



COLOMBIA FORESTRY DEVELOPMENT PROGRAM

ENVIRONMENTAL ASSESSMENT

Submitted to:
USAID/Bogotá

Submitted by the Chemonics consortia of:

Prime International Inc.
Crimson Capitol
Corporación Nacional de Investigación y Fomento Forestal (CONIF)
World Wildlife Fund, Forest Resource Marketing Inc.,
Rainforest Alliance, Renewable Resource Associates

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EXECUTIVE SUMMARY

On August 11, 2003, USAID/Colombia awarded the Colombia Forestry Development Program (CFDP) to Chemonics International Inc. The CFDP forms part of USAID/Colombia's Strategic Objective No. 2, "Promote Economic and Social Alternatives to Illicit Crop Production". Its objectives are increased rural employment and income, improved technical capacity of participants in production chains for wood products, increased forest area under sustainable management, increased value of standing timber and returns to rural communities, and a more competitive Colombian forestry and wood products sector. The CFDP works in four forest clusters, located in the Pacific Coast of Nariño and Cauca, Bajo Atrato/Urabá, Bajo Magdalena, and Northeastern Antioquia regions. USAID/Colombia selected these regions because they contain forest resources, illicit crops, and potential markets for forest products. The program has a projected life of 36 months and a budget of US\$22.7 million.

However, there are a number of critical issues identified in 22CFR 216 *USAID Environmental Procedures* and associated guidelines that must be addressed in order for USAID funds to be utilized by the program. This Environmental Assessment (EA) identifies five significant issues that are the management of natural forests, logging practices, potential problems related to road and canal construction/rehabilitation in the forest management units, pesticide use, and the development of wood processing centers. Three non-significant issues are also identified and discussed. These are the impact of project activities on archeological sites, protected areas and the development of industrial forest plantations.

The EA analyzes different programmatic alternatives and recommends that the proposed alternative be modified by the addition of an Environmental Program (EP). The EP sets forth a two prong approach to addressing the environmental issues identified. In the case of the non-significant issues, the use of pesticides, and the development of wood processing centers, the Mission's established Environmental Review Process will be utilized. In the case of forest management, logging, and road and canal construction/rehabilitation a separate third party review (TPR) process is established. The TPR process will monitor and report upon the compliance of the CFDP with the proposed mitigation measures for each significant issue and review all forest management and annual operational plans.

The EA describes the geographic areas where project activities are to take place. It defines a program for strengthening of local institutions in environmental compliance issues and budgets for the implementation of the EP. The EA Team consisted of Team Leader Bruce Kernan, Forestry Specialist Jorge Arias, and Institutional Specialist Jaime Ospina. John Nittler of Chemonics International finalized the EA making substantial edits and modifications.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

SECTION I	Introduction	I-1
	1.1. Purpose of the Environmental Assessment	I-1
	1.2. Structure of the Environmental Assessment	I-1
	1.3. Methodology	I-2
	1.4. Limitations of the Study	I-3
SECTION II	Alternatives	II-1
	2.1. Alternatives Considered but Eliminated from Detailed Study	II-1
	2.2. Alternatives Considered in Detail	II-2
	2.3. Comparison of the Environmental Impacts of the Alternatives	II-4
	2.4. Recommendations for a Preferred Alternative	II-9
SECTION III	Affected Environment	III-1
	3.1. Map of Regions	III-1
	3.2. Pacific Coast of Nariño and Cauca	III-1
	3.3. Bajo Atrato	III-3
	3.4. Urabá	III-4
	3.5. Magdalena Bajo	III-5
	3.6. Northeast Antioquia	III-7
	3.7. Comparison of Regions	III-8
SECTION IV	Environmental Consequences	IV-1
	4.1. Environmental Issues	IV-1
	4.2. Structure of the Analysis	IV-2
	4.3. Non-Significant Issues	IV-4
	4.4. Significant Issues	IV-10
SECTION V	Environmental Review Process	V-1
	5.1. Environmental Program for the CFDP	V-1
	5.2. Environmental Clause in Contracts and Grants	V-7
	5.3. Program for Strengthening Institutional Capacity	V-7
	5.4. Budget	V-8
ANNEX A	Terms of Reference	
ANNEX B	Record of Interviews	
ANNEX C	Charts: <i>Plaguicidas</i>	
ANNEX D	Institutional Roles and Responsibilities	
ANNEX E	Basis for CFDP Environmental Program	
ANNEX F	Possible Third Party Verifiers	
ANNEX G	Environmental Assessment Team	

BIBLIOGRAPHY

SECTION I

Introduction

1.1. Purpose of the Environmental Assessment

On August 11, 2003, USAID/Colombia awarded the Colombia Forestry Development Program (CFDP) to Chemonics International Inc. under the General Business, Trade, and Investment (GBTI) Indefinite Quantity Contract (IQC). The CFDP forms part of USAID/Colombia's Strategic Objective No. 2, "Promote Economic and Social Alternatives to Illicit Crop Production". It is also part of President's Bush's commitment to address illegal logging in developing countries. Its overall purpose is threefold: 1) the creation of economic and social alternatives to illicit crops in the forestry and wood industry sector; 2) the reduction of illegal and unsustainable logging in Colombia through improved forest management; and 3) the reduction of deforestation for illicit crop production. Its objectives are increased rural employment and income, improved technical capacity of participants in production chains for wood products, increased forest area under sustainable management, increased value of standing timber and return to rural communities, and a more competitive Colombian forestry and wood products sector. The CFDP works in four forest clusters, located in the Pacific Coast of Nariño and Cauca, Bajo Atrato/Urabá, Bajo Magdalena, and Northeastern Antioquia regions (due to significant differences in characteristics pertinent to this study, Bajo Atrato and Urabá will be analyzed separately, although it is one contiguous cluster). USAID/Colombia selected these regions because they have forest resources, illicit crops, and potential markets for forest products. The program has a projected life of 36 months and a budget of US\$22.7 million.

CFDP is an environmental mitigation measure designed to reform Colombia's currently unsustainable forest practices, which are in part threatened by the expansion of illicit crop production into forest lands. It sets out to reduce illegal and destructive logging and deforestation and to improve sustainable forest management, while creating the socioeconomic basis for perpetuating appropriate and sustainable land use. However, there are a number of critical issues identified in 22CFR 216 *USAID Environmental Procedures* and associated guidelines that must be addressed in order for USAID funds to be utilized by the program. These include potential problems related to road construction, pesticide use, logging in natural forests, and the establishment of processing centers, among others. This Environmental Assessment (EA) identifies and describes these issues and establishes a system to assure that potential problems are fully mitigated by the program. Moreover, the EA establishes the analytical basis for assuring that environmental factors and values are fully integrated into the CFDP decision-making process in order to mitigate and avert adverse environmental effects and maximize environmental benefits.

1.2. Structure of the Environmental Assessment

The Environmental Assessment has the following five sections:

- Section I (this section), having stated the purposes of the Colombia Forestry Development Program (CFDP) and the Environmental Assessment, will also briefly review the methodology used to prepare the Environmental Assessment, and will discuss the limitations on the Environmental Assessment's scope and detail.
- Section II describes the *No Action Alternatives* and *Proposed Alternatives*. The Proposed Alternative has been analyzed from two perspectives. The first analyzes it as it is currently proposed and the second has incorporated an Environmental Program to respond to the mitigation actions defined in this EA. It summarizes and compares their environmental effects in relation to the significant issues and states the EA Team's Preferred Alternative, based on the three alternatives' predicted environmental effects.
- Section III provides a summary description of the environments that the actions the CFDP proposes to finance or promote could affect.
- Section IV identifies the environmental issues associated with the CFDP and separates the significant from the less significant issues. It then summarizes the best practices and mitigation measures that would avoid or minimize adverse environmental impacts and compares the environmental effects of the three alternatives.
- Section V proposes an Environmental Program for the CFDP site-specific actions whose character and location have not yet been determined. Section V goes on to outline a training and technical assistance program for strengthening the capacity of the Regional Autonomous Corporations and other local actors based on an institutional analysis included in Annex D. A following section provides wording for a clause to be incorporated into the CFDP's subcontracts and grants in order to clarify the subcontractors' and grantees' responsibilities for environmental review and monitoring. Finally, Section V provides an illustrative budget for the implementation of the Environmental Program and associated training.

1.3. Methodology

The EA Team prepared the Environmental Assessment using the methodology required by 22 CFR 216, USAID Environmental Procedures.¹

- First, the EA Team, through a review of secondary information, field observations, and interviews with knowledgeable people (Annex B), identified the environmental issues associated with the CFDP.
- Second, the EA Team identified and described the elements of the environments that the CFDP's proposed actions could affect.
- Third, the EA Team separated the significant from the less significant issues, analyzed the environmental consequences of the proposed actions, and summarized the professional best

¹. It also drew on the recommendations in the document that the U.S. Forest Service has prepared for USAID entitled Guidelines for Compliance with NEPA, 22 CFR 216 for Environmental Assessments Involving Timber Extraction.

practices and mitigation measures that would avoid or mitigate the predicted adverse environmental consequences.

- Fourth, the EA Team designed an Environmental Program (EP) for monitoring and evaluating the CFDP's compliance with standard, professional best practices and mitigation measures and its effectiveness in the resolution of the significant issues. The Environmental Program also identifies the potential adverse environmental effects of actions which the CFDP may finance or promote in the future but whose character and specific location have not yet been determined, and will recommend professional best practices and mitigation measures to avoid these site-specific adverse environmental effects.

1.4. Limitations of the Study

Two factors limited the scope and detail of the Environmental Assessment.

- First, the character and location of the CFDP's proposed actions had not been fully defined at the time of the preparation of the Environmental Assessment, between January and May 2004. In order for its conclusions and recommendations to be incorporated into the design of the CFDP, however, the Environmental Assessment had to be prepared at this preliminary stage of the CFDP. In any case, as the CFDP is a flexible, adaptive activity which can respond to new information and opportunities, the exact character and sites of all its potential activities could not be completely determined before the preparation of the Environmental Assessment. In order to ensure, however, that all the actions that the CFDP finances or promotes are adequately reviewed for their potential environmental effects, and appropriate measures are taken to avoid or mitigate potential adverse environmental effects, the Environmental Assessment proposes an Environmental Program that includes two separate mechanisms for reviewing forest management and non-forest management related activities.
- Second, security conditions did not permit the EA Team to travel on the ground in Bajo Atrato, Guapi, northeastern Antioquia, and Urabá. The EA Team was, however, able to consult with a wide range of people who had detailed knowledge of the proposed regions for the CFDP work. It also reviewed numerous documents, made field observations in the Magdalena Bajo and the Pacific Coast of Nariño and observed the proposed sites for field work in Bajo Atrato and Urabá from the air. Most importantly, the Colombian members of the EA Team have worked professionally for many decades in the regions where the CFDP's fieldwork will occur. They provided valuable information and insights for the preparation of the Environmental Assessment.

Thus, in spite of some limitations on its scope and detail, the EA Team obtained sufficient information for drawing the conclusions and making the recommendations contained in this Environmental Assessment.

SECTION II

Alternatives

The purpose of Section II is to compare the environmental effects of the alternatives, thus sharpening the environmental issues, and providing decision makers a clear basis for choice between the alternatives. Section II first eliminates a number of potential alternatives from detailed description or analysis. Next it summarizes and compares the predicted environmental impacts of the No Action, Proposed, and Proposed with Environmental Program Alternatives, based on the analysis (in Section IV) of their environmental consequences. Based on this comparison, the Preferred Alternative of the EA Team is stated.

2.1. Alternatives Considered but Eliminated from Detailed Study

This section summarizes the alternatives that the EA Team eliminated from detailed study and states its rationale for doing so.

2.1.1. Commercial Tree Plantation Alternative

Summary of the alternative. Under the *Commercial Tree Plantation Alternative*, Component 3 of the CFDP would finance only activities involving the establishment, management, and harvest of industrial tree plantations, without financing the management of natural forests or the establishment of agro-forestry systems. Components 1, 2, and 4 would continue to finance activities to improve forestry policies, assist Plan Colombia, and address strategic issues in the forestry sector.

Rationale for eliminating the alternative. Illicit coca production is expanding into the tropical natural forests of the Pacific Coast. These forests supply 60 percent of the wood used in Colombia's wood industry. Therefore, to achieve its purpose of providing alternatives to illicit activities by stimulating the competitiveness of Colombia's commercial forestry sector, the CFDP must work on the Pacific Coast in the management of natural forests.

2.1.2. Natural Forest Management Alternative

Summary of the alternative. Under the *Natural Forest Management Alternative*, Component 3 of the CFDP would finance only activities to establish and improve natural forest management, not activities to establish or improve industrial tree plantations or agro-forestry practices. Components 1, 2, and 4 would continue to finance activities to improve forestry policies, assist Plan Colombia, and address strategic issues in the forestry sector.

Rationale for eliminating the alternative. Currently in Colombia industrial tree plantations are the most reliable means to assure forest industries stable supplies of the types of wood that they require. To achieve its objectives, therefore, the CFDP must become involved in the establishment of industrial tree plantations.

2.1.3. Agro-forestry Alternative

Summary of the alternative. Under the *Agro-forestry Alternative*, Component 3 of the CFDP would finance only activities to establish and improve agro-forestry practices. Component 3 would not finance activities to establish or improve industrial tree plantations or to establish natural forest management units. Components 1, 2, and 4 would continue to finance activities to improve forestry policies, assist Plan Colombia, and address strategic issues in the forestry sector.

Rationale for eliminating the alternative. Wood production from agro-forestry systems is not presently a reliable means to supply the Colombian forest industry with the types of wood that it requires. To achieve its objectives, therefore, the CFDP must finance activities to establish commercial tree plantations and natural forest management.

2.2. Alternatives Considered in Detail

The EA Team analyzed the alternatives *No Action*, *Proposed*, and *Proposed with Environmental Program Alternative* in detail. The following sections describe these alternatives.

2.2.1. No Action Alternative

The *No Action Alternative* would require that the Colombia Forestry Development Program (CFDP) close down its operations, undertaking no further actions.

2.2.2. Proposed Alternative

The *Proposed Alternative* consists of the planned actions of the Colombia Forestry Development Program as described in Chemonics initial proposal, its Life-of-Project Work Plan, dated November 2003, and being developed by the CFDP at this time. Program activities will occur in four components.

2.2.2.1. Component 1 - Forest Policy

CFDP will improve knowledge about the constraints imposed on the commercial forestry sector because of inadequate and inappropriate policies and will work to make the policy framework conducive to private sector forest management and investment. Results from preliminary workshops have indicated that the CFDP should focus on developing the regulations or technical norms for plantation and natural forest management, improving the institutional framework administering the forestry sector, and improving the incentive system. The National Council for Forestry Research and Development (CONIF) will coordinate the analysis of important forest policy issues.

2.2.2.2. Component 2 - Plan Colombia

CFDP will assist Plan Colombia in strengthening its *Familias Guardabosques* program by improving forest production chains that are linked to the targeted communities. The types of

activities that may be supported include training in small forest enterprise development, forest inventories, forest management plans, plantations, agroforestry, formation of forest-based producer groups, and support to wood processing facilities.

2.2.2.3. Component 3 - Improved Forest Product Production Chains.

The CFDP will provide assistance to all segments of the forestry production chain to improve conversion efficiency and utilization of raw materials. The component will attempt to increase the price of standing timber for forestland owners as well as the overall value of the wood, improve plantations and agro-forestry systems, link industries to managed forests, expand markets for structural lumber in domestic construction, and expand exports of furniture, millwork and flooring. The CFDP will work to establish forest management units, based on community organizations, in natural tropical forests in three of the four selected regions. It will use a “rapid appraisal” methodology in order to select the sites for the establishment of forest management units. Based on the rapid appraisal the CFDP will make a “go-no-go” decision. Selected sites must have blocks of 7,000 to 10,000 ha or more of natural forest with sufficient potential harvest volumes. The target is to have 120,000 ha of natural forest under management by the end of the CFDP in three years. The Proposed Alternative will also support the establishment of industrial plantations in three of the four clusters. In all of the regions it will identify transportation constraints and development of methods to overcome those constraints, will improve conversion of raw materials to market products and enhance collaboration among the links in the production chain. CFDP will achieve a better understanding of market conditions and opportunities in the forestry sector including international and domestic markets and standards and non-traditional markets such as “certified wood” and CO₂ sequestration credits.

2.2.2.4. Component 4 - Commercial Forestry Development Fund

CFDP will provide additional assistance to support viable and responsible commercial forestry incentives outside the four clusters. It will support such activities as the creation of a forest industry association, the creation of a forest product marketing service, promotion of third-party certification, and feasibility studies for specific wood industries.

The overall Colombia Forestry Development Program’s program results include establishing 21,800 ha of industrial plantations, managing 120,000 ha of natural forest, establishing 8,740 ha of agro-forestry systems, creating 500 new jobs and benefiting 3,000 families. These quantitative targets, however may change upon completion of field investigations.

Table II-1: Colombia Forestry Development Program: location, character, and tentative quantitative targets for proposed activities under component 3.¹

Region/Site	Natural Forest Management (ha)	Industrial Tree Plantations (ha)	Agroforestry (ha)
Bajo Atrato	40,000	3,000	0
Cacarica	40,000	0	0
Undefined site	0	3,000	0
Urabá	40,000	3,000	4,800
Bajo Magdalena	0	7,000	40
Nariño	40,000	0	3,500
Sanquianga- Satinga	12,000	0	1,700
Bajo Mira	8,000	0	1,500
Guapi	20,000	0	300
NE Antioquia	0	8,800	400
TOTAL	120,000	21,800	8,740

2.2.3. Proposed with Environmental Program Alternative

The *Proposed with Environmental Program Alternative* is basically the Proposed Alternative with a defined environmental program that clearly identifies significant environmental issues, mitigation measures to thwart the negative environmental impact of the identified issues, and an environmental review process that defines how the CFDP and USAID are to monitor and address these issues. The CFDP intends to promote and apply standard, professional, forestry and environmental best practices in line with USAID regulations and guidelines. The application of these practices will generally and adequately avoid or mitigate potential adverse environmental effects of the CFDP's proposed actions. These best practices are summarized in the analysis of the significant and non-significant issues and should be fully adhered to. Therefore, the Proposed with Environmental Program Alternative consists of the same four components mentioned above, with the only difference being the addition of the Environmental Program defined in this document.

2.3. Comparison of the Environmental Impacts of the Alternatives

The following sections compare the predicted environmental impacts of the three alternatives that Section IV analyzes in detail. It bases this comparison on the five significant issues that Section IV identifies and analyzes: forest management, logging practices, road and canal construction/rehabilitation, pesticide use, and wood processing centers.

2.3.1. Forest Management

2.3.1.1. No Action Alternative

The *No Action Alternative* would not have any impact on how forest management occurs in Colombia at the current time. Illegal logging, estimated to contribute upwards of 70% of forest

¹ CFDP. 2003. Life-of-Project Work Plan.

products to the sector, would continue unchecked. The existing confusion concerning resource access, institutional roles and responsibilities, and rights of private landowners would continue. So while this alternative would not necessarily increase negative environmental impacts, it can easily be seen as the worse case scenario.

2.3.1.2. Proposed Alternative

The *Proposed Alternative* would work towards resolving the existing turmoil within the forestry sector by working on policy reform to instill the concept of sustainable forest management as a viable land use within Colombia. It would work to define institutional roles and strengthen key institutions to ensure they have the capacity to support and oversee forest management activities developed by forest owners and operators. Most importantly it would apply international criteria and indicators to create viable sustainable forest management models for the Colombian context. By placing existing forests that are being harvested with little long-term foresight under sustainable forest management plans, it would greatly work to reduce the negative environmental impacts caused by current exploitation activities.

2.3.1.3. Proposed with Environmental Program Alternative

The *Proposed with Environmental Program Alternative* would enhance the Proposed Alternative by insuring that all forest management plans and subsequent activities developed under the project meet a defined set of criteria and indicators or standards and follow the format of the Villa Garzon forest management plan approved by the BEO. It would ensure that the CFDP training program fully address the significant and insignificant issues and the related best practices and environmental guidelines. It would establish an outsourcing mechanism to verify compliance by a recognized third party institution through review of newly elaborated forest management plans and recurrent annual harvest plans. And finally it would carry out a study to document actual environmental impacts caused by logging and develop a monitoring system to track improvements or changes in these areas.

2.3.2. Logging Practices

2.3.2.1. No Action Alternative

The *No Action Alternative* would neither improve the implementation of Colombia's current forestry policy nor impact upon current logging activities, which for the most part take place without regard to forest management plans or best practices. It would therefore cause neither positive nor negative environmental impacts except in the sense that, in the absence of the CFDP or other forestry related projects, current trends of forest degradation and deforestation attributable to destructive and over logging and land conversion for illicit crop production would continue.

2.3.2.2. Proposed Alternative

The *Proposed Alternative* would finance activities to improve the policy and institutional framework and create models under which logging is carried out according to well designed and long-term forest management plans in Colombia. Activities would fall into all four components and would:

- 1) Promote the establishment of a regulatory and institutional framework conducive to sustainable forest management by private stakeholders, including indigenous and Afro-Colombian communities.
- 2) Train forest workers in Plan Colombia target areas in sustainable forest management planning, reduced impact logging including directional felling, harvest lay-out, skid trail design, and proper equipment selection, among other related themes.
- 3) Train and support forest workers and communities in the production chains identified in the selected forest clusters in themes identified in point 2 above. Provide direct technical assistance to forest planning and logging operations to increase their efficiency and mitigate their negative impacts.
- 4) Support overall sector development, promote legal logging, and develop support mechanisms for promoting sustainable forest management through market-driven incentives through activities in the Commercial Forestry Development Fund.

2.3.2.3 Proposal with Environmental Program Alternative

The *Proposed with Environmental Program Alternative* would include the same activities as that of the Proposed Alternative. The only difference is that the Environmental Program will establish the mechanism to assure that USAID, GOC, and international best practices are being promoted, followed and monitored as the core of the Proposed Alternative. Much of this will be accomplished through the above mentioned monitoring system. It will also include a review of the adoption and understanding of the reduced impact logging training that the CFDP is to carry out and the associated impacts in the field of the logging activities.

2.3.3 Road and Canal Construction and Rehabilitation

2.3.3.1. No Action Alternative

The *No Action Alternative* would do nothing to improve road and canal construction and rehabilitation, so it would not affect this significant issue. Note that in several parts of Colombia, including the Nariño and Atrato areas, canals are dug to facilitate the movement of logs instead of skid trails. Road and canal construction would continue in unplanned and environmentally intrusive fashion, leading to increased erosion, spontaneous colonization, and illegal logging.

