

Appendix B

Colombia country paper

Appendix B Colombia country paper

Table of contents

<u>B1. POVERTY ALLEVIATION AND THE CDM</u>	<u>3</u>
B1.1. THE DEVELOPMENT PROFILE IN COLOMBIA	3
B1.1.1. POVERTY IN COLOMBIA	3
B1.1.2. THE INVESTMENT CLIMATE IN COLOMBIA	3
B1.1.3. INSTITUTIONAL FRAMEWORK FOR POVERTY REDUCTION	4
B1.2. THE OVERLAP BETWEEN CDM AND POVERTY REDUCTION	5
B1.2.1. RESEARCH RESULTS	5
<u>B2. CAPACITY BUILDING NEEDS</u>	<u>8</u>
B2.1. EXISTING CAPACITY	8
B2.1.1. INSTITUTIONAL FRAMEWORK FOR CLIMATE CHANGE	8
B2.2. CAPACITY BUILDING ACTIONS TO DATE	9
B2.3. CAPACITY BUILDING NEEDS FOR CDM PROJECT IMPLEMENTATION	11
B2.3.1. RESEARCH RESULTS	11
<u>APPENDIX B1.1: PROJECT STAKEHOLDERS CONSULTED</u>	<u>16</u>
<u>APPENDIX B1.2 POVERTY BASELINE</u>	<u>20</u>
<u>APPENDIX B1.3: DESCRIPTION OF THE PROJECTS SELECTED</u>	<u>22</u>
<u>APPENDIX B1.4 SCOPING OF PROJECT BENEFITS</u>	<u>27</u>
<u>APPENDIX B1.5 ACTORS & INSTITUTIONS - SCOPING OF CAPACITY NEEDS</u>	<u>30</u>

B1. Poverty alleviation and the CDM

B1.1. The development profile in Colombia

B1.1.1. Poverty in Colombia

The UNDP ranks Colombia 12th out of the list of 92 developing countries, an improvement of six places when compared to 1999 (UN Human Development Report, 2000). By Latin American standards, Colombia has one of the highest coverage of basic public services, an life expectancy equal to the average regional and a low illiteracy rate.

These country ratings hide serious income disparities in Colombia. Colombia's Gini coefficient was 0.56 in 1999, making it one of the highest in Latin America.¹ In 1999, the poorest 50 percent of the population received 14 percent of national income. The richest ten per cent received just over 45 percent. Between 1997 and 1999 the growth rate in the number of poor was triple the population growth rate. Small farmers and farm labourers earn the lowest average incomes.²

In 1999, some 56 percent of the population, or 22.6 million people were below the poverty line.³ 11 percent of the population were below the international poverty line of US\$1 per day. In 1999, some 24.9 per cent of Colombian households had one Unsatisfied Basic Need, while over seven percent had more than one. The percentage of households with Unsatisfied Basic Needs is considerably higher in the countryside than in towns.⁵ All poverty indicators show that poverty levels have increased in recent years.

Poverty, guerilla warfare and drug trafficking are intimately linked in Colombia.

B1.1.2. The investment climate in Colombia

¹ Londoño, Juan Luis (1996). Cambios en la Distribución del Ingreso, la Pobreza y el Desarrollo Humano en las Últimas Décadas. Bogotá.

² Londoño, Juan Luis (1996). Cambios en la Distribución del Ingreso, la Pobreza y el Desarrollo Humano en las Últimas Décadas. Bogotá.

³ Colombia has two ways of defining poverty: An index of Unsatisfied Basic Needs (NBI) and the Poverty Line. The NBI index includes criteria such as housing type; connection to water and sewerage services, educational level and others. Households are considered to be poor if they do not positively meet all the criteria. The poverty line is the minimum income level needed to give rise to a minimum calorific intake, together with minimum consumption rates of different food groups. This is weighted by the proportion of total expenditure on food by the poorest 25 per cent of the population.

⁴ Some 42.5% of urban dwellers live below the poverty line and 10.4% below the indigence line; the corresponding figures for country people are 68.9% and 32.5% respectively. Source: National Planning Department's Social Development Unit, 2000.

⁵ Ibid.

Colombia has enjoyed a relatively good economic record for many years. Foreign direct investment (FDI) flows rose from 1.3 percent of GDP in 1993, to 5.6 percent in 1997 (\$5,477 million), mainly due to the privatisation drive in the electricity sector, communications and financial sectors. FDI is expected to play a key role in investment in public infrastructure.

The biggest risk to private investment in Colombia is the political instability caused by almost fifty years of left-wing guerilla activity and the rise of right wing private justice groups, commonly known as paramilitaries, in the 1980s. In recent years, political violence has become more complicated as these two groups have largely financed their subversive activities with money from narco-trafficking.

B1.1.3. Institutional framework for poverty reduction

There is no explicit poverty reduction strategy in Colombia although the principle of sustainable development is recognised by the Colombian constitution. The government's policy, set out in the 1998-2002 National Development Plan, clearly defines the importance of sustainable development on multiple fronts:⁶

- o on the economic front, growth should be driven by rising productivity;
- o on the environmental front, growth should be compatible with the preservation and proper management of natural resources;
- o on the social front, growth should generate employment, skills and opportunities for the poorest as well;
- o on the political front, the process of growth should be essentially fair and participatory."

The government's sustainable development policy is on the whole a philosophical guiding concept. The relevant indicators are in the process of being developed.

Poverty is a rural phenomenon in Colombia and from 1993 responsibility for rural development was decentralized to local government. An integrated fund for rural development, representing municipalities and other public sector departments, and rural community leaders is responsible for financing and implementing infrastructure and services for the rural community.

An ambitious social and economic investment programme in depressed and violence-stricken areas is part of the 1998 - 2002 National Development Plan, which attempts to address the underlying sources of the conflict and complements peace efforts.

⁶ Cambio para construir la paz. Plan Nacional de Desarrollo 1998-2002. Departamento Nacional de Planeación (National Planning Department) (1998) Bogotá.

B1.2. The overlap between CDM and poverty reduction

B1.2.1. Research results

Table B1 sets out the development-focused CDM projects scoped by the Colombian steering committee.

Table B1 Development-focused projects selected

Sector		Project
Energy	Grid connected	
	Renewable energy	1. Landfill gas recovery
	Energy efficiency	2. Efficiency lighting in urban areas
	Off-grid	
	Renewable energy	3. Solar electricity for small villages 4. Substitution of diesel fuel by vegetable oil in diesel generation plants 5. Integrated biogas plants for small farms
Industry	Energy efficiency	6. Coke production
		7. Unrefined brown sugar blocks (panela) furnaces
Forestry		8. Small reforestation units

Appendix B1.3 provides more detailed descriptions, the baseline and the replicability value of the projects.

Table B2 highlights the overlap between greenhouse reduction projects and development objectives.

