources which ensure access and benefits are more equitably shared ([Berkes, 2002]). [Smith and Scherr, 2002], p. 7) propose a set of enabling conditions to enhance local livelihood benefits of forest carbon projects, but these still fundamentally depend on secure rights and access to markets, and equitable local social institutions and organisations being in place. In many cases concerning forests, as we have shown, these conditions do not apply, and the danger is that forest carbon projects, whilst seeking to bring development benefits that are poorly defined, may exacerbate existing societal inequalities.

Equity considerations on different scales are critical to the further development of CDM and other Kyoto mechanisms. A number of authors have suggested means by which these can be constructed to ensure anti-poverty and pro-poor development benefits. We have restated that there are disparities between countries, for example with only a handful of countries likely to gain most investments. [Rowlands, 2001] suggests that geographical quotas are necessary to ensure that CDM activities take place throughout the developing world which would enhance more equitable benefits for society and opportunities for facilitating adaptive management. There may be opportunities for creating niche markets for ethically motivated CDM investments, where sustainable development benefits are prioritised above carbon benefits ([Huq, 2002]). This is the thinking behind the Community Development Carbon Fund launched by the World Bank at WSSD in Johannesburg last year. However, even with these reforms to flexible mechanisms and particularly CDM, there is relatively limited scope for forest carbon projects. Demand is by no means assured. For example, many projects in Mexico and elsewhere established without a priori agreed investment are currently on hold or under funded. [Bernoux et al., 2002], p. 385) have argued that the global market is limited and that "the LULUCF-CDM market may be most important as a statement of an emerging global partnership between developed and developing countries to address the global climate change issue rather than a windfall of money to the developing world". It seems likely that the carbon economy will involve the development of markets outside the CDM, including those promoted by consumer-oriented organisations that will try to capture revenues from individuals or companies to finance carbon projects, perhaps channelled through new frameworks or the CDM non-compliant windows of the World Bank Prototype or Biocarbon Fund, as well as the national institutions being established for environmental services, such as those in Mexico. Equity and sustainable development are critical challenges for these new institutions.

Acknowledgements

This research is funded by the Tyndall Centre for Climate Change Research and supported by CSERGE Programme on Environmental Decision-making. The authors would like to thank Instituto Nacional de Ecología, Unidad Coordinadora de Asuntos Internacionales (SEMARNAT), El Colegio de la Frontera Sur and AMBIO in Mexico, and Emily Boyd and Neil Adger at UEA for their collaboration in developing the ideas for this paper. Earlier versions of the paper were presented at the International Society for Ecological Economics Conference in Tunisia in 2002 and the European Society for Ecological Economics in Tenerife 2003. The views expressed, and any errors, remain sole responsibility of the authors.

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Appendix G List of interviewed individuals and organisations in Belize

Government and Multilateral Organisations	
National Meteorological Service. Chief Meteorologist	In-depth interview 20/06/2003
Forestry Department. Chief Forestry Officer	In-depth interview 23/06/2003
United Nations Development Programme. UNDP Programme Officer	In-depth interview 23/06/2003
Coastal Zone Management Authority and Institute. Oceanographer	In-depth interview 24/06/2003
Department of the Environment. Environment Officer	In-depth interview 25/06/2003
Public Information Coordination Unit (Policy Unit), Ministry of Natural Resources. Coordinator	Email questionnaire responded 30/06/2003
Global Environment Fund Small Grants Programme. National Coordinator	In-depth interview 25/06/2003
Protected Areas Conservation Trust. Executive Director	In-depth interview 26/06/2003
NGOs	
Programme for Belize. Technical Coordinator	Preliminary interview 28/03/2003 In-depth interview 08/04/2003 Preliminary meeting and comments 19/06/2003 In-depth interview 24/06/2003
Belize Audubon Society, Research Coordinator; Director of Education, Advocacy and Policy; and Executive Director	Preliminary interview 19/06/2003 In-depth interview 24/06/2003
Society for the Promotion of Education and Research. Executive Director	Interview 19/06/2003
Help for Progress. Executive Director	Interview 23/06/2003
Toledo Institute for Environment and Development. Executive Director	Telephone interview 26/06/2003
Belize Tropical Education Centre. Executive Director	Email questionnaire responded 30/06/2003
Toledo Development Corporation. Executive Director	Email questionnaire responded 10/11/2003
Other	
Mesoamerican Biological Corridor. National Technical Liason Officer	In-depth interview 25/06/2003
Independent Consultant	In-depth interview 24/06/2003

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