2.3.3.2. Proposed Alternative

The *Proposed Alternative*, if successful in establishing organized, technical community forest management on 120,000 ha, would cause large-scale, long-term, positive environmental effects. While the project will not directly pay for road or canal construction/rehabilitation, both currently exist and are key features of long-term forest management planning in the areas targeted by the project. In fact in all areas where the project is to work, forest extraction has been taking place, most if not all extraction infrastructure of one type or another was developed with little environmental criteria, and most of it causes unnecessary and unwanted environmental impact. To the extent possible the project will support the use of the existing infrastructure and work to upgrade it to meet environmental design criteria. The design and maintenance of roads and canals based on USAID, GOC and international best practices will be a corner stone of the training program related to forest planning and reduced impact logging.

2.3.3.3. Proposed with Environmental Program Alternative

The *Proposed with Environmental Program Alternative* will assure that providing effective training to a large number of participants in existing forest product chains, including CAR and other GOC officials responsible for monitoring the implementation of the GOC environmental review process, in environmental criteria for road and canal design, rehabilitation and construction will result in large-scale, long-term positive environmental effects. The training will build upon USFS experience in this area. A road construction specialist will be contracted to carry out a review of forest roads, canals and bridges and the results of the study will form the basis of the training program.

2.3.4. Pesticide Use

2.3.4.1. No Action Alternative

The *No Action Alternative* would do nothing to improve the selection, use and handling of pesticides in tree seedling and plantation production schemes and in the treatment of wood products so it would cause neither negative nor positive environmental effects.

2.3.4.2. Proposed Alternative

The *Proposed Alternative* does not specifically address the use of pesticides as the CFDP does not plan to purchase pesticides nor promote their use. However, project related tree nurseries and plantations will involve the use of pesticides and it is possible that some wood processing centers may use chemical products to treat lumber after it is processed and if this issue is not addressed, it could cause major negative environmental impacts.

2.3.4.3. Proposed with Environmental Program Alternative

The *Proposed with Environmental Program Alternative* will mitigate any potential negative impacts caused by pesticides through the adoption and if necessary expansion of the Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) that was prepared for all Plan Colombia activities. In order to determine which beneficiaries or partners utilize pesticides, the CFDP under this alternative would conduct a survey to determine the level of pesticide use, what pesticides are being used, and the manner in which they are being handled. An appropriate training program would be designed to promote IPM and recommendations found within the PERSUAP. The PERSUAP includes pesticides commonly used in forestry and if the CFDP were to finance or promote the pesticides that are included in the PERSUAP it would be required to follow the PERSUAP's requirements.

Table II-2 summarizes this comparison between the predicted environmental impacts of the three alternatives in relation to the significant issues.

Table II-2: Summary of predicted environmental impact of three alternatives for the Colombia Forestry Development Project in relation to the significant issues

Significant Issue	Predicted environmental impact of the three alternatives		
	No Action	Proposed	Proposed w/Env. Program
Sustainable Forest Management	Negative Colombia desperately requires policy reform and experience in SFM to break out of its current scenario of forest degradation and deforestation	Positive Current logging practices will be transformed in 120,000 ha of natural forest and internationally recognized standards will be applied to mitigate existing negative impacts	Positive In addition to the Proposed alternative, CFDP and USAID will have third party verification to orient and substantiate gains in SFM.
Logging in Natural Forest	Negative Deforestation and forest degradation continues unchecked	Positive, Best practices in reduced impact logging, equipment selection, etc will provide positive impacts on 120,000 has of natural forest that is currently being logged unsustainably and in many cases illegally.	Positive In addition to impacts mentioned for the Proposed Alternative, the implementation of best practices and their environmental impacts will be monitored and documented as a result of the CFDP
Road and Canal Construction/ Rehabilitation	Negative Road and canals in logging areas continue to cause negative environmental impacts	Positive Existing infrastructure in logging units will be upgraded by forestland owners and communities to meet USAID, GOC and international best practices thus reducing erosion, spontaneous colonization and deforestation.	Positive Immediate training for forestland owners, communities and GOC officials reduces adverse environmental effects of poor road and canal construction in forests where timber extraction currently occurs.
Pesticide Use	Negative Use of highly toxic pesticides in nurseries continue and threaten health of workers.	Neutral CFDP does little to influence pesticide selection and use thus having a neutral impact on the environment and well being of the communities/operators associated with the project.	Positive The PERSUAP is adopted and if necessary expanded to address all related pesticides and serves as the basis for CFDP training and support to forestland owners and communities in selecting, use and handling of pesticides. Potential negative impacts are avoided.
Wood Processing Centers	Neutral No new centers would be developed.	Positive Improved processing centers will increase the value of the wood, interest in forest management, and returns to the forest owners.	Positive Centers will be compliant with specific environmental regulations and located and dimensioned to avoid processing wood from unsustainably managed forests.

2.4. Recommendation for a Preferred Alternative

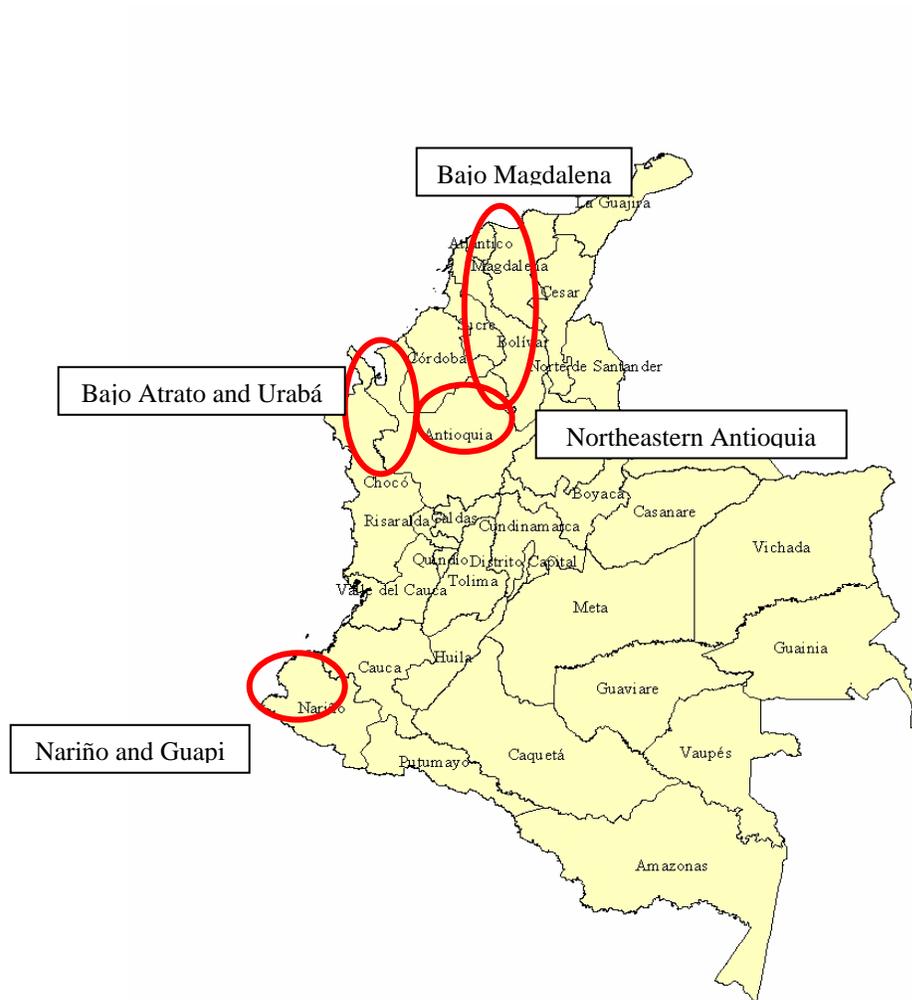
Based on the balance of trade-offs between environmental impacts and project objectives discussed above, as analyzed in Section IV, the Environmental Assessment team recommends the *Proposed with Environmental Program Alternative*.

SECTION III

Affected Environment

Section III describes the existing environment that the three alternatives could affect. Note that despite the word *affected* in its title, this section does not present *effects* of the three alternatives but a description of the baseline environmental situation. Section IV uses this description in analyzing the alternative's environmental consequences.

3.1. Map of the Regions



3.2. Pacific Coast of Nariño and Cauca

3.2.1. Location

The CFDP has selected three sites for implementation of forest management and agro-forestry activities on the Pacific Coast of Nariño and Cauca: Bajo Mira, Sanquianga, and Alto Guapi.

The *Bajo Mira* site is located to the south of the city of Tumaco on the communal property of the Community Council of Bajo Mira and Frontera. Forest management would occur on 8,000 ha of the 45,482 ha which the Council owns. Agro-forestry activities, however, could occur throughout the Council's property.

The *Sanquianga* site lies between the Satinga and Sanquianga Rivers to the north of the city of Tumaco, within the Municipality of Olaya Herrera, on the communal property of the Community Councils of Río Satinga and Río Sanquianga. Forest management would occur on 15,000 ha of the Council's property of 58,200 ha. Agro-forestry activities could occur throughout the area.

The *Alto Guapi* site lies upriver from the town of Guapi. Management would occur on 20,000 ha of the Alto Guapi Community Council property.

3.2.2. Physical Characteristics

The topography of all three sites is mostly flat and low although there are terraces and low hills further from the rivers. Soils are generally poorly drained and infertile. Annual rainfall averages more than 3,000mm per year and annual temperatures average more than 25°C.

3.2.3. Biological Characteristics

Humid Tropical Forest and Very Humid Tropical Forest originally covered all three sites. Swamp forest, or "guandal," which grows on water-saturated soils of the flood plains, is typical of Bajo Mira and Sanquianga. The predominant species are sajo (*Camnosperma panamensis*) and cuángare (*Iryanthera joruensis*). Other common species on these sites are garza (*Tebebuia roseae*), machare (*Symphora globulifera*), maría (*Calophyllum* sp.), and chalviande (*Virola* sp.) Valuable timber trees, including the species tangare, cuangare, and sajo, occur only in the flood plain forest. Much of the original forest has been fragmented or cleared. Due to this and hunting, the original diverse and abundant animal population has decreased in number and variety.

3.2.4. Protected Areas

The Sanquianga Natural Park lies close to the sites of Guapi and Sanquianga-Santinga, in the delta of the Sanquianga River. It contains mangrove forest, swamp forest ("natal"), and flood plain forests. About 6,000 people live within the park boundaries.

3.2.5. Social Characteristics

Afro-Colombians predominate in all three areas. Less than 3 percent of the population is indigenous and even fewer are *mestizos*. The extended family is the organizing element of Afro-Colombian society. Health, sanitation, and education standards are very low.

3.2.6. Economic Characteristics

Exploitation of the timber in the natural forests has long been the primary economic activity on the Colombian Pacific Coast. Agriculture and livestock have been of secondary importance. Olaya Herrera is the single largest source of wood from natural forests in Colombia. It has 23 sawmills that process up to 250,000 cubic meters of logs per year. Boards are shipped to Buenaventura by boat and then to Cali and the rest of the country by truck. Gold mining, cacao, African oil palm, fishing, hunting and gathering are other economic activities. Coca production has expanded rapidly during the last few years in Nariño and Cauca and now there are about 60,000 ha.¹

3.3. Bajo Atrato

3.3.1. Location

The region of Bajo Atrato lies in northwestern Colombia, in the Department of Chocó. It comprises the lower watershed of the Atrato River, near to the Gulf of Urabá, and adjoins the frontier with Panama. The CFDP plans to establish a forest management unit in Cacarica, an area of 45,000 ha to the west of the Atrato River, near the town of Riosucio. Cacarica contains 17 Afro Colombian communities and 2 Indigenous Reserves.

3.3.2. Physical Characteristics

Flat, alluvial flood plain, with many swamps and lakes, covers 30,000 ha of Cacarica. Low, moderately sloped terraces further to the northwest cover 4,000 ha. Steep hills and mountains, the Darién Mountains, occupy 2,000 ha along the border with Panama. Many rivers flow from the mountains. “Typic” soils, which are superficial, acidic, poorly drained, low in organic matter, and infertile, cover most of the area. Annual rainfall is very high, up to 4,500 mm/yr., distributed evenly, and temperature averages about 26°C.

3.3.3. Biological Characteristics

Biological diversity is extremely high. Fifty-five percent of Cacarica is within the Humid Tropical Forest (Bh-T), 41 percent in the Very Humid Pre-Montane Tropical Forest (bmh-PM), and 4 percent to the Very Humid Tropical Forest (bmh-T) Holdridge Life Zones.

3.3.4. Protected Areas

The Los Katíos Natural Park, with 72,000 ha, lies close to Cacarica along the border with Panama. On its southeastern side, the park includes part of the swampy lowlands known as the Darien Gap. Poor soil drainage limits forest growth in its lowland areas to the southeast where typical forests are quite homogeneous with “cativo” (*Prioria copaifera*) being the predominant species. At higher elevations, similar to mangrove the typical species are Caracolí and Guino. Further to the northwest, where elevations increase, high forest can develop, characterized by high diversity of floral and faunal species and abundance of the “mil pesos” palm. Near the park, there are some settlements of Emberás, an indigenous group, but no permanent human population lives within the park boundaries. The route of the Pan American Highway runs close to the western boundary of the park.

3.3.5. Social Characteristics

¹ El Comercio, April 3, 2004

Bajo Atrato has three population groups. *Colonists* are migrants from other regions who practice itinerant agriculture of subsistence crops by clearing and burning forest. As they invade forestland, the colonists frequently come into conflict with *Afro Colombians*, who have recently been given legal title to large areas of formerly state land² and who live mostly from subsistence crops and timber.³ The *indigenous peoples* live a nomadic life, living mostly along the river banks, cultivating subsistence crops, fishing, hunting, and gathering wild fruits. Their culture is changing rapidly as they have increasing contact with other cultures. They have a communal organization structure.

In 1996 and 1997 the FARC, ELN, and AUC massacred many people in the Bajo Atrato, driving most of them to the towns of Turbo, Riosucio, Mutatá and Quibdó. Although the level of violence has recently decreased in the Bajo Atrato, few families have returned to live permanently in Cacarica. Most visit their properties only sporadically. Within the Bajo Atrato there are 21 Afro-Colombian Community Councils (Consejos Comunitarios) with collective title to 691,065 ha and 6 Indigenous Reserves (Resguardos Indígenas) with title to 196,913 ha. Within Cacarica there are 17 Afro-Colombian Community Councils and 2 Indigenous Reserves. The total population within Cacarica is about 1,596 individuals in 391 families.

3.3.6. Economic Characteristics

The Bajo Atrato has suffered a severe economic crisis due to the violence caused by guerrilla groups. The rural population lost its possessions and crops. The principal economic activities of most rural people are logging, artisanal fishing, and cultivation of crops for home consumption. The soils and climate of Bajo Atrato make it suitable only for forests. Timber exploitation is selective of a few commercially valuable species. Most agriculture is subsistence cultivation on the alluvial plains of corn, rice, plátano, yuca, and beans, but some crops are sold in the markets of Cartagena, Chigorodó and Turbo. Fishing is another important economic activity.⁴

3.4. Urabá

3.4.1. Location

The Region of Urabá is located in the northern section of the Department of Antioquia on the east side of the Atrato River and to the south of and to the east and west of the Gulf of Urabá. The central and northern sections of the region include the Serranía de Abibe, the alluvial plain of the León-Mutatá River, and various Indigenous Reserves. Within this general area the CFDP has selected the zones of Serranía de Abibe and part of the indigenous reserve named “Caiman” for its field activities.

3.4.2. Physical Characteristics

Flat lowlands characterize the zones to the south of the Gulf of Urabá. Some of these lowlands are flooded frequently. To the east of these lowlands lies the range of low hills called the Serranía de Abibe, where slopes can be quite steep. The Chigorodó, Carepa, Zungo, Vijagual are the principal rivers. Soils in the flat lowlands may be fertile, deep, and suitable for

² Tierras Baldías

³ Mosquera, Juvenal. 2004. Personal communication. Mr. Mosquera is an Afro-colombian leader.

⁴ Piñeros Ignacio. 2004. Región Bajo Atrato-Urabá, Diseño de diagnóstico Forestal” CFDP, Medellín

intensive agricultural production. On the hills, the soils generally are more superficial and less fertile. Within the region average annual rainfall varies considerably, from as low as 1,800mm to as high as 4,500mm. Average temperature is about 26°C.

3.4.3. Biological Characteristics

According to the Holdridge Life Zone classification, 90 percent of the area is Tropical Humid Forest. The rest of the area is Very Humid Tropical Forest.

3.4.4. Protected Areas

There are no protected areas in the Urabá region.

3.4.5. Social Characteristics

The census of 1993 recorded a total adult male working population for the municipalities of Chigorodó, Mutatá, and Dabeiba of 2,000.⁵ The population of Urabá consists of three groups. *Absentee landowners* own large farms but generally live in Bogotá, Medellín, and other large urban areas. Their land is mostly unused or used only for extensive, low productivity cattle grazing. Their income tends to be high from cattle, commerce, and banana plantations. *Resident landowners* own small farms. In addition to small-scale agriculture and livestock on their own properties they frequently also work as hired labor on banana plantations or other enterprises. *Indigenous peoples* live in the 12 indigenous reservations which, altogether, cover 32,000 ha and belong to the Indigenous Organization of Antioquia (OIA).

3.4.6. Economy

Banana plantations on about 35,000 ha of flat, alluvial plains to the south of the Gulf of Urabá drive the region's economy. The economy of the city of Turbo revolves around the export of bananas. Wood is no longer an important component of the Urabá economy because most of the previous forested areas have been converted to pasture and agricultural use.⁶ Much of the land has been left to regenerate to natural brush and secondary forest or is maintained in low productivity pasture. The establishment of tree plantations is perhaps more feasible in Urabá than in most other regions of Colombia because of the concentration of capital in the hands of the banana growers.

3.5. Magdalena Bajo

3.5.1. Location

Magdalena Medio and Bajo are located in the lower reaches of the Magdalena River, in the Departments of Bolívar, Magdalena, and Atlántico.

3.5.2. Physical Characteristics

Magdalena Bajo is mostly flat, alluvial plain although it has terraces and hills with elevations up to 500 meters above sea level. Soils are mostly deep, clay, neutral in pH, and fertile. The climate is hot and rainfall is between 1000 and 1500mm per year distributed in two distinct

⁵ "Desarrollo forestal en la región de Urabá". Corpourabá-Proforest; Informe final proyecto forestal de los territorios indígenas de Antioquia OIA; Fuente Ultimo censo poblacional del DANE. 1995

⁶ The production of pallets from wood from natural forests has been prohibited so presently pallets are produced from pine wood grown in plantations at higher elevations, mostly in the more northern sections of the Department of Antioquia.

rainy seasons with intervening dry seasons. A dry season occurs from December through March, during which months rainfall is less than 50mm and falls in only a few days. From April to November there is a rainy season with the concentration of rain falling within 20 days in late July and early August. Another dry season occurs in late June and early July.

3.5.3. Biological Characteristics

According to the Holdridge Life Zone classification, the region is a dry tropical forest (bs-T). Temperature is hot, mostly over 26 degrees. Vegetation is mostly pastures and natural regeneration which may have a few larger trees like roble (*Tabebuia rosea*), cedro (*Cedrela odorata*), ceiba blanca (*Ceiba petandra*), ceiba tolúa (*Pachira quinata*), camajón (*Sercolea apetala*) and many other species

3.5.4. Protected Areas

The *Flora and Fauna Sanctuary of the Ciénaga Grande de Santa Marta*, located in the Department of Magdalena, contains 23,000 ha. It is the largest and most productive coastal lake on the Atlantic coast of Colombia. The marine waters of the Caribbean mix with the fresh water from the Magdalena, Aracataca, Fundación and Sevilla Rivers and from the Sierra Nevada de Santa Marta. Extensive mangrove forests provide protection and food for many bird and fish species. More than 25,000 families live from fishing within the protected area.

The *Sierra Nevada de Santa Marta Natural Park*, located on the coast in eastern Magdalena Department, covers 393,000 ha. It has the highest mountain in Colombia. At lower elevations dry tropical forest dominates. At higher elevations, there is more moisture and a montane rainforest occurs. At the highest elevations, there are natural grasslands. There are many species of plants and animals, many of them endemic. Four indigenous groups, the Koguis, Kankuamos, Ijkas, and Wiwas, live within the park.

3.5.5. Social Characteristics

In the Magdalena Bajo there are four groups of people. *Absentee landowners* own more than 500 ha, generally live in the cities, and derive their principal income from business or professional activities. *Middle level landowners* possess less than 500 ha, generally live on their property, and participate in the local social and economic life. They tend to have extensive livestock operations and derive their income from their land and other local economic activities. *Small landowners* have often obtained their land through agrarian reform programs. They derive their income from non-technical agricultural and livestock activities and daily labor on larger properties. *Displaced people* form a large part of the population. They have moved from their original homes to new locations in order to avoid rural violence. They often live with relatives or around villages and towns. They own no land and derive their income from work as daily laborers or caretakers on other people's properties. *Afro-Colombian populations* are a small part of the rural population of the Bajo Magdalena. Four thousand *Indigenous peoples* live in the Sierra Nevada of Santa Marta but do not live in the areas where the CFDP is likely to finance field activities.⁷

In the Department of Bolivar, CFDP is likely to support the establishment of commercial tree plantations in the municipalities of Zambrano and Córdoba, which have a total rural

⁷ Ultimo censo poblacional del DANE. 1993

population of 26,200. There are about 2,500 indigenous people in the department. About 30,000 Afro Colombians live in Cartagena and other urban areas.

3.5.6. Economic Characteristics

Livestock production dominates the economy of the Bajo Magdalena. Agriculture is marginal in most areas. Most of the rural population works as day laborers on the large ranches of a relatively few absentee landowners. There are about 32,000 ha of industrial tree plantations. Around these some economic growth has occurred related to the establishment, management, and harvesting of trees.

3.6. Northeast Antioquia

3.6.1. Location

The CFDP intends to improve the management of commercial tree plantations in Northeast Antioquia area known as the Territory of Zenufaná. The total area is 8,544 km². Specific sites include the tree plantations of the forest industry called Dona Maria.