Table B2 Overlay between greenhouse gas reduction objectives and development priorities in Colombia

Colombia		Projects							
	Development priority	1	2	3	4	5	6	7	8
<i>Crime/Security and Peace</i>	High				XX		XX	XX	XX
Education	High			X					
Employment	High	X		X	X	X	X	X	XX
Housing	High								
<i>Income</i>	High		XX	XX	XX	XX	XX	XX	XX
Energy provision	Medium	XX		XX	XX	XX	XX	XX	
Sanitation	Medium	XX				XX			
Social Exclusion	Medium			XX	XX	XX	XX	XX	XX
Water	Medium								
Food Security	Low				XX				
Health	Low	XX		X		XX	XX	XX	
Transport	Low								
Reliability		L	H	H	H	H	H	H	H
Assured benefits Score		7	5	11	17	15	17	17	18
Other potential Benefits Score		5	0	11	5	5	5	5	0
Total benefits		12	8	22	22	20	22	22	18

Assured benefits, those benefits that would occur through the implementation of the project itself, receive two XX. Potential benefits rely on collateral assets being supplied, for example, solar home systems in rural areas may lead to rural enterprise development if credit services are also provided, however, credit services lie outside the project boundary. 1 X represents these benefits. Each benefit receives one point, which is multiplied by its developing ranking. Impacts are weighted according to development priority: those in a high priority are weighed by 5, medium priority by 3 and low priority by 1. Where the project partners have established medium-high and medium-low priorities the factors are 3.5 and 2.5 respectively. Two numerical rankings are given at the bottom of each column. The first shows the value of the assured benefits, and the second ranking shows the value of potential benefits.

The energy sector is the main focus of the CDM projects scoped through stakeholder consultation in Colombia. Electricity coverage nationwide has reached 93 percent for the urban population but only 55 percent for the rural population. For many, electricity is rationed to a small number of hours per day, because of power shortages and also because of limited affordability. The total number of people living in rural areas is 12 million. People not connected to the grid meet their electricity needs by using either diesel-fuelled generating systems or, in the case of isolated households, small gasoline generators. The total number of people with electrification based on diesel fuel is close to 7 million. The number of people dependent on state subsidies for the diesel provision in order to have subsistence energy is close to 7 million. The total number of municipalities running diesel generator

sets, ranging from 200 kW to 800 kW, is around 500⁷. Wood is still used for cooking. Kerosene lamps or candles provide lighting.

When considering the direct benefits attributable to the scoped projects, C8, which combines reforestation with agro-forestry and livestock activity, has the highest scoring. C4, the substitution of diesel fuel by vegetable oil in diesel generation plants, and C6 and C7, energy efficiency in small-scale manufacturing rank second in terms of direct benefits.

C8 consists of small family parcels of 14 hectares. Household-level agricultural production takes place in 3 of the 14 hectares. The other 11 remaining hectares are dedicated to commercial reforestation with varieties like eucalyptus, pinus caribea or tectona grandis, which have different rotation periods (8 to 20 years). A variation on this is the integration of forestry with livestock activities. The project would be developed in the depressed regions of the Llanos Orientales, the Costa Atlantica and the Magdalena Medio, which are impacted by guerilla groups. C8 is seen as particularly beneficial to crime and security issues because it provides an alternative income stream to illicit cultures for the rural population. The forestry sector is important to Colombia in many ways. A rural population of 1.8 million inhabitants interacts in direct and indirect ways with the natural forest for wood, firewood, timber subsistence and other income streams.

C4, the substitution of diesel fuel by vegetable oil in diesel generation plants, proposes the cultivation of short cycle oleaginous cultures to produce vegetable oil that in turn will substitute the diesel fuel in the diesel generators. The money spent by the municipality to buy the diesel fuel will be used to buy the harvest from the farmers. This money will therefore stay in the rural community creating a legal and profitable economy. The project will solve some of the electricity shortages in the region, providing an impetus for development. The project has been promoted in a few governmental institutions where it was received scepticism due to the unproven nature of the technology in Colombia. Major barriers are the difficulty to find the financial resources to develop a feasibility study to demonstrate the technology. Another important barrier is the exclusively sectoral vision of many of the decision-makers that do not identify with the project because of its multidisciplinary nature.

C6 and C7 are energy efficiency projects focused on the small-scale industrial sector. Coal coke and unrefined, brown sugar blocks (panela) are produced at household level in Colombia. In their great majority, they are small family industries concentrated on rudimentary manufacturing methods. Around 30,000 people are involved in the coal coke production, in production units of around 30 people. The ovens (Pampa or Colmena) are characterised by low energy efficiencies, with no emissions control. Coal consumption is growing at a rate of four percent per year. The production of raw sugar in Colombia is a family activity in rural areas. Around 350.000 people are involved in this activity. The average production is of 40 tonnes raw sugar per year and family. The annual energy consumption is of about 16 tonnes of waste tyres and 40 tonnes of fuel wood, plus sugar cane bagasse (waste).

C5, the provision of integrated biogas systems for small farms, is medium-ranking both in terms of direct benefits and also total benefits (direct & potential). Bio-digestors are a valuable technology for the treatment of organic agricultural wastes as it is a system that: decreases environmental pollution,

⁷ Information supplied by IPSE

increases the fertiliser value of wastes, decreases the concentration of odorous substances, and produces a flammable gas called biogas which has energy value.

For C3 (solar home systems), half of the project benefits are provisional on other services being provided such as education and business development services. When these benefits are considered, the project is boosted to top place, which it shares with two other projects: C6 and C7. Solar electricity is the energy of choice for rural isolated regions in Colombia. According to the ZNI-Study (ZNI: Zonas No Interconectadas or Non Interconnected Zones), over 100,000 PV systems could be installed in these regions. IPSE has already identified 5,600 users in various villages. At the moment, they are screening more villages and expect to identify other 8,000 users.

The lowest ranked project is C2: energy efficiency lighting in the domestic sector, which only has a direct benefit linked to saved income from reduced electricity consumption levels. This effect is small. The second lowest is C1, involving landfill gas recovery, scores highly in the medium ranking priorities of sanitation and energy provision, and could have some employment impacts, although it should be noted that this employment could be negative as well as positive depending on national waste recycling policy.

The conclusions of the Colombian study are summarised as follows

- ?? The majority of projects can yield high direct development benefits (i.e., crime & security and increased income).
- ?? Forestry projects are highly recommended in order to provide alternative income strategies for rural communities currently involved in the illicit drug sector.
- ?? The majority of the projects scoped can yield high indirect development benefits, for example, employment. Employment creation is dependent on mechanisms to translate productivity increases and increased competitiveness into increased employment or provision of clean power into increased employment.
- ?? Many direct impacts are for medium to low development priorities, such as energy provision and increased reliability and social exclusion benefits.
- ?? All projects, except for Project 1: Landfill gas capture, have high replicability.

B2. Capacity building needs

B2.1. Existing capacity

B2.1.1. Institutional framework for climate change

Colombia has signed the UN FCCC in 1995 and has committed itself to the Kyoto Protocol through Law 629, in 2000 (this law transcribes the content of the Kyoto Protocol and adopts it for the Republic of Colombia). The Constitutional Court declared the Kyoto Protocol in accordance with the Colombian Constitution in August of 2001.

The Ministry of the Environment is the focal point for climate change issues. The Office of Economic Analysis has been acting as the CDM Office for Colombia. This office reaches out to other ministries on CDM-related issues.

B2.2. Capacity building actions to date

It is worth noting the activities that have to date been implemented in Colombia to inform the assessment of capacity needs of Colombia with regards to implementation of a greenhouse gas mitigation strategy. Table B3 sets out the capacity building activities carried out in Colombia to date.

The emphasis of capacity building actions to date has been on raising awareness and identifying national mitigation options. These capacity building actions have largely targeted national government - specifically the environment and energy ministries, and a few national associations.

Table B3 Capacity building activities carried in Colombia to date

Sponsor	Activity	Participants
Awareness raising and technical training		
World Bank/ Swiss Government, 2000	Methodological Workshop: CDM – Seminar on the Methodology for the Implementation Study and Project Design	Government: Environment, Energy, Planning Board; Regional Environmental Organizations; Industry Associations; Forestry Associations; Financial sector; Potential Project Developers; Academic Sector (energy and environmental sectors); Consultants.
World Bank/ Swiss Government, 1999	?? Seminar on Forest Projects for CO2 Capture under CDM: Basis and Methodology for Project Formulation ?? Seminar on the Outlook for the GHG market. ?? Workshop on Analyzing the Choco Project	Government: Environment, Energy, Planning Board; Regional Environmental Organizations; Forestry Associations; Financial sector; Potential Project Developers; Academic Sector (forestry and environmental sectors); Consultants.
Scoping/strategy building		
DFID-UK, 2000 - 2002	An assessment of the links between the CDM and poverty alleviation. Recommendations on capacity building actions	
World Bank/ Swiss Government, 2000	National Strategy Study for Implementation of the CDM in Colombia	
World Bank/ Swiss Government, 1999	Workshops for Analysing Alternatives for the Cement Sector	
Ministry of Environment / Accefyn/GTZ, 1998	Seminar 01 on GHG Emissions in Colombia and Reduction Options	
Ministry of Environment / Accefyn/GTZ, 1998	Seminar 02 on GHG Emissions Reduction Options - ENERGY SECTOR	
Ministry of Environment / Accefyn/GTZ, 1998	Seminar 03 on GHG Emissions Reduction Options - NON-ENERGY SECTOR	
Ministry of Environment / Accefyn/GTZ, 1998	Seminar 04 on GHG Emissions Reduction Plan - FINAL RESULTS PRESENTATION	

*Accefyn: Colombian Academy of Exact, Physical and Natural Sciences

GTZ: German Technical Cooperation Agency

In addition, a structured workshop programme is planned for the near future. Key issues to be addressed include project formulation, project evaluation and monitoring issues.

The Environment Ministry has developed an application Form for CDM Projects together with a project formulation guidelines handbook. These documents can be downloaded from the Internet but the best way is to train people on the use of the Application Form together with the Handbook.

One of the major efforts carried out by the Colombian government to develop capacity for the implementation of the CDM was the NSS (National Strategy Study). The Ministry of the Environment,

with support of the World Bank and the Swiss government, developed this study.⁸ The study evaluated the competitiveness of mitigation options in key sectors of the Colombian economy, including forestry, electricity generation, cement and unrefined brown sugar blocks (panela) production. The results include a national marginal cost of abatement curve and estimation of annual CER generation potential. Mitigation options were scoped using a cost model, developed by UNEP Collaborating Centre on Energy and Environment.

B2.3. Capacity building needs for CDM project implementation

B2.3.1. Research results

The gap analysis, shown in Table B4, shows that there is little capacity in Colombia for any of the indicators chosen.

⁸ Opciones para la Reducción de Emisiones de Gases De efecto Invernadero en Colombia, 2000. Funded by GTZ.

Table B4 Gap Analysis

Indicators of capacity	Level of capacity	Details
Skills/expertise/awareness		
Awareness levels	?	There is good awareness among some potential participants and poor awareness in others, such as the development community and regional institutions. The Ministry of Environment and the National Academy of Sciences provide general information on the CDM. However, this is only via the internet, and the information is not comprehensive, and not necessarily linked between the two sources. Investment promotion is competently handled by Coinvertir, a private/public organisation promoting investment in Colombia.
Technical expertise	?	
Institutional		
CDM Office	X	This is being discussed.
Small scale projects bundling mechanism	X	
Technology transfer strategy	X	Technology related information is collected by university and research centres. Information dissemination is poor, and there is no focal point for this.
Policy & Legal Context		
Country climate change strategy	??	The mitigation strategy was carried out using a least cost implementation economic model and applied to a wide range of sectors in the economy. The emphasis was on cost rather than on development benefits.
Legal framework	X	
Integration into other policy areas	X	Rather limited - most policies deal with renewable energy. There is one fiscal incentive in the forestry sector.
Development of standardised approaches to the project design document	X	
Streamlined CDM approval procedures	X	

(X=not available, ?=some/partly, ??=good.)

The following sections provide further country-specific information on four key areas of capacity needs:

- ~~??~~ Awareness raising;
- ~~??~~ Experience in the implementation with the scoped technologies;
- ~~??~~ Supporting fiscal regime.

For information on other capacity indicators, please refer to the main capacity building paper.

B2.3.1.1. Level of awareness among relevant stakeholders

Table B5 highlights the level of awareness among different stakeholder groups. The workshops and seminars organised to date have focused on participation of national actors and institutions. More emphasis needs to be placed on regional organisations and on a wider set of stakeholders across all sectors, such as community organisations and small industry associations. The development community also needs to be targeted.

Table B5 Level of awareness among stakeholder groups in Colombia

Actors/ Institutions	Level of awareness	Comments
Government	High	Awareness is in the government restricted mainly to the Environment and Energy ministries, and the National Planning Board. Information on the CDM is currently disseminated via the internet by the Ministry of Environment and The Colombian Academy of Sciences. The latter contains information on all the studies this institution has carried out with the support of the GTZ (German Technical Cooperation Agency). Internet service is available in all large, medium and small Colombian cities, but not in rural areas, although at present, a programme for bringing Internet service to 300 major rural isolated villages is under way.
Local government	Low	
Business sector	Some	Awareness raising has focused on particular business sector groups, such as the energy sector. However, many of the development-focused projects require awareness among local investors/financiers in sectors other than energy.
Financing institutions	Low	
NGOs	Low	There is little awareness among the development community of the relevance of CDM to the remits.
Research/technical institutes	Some	This is restricted mainly to the National Academy of Sciences.

B2.3.1.2. Experience in technology implementation

Successful experiences of small-scale reforestation projects exist at national level. The country has special ecological characteristics (climatic conditions of temperature, precipitation and quality of soils) that allow the development of forest plantations with very short maturity times (seven years).

Compact fluorescent lamps were introduced during the second mid of the nineties on a private basis and with no governmental support. A total amount of 300,000 installed units has been estimated. However, the potential has been estimated in 18 million units (on the basis of 6 million homes, each home 3 CFL)s.

Biofuel technology has been promoted in few government institutions in Colombia, although the idea has never got past concept stage. A major barrier is the lack of financial resources to develop a feasibility study for a pilot project. Biogas technology faces similar difficulties, although there has

been some experience with biogas production which has demonstrated the viability of using biogas for cooking, illumination, production of heat and also to operate small electric plants.

There is substantial experience in implementation of solar electricity. PV systems were introduced during the second mid of the seventies on private bases and with financial governmental support through the Caja Agraria during the eighties. It is estimated that there are a total of 100,000 installed PV systems. The potential has been also estimated in 1 million units (on the basis of 2 million rural homes).

B2.3.1.3. Integration into other policy areas

Carbon values may improve the internal rate of return of greenhouse gas reduction projects, but in many cases will make a marginal difference. It is important to have supporting policies in the given sector. Fiscal incentives can be particularly important in helping to attract clean technology transfer.

Table B6 highlights the policy tools that Colombia currently applies to the greenhouse gas mitigation sectors.