3.6.2. Physical Characteristics

The Territory of Zenufaná has steep mountains and hills and soils that, although generally infertile, contain patches of fertility. Annual rainfall is between 2,000 and 4,000mm. Temperatures average around 24 °C.

3.6.3. Biological Characteristics

According to the Holdridge Life Zone classification Northeast Antioquia contains tropical Humid Forest (bh-T) in the municipalities of Caracolí, Puerto Berrío, Puerto Nare, Remedios, Segovia, Vegachí, Yalí, Yondó, and Yolombó. In these municipalities there are still large areas of natural forest. Very Humid Tropical Forest occurs mostly in the municipalities of Amalfi and Yondó where the annual precipitation can be between 4,000 and 8,000mm. These two municipalities are covered almost entirely with natural forest. Premontane Very Humid forest (bmh-PM) previously covered the higher elevations of the municipalities of Amalfí, Caracolí, Cisneros, Puerto Nare, Vegachí, Yalí, Yondó, and Yolombó. Most of this forest has been cleared and the land converted to pasture and agriculture, although some relict patches of natural forest still remain. Premontane Pluvial Forest (bp-PM) occurs on the steepest slopes mostly in the Municipality of Amalfi. Much of this forest remains intact.

3.6.4. Protected Areas

There are no protected areas in this part of Antioquia.

3.6.5. Social Characteristics

Most of the population is *Afro Colombian* or *Indigenous*. Much of the rural population has moved to the cities in order to escape violence. Standards of health and education are very low.

3.6.6. Economic Characteristics

The principal economic activities of Northeast Antioquia are gold mining, agriculture, livestock, fishing, and logging. Tree plantations cover approximately 20,000 ha of Northeast

Antioquia. The principal forest industry is the Industrias Forestales Doña María in the municipality of Yolombó which has 1,800 ha of pine plantations (*Pinus tecunumanii*, *Pinus oocarpa*) and 7,000 ha owned by Empresas Públicas de Medellín. These plantations are 35 years old and are well managed.

3.7. Comparison of Regions

Table III-1: Comparison of characteristics of the regions proposed for fieldwork under the Colombia Forestry Development Program

Location	Bajo Atrato	Urabá	Bajo Magdalena	Nariño y Cauca	Northeast Antioquia
Site	Cacarica	Serranía de Abibe – Indigenous Reserves	Municipals: Monte Rubio, Zambrano, S. Sebastian	Bajo Mira, Satinga, Guapi	Yolombó, Vegachi, Amalfi
Total Area ⁸	40,000 ha.	40,000 ha	7,000 ha	40,000 ha	8,000 ha.
• Physical					
Topography	Alluvial plain, low hills & mountains	Plains and low hills	Plains and dissected terraces	Alluvial plains and dissected terraces	Mountains, low hills and valleys
Climate	Hot, Very high rainfall	Hot, Very high rainfall	Hot, Low rainfall	Hot, Very high rainfall	Montane, Moderate rainfall
Soils	Alluvial	Alluvial	Alluvial	Alluvial	Upland
• Biological					
Holdridge Life Zone	Tropical humid forest	Tropical humid forest	Dry tropical forest	Tropical humid forest	Montane rain forest
Biological Diversity	Extremely high	Extremely high	Moderate	Extremely high	Moderate
• Protected Areas	Los Katíos	Paramillo	Ciénaga Grande. Sierra Nevada Sta. Marta	Sanquianga National Park	Las Orquídeas
• Area (ha)	80,000	n.a.	393,000	60,000	n.a.
• Importance	Extremely high biodiversity/	n.a.	Extremely high biodiversity/	Extremely high biodiversity/	n.a.
• Social					
Population	1,600	22,000	Not defined	2,400	Not defined
Predominate Group	Black, Indigenous	Black, Indigenous	Mestizo	Black, Indigenous	Mestizo Black Indigenous
• Economy					
Predominate Activity	Logging, fishing, agriculture	Banana plantations	Livestock	Logging, sawmills, fishing, agriculture	Mining, agriculture Logging, Livestock

⁸ Refers to total area where the intervention will take place according to the Life-of-Project Work Plan.

SECTION IV

Environmental Consequences

4.1. Environmental Issues

Section IV analyzes the environmental consequences of the actions that the Colombia Forestry Development Program will finance or promote. While the CFDP is a sustainable forest management and development project in scope and intends to mitigate environmental damages caused by illegal logging and deforestation, there are concerns about the potential adverse effects of the proposed actions on the environment that must be addressed.¹

Based on its review of documents, interviews with knowledgeable informants, and field observations, the EA Team identified eight preliminary environmental issues. It then classified the preliminary issues into three non-significant and five significant issues. Non-significant issues *are not unimportant issues*. Rather, they are environmental issues that either (1) are unrelated to the proposed actions; (2) or can be resolved adequately through the application of standard professional best practices and mitigation measures, which have been established by USAID. Significant issues, by contrast, (1) are related to the proposed actions; and (2) given their nature, require that special attention be focused on them to assure their resolution through the application of standard best professional practices.

The separation of significant from non-significant issues permits the Environmental Assessment to facilitate the formulation of an alternative that will resolve the significant issues while still permitting the attainment of the program's purpose and objectives. Table IV-1 indicates the non-significant and significant environmental issues related to the CFDP that the EA Team identified and analyzed.

¹ CFR 22 216 says that the scoping process to identify environmental issues and separate the significant from the non-significant issues will take place before the preparation of the Terms of Reference for the Environmental Assessment. For this EA, however, no formal scoping process appears to have been carried out previous to the preparation of the Terms of Reference. Therefore, the EA Team, carried out the scoping process.

Table IV-1. Colombia Forestry Development Project: summary of significant and non-significant environmental issues:

Issue Title	Summary of Issue
Non-Significant	
Archeological / cultural sites	<ul style="list-style-type: none"> • Forest management operations may damage archeological/cultural sites
Protected areas	<ul style="list-style-type: none"> • Forest management practices may adversely affect, directly or indirectly, biodiversity and ecosystem functions within protected areas
Industrial tree plantations	<ul style="list-style-type: none"> • The establishment of tree plantations could replace natural vegetation, cause soil erosion or otherwise affect biodiversity and ecosystem functions.
Significant	
Forest Management	<ul style="list-style-type: none"> • Silvicultural practices could high-grade forest stands decreasing future commercial value of forest stand and place the forest at risk for conversion to other land uses
Logging	<ul style="list-style-type: none"> • Logging could cause soil erosion, excessive impact on remaining vegetation, pose health and security risks to wood workers, among other negative environmental impacts.
Road and Canal Construction/ Rehabilitation	<ul style="list-style-type: none"> • The construction, rehabilitation, and maintenance of transportation infrastructure has potential to cause direct negative impacts on soil and vegetation and indirect impacts on extent of forest cover
Pesticides	<ul style="list-style-type: none"> • Pesticides can cause a wide range of negative environmental impacts. Since various aspects of forest product chains could use pesticides, the CFDP may promote, finance, or be associated with their use
Wood processing	<ul style="list-style-type: none"> • Wood processing may displace current residents, create waste products that cause contamination of air, water, and soils, and create safety hazards for workers. They could also be used to process unsustainably managed wood and increase illegal logging.

4.2. Structure of the Analysis

The following sections discuss the non-significant and significant environmental issues. The discussion of each issue is divided into a number of sections.

- First, the discussion of each issue first gives the source(s) of the issue. The Environmental Assessment does not attempt to formulate issues based on a statistically valid survey of a defined study group. Rather the EA Team identified issues through their interviews with knowledgeable informants or review of relevant documentation. Thus, the Environmental Assessment notes the issues that its informants expressed or that were identified in program documentation. Other informants might have expressed the issue differently or not have brought up the issue at all.

- Second, the discussion of the issues makes a statement that summarizes the environmental issue. The purpose of stating the issue is to make clear the connection between the CFDP's proposed action and a potential adverse environmental effect. The statement of the issue does not evaluate the validity of the issue. Rather, it draws attention to the potential adverse environmental effects of the proposed actions.
- Third, the discussion summarizes standard professional practices and mitigation for the potential adverse environmental effects that the proposed action might cause. This Environmental Assessment cannot review the entire range of professional forestry knowledge related to the proposed actions of the CFDP. In any case, professionalism, by definition, involves judgment based on specific circumstances. The discussion of potential environmental impacts cannot yet be site specific. The CFDP has not yet identified the specific sites where it will carry out its activities. However, the CFDP Environmental Program, described in Section V, will provide for more detailed environmental review of the CFDP's proposed actions, once their character and location has been determined. Even then, however, permanent, professional supervision of forestry field activities will be required to fully identify, avoid, and mitigate adverse environmental effects. Nonetheless, this section provides a summary of the standard, professional practices for avoiding and mitigating adequately the potential adverse environmental effects that the proposed CFDP actions may cause.
- Fourth, the discussion compares the relationship between the issue and the characteristics of the four regions in which the CFDP will have activities. The four regions vary considerably in their extent of forest cover, topography, climate, land tenure patterns, and other characteristics. The environmental issues, therefore, have different relevance in the different regions. This section highlights these differences in the relevance of the issue to each of the four regions.
- Fifth, for each significant issue, the paper identifies mitigation measures that should be taken into account for the Proposed Alternative to be compliant with 22cfr216 and related regulations. There are no mitigation measures for the No Action Alternative – its mitigation measure, in a sense, is the CFDP itself. Mitigation measures for the Proposed Alternative are actions that would address the significant environmental issues and these form the basis for the Proposed with Environmental Program Alternative.
- Note again, however, that the term “non-significant” *does not mean that the environmental issue is unimportant*. Rather, it means that the adverse environmental effects related to the issue are, in the judgment of the EA Team, likely to be less important than the significant issues in the context of the CFDP.

4.3. Non-Significant Issues

4.3.1. Archeological and Cultural Sites

4.3.1.1. Source

CFR 216.6 c (5), USAID Environmental Procedures

4.3.1.2. Issue Statement

All of the regions contain archeological and cultural sites. Some of the forest management activities that the CFDP will support could occur in forests where these sites are located. These activities, especially road rehabilitation and timber harvesting, could adversely affect archeological or cultural sites.

4.3.1.3. Summary of Best Practices

Forest management plans or construction projects must identify archeological and cultural sites within the forest management unit. Especially valuable sites should be marked on maps and on the ground and eliminated from the area of production forest. If necessary, small sites could be fenced or otherwise protected from intrusion. The key to avoiding adverse impacts to these sites is the creation of awareness on part of the forest workers and forester owners of their importance. Administrators and woods workers must be trained to recognize archeological sites and instructed to protect them from adverse impacts.

Table IV-2. Ideological and cultural sites: potential adverse impacts summary of best practices

Potential Adverse Impacts	Summary of Best Practices
Destruction/degradation of archeological and cultural sites	<ul style="list-style-type: none"> • Identify archeological/cultural sites through field observations and consultations with knowledgeable local people and experts and authorities. • Locate archeological/cultural sites on forest maps. Designate sites for protection rather than production. • Train field supervisors and workers on the importance of and to identify and protect archeological/ cultural sites. • Formulate standard procedures for reporting and protecting archeological/cultural sites discovered during forestry operations.

4.3.1.4. Comparison of Regions

The EA Team could not identify specific archeological/cultural sites that an action of the CFDP might affect since the specific locations and character of the actions that the CFDP will support have not yet been determined. Archeological and cultural sites, however, occur in all four regions where the CFDP will work. So far as the EA Team could determine, however, none of the regions were important cultural centers before the Spanish Conquest and no known major sites exist.

4.3.1.5. Rationale for Classification as a Non-Significant Issue

Standard professional practices and mitigation measures will avoid adverse impacts on archeological and cultural sites. The forest management planning process will identify such sites if they occur within forest management units or industrial tree plantations and the Environmental Program will create awareness on this issue and monitor compliance with standard professional practices and mitigation measures.

4.3.2. Protected Areas

4.3.2.1. Source

Foreign Appropriations Act Section 219, CFR Reg.216, and FAA Sections 118-199

4.3.2.2. Issue Statement

Although the CFDP will not promote or finance any activity within a protected area, it will promote competitive forest product chains in regions where protected areas occur. Protected areas are rarely completely isolated from processes in the surrounding landscape. Thus, actions taken by the CFDP to make forest product chains more competitive could conceivably affect a protected area and should be based LAC Environmental Guidelines to avoid or mitigate possible adverse impacts. Logging operations or road use, for example, could increase sedimentation in a river that flows through a protected area or logging roads could facilitate access by agricultural colonists into or to the boundaries of a protected area. The ecosystems surrounding a protected area frequently provide essential habitat for wide ranging animal species also found within the protected area. Logging operations might change the quality of that habitat. If logging operations reach the boundaries of a protected area, they could continue beyond, especially if the boundaries of the area are not well marked or patrolled.²

4.3.2.3. Summary of professional best practices

Professional practices that are to be applied by the CFDP avoid indirect adverse environmental effects of forest management and tree planting activities on protected areas. Harvesting operations will be designed to result in rapid re-vegetation of exposed soil in order to minimize soil erosion. Silvicultural practices will consider effects on species of plants and animals that may provide food for wide ranging rare animals that live within protected areas. Forest roads will be closed to agricultural colonists so as not to provide access to protected areas.

Forest management units may likely contribute to the more effective protection of protected areas since they in effect place the forest under control and management. They could provide additional unmodified or slightly modified habitat for the wide-ranging animals that live within a protected area. They may create a barrier that reduces the spread of colonization up to, and perhaps across, the protected area boundaries. By reliably producing wood and other forest products, forest management units may compensate for the production that cannot be extracted from within protected areas. This increased production, although perhaps only in the long-term, may reduce the pressure to exploit the protected area's wood resources.

² In the Catskill Mountains of New York State, for example, loggers sometimes help themselves to logs across the boundary of the State Forest Preserve. The Guayaquil parrot nests within the boundaries of the Cerro Blanco Preserve but also uses the mangrove forests outside the preserve.

Table IV-3. Protected Areas: potential adverse impacts summary of best practices

Potential Adverse Impacts	Summary of Best Practices
Upstream logging operations cause sedimentation in rivers that flow through protected areas	<ul style="list-style-type: none"> • Technical planning, design and implementation of logging operations reduces area of soil affected by skidding and roads avoiding soil erosion. • Silvicultural practices that achieve rapid natural regeneration after logging operations reduce soil exposure, avoiding soil erosion. • Silvicultural practices that limit number of stems and volume removed reduces exposure of soil and avoids soil erosion.
Logging operations on borders change habitats or cause increased hunting pressure for animals that migrate outside of protected areas	<ul style="list-style-type: none"> • Silvicultural practices limit changes to species composition and structure protecting animal habitats. • Silvicultural practices purposefully augment habitat for specific rare plants and animals permitting their regeneration and increased abundance. • Silvicultural practices protect sites of special importance for endangered or rare animals and plants. • Forest management plans and operations designate part of the forest management unit for protective rather than productive function. • Forest management plans and operations designate part of the forest management unit for protective rather than productive function. • Forest management plans should insure provisions to strictly limit hunting by logging and forestry crews.
Access roads permit influx of agricultural colonists to borders or within protected areas	<ul style="list-style-type: none"> • Forestland bordering access roads designated for permanent forest management units before access roads are constructed, improved, or rehabilitated. • Forest management unit controls access of agricultural colonists into areas surrounding protected areas.

4.3.2.4. Comparison of Regions

The protected area most vulnerable to being affected by timber extraction associated with the CFDP is the Sanquianga Natural Park in the Pacific Coast of Nariño Region. This park lies in the mangrove and flood plain forests downstream from Alto Guapi, where the CFDP intends to establish a forest management unit. Non-technical logging operations within the Alto Guapi forest management unit could possibly affect the park. In the Bajo Atrato Region, the Katíos Natural Park lies to the northeast of Cacarica mostly at higher elevations and in other watersheds. There is little chance that forest management operations in Cacarica can negatively affect this park. The Ciénaga Grande protected area, in the Bajo Magdalena, lies well down river, out of the range of influence from the potential sites for industrial tree plantations in the Bajo Magdalena. Likewise, the industrial tree plantations in the Bajo Magdalena will not affect the Sierra de Santa Marta Natural Park, which lies well to the east and at higher elevations than the proposed plantation sites. There are no protected areas in Antioquia that are close to the proposed sites for CFDP activities.

4.3.2.5. Rationale for Classification as a Non-Significant Issue

Standard, best professional practices and mitigation measures will almost certainly be effective in avoiding adverse environmental impacts on protected areas of the CFDP activities.

Nonetheless, the CFDP Environmental Program will consider the potential for forestry management and logging operations to affect protected areas in the same region, include this theme in training related to forest management planning, and will include this issue in the monitoring system to measure related environmental impacts.

4.3.3. Industrial Tree Plantations

4.3.3.1. Source

Colombian environmental NGOs

4.3.3.2. Issue Statement

The CFDP will promote and perhaps finance industrial tree plantations in Bajo Atrato, Urabá, Bajo Magdalena, and Northeast Antioquia. Industrial tree plantations could cause adverse environmental effects. Industrial tree plantations may replace diverse native vegetation with monoculture plantings of exotic species of the same age, thus reducing available habitats and special niches, important perhaps for rarer flora or fauna. Exotic tree species sometimes regenerate naturally, creating a risk of competition with native vegetation. Site preparation may cause short-term soil erosion and compaction or, if herbicides are used, contaminate aquatic ecosystems. Industrial tree plantations may increase fire occurrence in surrounding natural vegetation. Industrial tree plantations could reduce demand for wood from natural forests, lowering their financial return and making forestland conversion to other uses more financially attractive to its owners. Subsidies for industrial tree plantations may accentuate such a trend.

4.3.3.3. Summary of Best Practices

Professional practices will avoid the potential adverse environmental impacts of industrial tree plantations. LAC Environmental Guidelines define many of these practices and should serve as the basis for development of activities in this area. Under such practices, tree plantations must not eliminate even previously logged natural forests. They must provide a variety of habitats for animals and plants, especially by leaving corridors of natural vegetation along water bodies that provide habitat for fauna. Native vegetation must be encouraged and reforestation must avoid continuous blocks of the same species and seek to provide corridors of native vegetation that provides food and habitat for native fauna. Harvesting practices must minimize soil movements and erosion. Plantation establishment and management must identify and provide for traditional uses of the forest by local people if they exist in the area. Table IV-1 summarizes the principal environmental mitigation and monitoring issues and mitigation measures that are associated with tree plantations.

With the application of such professional practices industrial tree plantations will produce positive rather than negative environmental impacts. For example, the CFDP will support industrial plantations in Magdalena Bajo and Northeast Antioquia. In both areas, extensive livestock grazing has caused degradation of soils and native vegetation. Tree plantations frequently improve soils and ameliorate microclimates, creating the conditions for

reestablishment of natural vegetation in the plantation understory.³ Professionally planned, established and managed industrial tree plantations will in general increase the employment opportunities of the poorer segments of the rural population.

Table IV-4: Industrial tree plantations: summary of potential adverse environmental impacts and best practices

Potential Adverse Impacts	Summary of Best Practices
Loss of forest ecosystem integrity	<ul style="list-style-type: none"> • Replace native vegetation with tree plantations only as part of an overall plan for maintaining and augmenting natural vegetation within the plantation unit and in the landscape • Test and use native species as part of reforestation programs for productive and protective purposes. • Use tree plantations to establish soil and microclimatic conditions that favor regeneration of a natural mix of native plant species. • Maintain, restore, and increase native vegetation along water bodies and steep slopes and within the tree plantations themselves. • Identify, map and protect special habitats, especially for rare plant and animals, favoring the natural regeneration of native flora but using artificial plant establishment as required to reestablish adequate soil and microclimatic conditions. • Avoid large-scale earth movements or compaction during road construction or site preparation to prevent soil erosion and sedimentation into water bodies and degradation of soil structure and fertility. • Concentrate tree plantations on best sites, use genetically improved planting stock, and adequate site preparation in order to obtain maximum yields per hectare, thus leaving poorer sites for the regeneration of natural vegetation which provide habitat for native fauna. • Use only authorized pesticides for nurseries, site preparation and control of pests and follow all procedures to avoid contamination of soil, air and water bodies. Incorporate Integrated Pest Management practices into silvicultural operations. • In regions with dry seasons, protect plantations and natural vegetation from seasonal wildfires. • Develop an awareness campaign to educate local communities and other actors as to the environmental and socio-economic benefits of forest plantations.
Natural forest loses economic value	<ul style="list-style-type: none"> • Improved integrated land use planning, resource assessments, and land use zoning
Human health and safety	<ul style="list-style-type: none"> • Use only authorized pesticides and follow all use instructions and safety precautions during their use. • Assure that all work and supervisory personnel have and use safety equipment such as masks, gloves, and steel toe boots during application of pesticides and during other plantation operations.

³ Studies made by the Corporación Nacional de Investigación y Fomento Forestal (CONIF) indicate that plantations of exotic tree species can increase the abundance and variety of native plant and animal species.

Potential Adverse Impacts	Summary of Best Practices
Loss of land use rights causes decline in status of basic needs	<ul style="list-style-type: none"> • Evaluate contribution of potential plantation site to basic needs of rural population for food, medicine, and shelter. Choose another site or provide alternative source if site supplies basic needs that cannot be supplied elsewhere. • Confirm land use rights before planning or implementing tree plantations

4.3.3.4. Comparison of Regions

The greatest extent of planting of industrial tree plantations will be in the Bajo Magdalena. There the CFDP's target is 7,000 ha of new plantations, mostly of eucalyptus and pine. These plantations will be established in low productivity pastures. Since many of these pastures are semi-abandoned, they do have regeneration of native species of flora and probably support some albeit small populations of native fauna. In this region, therefore, the plantation establishment must not replace natural vegetation. In addition, plantation planning must provide for the regeneration of native vegetation around natural water bodies and protection of special features, such as ravines, hills, or vegetation that provides habitat for native plants and animals. The Bajo Magdalena is prone to fires, usually set purposefully to clean pastures of weeds during the dry season. These fires sometimes sweep into industrial tree plantations. Plantation management should plan for the protection of natural vegetation within the plantations from such fires. Industrial tree plantations in Bajo Magdalena must not be a means for relatively few, well-off, absentee, landowners to displace local people.

The combined CFDP target for industrial tree plantations in Bajo Atrato and Urabá is 3,000 ha. In Bajo Atrato the CFDP will use the taungya system, which combines tree planting with agricultural crops during the first two-four years to establish these plantations. Tree plantations will be established in collaboration with the Community Councils in Bajo Atrato and with banana companies in Urabá. The former will inter-plant agricultural crops trees with trees for the first two years. Such plantations will be scattered and small and therefore unlikely to change the landscape or affect biodiversity or ecosystem functions.