Table B6 Supporting sectoral policies

	Sectoral strategy plan	Existing fiscal policies relating to the sector
CDM related	☞	X
Sustainable development	☞	X
Poverty reduction	X	X
Renewable energy		<p>The law 6/92, article 123; Tributary Statute, article 158-2 allow to all corporative organization or person to deduce the price of solar heaters (and other equipments teams of renewable energy) until 20% of their taxable liquid rent. Equipments such as solar water heaters fulfill the conditions of the law of tributary benefits.</p> <p>A key instrument is the Law No. 223 of 20 December of 1995. Different items are excluded from VAT. For the sale of solar generators with solar cells, the Ministry of the Environment exempts from the VAT to the solar modules when it is demonstrated that the project reduces the consumption of fuels. Since the module represents 50% of the cost of the system and the VAT is of 16%, the global effect is a reduction of 6% about the value of the solar systems.</p>
Energy efficiency	X	X
Forestry	☞	CIF (Certificado de Incentivo Forestal - Certificate of Forest Incentive. The CIF is of 75% of the costs for forest plantations with autochthonous species and 50% for introduced species, provided the density is bigger than 1000 trees for hectare.
Agriculture	X	X
Waste	X	X
Industrial	X	X
General investment	X	<p>There are 12 free trade zones and incentives relating to transport, tax and foreign investment apply to these. For example, there is exemption from income tax on all export earning, from all custom duties and VAT and from all taxes on the distribution of profits.</p> <p><i>Plan Vallejo</i> is an import- export mechanism through which companies may bring raw materials and other inputs, intermediate goods, capital goods and spare parts into the country, with a full or partial exemption from customs duties and VAT. The imports must be used to produce goods and services primarily for export.</p> <p><i>The Paez Law</i> is a special regime applicable to the zones affected the flooding of the Paez river. This regime gives a 10 year tax holiday to new enterprises. The investment in this region is treated as deductible from income tax. Imports are free of custom duties and VAT.</p> <p><i>The Quimbaya Law</i> helps the coffee zone recover from the earthquake, through income tax exemptions.</p>

Appendix B1.1: Project stakeholders consulted

NAME OF THE ORGANISATION	CONTACTED PERSON
National and Local Government Organisations	
Departamento Nacional de Planeación Unidad Ambiental	Claudia Hernández
Departamento Nacional de Planeación	Diana Hernández Hernández Asistente de Investigación
IDEAM Oficina CYT	Oscar Lozano
Ministerio de Agricultura Unidad Gestión Ambiental	María Teresa Palacios
Ministerio de Minas y Energía Grupo Ambiental Minero Energético	Hugo Duque
Ministerio de Relaciones Exteriores Asuntos Internacionales	Andrea Albán
Ministerio del Medio Ambiente Grupo de Política y Negociación Internacional	Adriana Wolff Delgadillo Coordinadora
Ministerio del Medio Ambiente	Andrea López
Ministerio del Medio Ambiente	Claudio Forner
Ministerio del Medio Ambiente Ambiental Sectorial	Gerardo Viña Director General
Ministerio del Medio Ambiente Oficina de Asuntos y Estudios Económicos	Javier Blanco
Ministerio del Medio Ambiente	José Montoya
Ministerio del Medio Ambiente	Marcela Bonilla Asesora
Ministerio del Medio Ambiente Grupo Analisis Económico y Financiero	María Piedad Medina Asesor
Ministerio del Medio Ambiente Oficina de Asuntos y Estudios Económicos	Mery Gómez
Ministerio del Medio Ambiente	Veronica Leontes
Unidad de Planeación Minero-Energética	Gabriel Sánchez Director
Unidad de Planeación Minero-Energética	Gilberto Jaimes Asesor
Unidad de Planeación Minero-Energética Subdirección Información (E)	Ismael Concha
Unidad de Planeación Minero-Energética	José Dagoberto Ortiz García Profesional Especializado
NGO's and Technical Agencies	
Cecodes	Enrique Guzmán Director de Programas
CEDE (Centro de Estudios para el Desarrollo Económico) Universidad de Los Andes	Ricardo Steiner Director

Centro Administrativo de Estudios de Economía de Medio Ambiente	Thomas Black Consultor
Centro de Estudios Ambientales Universidad Javeriana Depto Ecología y Territorio	Andres Etter Director
Centro de Estudios Ambientales Universidad Javeriana	Ernesto Puertas Dellepianes
CIPE	Vilma Safra Director
CONIF (Corporación Nacional de Investigación y Fomento Forestal)	Gustavo Adolfo Herrera Presidente Encargado
DAMA Proyecto PNUD	Luis Fernando Gonzales Miranda Coordinador
DAMA Proyecto PNUD	Mauricio Bayona Pulido
Fundación Natura	Ximena Franco Villegas Asistente de Dirección
IDEAM	Oscar Suarez
INVEMAR	Francisco Arias
MEND	Fabio González Consultor
MEND	Humberto Rodríguez Consultor
PNUD (Programa de Naciones Unidas para el Desarrollo).	Luis Olmedo Martínez Zamora Gerente Proyecto
Propel Gestión Sectorial	Carlos Mario Tamayo Gerente
Propel Gestión Sectorial	Orlando Quintero Montoya Ingeniero
Unidad de Planeación Minero-Energética	María Cecilia Concha Asesora
Financial Institutions and Micro-Credit Providers	
Bolsa de Bogota SA	Juan Pablo Gómez Asesor Vicepresidencia Ejecutiva
Bolsa de Occidente	Alvaro Pedroza
Bolsa Nacional Agropecuaria	Luis Alberto Huertas/ Pedro Nel Pineda
Commodities y Banca Inversión	Daniel Arcila Ramos Director Proyectos Especiales
Finamerica S.A.	Jose Manuel Montaña Gerente
IFI Reconversión Ambiental	Gewiel Schoenewolf
Industrial and Agricultural Association	
Pensiones y Cesantías Santander	Xenia de Ortíz Gerente de Mercadeo
ACIF (Asociación Colombiana de Ingenieros Forestales)	Alberto Leguizamó Presidente

ACIF (Asociación Colombiana de Ingenieros Forestales)	Nubia Estela Rodriguez Administradora
ACOFORE	Rodrigo Cid Edgar Otavo
ACOPI (Asociación de Pequeños Industriales) Comercio Exterior	Abel Rangel Director
ACOPI (Asociación de Pequeños Industriales)	José Miguel Carrillo Presidente
ANALDEX (Asociación Nacional de Exportadores)	Javier Díaz Molina Presidente
ANDI (Asociación Nacional de Industriales) Asuntos Ambientales	Angela Gómez
ANDI (Asociación Nacional de Industriales) Asuntos Ambientales	Carlos Manuel Herrera Gerente
ASOBANCARIA (Asociación Bancaria) Asuntos Ambientales	María Constanza Mejía
ASOCANA	Liliana María Calero Investigadora
Asociación Colombiana del Petróleo	Alejandro Martínez V. Presidente Ejecutivo
Asociación Colombiana del Petróleo Cambio Climático	Carlos Alberto Guerrero Fajardo Asesor
ASOCOLFLORES (Asocolflores)	Juan Carlos Isaza Director Flor Verde
CAMACOL (Cámara Colombiana de la Construcción)	Eduardo Jaramillo Robledo Presidente
CONFECAMARAS	Eugenio Marulanda Presidente
CONSEJO GREMIAL NAL	María Isabel Silva Nigrinis Directora
Consejo Intergremial de Minería de Colombia	Carlos Fernando Forero Bonell Presidente
FASECOLDA (Asociación Colombiana de Aseguradores)	William Fadul Vergara Presidente
FEDEGAN (Federación Nacional de Ganaderos)	Jorge Visbal Martelo Presidente
FENALCO (Federación Nacional de Comerciantes)	Sabas Pretelt de la Vega Presidente
Instituto Colombiano de Productores del Cemento Ambiental Industrial del Cemento	Ricardo Matallana R. Coordinador Comité
SAC (Sociedad de Agricultores de Colombia)	Fernando Devis Morales Presidente
Local Business and Enterprise Promoters	
Acerías Paz del Rio	Mario Socha
Cámara de Comercio de Bogotá Corporación Ambiental Empresarial	Consuelo Menendez Directora
Cámara de Comercio de Bogotá	Ferney Augusto Rojas Ingeniero Forestal

Cámara de Comercio de Bogotá	Ferney Augusto Rojas Ingeniero Forestal
Cementos Boyacá	Jaime Figueroa, Patricia Moreno Gestión Ambiental
Cementos Boyacá S.A.	Eunice Herrera Directora de Materiales Alternativos
Cementos del Nare S.A	Hernán Pulido Arroyave Asesor Ambiental
Ecolombia Ltda.	José Antonio Villa Lopera Gerente
Empresas Públicas de Medellín E.S.P.	Jaime Aramburo P. Especialista de Planeación
Independiente	Armando Lega Rueda Consultor
Pavco	Luz Marina Montañéz Gerente Ambiental
Pizano Recursos Naturales	Miguel A. Rodríguez M. Director
Clean energy developers	
AISE	Diego Córdoba Gerente General
Ambiencol Ing Ltda	Luis Gabriel Monroy/Carlos Guerrero Consultores
ENERGING	Claudia Marcela Lopez Vargas Ingeniera Proyectos
ENERGING	Linda Adriana Ayala Cristancho Ingeniera Proyectos
Gas Natural	Jorge A Penagos T Gerente Grandes Clientes
Horst Finck & Asociados	Horst Finck Gerente Técnico
INDUSTRIAS TECSOL LTDA.	José Maria Rincón Gerente General
INDUSTRIAS TECSOL LTDA.	Pedro Guevara Patiño Gerente Técnico

Appendix B1.2 Poverty baseline

Poverty and human development in Colombia

The poverty has been studied intensely in Colombia, overall in the last decade. The most important studies are studies by the World Bank⁹, the DNP¹⁰ (National Planning Board) and the reports of DNP under the auspices of the United Nations¹¹.

In the country three indicators are used to measure the advance of the population's conditions of life. Although each one has different methodologies all three inform about the capacity of the families to live a worthy life. The first indicator is that of Unsatisfied Basic Necessities, NBI (Necesidades Básicas Insatisfechas). Through this index it is known the percentage of the population that is lacking one of the five defined basic necessities. The second indicator, Line of Poverty, LP (Línea de Pobreza), allows the assessment of other measures of poverty, such as the gap of poverty, which estimates the resources necessary to lift the poor out of poverty. The third indicator, the Index of Conditions of life, ICV (Índice de Condiciones de Vida), ranks families from the poorest until the richest, in a scale from 0 to 100. The common feature of these indicators in the actual situation is that its progress has stagnated, contrarily to the observed behaviour along the last two decades.

Table 1 shows how the poverty situation measures up to these poverty indicators. Significant proportions of the population fall below these poverty thresholds (11 percent for US\$1 a day and 17.7 percent below the national poverty line).

Table 1 Colombian indicators on Human and Income poverty¹²

Population below income poverty line (%), \$1 a day (1993 PPP US\$), 1983-99	11.0
Adult illiteracy rate (% age 15 and above), 1999	8.5
HPI-1 rank minus income poverty rank.	-9.0
Population below income poverty line (%), National poverty line, 1984-99	17.7
Human poverty index (HPI-1) Rank	9
Probability at birth of not surviving to age 40 (% of cohort), 1995-2000	10.1
Human poverty index (HPI-1) Value (%)	9.1
Underweight children under age five (%), 1995-2000	8
Population not using improved water sources (%), 1999	9

The Index of Human Development of Colombia

In spite of having improved six positions in the classification of the Index of Human Development (IDH) for the 2001, Colombia still ranks lower than Argentina, Uruguay, Chile and Costa Rica (countries of high human development) and Mexico, Panama and Venezuela (countries of medium human development).

⁹ May, E. (General Coordinator). **La Pobreza en Colombia**. TM Editores/Banco Mundial (1996) Bogotá

¹⁰ DNP **Coyuntura Económica Informe 26**. DNP (2000) Bogotá

¹¹ **Desarrollo Humano – Colombia 2000**. DNP-UNDP (2001) Bogotá

¹² **UNDP Human Development Report –2001**. Information available on the web at <http://www.undp.org/hdr2001/>

However life expectancy improved (70.4 years compared to the regional average of 69.3), as well as the adult literacy rate for over- 15s (91.5 percent compared to 87.7, the Latin American average).

The Gross Domestic Product (GDP) per capita decreased to 5.75 dollars, compared to 6 dollars in 2000. The regional average is 6.88 dollars. The inequality in the Colombian society is particularly concerning. 11 percent of the population live with one dollar per day and 17,7 percent live below the national poverty line. 10 percent of the poorest account for 1,1 percent of national income, while the richest 10 percent account for 46,1 percent of the national income. This level of inequality is only surpassed in the region in Paraguay, Bolivia and Brazil.

Bogotá is one of the most dangerous Latin American cities. According to a survey in 1996, 54,6 percent of the population was declared victim of crime, only overcome among the 28 cities analyzed by Buenos Aires (61,1).

Health sector

In the health sector, Colombia has one of the highest indexes in the region, thanks to one of the biggest public expenditure percentages in Latin America (5,2 percent of the GDP, only surpassed by Nicaragua and Costa Rica).

85 population percent has proper sanitation services, 91 percent with improved sources of water, 88 percent with access of essential medications and 80 percent of children of one year are immunized against the tuberculosis. The use of the therapy of oral re-hidratation is very low (53 percent), and there are only 116 doctors per hundred thousand inhabitants - one of lowest ratios in the region.

Colombia suffers 452 cases of malaria for each a hundred thousand people, only surpassed by some Central American countries and Bolivia.

New Index of Technological Advance

The Index of Technological Advance (IAT) has recently been established. Norway heads that index and Colombia ranks 47 out of 72.

The so-called "potential leaders" (19) include Mexico, Argentina, Costa Rica and Chile, and the so-called "dynamic followers" (26) include Colombia and most of the Latin American countries.

Technological exports grow

Colombian exports of high and intermediate technologies accounted for 13,7 percent of total exports in 1999, year.

The number of Internet servers almost duplicated from 0,1 to 1,9 in 2000. The regional average is 5.6.