In Urabá, by contrast, banana companies will probably establish the industrial tree plantations. Banana plantations in Urabá have already almost entirely replaced natural forest. When industrial tree plantations replace banana plantations or occupy unused land without forest cover, they will not affect ecosystem functions or biodiversity.

In Northeast Antioquia the CFDP will support the better management of existing pine and eucalyptus plantations. It will not finance new plantations. Its actions, therefore, will improve, not harm, the environment. The CFDP will support no industrial tree plantations in the Pacific Coast of Nariño Region.

4.3.3.5. Rationale for Classification as Non-Significant

Professional practices and standard mitigation measures will avoid the potential adverse environmental impacts of industrial tree plantations with which the CFDP may become associated. As part of the planning for the industrial tree plantations, the CFDP Environmental

Review Process will predict site-specific potential adverse impacts and define and monitor the application of appropriate professional practices and mitigation measures.

4.4. Significant Issues

The following sections analyze the environmental consequences of the actions related to the four significant issues: Forestry Management, Logging Practices, Road and Canal Construction/ Rehabilitation, and Pesticide Use.

4.4.1. Forest Management

4.4.1.1. Source

Terms of Reference

4.4.1.2. Issues Statement

The CFDP will become involved in forest management of natural forests in the regions of the Pacific Coast of Nariño and Cauca, Bajo Atrato, and Urabá. Forest management is the core of the forestry profession. Forest management involves establishing the:

- Objective for the forest management unit;
- Forest management unit's resources (standing volume, infrastructure, etc);
- Silvicultural system to be used;
- Inputs required for reaching the objective;
- Financial costs, income, and investment related to a time period;
- Means to avoid adverse environmental impacts.

These aspects of forest management all influence the direction, intensity, and geographical and time scale of the environmental effects that forest management operations cause. For example, the objective of maximizing short-term income, will produce a different environmental impact than the objective of preserving biodiversity. The environmental impacts from management of a young forest without mature timber will be different from those of an old forest, with mature timber. Likewise, the application of a selective silvicultural system will affect the stand species and structure differently than a clear-cut or shelterwood silvicultural system. The use of heavy machinery and building of roads will affect the environment very differently than helicopter logging. The availability of investment and working capital will make some operations possible that would not be feasible without investment and working capital. The results of the environmental assessment depend on the site-specific characteristics of the sites where logging operations will be undertaken. In sum, the forest management plan and environmental impacts are inseparable. The significant issue thus arises of how forest management operations that the CFDP plans or implements will affect the environment.

4.4.1.3. Best Management Practices

This Environmental Assessment can only very briefly summarize the direction for the best management practices for forest management. It should be made clear that forest management planning is a two step process. The first or the overall forest management plan defines long-term

objectives and strategies as well as lays out the technical, financial, and environmental basis for subsequent annual harvest plans. This basis includes definition of:

- *Objective for the forest management unit.* Forest management should respond to the forestland owner's objective(s) while being compatible to those of the CFDP and overall sustainable management of the forest. If the management of the forest unit does not respond to the forestland owner's interests, then the forestland owner will generally not be interested in forest management. The forest management plan should clearly indicate to the forestland owner how forest management will contribute to her/his objectives. A forest management plan that is too complicated for the owner to understand will not convince him/her to manage and protect the forest management unit. But at the same time, the CFDP should not support a forest management plan or extraction activities that is not based on sustainability and is compatible with CFDP goals and objectives.
- *Forest management unit's resources.* The description of the forest management unit's resources should include all relevant information. This should be detailed to the extent necessary for the forest management plan to be of use to the owner of the forest management unit while complying with national regulations and international standards. This will include maps, inventory data, and description of road layout, processing centers, and other infrastructure as a minimum.
- *Silvicultural system to be used.* The silvicultural system should achieve the objective of increasing the productivity and quality of the forest stand while conserving its biodiversity and ecosystem functions to fulfill the owner's objective. Harvesting timber makes the greatest change in the forest stand's structure and species composition and is an integral part of the silvicultural system. Harvesting should therefore be seen as a key moment in the silvicultural system, perhaps even more so than other silvicultural operations such as thinning or releasing. The silvicultural system should therefore define the cutting cycle, the area that can be harvested each year, the minimum diameter limits, the incorporation of seed trees or other means to guarantee regeneration, the allowable harvest volumes, and other data to orient the harvest and management of the forest resource.
- *Inputs required for reaching the objective.* The inputs required for reaching the forest management plan's objective greatly influence its environmental effects. For example, if roads must be built to haul logs, then earth movement and destruction of vegetation may be necessary and the associate environmental impact may become an issue. Likewise the harvesting equipment and system required will be largely determined by the size of the logs to be harvested, volumes, and terrain and in turn can greatly influence the environmental impact of forestry activities..
- *Financial costs, income, and investment related to a time period.* The forest management plan is in part a business plan that defines how a forest management unit will be managed in order to reach its objective. Although the forest management objective is not necessarily cash income, the forest management unit should be able to pay for its own costs and generate benefits for its owner and society. However, there may be a long period of investment before the forest management unit begins to cover its operating costs. This happens, for example,

when the forest management unit has a large proportion of young, non-commercial trees. The economic basis for viability of the forest management plan must be clearly laid out in the forest management plan.

- *Means to avoid adverse environmental impacts.* Forest management plans include a section regarding environmental impacts and their mitigation. A general discussion of potential environmental impacts should be useful to the forestland owner. In the forest management plan, issues such as the definition of areas to set aside for protection (riparian, high biodiversity, fragile wetlands, etc.), road construction, maintenance and post-harvest closure, identification of endangered species, etc. should be addressed. However, to predict environmental effects of timber extraction with some degree of certainty it is necessary to analyze site-specific characteristics and this is done in the annual operation plans or POAs. Being aware of and mitigating environmental impacts must become an integral part of the forest management process. Harvest plans for specific sites and based on inventory data and maps are key to mitigating skid trail impacts, erosion and other negative impacts.

4.4.1.4. Comparison of Regions

The CFDP will prepare forest management plans in the four regions for quite dissimilar types of forests.

Afro Colombian Community Councils have title to most of the humid tropical forests of the Pacific Coast of Nariño and Cauca and Bajo Atrato Regions. The Afro Colombians, however, are not organized communally but by families. They view the forest as a source of cash income, especially for family emergencies.

In Urabá there are two forest management situations. The large banana companies in the flat lowlands of Urabá have company or individual titles to land. They do not have forestland, however, because their land has all been converted to intensive agriculture. Their interest in forestry is to establish plantations of fast-growing trees for pallets. The indigenous forestland owners in Urabá, by contrast, have communal titles to natural forestland, most of which has been previously cut over. Their interest is to sell logs or trees for cash income.

The forests with which the CFDP will work in Northeast Antioquia are pine and eucalyptus plantations on privately owned land under the control of commercial timber and sawmill companies.

Likewise, in Magdalena Bajo, the CFDP will be involved only with plantations and agro-forestry, not with natural forest. Private landowners and wood industries own the plantations. Their interest in tree plantations is improved environment and a cash return. They plan to intensify cattle production and use marginal land for industrial tree plantations.

4.4.1.5. Rationale for Classification as a Significant Issue

Forest management, especially of natural forest, is a sensitive issue as a result of 22CFR216, FAA Section 118 and international views related to and caused by inappropriate logging in the tropics. Therefore forest management is flagged as a significant issue and must be scrutinized.

An effective monitoring system must be established to assure that USAID funded CFDP activities comply with international standards.

4.4.1.6. Mitigation Measures for Forest Management

Forest management is in itself a mitigation measure for current poor logging, forest degradation through poor or no management, and deforestation. Best practices that are recognized by different international bodies, perhaps most notably the Forest Stewardship Council exist and are proposed to serve as the basis for implementing the CFDP. These principles and criteria have served as the basis for development of Colombia-specific forest management standards for natural and planted forests but the Technical Group on Voluntary Forest Certification (GTCFV). Thus the challenge for this EA is to define a process or set of activities that can be used to assure CFDP and USAID that these best practices are indeed being applied and produce the intended positive impact on the environment in the affected areas. FSC certification could possibly be the best mitigation measure to subscribe to and will be pursued in all CFDP supported activities. However, given the short term of the CFDP, it is unlikely that communities will actually reach this status. Therefore an alternative system is being proposed according to the following mitigation steps:

- i. All forest management plans developed under the CFDP should use the CAD-developed Villa Garzón management plan format, approved by the BEO, as the basis for their development. Improvements to the plan should be proposed and implemented based on ongoing experience in Putumayo, as well as other projects funded by USAID throughout the region.
- ii. Likewise all forest management plans should be based on the FSC principles and criteria and standards established by the Technical Working Group for Voluntary Certification in Colombia (GTCFV) and one of the goals of the forest management activities should be to become certified.
- iii. The CFDP has planned training programs in the different regions on sustainable forest management plan development, implementation and monitoring. These target communities, loggers, forest product companies, NGOs and local government officials in the CARs and municipalities. These training programs should use the Villa Garzón management plan outline as the basis for these courses. Additional themes such as the importance and identification of archeological sites and the relationship between the management unit and surrounding protected areas should be included in the training.
- iv. The CFDP supports the GTCFV and has contracted it through WWF to provide training on certified forest management and the certification process. These activities should be clearly integrated with the other CFDP training program.
- v. An overall training program on issues related to the significant and non-significant issues and the overall environmental review program related to forest management should be presented to the CTO and MEO for their approval on an annual basis. While to a certain extent, this is in the LOP work plan, the mentioned training activities should be reviewed and incorporated into a more detailed training plan.
- vi. An independent third party institution, probably Colombian, should be competitively identified and contracted to review each forest management plan to determine that the plan is indeed compatible with the FSC principles and criteria and USAID regulations. The institution should be tasked with providing a written determination of concerns

related to the environmental consequences of the plan and once these are satisfied, their approval. Note that later in the project life and after training supported by the CFDP, this task may be delegated to specific CARs if they are determined capable of playing this role.

- vii. A separate contract should be competitively issued to design and conduct an initial study and subsequent system to assess, document, and monitor the environmental impact of the forest management activities, including impacts on biodiversity. This should be done within one year of the initial harvesting activities under the forest management plans.
- viii. The CFDP should provide the appropriate documentation to the CTO and MEO to assure that these steps are being completed. To do so, they should identify a team member to be responsible for and oversee this process.

4.4.2. Logging Practices

4.4.2.1. Source

Foreign Assistance Act, Section 118

4.4.2.2. Statement Issue

The CFDP will be associated with sustainable forest management and logging operations in industrial tree plantations and in natural forests.⁴ Exploitation of either may cause mechanical damage to vegetation in the residual forest stand, soil erosion, and degradation of wetlands. Such impacts are generally less difficult to avoid in tree plantations than in natural forests. Cumulative effects could cause sedimentation and downstream flooding. Logging and logging slash can leave residual vegetation susceptible to pest invasions and fire.

The decimation by hunting of forest animal population by woods workers is commonly one of the greatest adverse impacts from logging. If woods workers are not provided with sufficient food, including meat, they frequently hunt wild animals. Even a small woods crew through hunting can decimate the population of wild animals in a wide area around a forest camp. If rare and endangered animals occur in the forest such hunting may put their population in serious risk of local extinction.

Improved logging equipment may be a very effective manner to increase the competitiveness of forest product chains while reducing adverse environmental impacts. Section 118 of the Foreign Assistance Act, however, clearly and specifically prohibits the use of USAID funding for the procurement of logging equipment unless an environmental assessment indicates that all timber harvesting operations associated with this funding will be conducted in an environmentally sound manner which minimizes forest destruction.

⁴ So far as the EA Team could determine, the CFDP will not work to make non-timber forest product chains more competitive.

4.4.2.3. Summary of Best Practices

A principal way to minimize adverse environmental effects from logging is to develop and implement sustainable forest management plans that include a number of best practices. Perhaps the most important of these is referred to as “reduced impact logging”. Reduced impact logging improves the competitiveness of a logging enterprise while minimizing adverse impacts on the forest ecosystem and biodiversity. It starts with careful planning of the logging operation, particularly through mapping of forest roads and skidding trails. This planning and mapping reduces the total surface area of the forest floor which logging machinery affects and increases the efficiency of felling and skidding. Reduced impact logging also uses preparation of the forest stand, such as cutting of vines and clearing underbrush, the directional felling of timber trees, and strictly reduced and restricted movement of heavy machinery, and avoidance of wetlands and streams to reduce adverse impacts.

There are other important measures that must be taken to reduce the adverse environmental effects of timber extraction operations. It is very important that woods workers not be permitted or should agree to not hunt or capture wild animals. The use of appropriate logging equipment can be a principal measure to reduce adverse environmental effects from logging. The characteristics of appropriate logging equipment vary according to climate, soils, topography, and the characteristics of the stand to be logged. To determine which equipment is most appropriate requires specialized technical knowledge.

Logging operations should occur when climatic conditions permit logging without excessive impact on soils. Generally, heavy rainfall makes logging difficult and less productive as well as more damaging to soils and residual vegetation. Thus if climatic conditions vary during the year, then the most favorable seasons should be chosen for logging the most difficult sites, such as steep slopes or clayey soils. The type of logging equipment can sometimes be adjusted to the site in order to reduce adverse impacts.

Logging best practices should be defined in detail in the forest management plan and then implemented. This should include the type of equipment to be used, logging season, hunting restrictions, reduced impact logging strategies, and so on.

Table IV-6. Logging practices: summary of potential adverse impacts and best practices

Potential Adverse Impacts	Summary of Best Practices
Damage to residual stand	<ul style="list-style-type: none"> • Plan skidding trails • Practice directional felling • Selection and use of appropriate equipment • Mark valuable residual trees previous to logging operation • Fell badly damaged trees after logging
Soil erosion and compaction	<ul style="list-style-type: none"> • Plan skidding trails to reduce total area crossed by machinery • Use appropriate equipment for stand characteristics • Use silvicultural practices that achieve rapid vegetation cover
Pest invasions	<ul style="list-style-type: none"> • Fell weaker & pest infested trees during logging operation • Cut up slash to achieve faster decomposition
Fires	<ul style="list-style-type: none"> • Cut up slash to achieve faster decomposition • Build fire breaks when required
Reduction in populations of wild animals	<ul style="list-style-type: none"> • Prohibit hunting by logging crews • Provide adequate food for logging crews • Identify & protect special animal habitat • Monitor impact of forest management and logging activities on wildlife.

4.4.2.4. Comparison of Regions

In the Bajo Magdalena, the CFDP will be associated only with logging in industrial tree plantations. The logging sites there are usually flat with few rivers, streams, or other water bodies. There are, however, marked rainy seasons from April through June and from October through November when logging will compact soils more than during the dry season.

In the Bajo Atrato, industrial logging operations make a census of all the trees to be cut, recording their diameter breast height (DBH), species and location. Each tree is marked. Trees are felled using a chainsaw. Treaded skidders pull tree length logs to landings on bank of the nearest river course or canal. Skidding distances generally do not exceed 750 m. The logs are bucked with a chainsaw into 5 to 16 m logs. Rivers and canals are cleared of vegetation and obstacles. If required to maintain a minimum depth of 2.5 m in the waterway, temporary dams are constructed. At the landing, rafts are formed, each with about 100 logs and are floated to the dam site. There the raft is disassembled, the logs winched across the dam and the raft reassembled. At the “boom”, places in the river where the current is deep and slow-moving, “boom” rafts are constructed, each formed from 500 to 1,000 logs. The “boom” rafts are floated down the Atrato River to the Gulf of Urabá where the logs are loaded on cargo boats and transported to Barranquilla. For a logging operation of this type in Río Sucio, costs to the Gulf of

Urabá total about US\$117.17/m³. Local people receive about US\$8.69 of this total, for trees, labor and social benefits.⁵

In the Bajo Atrato, Maderas de Darien has used treaded skidding equipment called KMC to log in the forests of the Community Council of La Larga. These skidders place relatively little pressure on the soil because they have 10 treads on each side. Since each tread is independent, the KMC can traverse almost any terrain without causing compaction of the soil. During the rainy season, the KMC can almost float into the flood forest, operating in extremely wet and muddy conditions to skid out logs. Since the logs partially float, they do little damage to the soil. In the dry season skidding is more difficult because the logs do not float, although the KMC works more rapidly.

In the Pacific Coast of Nariño and Cauca there are almost no industrial logging operations left, since the large timber companies moved out when land rights were transferred to the Afro Colombian and Indigenous communities. In an artisanal logging operation in Bajo Atrato or the Pacific Coast of Nariño, sellers and buyers jointly select the trees and negotiate a price per tree. Axes are generally used to fell the timber tree. Either chainsaws are used to buck them up into 3m lengths or the logs themselves are hauled manually to a landing site on the nearest suitable river or canal bank. The logs are formed into rafts, which are floated down to a sawmill in a local town. Species that are too heavy to float must be floated together with species that do float.

Sometimes manual saws or chainsaws are used to saw up the logs into boards. The boards generally measure 3 mts length x 20 cm x 20 cm. Less than 30 percent of the standing volume is generally transformed into boards. Boards are then transported by mule or manually to the nearest suitable canal, river or road and moved by raft or truck to the market. For an artisanal logging operation of this type, the total cost is about US\$18.54/m³. The percentage of this that flows to local people depends on the extent of their participation in the operation.

In Northeast Antioquia the CFDP will be involved with logging only on the plantations that belong to Empresas Forestales Dona Maria. These plantations occur in five different properties, each one with its own characteristics of slope, soils, and rainfall. The EA Team was not able to make a detailed study of logging operations in each of these properties and only visited a property just to the south of Medellín. The plantations on this property occur on very steep slopes. Nonetheless, Empresas Forestales Doña María uses cable logging to harvest these plantations with almost no long-term, adverse effects on the soil. The key factors in the ability of their operation to harvest timber efficiently while not causing adverse environmental impacts are the experience and motivation of their logging crews and supervisors and the high quality of their equipment. The use of Swiss cable logging equipment, for example, has enabled Dona Maria to reduce its need for forest roads by half while increasing production and log quality.

4.4.2.5. Rationale for Classification as a Significant Issue

The basis of the CFDP is sustainable forest management and its overall intent is to improve how forestry and logging is carried out in the project areas. However, logging operations, even if artisanal, currently produce adverse environmental effects given their lack of adoption of professional best practices. These inappropriate and often illegal activities have given forestry a

⁵ This description is based on the operations of Maderas del Darién in the Bajo Atrato.

bad reputation, especially in the tropics. These operations require substantial training, management supervision, incentive systems, occasionally new investments, and technical assistance if they are to be turned around to practice logging in a sustainable and yet economically viable fashion. The CFDP is to provide this assistance but it must develop the appropriate environmental oversight systems in order to assure compliance with the defined professional best practices, mitigation measures and the use of appropriate logging equipment.

4.4.2.6. Mitigation Measures for Logging Practices

As is the case with forest management planning, best practices in logging exist, as is discussed above. Therefore the challenge for the CFDP is to promote and to the extent possible insure that communities and companies are utilizing these practices, In that regard, the EA team recommends the following mitigation actions:

- i. The CFDP has plans to implement a modular training program in all the regions of program activities to introduce reduced impact logging technologies and train forest operators and woods workers in their application. These will include directional felling, harvest design and skid trail layout, bucking, vine cutting, equipment selection and operation, and the identification of future harvest trees. A reduced impact logging specialist will be contracted on a short term basis to conduct these courses. The EA Team recommends that this program should be expanded to include representatives of the CARs and appropriate NGOs. Training materials stemming from the program should be made available to a broader audience.
- ii. The CFDP should contract a specialist in reduced impact logging to conduct a review of logging activities within six months of initial logging activities. The specialist should present a report to CFDP and USAID on the adoption of reduced logging techniques imparted by the CFDP training program, as well as the overall status of the environmental impacts being created by logging practices. The specialist should emphasize natural forests but also review logging in plantations, developing recommendations for the CFDP to follow in subsequent training and technical assistance activities. The CFDP should assure that all forest management plans thoroughly address logging practices and incorporate reduced impact logging. It should also specify in the terms of reference for the institutions to be contracted to review the forest management plans as well as the environmental impacts that logging is a significant issue that merits special attention.

4.4.3. Roads and Canals Construction/Rehabilitation

4.4.3.1. Source

22 CFR 216, USAID Environmental Procedures

4.4.3.2. Issue Statement

Transportation infrastructure is an essential element in the competitiveness of forest product chains. The ease with which logs or sawn wood reach the market or processing plant greatly influences their quality and cost. In addition, good transportation infrastructure makes it possible to reliably supply the market.

Potential adverse environmental effects from the rehabilitation of forest roads and canals occur during the construction and use stages. During the construction phase, the realignment of the road or reconstruction of its base generally requires movement of soils with the potential for erosion. Consequent sedimentation can degrade water quality, affecting aquatic ecosystems until the road stabilizes. Rehabilitation of canals may lower the water table of the surrounding land, affecting the forest ecosystem through changes in vegetation and associated fauna. During the operational phase adverse environmental effects generally start with lack of adequate road or canal maintenance. Deteriorating roads begin to erode, increasing sedimentation into water bodies. Deteriorated roads eventually must be rehabilitated again.

Perhaps the most serious effect of road rehabilitation occurs when it permits an influx of agricultural colonists into formerly uninhabited or lightly inhabited forested areas. Such areas tend to occur on infertile soils with little long-term aptitude for competitive agricultural or livestock production. Agricultural colonization thus tends to be temporary. Rather than establish permanent production units, therefore, new or rehabilitated roads frequently stimulate temporary settlement, destruction and degradation of forest resources, and land semi-abandonment as colonists move on to other forested areas, as new or rehabilitated roads make them accessible.

Under USAID's Environmental Procedures, all rural road construction and rehabilitation activities require a full environmental assessment. Although the CFDP will not finance the construction of any new roads or canals, it may finance or promote the rehabilitation or improvement of roads or canals that are used to transport logs or sawn wood from the forest to the road network or to rivers. These roads would be forest roads internal to the forest management unit but not linked to the national road network. These types of internal, temporary forest roads would not require the preparation of a full Environmental Assessment but rather their impact will be assessed through the Environmental Review Process, which is to identify major issues that would make such an assessment advisable. Generally, the Environmental Review Process itself would be sufficient to identify potential adverse environmental effects from such roads and canals, and define the appropriate measures to avoid or mitigate them.