Appendix B1.3: Description of the projects selected

<p>1. Landfill gas recovery</p>	<p>Waste management through landfills is increasing in Colombia. The main objective of the project is to recover the methane in landfills in small and medium urban centres (200.000<people<500.000). The recovered landfill gas is used as fuel for electricity generation or directly transported by pipelines and consumed (previous treatment) for domestic or little industries applications.</p> <p>Major barriers have been the costs of implementation and the lack of technical information about this technology in Colombia. In Colombia, waste disposal through landfills is a recent practice.</p>
<p>2. Efficient lighting in urban sectors</p>	<p>The project intends to introduce 100.000 CFL in one (or two) intermediate Colombian city(ies). The target population is the low-income inhabitants. This project can be replicated in other Colombian cities.</p> <p>There is a high potential for FCL (Fluorescent Compact Lamps) in Colombia. FCL's were introduced during the second mid of the nineties on private basis and with no governmental support. A total amount of 300,000 installed units has been estimated. However, the potential has been estimated in 18 million units (on the basis of 6 million homes, each home 3 FCL).</p> <p>For a large massive FCL's program, the break even point for the electricity rate computed as the kWh cost that cover the investment leads to 22 mills US\$ (FCL 15 W replacing a 60 W incandescent bulb; FCL's lifetime: 8000 hours equivalent to 5 to 6 years operation @ 4 hours/day); price: 8 US\$).</p> <p>For very low-income consumers, electricity bills savings are not a driving force (the pay low electricity rates). For medium income consumers as well as for low-income consumers the initial cost of the FCL down payment constitutes a barrier to implementation.</p> <p>Major barriers for the massive introduction of the FCL have been:</p> <ul style="list-style-type: none"> ?? Lack of awareness in the consumers ?? High initial (or front) cost for low income consumers
<p>3. Solar electricity for small villages</p>	<p>Solar electricity is the energy of choice for rural isolated regions in Colombia. According to the ZNI-Study (ZNI for Zonas No Interconectadas or Non Interconnected Zones) over 100,000 PV systems could be installed in these regions. IPSE has already identified 5600 users in various villages. At the moment, they are screening more villages and expect to identify other 8000 users.</p> <p>The total number of people living in Colombian rural areas is 12 million. About 40% have no access to electricity (e.g. 5 millions). 10,000 PV systems would provide electricity services to 50,000 people.</p> <p>Kerosene lamps have been traditionally used in the rural sector. Small batteries have covered small electricity demands. PV systems are able to supply electricity for appliances like CFL's (or fluorescent tubes), radio-cassettes and small 12 W black and</p>

	<p>white TV.</p> <p>There is a high potential for PV Systems in Colombia. PV systems were introduced during the second half of the seventies on private basis and with financial governmental support through the Caja Agraria during the eighties.</p> <p>A total amount of 60,000 to 80,000 installed PV systems has been estimated. This figure has been calculated on the basis of 3000 systems sold during the last 20 years. The potential has been also estimated in 1 million units (on the basis of 2 million rural homes).</p> <p>The project consists of the installation of 10,000 PV systems over the next 4 years.</p> <p>Two major barriers have been detected for the further penetration of PV systems in rural areas:</p> <ul style="list-style-type: none"> ?? Financial constraints: There are no financing lines for the system and the cost is normally paid in one installment. ?? Service: Only in regions where a relative high density of systems can local expertise and spare parts service can be provided to the consumers. <p>About 2/3 of the final costs of the PV system are imported elements. 1/3 is made of locally manufactured elements.</p>
<p>4. Substitution of diesel fuel by vegetable oil for electricity generation in Diesel generator plants</p>	<p>The project proposes the substitution of diesel fuel by vegetable oil for electricity generation in diesel generators. The project is to be developed in a typical village where electricity is supplied by a diesel generation plant. The total number of municipalities running diesel generators sets is around 500, ranging from 200 kW to 800 kW¹³.</p> <p>The project propose the substitution of illegal cultures by short cycle oleaginous cultures to produce vegetable oil which in turn will substitute the diesel fuel for the diesel generators. The money spent by the municipality to buy the diesel fuel will be used to buy the harvest to the farmers. This money will stay in the rural community creating a legal and profitable economy. The electricity will become an instrument for development and not a subsistence element as it is actually.</p> <p>A demonstration project can be developed in few (for example, in 10) communities and after development and evaluation of results, can be replicated in other communities. The replication potential is in the order of hundreds (up to 500 hundred).</p> <p>The project has been promoted in few governmental institutions where they remain sceptical due to the novelty of the idea. Major barriers are: the difficulty to find the financial resources to develop a feasibility study to demonstrate the helpfulness of the idea and to select 10 pilot sites. Another important barrier is the exclusively sectoral vision of many of the decision makers that do not have experience in dealing with a project that is multidisciplinary in nature.</p> <p>?? The total number of people with electrification based on diesel fuel is close to 7</p>

¹³ Information supplied by IPSE

	<p>million.</p> <ul style="list-style-type: none"> ✍ The number of people dependent on state subsidies for the diesel provision in order to have subsistence energy is close to 7 million. ✍ The total number of municipalities running diesel generators sets is around 500, ranging from 200 kW to 800 kW. <p>The use of diesel fuel for road vehicles is increasing due to difference costs between gasoline and diesel fuel. At the moment, diesel price is around 50% of gasoline price.</p>
<p>5. Integrated biogas plants for small farms</p>	<p>Electricity is currently supplied for a few hours per day. Reasons can be the lack and/or cost of fuel. The project will aim to extend electricity production to more than 4 hours a day.</p> <p>For productive purposes, alternatives like photovoltaic generation have high costs. Currently, rural communities use diesel plants in the range 50 to 100 kW and higher.</p> <p>Experiences carried out in Colombia have allowed the demonstration of biogas technologies for cooking, lighting, production of heat and also to operate small electric plants.</p> <p>Biogas plants have a series of advantages like:</p> <ul style="list-style-type: none"> ?? Reduction of the firewood consumption and fuels for small electric plants ?? Bio-fertilizer production, displacing commercial fertilizers with nitrogen content ?? Improvement of the level of health of the family ?? Increase of the free-time of women in the kitchen <p>Successful experiences in Colombia and in other countries have demonstrated the possibility to integrate the production of allowances and of energy in a sustainable way.</p> <p>Major barriers for the diffusion of these systems has been:</p> <ul style="list-style-type: none"> ?? Perception: new technologies are only accepted when they have been demonstrated. ?? The relatively high initial cost. ?? Absence of qualified personnel that offers the maintenance services. <p>The project seeks to introduce 2000 systems of integrated biogas units (capacity of 10 m³, generation approx. 2 m³ biogas per day) in the Colombian rural sector, in the southwest and the north coast, and in regions between 0 and 2000 m above sea level.</p>
<p>6. Energy efficiency in the coke production</p>	<p>Coal coke and unrefined, brown sugar blocks (panela) are produced at household level in Colombia. In their great majority, they are small family industries concentrated on rudimentary manufacturing methods. Around 30,000 people are involved in the coal coke production, in production units of around 30 people. The ovens (Pampa or Colmena) are characterised by low energy efficiencies, with no emissions control.</p> <p>The project consists of the substitution of the ovens type Colmena or Pampa for Solera or Vertical oven, with additional arrangements to take advantage of the hot</p>

	<p>residual gases in the cooking and brick drying.</p> <table border="1" data-bbox="483 264 1401 577"> <thead> <tr> <th>OVEN TYPE</th> <th>NUMBER OF OVENS</th> <th>INSTALLED CAPACITY (thousand tonnes)</th> <th>PRODUCTION (thousand tonnes)</th> <th>RAW COAL (thousand tonnes)</th> </tr> </thead> <tbody> <tr> <td>Vertical</td> <td>57</td> <td>360</td> <td>250</td> <td>420</td> </tr> <tr> <td>Solera</td> <td>34</td> <td>35</td> <td>35</td> <td>62</td> </tr> <tr> <td>Colmena</td> <td>589</td> <td>236</td> <td>130</td> <td>250</td> </tr> <tr> <td>Pampa</td> <td>228</td> <td>164</td> <td>119</td> <td>220</td> </tr> <tr> <td>Total</td> <td>908</td> <td>795</td> <td>534</td> <td>952</td> </tr> </tbody> </table> <p>Besides the improvement in the energy efficiency in the coke production process, production time decreases and better quality is obtained in the end product. The reduction of emissions is achieved by the fuel saved for the brick production, in this case mineral coal, and also for the raw material saving in the coke consumption. The project considers 5 medium ovens with a capacity of production of 900 tonnes/month each one.</p> <p>The main barriers to these projects have been the implementation costs, since the families dedicated to this activity have limited affordability.</p> <p>Coal consumption is growing at a rate of 4% per year.</p>	OVEN TYPE	NUMBER OF OVENS	INSTALLED CAPACITY (thousand tonnes)	PRODUCTION (thousand tonnes)	RAW COAL (thousand tonnes)	Vertical	57	360	250	420	Solera	34	35	35	62	Colmena	589	236	130	250	Pampa	228	164	119	220	Total	908	795	534	952
OVEN TYPE	NUMBER OF OVENS	INSTALLED CAPACITY (thousand tonnes)	PRODUCTION (thousand tonnes)	RAW COAL (thousand tonnes)																											
Vertical	57	360	250	420																											
Solera	34	35	35	62																											
Colmena	589	236	130	250																											
Pampa	228	164	119	220																											
Total	908	795	534	952																											
<p>7. Raw sugar furnaces</p>	<p>The production of raw sugar in Colombia is a family activity in rural areas. Around 350,000 people are involved in this activity. The average production is of 40 tonnes of raw sugar per year and family. The annual energy consumption is of about 16 tonnes of waste tyres and 40 tonnes of fuel wood, plus sugar cane bagasse (waste).</p> <p>The project is to improve by 50% - 60% the efficiency of raw sugar furnaces, refurbishing the actual combustion system or changing the design introducing vapour process, reducing the fuel wood and waste tyres and others nonconventional fuel consumption.</p> <p>In refurbished plants, the energy consumption decreases to 8 tonnes of waste tyres and 20 tonnes of fuel wood, according to experimental data.</p> <p>The total number of raw sugar family factories is 25.000. The project target is 10% of this figure.</p> <p>Major barriers have been the costs of implementation and the lack of technical information about these applications. The technology has been developed but requires the financial support for its mass introduction. In the case of larger factories, people require technical and management training.</p>																														
<p>8. Small reforestation units</p>	<p>The project consists of small family parcels of 14 hectares. Two types of parcels are considered: Type 1. Parcels in which 3 hectares are used for the cultivation of agricultural products and the 11 remaining are dedicated to commercial reforestation with varieties such as eucaliptus, pinus caribea or tectona grandis, which have different rotation periods (8 to 20 years). Type 2. Similar to Type 1 except that the 11</p>																														

	<p>hectares are used for a mix of reforestation with cattle raising. The reforestation in this case would be with varieties like eucalyptus or tectona grandis. In this area it would be possible to raise up to 21 cows.</p> <p>The area of the property of 14 hectares is the minimum area required to make the sustainable project economically for a rural family.</p> <p>The project seeks to develop 900 units of the type 1 and 2. The regions where the project would be developed are depressed regions of the Llanos Orientales, the Costa Atlantica and the Magdalena Medio. These regions are also affected by guerrilla activity. This project then could give alternative income strategies to these rural communities, thereby contributing to the Colombian peacebuilding process.</p> <p>The potential for replication of this project is a factor 100.</p>
--	--

Appendix B1.4 Scoping of project benefits

Project #	Project name	Primary (direct) benefits	Secondary (indirect) benefits	Empowerment
1	Landfill gas recovery	<ul style="list-style-type: none"> ?? Diversification of energy supply ?? Avoids noxious emissions ?? Avoids spread of infectious diseases ?? Improves visual impact of urban centres ?? Increased demand and use of local materials (33% of system comprises locally produced elements) 	<ul style="list-style-type: none"> ?? Promotes jobs in service and maintenance 	
2	Efficient lighting in urban sectors	<ul style="list-style-type: none"> ?? Increases in income through a reduction in energy expenditure (electricity) 	<ul style="list-style-type: none"> ?? Increased access to savings 	<ul style="list-style-type: none"> ?? Increases the participation of the target population in decision-making.
3	Solar electricity for small villages	<ul style="list-style-type: none"> ?? Increased diversification of energy supply ?? Increased reliability of energy supply ?? Increases in income through a reduction in energy expenditure (batteries, kerosene & candles) ?? Increased demand and use of local materials (33% of system comprises locally produced elements) 	<ul style="list-style-type: none"> ?? Improves access to the media ?? Improves access to education ?? Improved health ?? Increased access to productive uses of time ?? Increases access to savings ?? Promotes jobs in the service and maintenance sector. 	<ul style="list-style-type: none"> ?? Promotes links between micro and meso level actors and institutions. ?? Increases the participation of the target population in decision-making.
4	Substitution of diesel	<ul style="list-style-type: none"> ?? Diversification of energy supply 	<ul style="list-style-type: none"> ?? Improves awareness 	<ul style="list-style-type: none"> ?? Promote community

	fuel by vegetable oil	<ul style="list-style-type: none"> ?? Increased reliability of energy supply ?? Increased supply of electricity (from 4 hours) ?? Develop new market for agricultural sector output ?? Discourages participation in the crime and drugs sector ?? Diversify income sources from illicit cultures ?? Improved food security ?? Increased access to income through reduction in expenditure on diesel and batteries 	<ul style="list-style-type: none"> ?? Improved access to savings ?? Promote jobs in the small oil processing plants and service and maintenance sector 	<ul style="list-style-type: none"> resource ownership ?? Promote participation in decision making in agricultural production ?? Promote links between meso and micro level actors and institutions ?? Strengthens agricultural groups
5	Integrated biogas systems	<ul style="list-style-type: none"> ?? Diversification of energy supply ?? Increased reliability of energy supply ?? Increased supply of electricity (from 4 hours) ?? Time savings for women due to reduced need to collect fuelwood ?? Health impacts from fuel switching from wood to biogas for cooking purposes ?? Improved sanitation ?? Increases in income through a reduction in energy expenditure (gasoline & kerosene) ?? Increases in income through a 	<ul style="list-style-type: none"> ?? Increased access to income through increased productive uses of womens' time ?? Increased access to savings (through increases in income) ?? Promotion of jobs in service and maintenance 	<ul style="list-style-type: none"> ?? Increase the participation of target population in decision making processes; ?? Promotes community resources ownership

		<p>reduction in fertiliser expenditure</p> <p>?? Provides demand for locally produced technology</p>		
6	Energy efficiency in coke production	<p>?? Improves the productivity</p> <p>?? Increases in income through a reduction in energy expenditure (coal)</p> <p>?? Improved health of the population in the areas surrounding the coke factories</p> <p>?? Provides demand for locally produced technology</p>	<p>?? Increased competitiveness of brick manufacturing sector</p> <p>?? Promotes the use of credit</p> <p>?? Promotes skills and knowledge</p> <p>?? Promotes transport improvements</p> <p>?? Increases access to savings</p> <p>?? Promotes jobs in service and maintenance</p>	<p>?? Promotes participation in decision making by small scale producers</p> <p>?? Promotes closer links between members of producer associations</p> <p>?? Promotes links between micro and meso-level actors and institutions</p>
7	Energy efficiency in the raw sugar industry	<p>?? Improves the competitiveness of the raw sugar</p> <p>?? Increases in income through a reduction in energy expenditure (coal)</p> <p>?? Improved health of the population in the areas surrounding the raw sugar producers</p> <p>?? Provides demand for locally produced technology</p>	<p>?? Increases the access to savings</p> <p>?? Promotes the use of credit</p> <p>?? Promotes jobs in service and maintenance</p>	<p>?? Promotes links between meso level actors and institutions and micro level actors, directly or through producer associations</p>
8	Small reforestation units - agroforestry combined with cattle growing	<p>?? Increase in forest cover</p> <p>?? Discourages participation in the crime and drugs sector</p> <p>?? Promote employment and gainful activity</p> <p>?? Introduction of education and skills</p>	<p>?? Promotes jobs in service and technical assistance</p>	<p>?? Promotes participation in decision making of target population</p> <p>?? Promotes links between meso level and micro actors and institutions</p> <p>?? Promotes community resource ownership</p>