4.4.3.3. Summary of Best Practices

The best practices for roads and canals involve three basic considerations.

- First, the road and canal should be situated to minimize adverse environmental effects. Road lay-out should follow contours, not create slopes of more than 10 percent, avoid water bodies and wetlands as well as ecologically sensitive sites, and minimize cuts and fills. Canals should be as short as possible and their construction should require the minimal amount of earth movement.
- Second, road or canal design should be adequate for the weight and volume of the logs that will be used to transport. If roads will be used to transport heavy logs, they should not be designed to carry only light agricultural products. Otherwise they will deteriorate quickly, raising maintenance costs, thus reducing the net profit of the forest management unit and causing adverse environmental effects through soil erosion. In most areas where the CFDP will work, forest roads should be designed to handle very high rainfall conditions.

- Third, after their use during a logging operation, forest roads and canals should be either maintained or closed down properly. It is likely that most roads will stay open to permit forest management operations. Regular maintenance of drainage structures and the road surface will both extend the road's useful life without rehabilitation and minimize adverse environmental effects from soil erosion. Canals should be adequately dammed so that they do not continue to drain the adjoining sites and lower the water table.

Table IV-7. Roads and canals: summary of potential adverse environmental impacts and best practices

Potential Adverse Impacts	Summary of Best Practices
Soil erosion and drainage degrades water quality	<ul style="list-style-type: none"> • Select road and canals lay-out based to minimize effect on water, soil, vegetation and animals. • Design/rehabilitate roads and canals based on type and quantity of future demand • Use design and maintenance specification to minimize accumulation of water on road surface • Prepare quarry, borrow pit, and stream mining management plans that identify locations, quantities and reclamation procedures • Train equipment operators and road crews in environmentally sound road construction and maintenance • Identify recurring costs and funding sources for road operation and maintenance • Plan and prepare construction sites, camps, work depots, and storage areas to avoid environmentally sensitive areas • Ensure than road maintenance operates effectively through regular drain clearing, upkeep of vegetation on slopes and exposed surfaces, maintenance of flow reduction devices in drains, and avoiding use of contaminating substances
Gravel mining in streams degrades water quality	<ul style="list-style-type: none"> • Avoid gravel mining in streams.
Fuel and oil spills degrade soil and water quality	<ul style="list-style-type: none"> • Avoid spills of fuel and oil through training of machinery operators, close supervision of work crews, and provision for adequate disposal of used materials.
Influx of agricultural colonists causes deforestation	<ul style="list-style-type: none"> • Control access to rehabilitated road and block off unused roads

4.4.3.4. Comparison of Regions

In the Northeast Antioquia, Urabá, or the Bajo Magdalena, roads are used for transportation of forest products from the forest to the national road network. In the Pacific Coast of Nariño and Cauca and the Bajo Atrato, canals and rivers are the principal form of transporting logs and sawn wood because road construction would be extremely difficult and expensive in through the swampy lowland areas near the coast and in the flood plains or on the steep slopes in the Andean foothills.

4.4.3.5. Rationale for Classification as a Significant Issue

Standard professional best practices and mitigation measures can avoid or mitigate the adverse environmental effects of road and canal construction and rehabilitation. However, given the potential negative impacts that can result from road and canal construction or rehabilitation, this has been identified as a significant issue. A monitoring system is required to assure that these practices and measures are taken to minimize or otherwise mitigate these impacts. The forest management plans and CFDP Environmental Review Process will formulate site-specific mitigation measures for predicted negative impacts on internal roads used for skid trails and logging.

4.4.3.6. Mitigation Measures for Road and Canal Construction/Rehabilitation

Once again, the best practices for road and canal construction have been introduced and are part of the Proposed Alternative. Therefore the mitigation measures target their implementation. They are:

- i. The CFDP should contract a specialist in road and canal construction/rehabilitation to conduct a review of roads and canals within the forest management units related to the project areas. The study should be carried out once the harvest areas in at least 3 areas are identified. The study should be used to document current practices as well as serve as the basis for developing the proposed CFDP training program.
- ii. The CFDP has plans to design and implement a modular training program in all the regions of program activities to improve road and canal construction/rehabilitation. USFS experience and training materials should be used where applicable as a basis for this training. These materials should be modified to fit the Colombia context and distributed broadly.
- iii. The CFDP should assure that all forest management plans thoroughly address infrastructure needs for roads, canals, and bridges and that the financial projections allocate sufficient resources for the infrastructure to meet environmental design criteria. Maintenance should likewise be budgeted for.
- iv. The CFDP should also specify in the terms of reference for the institutions to be contracted to review the forest management plans as well as the environmental impacts that road and canal construction/rehabilitation is a significant issue that merits special attention.

4.4.4. Pesticides

4.4.4.1. Source

CFR 216.3(b), Pesticide Procedures

4.4.4.2. Issue Statement

The CFDP will be involved in aspects of forest production chains, such as seedling production, site preparation, protection of plantations, and wood product preservation that may require the use of pesticides. The agro-forestry systems that the CFDP will promote may also use pesticides for the cultivation of agricultural crops. Although it will not finance pesticides, the CFDP may promote or be associated in some way with the use of pesticides.

Many pesticides, especially those commonly used in poorer countries, may be hazardous to human health and the environment. Some pesticides are not specific to the pest on which they are used and have broad and unexpected effects on other animals, including humans. Acute and chronic exposure to pesticide can cause vomiting, skin damage, cancer, mutations, immune system suppression, reduced fertility, permanent damage to eyes, lungs, liver and other organs, and death. Incorrect use and disposal of pesticide containers increases the risk of exposure of the user and other community members. The development of pest resistance to the pesticide frequently accentuates the risks to the environment and humans from pesticide use.

4.4.4.3. Summary of Best Practices

The principal means to avoid and mitigate negative environmental and health effects from the use of pesticides is the adoption of Integrated Pest Management Practices (IPM). IPM consists of three general steps.

- The first step involves evaluating the impact of pests before deciding to control them. This requires identifying the pest, determining its biology, determining the scale of the pest problem, evaluating the current level of natural control, and determining if the pest is a primary or a secondary pest.
- The second step involves evaluating the management options for controlling the pest. There are two types of management options: preventive and responsive interventions. The preventive option consists of plant selection and plant tending. Through plant selection tree stock is selected for pest resistance and surrounding vegetation that provides habitat for natural pest enemies is maintained and encouraged. Responsive interventions include removal and destruction of diseased plants, the use of trap plants, and bio-chemicals to kill pests.
- The third step involves the use of synthetic pesticides. They are used only when the pest population reaches a pre-established economic threshold. If the third step is required, reducing risks from synthetic pesticides involves:
 - the use of the least toxic effective chemical possible;
 - reducing exposure time or degree of exposure;
 - following the application and safety instructions on the packaging;
 - storing the chemical according to standard guidelines;
 - formulating and mixing the pesticide correctly;
 - providing training for pesticide applicators;
 - provision of correct application equipment;
 - use of protective equipment and clothing;
 - safe cleaning and storage of equipment and pesticides.

Most important, the IPM process must be adequately monitored and evaluated.

The Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) developed based on LAC Environmental Guidelines and that was prepared for all Plan Colombia activities, includes pesticides used in forestry. The Bureau Environmental Officer (BEO) has approved the

PERSUAP. If the CFDP were to finance or promote the pesticides that are included in the PERSUAP it would be required to follow the PERSUAP's requirements. However, if the CFDP were to finance, promote, or be associated with pesticides that the PERSUAP does not cover, then it would be required to follow the Pesticide Procedures stated in 22 CFR 216.3(b).

4.4.4.4. Comparison of Regions

In general, in none of the regions is the CFDP likely to finance, recommend, or be associated with pesticide use. Pesticide use in forestry is presently very restricted in Colombia. Pesticides are too expensive to be widely used for tree plantation site preparation, thinning, silvicultural operations in natural forest stands, or in agro-forestry systems. Fungicides sometimes are required to control damping-off in tree nurseries. The PERSUAP discusses the fungicides that are likely to be used for this purpose. In tree plantations, the general practice for controlling insect or fungal pests is to depend on natural predators that breed and multiply in patches of nearby natural vegetation. Agro-forestry practices that the CFDP intends to promote have the benefit of reducing the need for pesticides, because they mix different species of plants together on the same site, reducing the possibilities for pests to multiply.

In the Bajo Magdalena and Urabá Regions, however, the control of damping-off in tree nurseries may require the use of fungicides. In Bajo Magdalena, site preparation involves soil chiseling and plowing to eliminate competing vegetation, so herbicides are not used for site preparation. Pesticides may be used, however, to control ant attacks on newly planted seedlings. In Urabá, industrial tree plantation will be established as part of banana plantation operations, to grow wood for the pallets that the export of bananas requires. Banana operations are accustomed to making heavy applications of pesticides, which suggests that they may begin to use pesticides for tree plantations as well. The CFDP should monitor this possibility through the Environmental Review Process.

People in Bajo Atrato and the Pacific Coast of Nariño and Cauca are generally too poor to afford pesticides. Very heavy rainfall, moreover, makes pesticide applications ineffective most of the year. In Northeast Antioquia, fungicides may occasionally be used for control of damping-off and for site preparation.

4.4.4.5. Rationale for Classification as a Significant Issue

Standard professional practices, as outlined in the approved PERSUAP, will avoid or mitigate the potential adverse environmental effects from pesticides use. While the PERSUAP for Plan Colombia applies to the CFDP and has already established which pesticides are permitted and the procedures for their safe application, the EA team felt that this issue should be highlighted and marked as significant given the limited if not non-existent attention thus far by CFDP staff and project documentation.

4.4.4.6. Mitigation Measures for Pesticides

The CFDP has not contemplated the role of pesticides in its activities. This must be revisited and the PERSUAP fully adapted. To accomplish this, the mitigation actions are:

- i. The CFDP should conduct a survey of all private companies and communities with which it works or intends to work to determine if and what pesticides they utilize. The

survey should assess the knowledge level of pesticide users concerning their handling and management of pesticides. This survey should be conducted by a local agronomist specialized in integrated pest management the results of the survey should be presented to the CFDP, and USAID's CTO and MEO.

- ii. From the results of this survey, an appropriate training program should be developed based on the PERSUAP that will address pesticide selection and management. The program should reach all companies or communities that the CFDP plans to work with.
- iii. If the pesticides being utilized are not included in the PERSUAP, the organization should be encouraged to change their pesticide selection or the CFDP must then follow the Pesticide Procedures stated in 22 CFR 216.3(b) and process detailed below.

4.4.5. Wood Processing Plants

4.4.5.1. Source

CFDP Technical Team

4.4.5.2. Issue Statement

The CFDP may finance or otherwise support the construction or improvement of wood processing facilities. Construction could displace current residents on the site or destroy buildings with historic, social or cultural importance. Construction itself may require soil movement, creating the risk of soil erosion and destruction of natural vegetation. Equipment operation may cause soil, air, and noise pollution. Construction may create solid wastes, such as excess cement, chemicals, wood, plastic and other construction materials.

The operation of a wood processing facility could cause adverse environmental effects. Wood processing frequently produces waste products, particularly sawdust but also, in secondary and tertiary processing, chemicals, such as paints, varnishes, and preservatives. If not properly disposed of, such wastes could contaminate the environment. Burning sawdust, for example, could contaminate the air and chemicals dumped in drainage system could contaminate water bodies. If the generation of electrical energy is part of the operation of the processing facility, then burning of wood, diesel or other types of fuel could cause air and noise pollution. Operation may create additional safety and health hazards.

New, improved, or expanded processing facilities could also process illegally harvested wood that could contribute to further deforestation. This is of particular concern after the end of the project when project oversight is not provided.

4.4.5.3. Summary of Professional Best Practices

Careful site selection will avoid the displacement of current residents or the destruction of historic, social or cultural importance. Layout and design according to criteria that avoids long-term negative impacts on the environment will avoid negative effects of construction of new facilities or expansion of existing plants. Generation of pollutants during the operation of the facility can be avoided by designing and implementing clean production technologies. Of particular importance for the operation of wood processing facilities is the disposal of sawdust and other waste materials and the avoidance of air pollution. Incorporation of safety

considerations into its design and operation, including training for workers and provision of safety equipment will avoid risks to worker safety and health.

The issues related to the harvesting and processing of illegal wood is more difficult to attack. Measures to assure that this does not occur include only supporting processing centers that are closely tied to a sustainable source of raw material that is managed by companies or communities committed to sustainable forest management. A second measure is to design the center based on real inventory data to assure that the planned capacity of the processing center is consistent with the planned raw material supply so that excess processing capacity cannot be supplied from illegal sources.

Table IV-5. Wood processing facilities: summary of potential adverse impacts and best practices

Potential Adverse Impacts	Summary of Best Practices
Displacement of inhabitants	<ul style="list-style-type: none"> • Find alternative location or compensate current residents
Historic, social or cultural importance	<ul style="list-style-type: none"> • Find alternative site
Generation of pollutants (solid waste, air particulates and gases, chemicals, fuels, oils, etc)	<ul style="list-style-type: none"> • Include provision for technical disposal of solid wastes in design and financing of facility • Explore and design products that can be generated from the waste to benefit local communities or the company itself (firewood, presto logs, certified charcoal, etc) • Incorporate clean production technologies into design and operation of facility
Risks to worker safety increase through operation of equipment	<ul style="list-style-type: none"> • Incorporate safety measures into design and operation of the facility • Provide workers with safety training and equipment
Sourcing wood from illegally harvested forests	<ul style="list-style-type: none"> • Condition project investments in processing centers to companies/communities that are committed to sustainable forest management and that have sources of sustainably managed raw material • Design and invest in centers that are dimensioned based on availability of sustainably managed raw materials.

4.4.5.4. Comparison of Regions

Any investments in processing centers in Bajo Magdalena and N.E. Antioquia will be tied directly to plantation forests, whereas centers in Bajo Atrato, Nariño, and Urabá will utilize wood from natural forests. The issues related to mill location and on-site establishment will not vary by region. The issues related to possibly processing wood from illegal sources principally applies to the areas with natural forests. The CFDP has not yet arrived at the definition of specific investments in processing centers and therefore does not have sufficient information to enable a comparison of the processing facilities that the CFDP may support in each region.

4.4.5.5. Rationale for Classification as a Significant Issue

Standard professional practices and mitigation measures will avoid or mitigate the adverse environmental impacts from wood processing facilities supported by the CFDP as they relate to mill location and on-site issues. The CFDP's Environmental Review Process will identify the standard professional practices and mitigation measures required for a specific facility and will monitor compliance. If necessary, it will require the preparation of an Environmental Assessment according to USAID Environmental Procedures.

However, it was decided to classify this as a significant issue due to the issue on possibly sourcing raw material from illegal and unsustainably-managed sources. Increasing the capacity of wood processing centers, if not properly controlled or directly linked to legally harvested and sustainably managed forests, could lead to deforestation. While best practices can minimize the risk of illegal wood being purchased and processed, the CFDP must take steps to avoid or mitigate this potential problem.

4.4.5.6. Mitigation Measures for Wood Processing Centers

Investments in wood processing centers aim to improve the recovery of wood and value in the production chain making forest management more profitable for forest owners as well as other links in the production chain. However, these benefits could be offset if the centers are utilized to process wood from illegal and unsustainably managed forests. Therefore the following mitigation measures have been defined:

- i. All project investments in wood processing centers should be made with companies or communities that have demonstrated a strong commitment to sustainable forest management and legal activities. Commitments such as efforts to be independently third party certified, practices of sourcing raw material from legal sources, and being recognized as leaders in the sector and society should be used to gauge this commitment.
- ii. All project investments in wood processing centers must be made with companies or communities that have a direct and demonstrable link to sources of wood from sustainably-managed forests. While such links may be tenuous for down stream processors, the project should forge links between communities sourcing raw material and the various steps of the production chain. Given the market-driven approach of the CFDP, this will be possible.
- iii. Investments in wood processing centers must only be made once a complete design and feasibility study are completed. The design should be based on the availability of sustainably managed wood and the processing center dimensioned accordingly. The feasibility study will insure that the project is viable from technical, social, and economic perspectives to avoid situations where a center is forced to shift sourcing strategies and move from legal to illegal sources. The feasibility study should also include an analysis of cleaner production technologies applicable to the center.

SECTION V

Environmental Review Process

5.1. Environmental Program for the CFDP

Section V describes an Environmental Program to be implemented by the CFDP to assure the Proposed Alternative is compliant with the various USAID regulations. It describes the process by which the potential adverse environmental impacts attributable to CFDP actions will be identified, avoided or mitigated, and monitored. It builds upon and addresses the mitigation measures mentioned in Section IV. The section proposes a process for selecting and strengthening the capacity of local institutions to implement the Environmental Program. The recommendations reflected in this section are based upon an institutional review carried out with the key national and regional government offices and other related institutions. A summary of this analysis can be found in Annex D.

The activities to be carried out under the CFDP fall into two general categories which will be treated differently under the Environmental Program. First are all of the activities that are not directly tied to forest management plans. Examples of these activities are nursery management, plantation establishment, agro-forestry plantings, and support to wood processing centers. These activities will be handled through an environmental review process defined by the Mission's PEA. The Mission has developed a CD that houses these guidelines along with those of the Ministry of Development and others from USAID. The second set of activities are all those that are related to, defined in, and form an integral part of forest management plans and activities. These include forest planning, harvesting, silvicultural treatments, and road and canal construction/rehabilitation, among others. These will be handled through a separate process which is based on third party reviews that include an environmental monitoring system. Both the environmental and third party review processes are defined in depth below.

The CFDP Environmental Program (EP) should use and combine elements of environmental and forest management standards and processes that already exist. This Environmental Assessment recommends that the CFDP EP use the following existing standards and processes:

- USAID Environmental Procedures/LAC Environmental Guidelines;
- Environmental issues identified in this Environmental Assessment;
- Environmental Review Process defined by the Colombia Mission
- Colombia Forest Stewardship Council Principles, Criteria, and Indicators;
- Colombian Forestry Regulations;
- Approved EA for forest management plans developed under the CAD project.

A brief explanation of these different elements can be found in Annex E.

5.1.1. Environmental Review Process for Activities not Directly Tied to Forest Management

Based on the established processes and the above elements, the CFDP Environmental Review Process for activities that are not directly tied to or defined in a forest management plan consists of the following procedures:

- The interested party prepares an Environmental Review Document (*Ficha Ambiental*) together with the activity design. The ER document will indicate whether an Environmental Assessment is required or not, based on its evaluation of whether the predicted adverse impacts can be avoided or mitigated through standard professional best practices or if they require comparative analysis between potential alternatives.
- If an Environmental Assessment is not required, then the Environmental Review Document itself will establish the requirements for avoiding or mitigating adverse environmental effects and for monitoring compliance. The CTO reviews and the MEO approves the Environmental Review Document.
- If an Environmental Assessment is required as defined below under the discussions related to Pesticide Use and Road and Canal Construction/Rehabilitation, then the CFDP prepares draft Terms of Reference. The CTO and MEO review the draft TORs and send them to the BEO for approval. The contractor or grantees prepare the Environmental Assessment. The CTO and MEO review and the BEO approves the Environmental Assessment. The contractor or grantee implements the avoidance or mitigation measures specified in the Environmental Assessment.
- The CFDP prepares six-month Environmental Review Reports and sends them to the CTO. The CTO reviews the report and sends it to the MEO for preliminary approval. The MEO transmits the report to the BEO for final approval.

Of the five significant issues, only two falls directly under this process, and they are Pesticide Use and Wood Processing Centers, as the other three significant issues will be handled under the third party review (TPR) process. Many of the activities related to non-significant issues however, will also use this process.

The use of pesticides will be evaluated and monitored according to the process described in 22 CFR 216.3 (b) Pesticide Procedures and the PERSUAP developed for the Colombia Mission. As defined in the mitigation measures, each beneficiary of the CFDP will be surveyed to determine the individual's use of and experience in handling pesticides. For each that does use pesticides, an ER will be completed following the above process. If the Environmental Review determines that the proposed pesticide is registered for the same or similar uses by the U.S. Environmental Protection Agency (USEPA), the Environmental Review shall evaluate the economic, social and environmentally risk and benefits of the planned pesticide use to determine whether the use may result in significant environmental impact. This evaluation will consider, but not be limited to, the following factors:

- (a) The USEPA registration status of the requested pesticide;
- (b) The basis for selection of the requested pesticide;

- (c) The extent to which the proposed pesticide use is part of an integrated pest management program;
- (d) The proposed method or methods of application, including availability of appropriate application and safety equipment;
- (e) Any acute and long term toxicological hazards, either human or environmental, associated with the proposed use, and measures available to minimize such hazards;
- (f) The effectiveness of the requested pesticide for the proposed use;
- (g) Compatibility of the proposed pesticide with target and non-target ecosystems;
- (h) The conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils;
- (i) The availability and effectiveness of other pesticides or non-chemical control methods;
- (j) The requesting country's ability to regulate or control the distribution, storage, use and disposal of the requested pesticide;
- (k) The provisions made for training of users and applicators; and
- (l) The provisions made for monitoring the use and effectiveness of the pesticide.

When the ER indicates that the proposed pesticide use will significantly affect the human environment and the pesticide and its management is not covered by the PERSUAP, a Pesticide Environmental Assessment will be required. Otherwise, and as stated in the mitigation measures, the guidelines established in the PERSUAP will be followed. As for any USAID Environmental Assessment, both the Terms of Reference and the Environmental Assessment itself must be reviewed by the CTO and the MEO and approved by the BEO.

Wood processing centers will also undergo the existing environmental review process defined by the Mission. The review process will gauge:

- (a) The interest and commitment of the processing facilities owners to sustainable forest management and social equity.
- (b) The link between proposed processing facilities and a sustainable source of wood from well managed forests
- (c) The compatibility of the designed production capacity and the reliable sourcing of wood from well managed forests.
- (d) The appropriateness of the site selection and the designs to mitigate adverse environmental issues related with the center's development.
- (e) The provision made for training in areas related to industrial and worker safety and labor conditions.

5.1.2. Third Party Review Process for Forest Management Activities

Since logging and road or canal construction/rehabilitation are perhaps the biggest issues related to forest management from the direct environmental impact perspective, they have been combined with forest management planning for the purpose of the environmental review process. There are two parallel tracks that play a role in the approval and monitoring of forest management plans and activities. These are: 1) the legal process that all forest management plans must comply with under Colombian law and 2) the process defined within this EA to assure the plans are fully compliant with USAID regulations. Both are important and to a large extent are and should be compatible. Unfortunately, the institutional analysis developed as part of the EA

does not indicate that the official process alone will assure USAID and LAC Environmental Guidelines will be met, due to the weakness within the regional CARs. The CFDP aims to increase the capacity of the CARs in forest management planning and related implementation issues. However, they cannot meet the immediate needs of the project to the satisfaction of the EA Team.

Therefore as stated in the mitigation measures for forest management, the CFDP should establish a third party review process (TPR) that serves to review and approve forest management plans prior to their implementation. The EA Team identified possible institutions to conduct these reviews. These include CAEMA, the National University of Medellín, and the GTCFV, among other private consulting companies (see Annex F for an initial list of possible third part verifiers). All have their advantages and disadvantages but all have the capacity to provide the services of a third party reviewer. The CFDP should develop TORs for this process and competitively select an appropriate institution complying with their contractual clauses related to competitiveness. The institution to be contracted must have the following requirements and capacity:

- a. Experience in natural forest management (planning and implementation) that complies with GOC regulations, areas of special interest include reviewing inventory data, determination of cutting cycles and harvest volumes, definition of corresponding silvicultural systems, selection and planning of harvesting systems including harvest equipment
- b. Thorough knowledge of international third party certification standards and processes
- c. Thorough knowledge of road and canal construction/rehabilitation issues and environmental design
- d. Experience in environmental conservation issues related to forest management systems such as the definition of riparian zones, protection forests within the management unit, sites of high conservation value for endangered species, etc.
- e. Ability to assess financial viability of the proposed management plans

Subsequently the CFDP should establish a monitoring system to determine the environmental impact of the forest management activities. These two steps are described separately but could and perhaps should be implemented by the same institution. The first step in defining the environmental monitoring system is the assessment of the environmental impact of the first year harvesting activities. Based on this assessment and the number of forest management units being supported by the CFDP, a system for monitoring the environmental impact should be established prior to subsequent harvests. The logic for designing the system post-first year logging is that it is unclear what the most important issues are and how they vary by site for the monitoring program at this time. While the CFDP will subsidize its definition and startup, the system has to be financially sustainable and paid for by the forest owners, and thus should focus only on priority issues which are not yet apparent.

Terms of Reference for both of these contracts will be developed by the CFDP and approved by the CTO and MEO. Table V-1 illustrates the ties between the legal process and that being proposed by the EA team with the required inputs from the CFDP.

Table V-1. Third Party Process for Forest Management Activities

Process Required by Colombian Law	Inputs by the CFDP	Parallel Process of CFDP
<p>Forest Unit Identification: The interested party will apply to the appropriate Autonomous Regional Corporation (CAR) for permission to undertake forest management. The CAR will determine if the area for which the permission has been requested lies in protection forest, protection/production forest, or production forest. If it lies in the first, then the CAR will deny permission for forest management. If it lies in the second or third, then the CAR will prepare Terms of Reference (TOR) for the preparation of a forest management plan.</p>	<p>The CFDP will work with the Ministry of Environment to standardize TORs for FMPs to make them compatible with USAID Guidelines and the FSC certification process and provide training to the CARs to implement these TORs.</p> <p>The forest managers will be trained in issues related to environmental issues and their mitigation. The training will be developed and implemented in conjunction with the MEO.</p>	<p>The CFDP will develop TORs and award a subcontract with a local institution to carry out Third Party Reviews (TPR) of the plans being developed.</p>
<p>Forest Management Plan Approval: The CAR will review the forest management plan and emit its technical opinion, or “Criterio Técnico”. If not approved by the CAR, the interested party will revise the forest management plan to meet the CAR’s objections. If the CAR does approve the forest management plan, then its implementation can begin.</p>	<p>The CFDP will provide training to the CARs, as well as to the forest owner in forest management planning.</p>	<p>Once the Plan is drafted and before submission to the CAR for approval, the plan will be reviewed by a TPR contracted by the CFDP. Only after the CFDP receives a green light from the TPR, will the Plan be submitted to the CAR. Once it is approved by the CAR, it will be submitted to the MEO with the approval by the TPR.</p>
<p>Harvest Plan or Annual Operational Plan Approval: The technical guidelines and process varies by region but in general, in preparation for timber extraction, detailed, site-specific harvesting plans will be prepared and approved by the CARs. They will contain a register of the trees to be cut and maps that indicate the location of forest roads, skidding trails and construction projects.</p>	<p>The CFDP will work with the CARs to standardize these processes and train the CARs and forest owners in harvest planning, and environmental monitoring.</p>	<p>1) The process for forest management promoted by the CFDP includes site specific annual operational plans (POA) that contains similar information. These will be made compatible with GOC regulations at the regional levels.</p> <p>2) The POA will include a section title environmental review and the format for this section will be that recommended to USAID by the US Forest Service. The document will identify significant and non-significant issues, compare the</p>

Process Required by Colombian Law	Inputs by the CFDP	Parallel Process of CFDP
		<p>environmental consequences of alternatives for timber extraction, and state required measures to avoid or mitigate predicted adverse environmental impacts.</p> <p>3) The TPR will be contracted to review the POAs prior to their submission to the CARs and their implementation.</p>
<p>Field Level Operations and Inspections: The CARs are to carry out field inspections of forest harvesting activities to insure harvest volumes, technical regulations and harvest sites are respected.</p>	<p>The CFDP will train the CARs and forest owners in reduced impact logging and the assessment of environmental impacts as a result of forest management.</p>	<p>After the first harvest cycle, the CFDP will contract out the development of a study to assess and document the environmental impacts of the forest management operations it supports. The MEO will be expected to participate in this process. Results of the study will form the basis for establishment of a longer-term monitoring process as well as specific recommendations for subsequent harvest plans.</p>
<p>Forest Harvest Reports: The CARs receive and approve reports on harvest plans on a periodic basis. Approval of the report is required before additional harvesting can take place.</p>		<p>The CFDP will compile all ERs, TPR reports, studies, and training reports, and present them to the CTO and MEO every six months. The CTO will review the report. If the CTO finds it satisfactory, she/he will send it for to the MEO. The MEO will review the report and if satisfactory will send it to the BEO who will give the final approval if she/he finds it satisfactory</p>

Road and canal construction/rehabilitation related activities will always be related to a forest management unit and be defined in either the forest management plan or POA. If the mitigation measures defined in Section IV are complied with and if the road is internal to a forest management unit and will be used only for forest management activities or for the transport of forest products within the unit, then an Environmental Assessment will not be required. The third party review report, however, must establish the specific measures that will be required to minimize adverse environmental impacts from the forest road or canal construction/rehabilitation work. If the road is connected to the national road network and if there is a possibility that it may be utilized for activities other than forest management or the transport of forest products, then an Environmental Assessment will be required. An Environmental Assessment will always be required if there is any risk that the road will be used by agricultural colonists to occupy forested

areas and convert forestland to pastureland or agricultural land or will in some way affect a protected area.

5.2. Environmental Clause in Contracts and Grants

All CFDP subcontracts and agreements will contain language that requires the contractor or grantee to prepare an Environmental Review Document (ERD) prior to receiving funding. Each subcontract which the CFDP signs should contain the following clause referring to environmental mitigation and monitoring:

The subcontractor/grantee agrees to provide all the information and assistance at its disposal for the adequate implementation of the Colombia Forestry Development Program's Environmental Review Process. The documents by which the subcontractor or grantee will convey the required information will be the Environmental Review Document and Environmental Reporting Documents. The contractor/grantee agrees to provide full disclosure on the Environmental Review Document and the Environmental Reporting Document of all actions related to the funding provided under this contract/grant that have the potential to affect or which have already affected the natural or human environment. The contractor/grantee will complete at six-month intervals the Environmental Reporting Document to the best of its ability and send it to the Colombia Forestry Development Program. The contractor/grantee agrees to clarify or add information to the Environmental Reporting Document at the request of the Colombia Forestry Development Program. The contractor/grantee understands and agrees that reimbursement for its services and/or products will be contingent on the approval of the Environmental Reporting Document by the CFDP.

Upon request by the CFDP, the contractor/grantee will provide logistical assistance to personnel contracted by the CFDP to make environmental reviews and conduct monitoring activities and evaluations. Furthermore, the contractor/grantee undertakes to maintain vigilance in all its operations for potential adverse environmental impacts of its actions, take corrective action as necessary, and bring such impacts to the attention of the CFDP promptly.

The contractor/grantee agrees to send its personnel to such environmental training courses as the CFDP may organize, at its own expense if necessary.

5.3. Program for Strengthening Institutional Capacity

The CFDP's Environmental Program (EP) should at the same time assist the CFDP to avoid and mitigate adverse environmental effects and improve the effectiveness of the CFDP itself. The CFDP is applying professional best practices to improve the competitiveness of wood product chains. Such practices should also avoid or mitigate adverse environmental effects. Thus, the CFDP Environmental Program should be an integral part of the CFDP overall program and monitoring and reporting system.

In order for the CFDP Environmental Program to contribute to the success of the overall CFDP, the involved institutions must be capable of operating it effectively and efficiently. This capacity will depend on their technical and administrative capacity and their equipment and infrastructure.

All of the involved institutions require some degree of institutional strengthening in order to be capable of operating the CFDP Environmental Program (EP).

The EP will provide training to three groups of people. The first group will consist of people who are responsible for preparing the Environmental Review Process and the forest owners that are developing forest management plans that will be reviewed by third parties. These people include selected staff of the NGOs and private companies which the CFDP will provide support to or sign subcontracts and grants with, and the staff of the CFDP itself. Their training will involve first, an explanation of the EP, and second, practical training in the completion of the Environmental Review and Third Party Review Processes. It will include field exercises based on the proposals that the CFDP has received for specific field activities. This course should be given as soon as possible in 2004 so that the EP will begin to operate efficiently and effectively. During the course, it is possible that the participants can suggest ways to improve the overall EP. The MEO should participate in both the design and implementation of these courses as appropriate to insure that the USAID processes are fully conveyed and understood.

The second group will consist of the professional staff of the CARs in the regions where the CFDP will implement activities. The focus of this training will be the review and reporting process for forest management plans as required to fulfill their mandate. The CFDP will request each CAR to designate a specific staff professional who will be assigned responsibility for the operation of this review and reporting process. The training will be for these CAR staff members. During this training, moreover, the CAR staff members will analyze the proposed review and reporting procedures from the viewpoint of their own CAR. They may suggest adaptations or changes to the procedures too make them more effective.

The third group will consist of wood workers. This is the most important group from the viewpoint of avoiding and mitigating adverse environmental impacts from CFDP actions. Paperwork, no matter how well prepared, will not avoid or mitigate adverse environmental effects that non-technical extraction of forest products may cause. Rather, effective avoidance, mitigation, monitoring, and evaluation of adverse environmental effects require that technically capable people with authority be present in the forest during woods operations, such as logging or road rehabilitation. This training is already the gist of the technical assistance being provided by the CFDP and should follow the mitigation measures identified in Section IV.

5.4. Budget

Table V-2 is an illustrative budget for the costs involved in setting up and operating the CFDP Environmental Program Table V-1 indicated illustrative inputs to strengthen the seven CARs that operate in the nuclear regions where the CFDP will finance or promote activities. During the activity design and the negotiations with the subcontractors and grantees detailed budgets will have to be prepared. Note that funds spent on the CFDP EP will contribute directly to the achievement of the CFDP's goal of more competitive forest product chains. This is because the application of professional best practices and mitigation measures will generally lower the production costs and raise the quality of forest products.

Table V-2: Illustrative Budget**CFDP Environmental Review and Reporting Process**

Item	Units	Cost/Unit US\$	No Units	Total Cost US\$
Training	Training events	6,000	10	60,000
Equipment	Equipment Packages	8,000	5	40,000
Costs to strengthen CARs	n.a.	n.a.	n.a.	61,000
Technical Assistance	Months	12,000	8	96,000
Third Party Reviews	Mgmt Plans and POAs reviewed	3,000	18	54,000
Environmental Monitoring Study/System design and start up	n.a.	60,000	1	60,000
Pesticide survey	survey	\$8,000	1	8,000
TOTAL				379,000

ANNEX A

Terms of Reference

Environmental Assessment (EA) of USAID/Colombia Colombia Forestry Development Plan

I. Objective

A. General Objective

Ensure that environmental factors and values are adequately integrated into the implementation phase of Colombia Forestry Development Program to be financed by USAID/Colombia in order to achieve the objective of increasing licit economic activities in rural areas of Colombia susceptible to illegal crop production. The EA will: (a) evaluate the environmental impact of proposed activities; (b) propose means to avoid deleterious impacts where possible; and (c) propose means to mitigate and monitor those impacts which cannot be avoided but are justified because of their developmental impacts.

B. Specific Objectives

1. Review the existing documents and determine if the proposed actions are effective and consistent with conditions (environmental, economic, physical, etc) in the four proposed forestry clusters: Bajo Magdalena, Bajo Atrato-Urabá, the Pacific Coast of Nariño, and the NE of Antioquia).
2. Define the magnitude, direction, location, and duration of potential positive and negative environmental impacts of the CFDP activities to be undertaken by USAID and the implementing entities in order to achieve the objective. Evaluate the possible environmental impacts of the proposed activities.
3. Utilize experience gained under AD and regional forestry activities in the design, evaluation, mitigation and monitoring of direct and indirect environmental impacts resulting from CFDP related activities.
4. Prepare budgets for implementation and monitoring of mitigation measures aimed at avoiding or correcting environmental impacts of the activities. The resulting environmental procedures will be adopted and applied by all implementing entities and will be consistent with 22 CFR Part.216 and the environmental legislation in Colombia.
5. Evaluate the capacity of the implementing institutions to adequately evaluate, avoid or adequately mitigate, and monitor the direct and indirect environmental impacts resulting from the CFDP activities.
6. Provide technical criteria for the incorporation of environmental aspects into the overall design of the CFDP activities.
7. Provide technical assistance and guidance for incorporating environmental mitigation and monitoring activities into all contractual documents

II. Background and General Guideline

After a recent review of its program strategy, USAID/Colombia decided that adding a program to assist the development of a viable commercial forestry sector would catalyze development efforts in rural, forested areas. Partnerships between Colombia's commercial forestry private sector and forest producers – often rural farmers in illicit crop zones - would materially increase results achieved under SO2. Development of these commercial forestry sector partnerships is focused on generating measurable results in the short term. This strategy compels the project to prioritize geographic areas that already offer developed access to markets, forest sector support services, and production chains (Forest Clusters).

The objective is to assist the private commercial forestry sector to improve efficiency through better technology and knowledge of the markets for their products. Equally important is better utilization of raw material, improved management of forest resources, and demonstrated partnering with rural forest residents cooperatives, or businesses. Another no less important objective is to provide Colombians with viable alternatives to involvement in illicit cultivation

The mechanisms through which this objective is to be achieved include technology transfer to the public and commercial forestry sectors, improved knowledge of and access to markets, better understanding of the policy environment affecting forestry that exists in Colombia, and the demonstration of appropriate and innovative methods of forest management

The balance is between areas or communities that enjoy conditions of market access and support services but that also are involved in, or threatened by, expanding illicit crop cultivation. The expected results are that the expansion in production of marketable and profitable forest products will increase incomes throughout the forestry sector and provide alternative sources of income to the rural communities where forestry activities are centered. An increase in profitable activities in the forest sector will serve to draw human resources away from illicit activities. For this reason, it is expected that the program's activities will be focused on three Forestry Clusters (Núcleos). These Clusters will be centered in Bajo Magdalena, Bajo Atrato-Urabá, NE Antioquia, and the Pacific Coast of Nariño. These areas were selected because they have considerable forest resources, have increasing cultivation of illicit crops, and have defined markets for forest products. Other areas with high potential for successful activities identified during implementation may be included after consultation with USAID. If areas prove to be inappropriate for activities under this program during implementation they may be dropped in a similar manner.

The CFDP is expected to focus on areas or communities that have the benefit of reasonable conditions of market access and support services. These areas or communities may also be involved in, or threatened by, expanding illicit crop cultivation. The activities will include improving knowledge about constraints imposed on the commercial forestry sector because of inadequate and inappropriate policies; lack of financing options for longer-term investments required for forestry; better understanding of market conditions and opportunities in the forestry sector including international markets and standards, domestic markets and standards, and non-traditional markets such as “certified wood” and CO₂ sequestration credits.

In addition the program will provide assistance to all segments of the forestry production chain to improve conversion efficiency and utilization of raw materials. The assistance will include improved management of plantation and natural forests; identification of transportation constraints and development of methods to overcome the constraints; improved conversion of raw materials to market products; and enhanced partnering between all links in the production chain.

Activity Description

Chemonics International as the Contractor will act as catalyst, motivator, and expeditor in accomplishing the results of the CFDP. In addition, the Contractor's consultants may function as alter egos to the partners by assisting with decision processes on investments and other actions recommended during implementation. The goal of this activity is to induce improvements in forestry and the forest products industry that are relevant to opportunities present in Colombia.

The general results expected include improved efficiency, competitiveness, greater entry and attention to markets, access to modern technology, access to non-traditional income sources, strengthened cooperation and understanding among the different producers along forestry productive chains. A collateral benefit of achieving these results is likely to be improvements in following legal processes - such as getting permits to cut timber. This project will address the needs for improved management of natural and plantation forests with due consideration of income to, at least, offset costs. Employment generation stemming from project activities is an important result to be achieved and reported.

With some improvements in the existing security framework and support from the private sector, the Mission and the GOC can work together to provide income and employment generation for the target areas. To be effective, such programs must be market driven and represent sustainable, economically viable activities. The most effective engine for this type of development is Colombia's private sector. The Contractor's principal activity then will be the identification of qualified private sector partners, the careful evaluation of proposed projects and the application of mechanisms for assistance tailored specifically to the identified project's requirements. This approach requires the Contractor to demonstrate flexibility, an understanding of the forestry production chain, and a mastery of the financial and other incentives necessary to make each forestry partnership under this program profitable. The Contractor will remain involved with the partnership throughout the program, providing technical assistance as needed; however, the Contractor will attempt to graduate each partnership at the appropriate time to become fully operational and profitable of its own accord.

Implicit in the partnerships with the Colombian private sector is the understanding that most of the projects proposed will be for those areas where significant infrastructure is already in place and that offer reasonable access to existing markets, whether domestic or export. The expectation of developing alternative sources of income is to attract those who may become engaged in illicit production into these new, licit activities. Thereby drawing human resources away from illicit cultivation while reinforcing the income levels and quality of life for those who have refrained or reverted from such activities.

Colombia's National Forestry Development Plan, published in December 2000¹, provides the official policy and guide for the development of the forestry sector. This document contains targets, provides details of the principal agencies with authority over forestry activities, and details many of the constraints in the sector. The plan includes the laws that apply to the forestry sector and specific activities contemplated for the sector. A comprehensive description of the proposed government funding is included as well. As part of the Plan, follow-up committees and a management entity have been established to implement the Plan's activities. The Contractor should review these documents carefully when developing activities under this Task Order. The National Forestry Development Plan and the CONPES actualized three-year plan are in Attachments to the CFDP.

The GOC and a number of other international donors plan complementary programs focused on alternative development. The Colombian Government counterpart institution for CFDP is the *Ministry of Agriculture and Rural Development and the National Corporation of Research and Forestry Fostering (CONIF)*. The Contractor will also be cognizant of related programs undertaken by the GOC Plan Colombia, Inter-American Development Bank (IDB), the World Bank (IRDB), the United Nations Drug Control and Crime Prevention Program, the European Union, and bilateral donors such as Germany, the Netherlands, France, Sweden, Spain and Japan.

Activity Components

The key components of the CFDP are: 1) Forestry Policy Improvement; 2) Support to the Forestry Initiative under Plan Colombia; 3) Improved Production and Income Generation in the Forestry Sector; and the 4) Forestry Development Fund.

All four components of the CFDP will maintain their focus on the improvement of commercial private sector forestry activities. The CFDP will work directly on improving, or creating, more integrated production chains for the forest products industry in geographically selected Forest Clusters. The process of integrating production chains will be different in each Forest Cluster, but is expected to include the formation of coordinated alliances between: forest owners/managers, timber harvesters, log transporters, first-cut sawmills, agents of secondary and tertiary product transformation (producers of molding, furniture, flooring, doors, windows, construction lumber, etc.), product transporters, marketing agents and final wholesale or retail outlets. The companies or organizations that make up the production chains are a key beneficiary group of the CFDP, hereafter referred to as 'partners'. The Forest Clusters selected for the CFDP offer a unique combination of: viable infrastructure, existing private sector forestry activity, existing natural and/or plantation forest cover, the presence of a forestry culture, the opportunity to align forestry activities that are widely dispersed, and the potential for illicit crops in the region.

¹ The National Forestry Development Plan covers a 25 year period (2000-2025), and is actualized every three years with a short-term action plan approved by CONPES (Consejo Nacional de Política Económica y Social). CONPES #3125 approved in June 2001 is the current short-term action plan. The National Forestry Development Plan can be found at <http://www.minambiente.gov.co> and the CONPES actualized plan can be found at <http://www.dnp.gov.co>.

Forest Policy Improvement, Component 1, will identify existing limitations and promulgate solutions to facilitate and foster the potential success of private forest sector partnerships.

Support to the Forestry Initiative under Plan Colombia, Component 2, is designed to directly assist Plan Colombia in implementing its alternative development forestry activities. Plan Colombia's ongoing Forestry Initiative has activities that directly dovetail with the CFDP.

Improved Production and Income Generation in the Forestry Sector, Component 3, is directly linked to the formation of integrated production chains through coordinated partnerships between different private sector forestry actors. This component includes the implementation of improved management practices in both natural and plantation forests, improved efficiency in the harvesting, handling, processing, marketing, and sales of forest products from the selected Forest Clusters.

Commercial Forestry Development Fund, Component 4, will provide grants to promote or facilitate activities/studies that lead to the improvement of Colombia's commercial forestry sector. Grant awards will require the recipient to provide a matching amount. The main purpose of these grants is to provide technical assistance for the development of work plans, feasibility studies, workshops, training, and other activities that support the commercial forestry sector. Development of business plans for commercial forestry industries is especially important. Many of these industries do not have a comprehensive description of their markets, their products, or targets for income and profit. Priority will be given to activities planned within the selected Forest Clusters, but appropriate grants to other areas will be considered.