Appendix B1.5 Actors & Institutions - Scoping of capacity needs

Stages of the project cycle	Identification of current actors & Institutions currently involved in the CDM	Identification of additional actors and institutions who should be involved in the CDM process	Capacity needs (training of existing or new actors, awareness raising workshops, courses, etc.)	Who should provide this capacity	Policy recommendation
Initiation	<p>General</p> <p>MMA, Colombian CDM office MME, UPME,</p> <p>Energy</p> <p>MME, UPME.</p> <p>Energy/Agriculture</p> <p>UPM, FEDEPANELA,</p>	<p>General</p> <p>Municipal governments, local and regional authorities.</p> <p>Energy</p> <p>MINERCOL,, local community orgs, City utilities, PV private sector, , Oven builder groups, SENA</p> <p>Energy/Agriculture</p> <p>MA, Corporaciones Regionales Ambientales (Regional Environmental Authorities), CORPOICA Cipav, , NGOs, Farmers organisations, Local utilities.</p>	<p>Constant flows of high quality regulatory information are needed.</p> <p>Information required:</p> <ul style="list-style-type: none"> ?? Regulatory & legal; ?? Technical information; ?? GHG reduction evaluation; ?? MDL developments elsewhere; ?? CER stock exchange related information. <p>More use of the internet.</p> <p>Workshops and seminars as offered in the past.</p> <p>Design of standardised schemes of project formulation.</p>	<p>One important role of the State is to transfer regulatory information to the sectors with potential and build their capacity to participate effectively in the market.</p> <p>Standardised schemes should be developed by the MDL Office. For instance, the National Energy Baseline for Electricity Generation should be developed , updated and supplied by the MDL Office to Energy project developers.</p> <p>The MDL Office has developed the MDL Project Formulation</p>	<p>More specific information should be disseminated and made available to different organisations and companies interested in the CDM.</p> <p>Channels for information dissemination should be available using media like the internet.-</p> <p>Information for dissemination via internet is at the present available from the Environment Ministry and ACCEFYN. But the activity should be</p>

	<p>Land use change & forestry</p> <p>ACIF, ACOFORE</p> <p>Waste</p> <p>Ciudad Limpia Waste Management Company.</p>	<p>Land use change & forestry</p> <p>MA ACIF, ACOFORE</p> <p>Waste</p> <p>Corporaciones Regionales Ambientales (Regional Environmental Authorities), City management companies.</p>		<p>Guidelines, document under discussion. The Guidelines would be made accessible from the web site of the Environment Ministry.</p> <p>A structured workshops program is in development. The workshops are going to be presented by international organisations and companies. Strong participation of local organisations, companies and consultants is desirable. National organisations like ACCEFYN, the Andean Centre for Environment and Economics, Villa Associates (Forestry), Robayo and Ospina, etc. among others, have capacity for participating actively</p>	<p>under the leadership of the MDL Office at the Ministry.</p> <p>Internet service is available in all large, medium and small Colombian cities. At present, a program for bringing Internet service to 300 major rural isolated villages is under way.</p> <p>Dissemination of standardised schemes for project formulation. The dissemination of standardised schemes is through the internet, printed material and workshops. The Application Form for MDL Projects is accompanied by the Guidelines Handbook. The whole can be downloaded from the Internet but the best way is to train people on the use of the</p>
--	--	---	--	---	--

				in the workshops.	<p>Application Form together with the Handbook.</p> <p>The workshops can be organized for specific sectors and brought to cities and regions outside Bogota.</p>
Packaging	<p>General</p> <p>Colombian CDM office, UPME, ACCEFYN, Private consultants.</p> <p>Energy</p> <p>MDL Office, Private Consultants</p> <p>Energy/agriculture</p> <p>MDL Office, Cipav, Tom Preston (UK) , Robayo & Ospina - Associates</p> <p>Land use change & Forestry</p> <p>MDL Office, ACIF, ACOFORE</p>	<p>General</p> <p>IPSE, Private consultants.</p> <p>Energy</p> <p>CORPOICA</p> <p>Energy/agriculture</p> <p>IPSE, Private consultants</p> <p>Land use change & Forestry</p> <p>Private Consultants, Regional Forestry Authorities and Project Developers</p>	<p>The owners of projects will require training for the appropriate formulation of baselines, registration, certification, domestic and international approval, measurement of GHG, estimate of additionality, certification of reductions and the generation of CERs.</p> <p>A fundamental issue in capacity building is the participation of research oriented institutions in order to build up institutional capacity. Very often training offered to private companies and organisations have limited impact due to lack of diffusion.</p>		<p>Project appraisal training belongs to the training in the MDL Project Formulation workshops.</p>

	Waste MDL Office, ACCEFYN, Ciudad Limpia	Waste Waste Management Companies, Private consultants			
Approval	For the approval of a MDL Project the MDL Office is the approval authority. The institutions usually involved in the foreign investment process are the Banco de la Republica, Banking Superintendency, Securities Superintendency, Superintency of companies, Ministry of Foreign Trade and Ministry of Mines and Energy.	Other very important offices are the National Planning Board, the Ministries for the Environment, Energy, Agricultural, Treasure, Foreign Trade and Development.	According to the NSS MDL should represent around US\$ 400 per year for Colombia. Due to the potential for the country, government actions should be put in place for developing this potential. The Ministries mentioned must work in a coordinated way. Easy to understand procedures, transparency in the information for foreign investors, simplicity in the procedures, clear and reliable timetables for investors, fast-track approval procedures, etc need to be developed.		
Management and monitoring	General Colombian MDL office, UPME	General ACCEFYN, Private companies, microfinancing institutions and other financing institutions, municipal and regional environmental authorities (Corporaciones	There is currently little experience in how to manage the projects listed, for example, a large number of separate projects bundled. In project management and development there is a large experience in Colombia, in the		

	<p>Energy</p> <p>UPME</p> <p>Energy/agriculture</p> <p>Cipav</p> <p>Land use change & forestry</p> <p>MA, ACOFORE, private reforestation companies.</p>	<p>Ambientales Regionales).</p> <p>Energy</p> <p>City utilities, MINERCOL, CORPOICA, FEDEPANELA, coke producer associations</p> <p>Energy/agriculture</p> <p>Local electricity companies, Regional corporations</p> <p>Land use change & forestry</p> <p>ACIF, ACOFORE, private reforestation companies.</p>	<p>private as well in the governmental sector. But management techniques are always in development and training is always welcome. But in monitoring of fully operational projects in the context of MDL is what is required.</p> <p>In that respect, pilot projects to accompany the learning process is the best way to identify the dimension and significance of the different project stages.</p>		
--	--	---	--	--	--

CER Sales	<p>The Environment Ministry and its MDL Office have been promoting the idea of the CER.</p> <p>Financial institutions have been made aware of the potential as they participated in the stakeholder meetings.</p>	<p>The Bourse, financial institutions should be involved.</p> <p>Companies involved in the stock market and linked to international companies should be involved.</p>			
-----------	---	---	--	--	--