Forestry partnerships shall be private sector driven. Collaborative activities undertaken to stimulate economic growth in the Clusters are to be implemented by the partner companies/actors in the production chain itself. CFDP financing and technical assistance will provide the tools, the technology, and in some cases the monetary investment to catalyze Colombian enterprises, producers, financial institutions, and technical experts in their efforts to make the Forestry Cluster partnerships successful. The Partnerships are not intended to be legal entities and may simply be a commitment by various interested parties to develop profitable business relationships and making viable products, in or near areas with illicit crops. The development profitable forest sector businesses will provide jobs to local inhabitants, generate income, provide needed social services, and the hope for a safer, and better life for their families.

It is essential to keep in mind that the CFDP will not engage in the development of any kind of project activity of its own account. Its purpose is to complement the efforts made by the Colombian, private sector, and partnership participants in a manner that makes their proposed activities not only feasible but also more efficient. In all cases, the selected activities must be economically viable and positioned to generate a net return on invested capital. Experienced, expert technical assistance will be the principal means of help to forest industries. The CFDP is designed to share risks as well as to assist the production chain partnerships access to credit, and productive infrastructure. This assistance, however, is only available when the costs associated with the project can reasonably be expected to be absorbed by the activity over the life of the project. The sustainability of the project activities is a major selection criterion for partnerships.

To be sure, Colombian businesses, financial institutions, universities, NGOs and government entities (national, regional, state, and local) will all want to bring their own versions of commercial forestry partnerships to the Contractor for its consideration. Only those business driven partnerships exhibiting strong profit potential that meet the other criteria for employment generation and income development for those living or working in or near the target areas should be seriously considered. The Contractor must develop a simple but effective process for considering all partnership applications. The Contractor must also develop a marketing effort to raise awareness of the CFDP and the benefits it offers to businesses, entrepreneurs, producers, financial institutions and other entities that may be sources of good project activities.

Activity Sub-Component Description

The sub components with mayor environmental impact are described as follows:

Component 3. Sub-Component 2. Improved Efficiency and Income in the Production Chain

The commercial forestry sector in Colombia is characterized by concentrations of production facilities in and around major cities. The source of raw material for these operations is often located far from these production centers. It is not uncommon for logs, cants², and rough lumber to be transported more than 300 km to a production facility such as the plywood factory, a major sawmill, or in the little shops and small lumber outlets that sell wood, which are common in Bogotá. The cost of transport is very high and is often a major limiting factor when investing in forestry production.

To reduce the cost of transport, many small sawmills have moved close to the forest where they transform logs to higher value by removing “waste” and forwarding only cants and rough lumber to mills, leaving the unused, lower value wood in the forest. While this appears to be a good practice, the fact is that much of the wood left in the forest is very high quality and should be used. Leaving the wood behind results in not only loss of value but also underutilization of the forest resource. This means that more trees must be harvested to produce the same volume of wood - and the forest is cut faster than it should be. This unintended result is neither environmentally wise nor economically sound. Discussions of forestry production in Colombia frequently estimate waste to be as high as 60% of the useful wood.

The contractor should review the advantages of developing saw/resaw yards in one or more of the three clusters selected for support under this project. The CFDP should assess the advantages of assisting the private sector and Colombia’s Regional Autonomous Corporations/Sustainable Development Corporations with the establishment of one or more Forestry Industrial Parks. If this were done, targeted annual production might be set at about 75% of the total wood production within a reasonable distance from the Forestry Industrial Park. CFDP could provide the design, and preparation of the site including basic infrastructure and utilities, if available. Security hardware including fencing and other such items could also be provided.

Private sector investors may be assisted in several ways. First they will be provided technical assistance to determine what equipment is required. Potential sources of the equipment will be provided. If the equipment is purchased using appropriate procurement methods, CFDP could

provide up to 50% of the equipment purchase price. No funding for such costs as interest, procurement agency, etc. should be paid by CFDP. CFDP might also pay for 50% or reasonable installation costs as well. Private sector collaborators could be required to cover the rest of the costs. Operating costs of the individual processors should not be subsidized. For the first year CFDP could pay for 50% of the general costs of the Forestry Industrial Park including security, general maintenance of the area, and administrative costs. The individual producer could pay the other 50%. After the first year, the producers would probably be expected to pay all of the general costs. Actual support provided through CFDP will be determined during design. Included in the design will be financial analysis as well as an environmental analysis.

A Forestry Industrial Park will normally be located in a cluster where CFDP is assisting with development of a forest management plan as discussed in the following sub-components. Normally the park will be within 30 km of the principal supply of raw material in order to reduce transport costs. The establishment of a Park and the development of forest management plans must be coordinated and evaluated. Information and technology need to be understood by all of the various partners in the supply chain. The wood supply needs of value added producers at the Forestry Industrial Park need to be clearly conveyed to tree harvesters and transporters and the supply of the raw material then needs to be appropriately managed to sustainably meet demand. For each park recommended by the Contractor will have an environmental evaluation conducted to insure that all ecological concerns are properly addressed. Waste must be disposed properly. Working conditions must address health and social norms.

However at the same time, development of Forestry Industrial Parks may divert some employment from current operations in rural areas and peri-urban centers. Therefore to the extent possible the CFDP should analyze and measure this potential impact and attempt to configure the processing links of the chain to minimize negative impacts on jobs along the chain and to capitalize on existing installed capacity. This could result in the CFDP working with existing operators to upgrade their capacity and diversify into additional product lines.

The following two activities directly support this sub-component. Proper management of forests and assured production are critical to the operation of the Parks. Information required for management of the Park, for example, inventories of the forests, is also required for a forest management plan. Sustainability of both activities is interrelated.

Component 3. Sub-Component 3. Development of Forest Management.

i. Development of Natural Forestry Management Plans in Forestry Clusters

The principal source of wood in Colombia is from natural forests. These forests also provide watershed protection, habitat for wildlife, soil stabilization on slopes, and many other non-market benefits. Appropriate management of these resources requires coordinated planning. This project will assist in improving the management of natural forests that provide the wood for the four forestry clusters. The forest management plan will assess the quantity and quality of the resource base, not only for wood extraction but also for the other existing and potential non-market benefits. Traditional uses of the forest will be determined. A complete inventory and a series of maps will be completed. It is expected that an assessment of the feasibility and

importance of certification will be included at the beginning of forest management planning activities.

Using methods that are common in Colombia, a forest management plan will be developed, reviewed with the local forest residents and users, and finalized as required by Colombian law. All applicable USAID regulations and US laws will also be followed. CFDP will assist with the development, approval, and implementation of the forest management plan. Local people will be organized and trained to manage the forest. Systems such as Community Forest Management will be used as appropriate. The contractor will provide development assistance as well as assistance with technology transfer. The forest management plan will cover problems like inefficient systems of harvesting and transporting timber, as well as improved methods of reforestation, mitigation of improper uses of the forest and related information.

These forest areas, like all others in Colombia are habitat for a wide variety of flora and fauna. The plan will address conservation of biodiversity as well as other resources. As these forests are also home to people, cultural, social and historical considerations will be addressed in the plan. CFDP will assist the implementers of the plans in working toward certification of wood extracted under these plans with one of the international programs of "green" wood as discussed above.

The USAID Colombia Alternative Development (CAD) Project working in Putumayo through its 'Bosques y Maderas' activity has already developed a management plan similar to those envisioned here. World Wildlife Fund/Colombia has been working on natural forest management plans in different parts of the country as well. CONIF has in house expertise that can assist with many of the needs of a management plan such as maps, inventory, and assessment of forest productivity.

The natural forest that will have plans developed usually have between 1,000 and 2,000 families using the resources. These will benefit from improved management and income produced from the management work and the increased incomes from the Industrial Parks.

ii. Development of Plantations and Agroforestry Systems in Forestry Clusters

Forest plantations and agroforestry systems already exist in the forestry clusters but are often isolated examples that may not be well managed. These systems rarely have been tied to markets. CFDP will analyze the existing examples, adjust them as needed and introduce new systems that better meet the expectations and needs of the landowners and the markets for wood products.

Land that is difficult to manage, is remotely located, or is degraded often becomes the first places where illicit crops are grown. A very appropriate alternative use for these areas is forest plantations. Trees require less care and less protection than most agriculture crops. They accumulate capital over years and represent a form of savings. Most plantation trees grown in Colombia are relatively fast growing, often reaching marketable sizes for pulp and woodchips in 7 or less years. For boards (plywood, particle board, fiberboard, MDF, etc.) the time frame is between 12-20 years, and for solid wood products (furniture, doors, etc.) the time frame is between 20-25 years. This is a traditional belief. Eucalyptus grown for 7 years can produce very

high quality solid wood produces but many do not believe this and do not use the wood for this purpose.

Agroforestry and silvopastoral systems are designed to allow some income earlier in the cycle of plantation management and to mitigate the risk of landowners who cannot risk even this time between planting and income.

Lack of understanding of potential markets and long waiting period on return of capital is a major reason the people are reluctant to plant trees for income on their land. Technology, choice of species, source of trees, and concerns about the affect of plantations on their land are also major concerns. The CFDP will assist groups of 50 to 100 landowners in developing at least 10 management plans for commercial forest and agroforestry plantations. These activities should occur in the selected Forestry Clusters and complement exiting policies of the Ministry de Agriculture. It is estimated the between 500 and 1000 families will be assisted with the systems under this component.

Markets will be identified. In addition to the traditional markets, the CO₂ sequestration program may provide annual income to the owners of plantations. CFDP will assist with sales to this market as appropriate. CFDP will support at least part of the first two-years establishment and maintenance costs for activities under this plan. Each plan will need a financial analysis to determine potential income. Sustainability and ecological soundness will be principal consideration for each plan.

III. Scope Of Work

A team of three (3) Environmental Assessment Specialists will prepare an Environmental Assessment of the proposed CFPD activities to be financed by USAID. The Environmental Assessment for the four clusters will be prepared in accordance with the procedures and content that is required by USAID Environmental Regulations.

The EA Team will prepare an EA that will:

- a) Establish a procedure to prepare, review and approve the necessary documents for the following activities: Forest Management Plans that will involve harvesting from natural forest, Management Plans for forest plantations establishment and harvesting, financing and upgrading wood processing industrial centers, and forestry road construction activities, etc.
- b) Define and qualify in-country institutional capacity for preparing and reviewing all the required planning and approval documents. This will include the capacity of the Chemonics team, as well as counterpart Colombian institutions like CONIF, WWF, Ministry of Environment, the CARs, and others. The EA will define a program to upgrade national institutional capacity if it is found to be deficient in these processes to assure in-country capacity to manage and monitor this activities exist within USAID and the contracting partners
- c) Present a clear description of the intended sites for the different activities, highlighting special characteristics of the different regions that will require specific mitigation measures to be considered.

- d) Include environmental guidelines for the preparation of the required documents: In some cases it may be necessary to create the guidelines for new activities, and in others it will be sufficient to review and/or adapt/adjust the existing guidelines
 - e) Define pesticide use and management guidelines according to Ref. 216.
 - f) Define an environmental training component for all program participants.
- For the FMP we have the sample of the Villagarzón FMP approved by LAC/BEO.
 - For forestry and agro forestry activities we have LAC and USAID/Colombia guidelines
 - For road construction activities we have LAC guidelines
 - For industrial facilities we have LAC Small Enterprises Guidelines. It may be it is necessary to create specific guidelines for wood processing facilities, but some guidelines exist in the mentioned documents

In each of the previous tasks, the Team will:

1. Define and describe the proposed actions using documentation provided by USAID/Colombia, Ministries of Agriculture and Environment, the National Corporation of Research and Forestry Fostering (CONIF), and all potential information sources.
2. Using the Life of Project Work Plan (attached) as a basis, define the environmental issues related to the proposed activities, and separate the significant from the less significant issues on the basis of a clear justification.
3. Evaluate the environmental impacts of the activity/project as designed, if significant adverse environmental impacts are expected, the specialist will design mitigation measures, which will be incorporated into the project/activity. If it is not possible to design measures sufficient to offset and/or mitigate the adverse impacts, or they are very costly, the Specialist will recommend that the Mission not implement the project/activity as designed.
4. Solicit public opinion on the proposed environmental intervention from the affected parties and other interested parties in workshops, public meetings and other appropriate venues. These parties include, but are not limited to, GOC entities such as the Ministerio del Medioambiente, Corantioquia, Corporaniño, Coopourabá, Corpocesar, Corponor, Cormagdalena and Corpoamazonia.
5. Propose in detail realistic mitigation measures (including a budget and description of institutional responsibilities) for the inevitable direct and indirect environmental impacts.
6. Propose a practical system for monitoring the environmental impacts of the proposed activities and the effectiveness of mitigation measures.
7. Provide detailed guidance to USAID/Colombia, on practical and workable means to strengthen the environmental assessment and monitoring capability of the contractor and other pertinent institutions to assure the adequate and effective implementation of the recommended mitigation measures.
8. If it is necessary to use pesticides in the project, the EA Specialist will prepare and submit the corresponding Pesticide IEE, as per 22 CFR 216.3(b).

IV. Methodology

A. Description of Proposed Actions

The EA Team will base their assessment on the description of proposed activities provided by USAID/Colombia, Chemonics International, the Ministry of Agriculture and Rural Development, and the National Corporation of Research and Forestry Fostering (CONIF), this description will include as detailed information as is available on the location of the proposed activities.

B. Parameters

Working closely with USAID/Colombia, the EA Team will utilize the following parameters in the preparation of the EA:

1. *Utilize Prior Experience.* The Specialists will fully evaluate and utilize the prior experience that has been accumulated in the region by CONIF and various GOC and other institutions.
2. *Review Environmental Materials.* The Specialists will review all the environmental materials prepared by the Mission and lessons learned. Specifically the EA shall be consistent with the Environmental Guidelines produced by the LAC Bureau and USAID/Colombia Mission.
3. *Focus on Implementation of Effective Mitigation Measures.* The Specialists, based on a thorough analysis of the potential environmental impacts of proposed actions, will focus his/her work on the design of practical, effective, and financially feasible mitigation measures for the negative direct and indirect environmental impacts of proposed actions.
4. *Contribute to Design of Activities.* The Specialists will contribute constructively to the design of the activities to be undertaken in order to execute the activities. This analysis will include identification of sensitive areas where some or all development activities would not be recommended because of their potentially serious environmental impacts. To that end, the EA will also ensure that all development activities comply with the regulations of Colombia's environmental legislation.
5. *Solicit Participation.* The Specialists will proactively solicit full participation of affected peoples and interested parties in the identification of potential impacts of proposed activities, the review of mitigation measures, and the design of a system of environmental evaluation, mitigation, and monitoring.

V. Activities And Schedule

Activity	No. of Work Days Estimated*
<p><u>Review of Documentation:</u> The EA Specialists will thoroughly review and evaluate the documentation made available to it by Chemonics, USAID/Colombia, Conif, Ministry of Agriculture, Ministry of Environment, and other donor organizations. Such documentation will include: project papers and descriptions, former environmental assessments, trip reports, and project evaluations, as well as activity planning documents such as concept papers, strategy statements and other design documents. The Specialists will also review and evaluate pertinent reports from other related agencies of the United States Government that may be involved in forestry activities, such as LAC Forestry team as well as the United Nations, FAO/UNDCP, and other bilateral programs and legislation from the U.S. and Colombia governments.</p>	3
<p><u>Consultation:</u> The Specialists will develop the environmental review procedure in concert with members of the SO Team, both inside and outside of USAID/Colombia, and staff from Chemonics and Conif, Ministry of Agriculture, Ministry of Environment, and other implementing agencies. They will keep a formal record of such consultations, including the names of persons interviewed, points raised, and conclusions reached. The Specialists will proactively solicit input from affected parties and other interested groups (NGOs, GOC and local agencies, private sector, etc) in workshops, town meetings and other appropriate venues.</p>	7
<p><u>Field Observations:</u> The Specialists will make trips to proposed areas to observe specific sites of potential environmental impact of proposed activities. Field trips will be carefully planned in consultation with the members of the SO Team.</p>	20
<p><u>Geographic Analysis:</u> The Specialists will conduct geographic analysis of proposed impacts. The Specialists will determine: (a) the location of the proposed development activities; (b) the appropriateness of the crop in the site (c) the location of environmentally sensitive areas (based in part on the Colombian Forestry Law that is attached); and (d) evaluate the impacts of the proposed activities, as well as opportunities for their mitigation, as a function of (a) and (b).</p>	7
<p><u>Briefings:</u> The Specialists will brief the SO Team including the MEO, the contractor and other counterpart institutions, according to a schedule to be arranged, which will include at least two briefings. . During its initial briefing, the Specialists will describe his/her work plan and schedule. The second briefing will take place before the submission of the first draft in which the Specialists will describe his/her main findings and recommendations</p>	3
<p><u>Reporting:</u> The Specialists will prepare a final report to be submitted to USAID/Colombia according the requirements of this SOW</p>	20

- Note: that the number of days is estimated as some of the activities will be ongoing congruently and carried out by different team members. The days listed are estimates of how the Team Leader will spend his time.

VI. Location of Work

The EA Specialists will work primarily in Medellín but will be required to visit the proposed Forestry Clusters sites for varying periods of time and have to consult with actors in Bogotá.

VII. Team Composition and Requirements of the Environmental Assessment Specialist

Team Leader, Bruce Kernan. The Team Leader will be responsible for organizing and overseeing the entire effort. He will bring to bare his extensive knowledge of Reg 216 and USAID policies as well as his experience in natural forest management. The team leader will be responsible for directing the EA through to its completion and have a total of 10 weeks of LOE assigned for this exercise. It is expected that the Team Leader will be able to travel to regional cities but not be able to access all of the proposed management units.

Colombian Forestry Specialist, Jorge Arias. The Forestry Specialist will work as part of the team and address the issues specifically related to his area of expertise. He will visit proposed management units and review the traditional logging activities, review and propose a final format for the FMPs for natural and planted forests, and address other issues related to the CFDP. The estimated LOE for this consultant will be 8 weeks.

Colombian Forestry Institutional Specialist, Jaime Ospina. The Forestry Industry Specialist will participate in the field visits and will address institutional issues---both related to the community, and private sector's capacity to manage forests and the CARs' capacity to administer the forestry sector, including the approval and monitoring of forest management activities under this program. The estimated LOE for this consultant will be 8 weeks.

The Team will bring the following skills to the EA:

- Strong professional education and background in forestry, natural resource management, ecology, rural development and land use planning expertise is required;
- Familiarity with USAID Environmental Procedures (22 CFR Part 216) and pertinent sections of the Foreign Assistance Act (FAA) that address environmental issues;
- Proven environmental expertise at the field and institutional level;
- Familiarity with the geography, ecology, sociology and culture most prevalent in Colombia in general and the program region in particular;
- Practical knowledge of the environmental implications of agricultural and forestry activities within the context of integrated or sustainable development programs;
- Proven experience on development of environmental assessments for productive projects and infrastructure development or equivalent knowledge;
- Expertise in natural resource management and land use policy planning;
- Familiarity with socio-economic conditions of the program areas;
- Experience in hydrology and watershed management;
- Fluent in written and spoken Spanish and English, and preferably a resident of Colombia.

VIII. Period of Performance, Personnel Required and Reporting Responsibilities

The work on this task order will begin o/a Dec 1, 2003 and terminate o/a March 30, 2004. The work will include an initial visit by the Team Leader in December to orient local staff and develop an initial work plan. Subsequent visits will be made in February and March once the local team has conducted the field level reviews.

IX. Reporting Requirements

The EA report will be structured according to the guidelines specified in 22 CFR 216.6. It will include for each type of proposed CFDP intervention:

- A description of the activity and a discussion of the possible environmental impacts.
- Analysis of environmental impacts of the proposed intervention and mitigation measures for the design and implementation stages.
- An assessment of the implementing agencies institutional capabilities for implementing intervention and mitigation measures and monitoring.
- A plan for the provision of technical assistance and training to strengthen the capabilities of the implementing agencies and to ensure sound environmental management of these activities.

Upon completion of the assignment, Chemonics will submit electronic copies on a CD or diskette, five copies of a draft EA report in English to USAID/Colombia for review. USAID/Colombia will transmit the EA, with its comments, to LAC/RSD/ENV for review. In turn, LAC/RSD/ENV will transmit the draft EA, with its comments, to the Mission Environmental Officer and Alternative Development Coordinator who in turn will transmit them to Chemonics. The Team Leader will incorporate changes for production of the final EA. Five (5) printed copies of the EA final report in English, ten (10) copies in Spanish, and five copies on computer diskette, or CD, in Word format shall be presented to USAID/Colombia by Chemonics. LAC/BEO will review and approve the final version of the EA.

X. Relationships and Responsibilities

The Specialists will work under the supervision of the Chemonics Project Supervisor and day-to-day guidance of the USAID/Colombia Mission Environmental Officer and CTO.

The team will be supported by other CFDP activities. For example the regional coordinators will organize and attend the field visits, the cartographic needs will be facilitated through CONIF, and the Project Supervisor, John Nittler, will work closely with the Team Leader to assure the required support is forthcoming. During the period of this assignment, the USAID Mission Environmental Officer and the CFDP CTO will be available for consultation, participation in workshops and meetings and involvement in the review of drafts of the EA as they are produced. All in-country logistical support will be provided by Chemonics under the CFDP.

ANNEX B

Record of Interviews

Entrevistas

Preparación de la Evaluación Ambiental – Programa Colombia Forestal

Institución	Nombre y Puesto
Smurfit Cartón de Colombia (Cali)	Héctor Fabio Calderón, Jefe Procesos Sociales, División Forestal
World Wildlife Fund (WWF)	Ing. Forestal Maria Ofelia Arboleda Coordinadora del GTCFV
Empresario de la madera	Luis Hernando Lenis
Corporación Autónoma Regional del Centro de Antioquia	Luis Alfonso Escobar y Rafael Álvarez
Ministerio de Medio Ambiente	Rubén Darío Guerrero Ingeniero Forestal, Coordinador de PNDF
Ministerio de Agricultura	Nelson Enrique Lozano Castro, Coordinador de las Cadenas Forestales
Proyecto Bosques y Maderas (B&M)	Carlos Barrera Moreno Coordinador de Plantaciones
Oficial del Medio Ambiente, USAID	Gabriel Escobar
CAD	William Ardila, Ing. Forestal en CAD
Ex-Ministro de Ambiente	Manuel Rodríguez Becerra
CFDP (PCF)	Laura Anderson, Coordinadora, Sistema de M&E para PCF John Riggin, COP Vicente Molinos, Especialista en Mercadeo Noemí Restrepo, Especialista en Manejo Forestal John Nittler, Supervisor del Programa
PDCF-CONIF	Omar Guauque y Héctor González
Corporación para el Desarrollo Sostenible de Urabá (CORPOURABA)	Ana Lucia Vélez y Harold Triana, Jefe de Planeación y Sub Director
Industrias Forestales Doña María	Luis Maria Artehortua y Emilio Grajales
Instituto de Investigaciones Von Newman del Choco	Sres. Abadía, Hinestroza y Mosquera, Director y subdirectores de la Corporación Autónoma para el Desarrollo Sostenible del Chocó (CODECHOCO)
Corporación Autónoma Regional del Magdalena (CORPAMAG)	Orlando Cabrera y Alfredo Martínez, Director y Sub director de Planeación
REFORCOSTA	Ernesto Gutiérrez y Carlos Arturo Londoño, Presidente y Director de operaciones
“Fundec”	Rodolfo La Valle y Débora Escorcía, Propietarios y Directora de la Fundación
Corporación Autónoma regional del Magdalena CORPAMAG	Ismael Gómez, Director Técnico Ambiental
CARDIQUE	Oscar Gómez, Director Sección Ambiental
Centro Ambiental Costa Pacífica	José Luis Freyre Director
CORPONARIÑO Tumaco	Gerardo Arteaga, Coordinador Recursos Naturales Costa Pacífica Nariño.
(Recompas) Red de Consejos Comunitarios.	Lidoro Hurtado, Hilda N. Hurtado y 14 directivos de los Consejos Comunitarios

CHEMONICS INTERNATIONAL INC.

Radicado en Bocas de Satinga	Yoryis Vivas, Tecnólogo Forestal
Corporación Semillas de Agua	David Díaz

ANNEX C

Plaguicidas Forestales							
Nombre técnico	Nombre Comercial	Tipo	Cultivo	Plaga	Problema	Recomendación	Bases Selección
Dicamba	Banvel	Herbicida. CT OMS: III; CT Colombia: III.	Pastos	Malezas hoja ancha	En lista de 'Mal Actor' de PAN por toxina reproductiva y posible contaminación de aguas.	Aprobado.	Costo. Dispon. Eficacia.
Di-clorofenoxi- acético, ácido - 2,4- D	Agritron, Anikil, Artillero, Aminex, Desyerbe, DMA, Agrogen, Formula 40, etc.	Herbicida. CT OMS: II, CT Colombia: II ó III	Pastos	Malezas hoja ancha	En lista RED-2004.	Aprobado. Pero pendiente del re- registro con USEPA en 2004.	Costo. Dispon. Eficacia.
Diclorprop (dichlorprop)	Malezafin (con 2,4- D)	Herbicida. CT OMS: III, CT Colombia: no disponible solo	Pastos	Malezas	En lista de 'Mal Actor' de PAN por toxina reproductiva.	Aprobado	
Glifosato	Roundup	Herbicida. CT OMS: U; CT Colombia: III ó IV	Cacao	Plantas de cacao enfermas <i>c/ Rose-Ilinia pepo</i>		Aprobado.	Eficacia.
				Malezas en general			Impacto reducido
							sobre salud y
			Palma de aceite,	Malezas varias			ambiente
			Palmito, Caucho, Plátano				Costo.
			Plantaciones forestales				Disponibilidad
Mancozeb	Manzate, Curzate, Dithane	Fungicida. CT OMS: U; CT Colombia: III	Plátano	<i>Ralstonia solanacearum</i> (Moko o maduraviche)	En lista de RED- 04.	Aprobado. Pero pendiente del re- registro con USEPA en 2004.	Costo
				Pudrición cogollo	En lista de "Mal Actor" de PAN por posible carcinogénico y toxina reproductiva.		Disponibilidad

Plaguicidas Forestales							
Nombre técnico	Nombre Comercial	Tipo	Cultivo	Plaga	Problema	Recomendación	Bases Selección
				Mancha aerolada			Eficacia.
				Mal suramericano (<i>Microcyclus ulei</i>)			
			Palma de aceite, palmito	Moko (<i>Ralstonia solanacearum</i>)			
			Caucho	Roya del roble			
				Phythophtora			
			Plátano				
			Forestales				
			Papa				
MCPA	Tiller, Aniten		Pasturas	Malezas			Costo.
							Disponibilidad
							Eficacia
Oxicarboxin	Plantvax	Fungicida. CT OMS: U; CT Colombia IV	Roble	Roya		Aprobado.	Costo.
			Papa	Roya			Disponibilidad. Eficacia
Triadimefon	Bayleton	Fungicida. CT OMS III; CT Colombia IV	Caucho,	Mancha aerolada (<i>Thanatephorus cucumeris</i>), roya (<i>Prospodium</i>)	En lista de "Mal Actor" de PAN por toxina reproductiva.	Aprobado.	Costo. Disponibilidad
			Forestales (roble)				Eficacia

Plaguicidas del CAD – Análisis de riesgos						
Nombre Técnico	Clase Toxaguda	Tipo	Toxicidad crónica	Eco-toxicidad	Potencial Contaminante de aguas	Mitigación de riesgo Comentario
Dicamba	OMS: III; Colombia: III	Herbicida	Promotor de toxina reproductiva. No carcinogénico, no mutagénico, o teratogénico.	Practicamente no tóxico a pájaros y baja toxicidad a peces. No tóxico a abejas.	Altamente soluble en agua y no se adhiere a suelos lo que lo hace un posible contaminante de aguas.	Debe usarse con precaución de no contaminar cuerpos de agua.
Di-cloro-fenoxi-acético, ácido (2,4-D)	OMS: III; Colombia: II o III	Herbicida	Posible carcinogénico y sospechoso disruptor endócrino. Posibles efectos reproductivos. Toxicidad aguda: puede ser un irritante serio de ojos y piel.	Posible acumulación en el ambiente con efectos sobre la vida silvestre. Situación no clara.	Potencial contaminante	En IRED-04. Revisar el estado de registro en 2004. Manejar con cuidado para evitar irritación de ojos y piel.
Glifosato	OMS U; Colombia: III- IV	Herbicida	No tiene evidencia de efectos carcinogénicos, teratogénicos, o mutagénicos.	Levemente tóxico a pájaros, no tóxico a peces o abejas.	Inprobable debido a adsorción a suelos.	
Mancozeb	OMS: U; Colombia: III	Fungicida	Posible carcinogénico, promotor de toxina reproductiva y disruptor endócrino.	Moderada a altamente tóxico a peces, levemente tóxico a pájaros y no tóxico a abejas	No es factible.	En IRED-04. Revisar estado de registro en 2004. Usar con cuidado: minimizar exposición de trabajadores.
MCPA	OMS: III; Colombia: no disponible	Herbicida (solo en mezclas)	Posible carcinogénico. Efectos reproductivos significativos han sido observados en ratas. Débil mutagenicidad.	No es tóxico peces, levemente tóxico a abejas y moderadamente tóxico a pájaros.	Improbable. Rápidamente degradado por los micro-organismos acuáticos.	En RED-04. Revisar el estado de registro en 2004. Proteger a los aplicadores.

Plaguicidas del CAD – Análisis de riesgos						
Nombre Técnico	Clase Toxaguda	Tipo	Toxicidad crónica	Eco-toxicidad	Potencial Contaminante de aguas	Mitigación de riesgo Comentario
Oxi-carboxin	Plantvax	Fungicida.	No teratogénico, no mutagénico, no carcinogénico.	Altamente tóxico a peces. Relativamente no tóxico a pájaros y abejas.	Improbable. Se degrada rápidamente en agua.	Proteger peces.
Triadime-fom	OMS: III; Colombia: IV	Fungicida.	Posible carcinogénico, posible promotor de toxina reproductiva y sospechoso de ser disruptor endócrino	Levemente tóxico a pájaros y peces y no tóxico a abejas.	Potencial de contaminación de aguas profundas	Proteger aplicadores y minimizar exposición

ANNEX D

Institutional Roles and Responsibilities

The following is a description of the main institutions that are related to the forestry sector in Colombia.

National Environmental Council

The National Environmental Council (NEC) coordinates public sector environmental policies, plans and programs. Its members include eight ministries, the Director of Administration and National Planning, the Public Defender, the National Controller, and representatives of the departmental governors, the Afro-Colombian and indigenous communities, and the national organizations that represent wood industry and agriculture. The Minister of Environment presides over the NEC. In fact, the NEC has little influence.

Ministry of Environment

The Ministry of Environment was established by Law 99 in 1993. It operates the National Environmental System (SINA) and formulates the national policy for the environment and natural resources. The Minister is a member of the National Council for National Economic and Social Policy. The ministry has received broad support within and outside of the country. The Ministry of Environment establishes the quotas for the volumes of wood that can be cut in each region of the country.

The Ministry of Environment, as most of the government institutions, suffers from cuts in its budget. It does not have a specific unit devoted to forestry and gives much greater attention to forest protection than to forest production. The Autonomous Regional Corporations (CAR) implements the policies established by the Ministry of the Environment.

Ministry of Agriculture and Rural Development

The Ministry of Agriculture and Rural Development (MARD) establishes and implements national policies for agriculture and rural development, including industrial tree plantations. A proposal for a new Forestry Law, prepared by the Ministries of Agriculture and Environment, would transfer responsibility for the management of natural productive forests to the Ministry of Agriculture and Rural Development.

At present, the only role of the Ministry of Agriculture and Rural Development Environment in forestry is the establishment of commercial tree plantations and competitive forest product chains of production. So far, three national Competitive Agreements have been formally established: (1) Paper and Graphic Arts; (2) Plywood and Furniture; and (3) Rubber and Industrial Wood Derivatives. In addition, formal productive chains exist in the departments Córdoba, Antioquia, Caldas, Santander y Magdalena Bajo and are being developed for the Departments of Valle del Cauca and Cauca. The Ministry does not maintain field offices but works through local institutions.

Autonomous Regional Corporations (CARs)

Thirty-three Autonomous Regional Corporations were created in 1993. They are the maximum environmental authority in their regions, which correspond to biogeographic or hydrographic units, not to departments. Their function is to protect the environment through the implementation of environmental policies established by the Ministry of Environment and projects and programs. They are financially, legally, and administratively autonomous, although some of them do receive funds from the national government.

The PFCD will work within the jurisdictions of the following seven Autonomous Regional Corporations:

CORPONARIÑO:	Pacific Coast of Nariño
CRC:	Pacific Coast of Cauca
CODECHOCO:	Bajo Atrato
CORPOURABA:	Urabá
CORANTIOQUIA:	Northeast Antioquia
CORPOMAG:	Bajo Magdalena
CARDIQUE:	Bajo Magdalena

These seven CARs fall into three groups according to their institutional capacity for implementing the CFDP's Environmental Review Process.

CORANTIOQUIA is the most capable CAR. It has a strong institutional structure, a dedicated and professional staff, and an adequate budget. Its size, however, makes it more difficult to work with than some of the smaller CARs.

Four CARs fall in the middle category of institutional capacity.

CORPONARIÑO has adequate infrastructure and sufficient foresters. It also appears to place a priority on forestry. Its greatest weakness is its lack of stable financing.

CRC's main strength is that income from the Salvajina hydroelectric plant gives it a reliable, although inadequate, income. It has adequate infrastructure. Two of its four foresters are excellent while the other two lack experience. Unfortunately its professional personnel tend to be appointed for political reasons and there is a strong division between indigenous professionals and non-indigenous. These two factors result in considerable instability in CRC professionals and programs.

CORPURABA's greatest strength is its professional capabilities. Its lack of a reliable source of income, however, makes it dependent on the national budget.

CORPAMAG's greatest strength is its excellent institutional structure. Its greatest weakness lies in its lack of recently trained foresters.

Two CARs are very weak.

CARDIQUE has adequate infrastructure and sufficient budget but almost no professional forestry capacity.

CORPOCHOCO's weakness' stems mostly from the influence of politics that causes its staff to turn over almost constantly. The Chocó's poor energy, communication and transportation infrastructure make its operations difficult. Its greatest potential strength is the rich forest resources of the Department of Chocó.

- In general, the seven CARs have devoted most of their budget and personnel to the preparation of Environmental Licenses for roads, construction projects, and processing plants. By contrast, they have relatively little experience in monitoring or evaluating forestry activities. The table that follows summarizes the strengths and weaknesses of the seven CARs. It rates their capacities on a scale 0 to 9 and summarizes what they would require in order to be able to carry out adequately the CFDP's Environmental Review process.

Comparison of the institutional capacity of the seven CARs in the regions where the CFDP will implement field activities

CAR	Evaluation		RATING	Program	US\$
	Strengths	Weaknesses			
STRONG					
CORANTIOQUIA					
Infrastructure/equipment	Excellent	None	3	N.A	0
Financial Resources	Excellent	None	3	N.A	0
Forestry Professionals	13 foresters	None	3	Training	1,000
TOTAL			9		1,000
MEDIUM					
CORPONARIÑO					
Infrastructure/equipment	Adequate	None	3	N.A	0
Financial Resources		Inadequate	1	N.A	0
Forestry Professionals	3 foresters		3	Training	1,000
TOTAL			7		1,000
CORPOURABA					
Infrastructure/equipment	Excellent		3		
Financial Resources		Inadequate	1	Funding	12,000
Forestry Professionals	3 foresters	Inadequate	3	Training	1,000
TOTAL			7		13,000
CORPOMAG					
Infrastructure/equipment	Adequate	None	3		0
Financial Resources	Adequate	None	2		0
Forestry Professionals	4 foresters		2	Training	1,000
TOTAL			7		1,000
CRC					1,000
Infrastructure/equipment	Adequate	None	3	N.A	0
Financial Resources	None	Inadequate budget	1	N.A	0
Forestry Professionals	4 foresters		2	Training	1,000
TOTAL			6		1,000
WEAK					
CARDIQUE					
Infrastructure/equipment	Adequate		2	None	0
Financial Resources	Excellent	None	3	None	0
Forestry Professionals		Only 1 forester	0	Training	1,000
TOTAL			5		1,000
COPORCHOCO					
Infrastructure/equipment	Good headquarters	Inadequate equip.	1	Equip.	30,000
Financial Resources	None	Inadequate budget	1	Funding	12,000
Forestry Professionals	1 forester	Inadequate staff	1	Training	1000
TOTAL			3		43,000
GRAND TOTAL					61,000

Municipalities

Elected mayors direct the municipal governments. The municipalities have environmental functions only when they sign agreements to this effect with a CAR. Usually the Units for Agricultural Technical Assistance (UMATAS) take on environmental functions. The strength of the municipalities lies in their local territorial authority. Few of them, however, have technical capacity in forestry.

National Council for Forestry Research (CONIF)

The National Corporation for Forestry Research (CONIF) is a privately incorporated, not-for-profit institution. Its mission is to develop technology for the establishment of protective and productive tree plantations, for the management and conservation of natural forests and for the establishment of agroforestry models that will contribute to rural development. The members of CONIF are the following:

- Ministry of Agricultural and Rural Development
- Ministry of Environment
- Smurfit Cartón de Colombia
- Pizano S.A.
- REFOCOSTA
- Instituto de Investigación de Recursos Biológicos Alexander Von Humboldt
- Corporación Colombiana de Investigación Agropecuaria
- Corporación Colombia Internacional

CONIF is a well-organized, strong institution that has made important contributions to Colombian forestry. It has a very limited budget, so its permanent professional staff is very small. It works mostly through short-term contractors, financed by specific projects.

Research Institutions and Universities

Law 99 established five research institutions:

- The Institute for Hydrology, Meteorology and Environmental Studies (IDEAM).
- The Institute for Marine and Coastal Research (INVEMAR)
- The Institute for Biological Resources "Alexander von Humboldt"
- The Institute for Amazonic Research (SINCHI)
- The Institute for Environmental Research of the Pacific John von Neumann.

These research institutes have the strength of specialized and trained scientific personnel. However, they do little forestry research.

There are a number of universities with careers related to forestry. The most well known are the National Universities in Medellín and that of Tolima. Both have solid programs in forestry.

World Wildlife Foundation (WWF)

The WWF is a financially strong, international environmental NGO with an influential presence in Colombia. WWF Colombia has the following five programs:

- Ecoregion of the Northern Andes
- Biogeographic Region of the Choco
- Geographic Information Systems
- Environmental Policy, Communications
- Protected Areas
- Forestry
- Environmental Education
- Voluntary Forest Certification.

WWF's priority that it gives to programs is to conserve forest ecosystems. It tends to sometimes take an extremely environmentalist point-of-view on forestry issues. Its participatory methodology for working with forest communities is extremely time consuming.

Colombian Environmental NGOs

Colombia has a very large number of national and international NGOs. Many of them have environmental programs, some of which include forestry. The NGO's have representation in the Board of Directors of the CARs and they frequently are influential at the regional level. The strength of the NGOs is their local influence and knowledge of the local situation and their relatively efficient administrative processes. They sometimes lack the ability to follow through completely on their programs.

Private Business

The type of business that is involved in forestry varies considerably by region. In the Pacific Region, many private companies operate, mostly dedicated to logging the natural forest and to sawmilling. These companies tend to be focused more on extraction than on forest management, given that there has been little incentive for organized forest management on the Pacific coast.

In Bajo Atrato the principal large wood industry is "Maderas del Darién", a wholly owned subsidiary of the plywood company Pizano S.A. Maderas del Darien logged for more than 30 years in the Bajo Atrato. Although it has not prepared forest management plans as such, its logging operations do attain the conservation and regeneration of the forest. It has financed many research projects on regeneration of the natural forest.

In Urabá there are no major forestry companies because banana plantations completely dominate the landscape and the economy. However, high level of organization and capital of the banana companies could provide the basis for large-scale establishment of industrial tree plantations. The banana companies are interested in such plantations as a source of wood for pallets.

In Northeast Antioqueño the only wood industry is Industrias Forestales Doña María. It has about 7,000 ha of pine, cypress, and eucalyptus plantations. Some of these plantations have been established on very steep slopes on the mountains surrounding Medellín. The cable logging

methods that Dona Maria uses show that it is possible to harvest very steep slopes while protecting the soil and water from degradation.

In Bajo Magdalena the largest forestry companies are Reforestadora de la Costa, Monterrey Forestal (Pizano S.A) Kanguroid, RESS, ONF-Cormagdalena, and Reforestadora del Caribe. These companies have established large tree plantations and are organized, experienced, and well financed.

ANNEX E

Basis for CFDP Environmental Program

USAID Environmental Procedures

22 CFR, 216 contains USAID Environmental Procedures. These procedures require the definition of specific actions that would affect the environment and connected actions that would not alter the environment and on the separation of significant from non-significant issues. The U.S. Forest Service prepared guidelines for LAC/USAID to follow for projects that involve timber extraction). These guidelines assume that it is possible to define site-specific locations for the timber extraction. If the site-specific location is known, then it is possible to estimate environmental effects with a moderate degree of certainty. The guidelines recommend that the Environmental Assessment be prepared concurrently with the implementation of harvesting plans.

Environmental Issues

This Environmental Assessment has identified four non-significant and four significant environmental issues. It proposes addressing the former through the application of standard, professional best practices and the latter through modifications to the Proposed Alternative through the development of a Proposed with Environmental Program Alternative. The ER should monitor and evaluate the CFDP's compliance with professional best practices and their impact upon both the significant and non-significant issues raised in this Environmental Assessment.

Environmental Review Process for the Alternative Development Program

The funds for the CFDP form part of the USAID/Colombia Alternative Development Program. The Mission conducted an overall Programmatic Environmental Assessment for all of its activities which has been approved by the BEO, and it therefore covers the CFDP. The PEA proposed the Environmental Review Process that the Mission is currently implementing. Thus, the CFDP Environmental Review Process must follow the same general procedures.

The Mission's Environmental Review Process (ER) begins with the preparation by the project contractor or grantee of an Environmental Review Document ("Ficha Ambiental"). Each individual contract or agreement contains language that requires the contractor or grantee to prepare the Environmental Review Document before the implementation of the activity. The Environmental Review Document summarizes a proposed activity and identifies its potential effects on the environment. The Cognizant Technical Officer (CTO) reviews and the Mission Environmental Officer (MEO) approves the document. To prepare the Environmental Review Document, contractors and grantees use USAID and GOC environmental guidelines and the environmental impact matrix.

The Environmental Review process also determines whether an Environmental Assessment (EA) is required or not, based on the significance of the potential adverse environmental effects of the proposed actions. If an Environmental Assessment is required then USAID Environmental Procedures require that the Terms of Reference (TOR) for the EA and the final EA report be approved by the LAC Bureau Environmental Officer (BEO), *prior* to initiating project activities.

USAID/Colombia has found that these procedures (a) guarantee the minimum quality standards required under US and Colombian environmental legislation, (b) ensure some degree of environmental and social sustainability, and (c) provide useful and practical guidance to prevent and mitigate environmental and social impacts of development activities.

Colombian Forest Stewardship Council Principles, Criteria, and Indicators

The GTCFV developed Colombian Forest Stewardship Council Principles, Criteria and Indicators for their voluntary forest certification program. There are 57 criteria contained within that can be used to add a practical and useful qualitative dimension to the evaluation of the CFDP forest management plans and their corresponding environmental impacts. These 57 criteria flow from 10 overarching principles that serve as the cornerstone for the FSC. The table below correlates selected FSC criteria with the environmental issues identified in this EA to indicate their relevance and how the FSC proposes that these issues be addressed within their certification program.

FSC Criteria Related to EA Environmental Issues

Environmental Issues	Related FSC Criteria	
Non-Significant	No.	Description
Archeological /Cultural Sites	3.3	<ul style="list-style-type: none"> Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized
Protected Areas	6.1	<ul style="list-style-type: none"> Assessment of environmental impacts shall be completed -- appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -- and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities.
Industrial Tree Plantations	6.10	<ul style="list-style-type: none"> Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion: a)entails a very limited portion of the forest management unit; and does not occur on high conservation value forest areas; and c) will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.
Wood Processing Plants	5.3	<ul style="list-style-type: none"> Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.
Significant	No.	Description
Sustainable Forest Management	7.1	<ul style="list-style-type: none"> The management plan and supporting documents shall provide: a) Management objectives.
	6.3	<ul style="list-style-type: none"> Ecological functions and values shall be maintained intact, enhanced,

Environmental Issues	Related FSC Criteria	
		or restored, including: a) Forest regeneration and succession. b) Genetic, species, and ecosystem diversity. c) Natural cycles that affect the productivity of the forest ecosystem.
	7.1.c	<ul style="list-style-type: none"> The management plan and supporting documents shall provide: Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.
Logging Practices	6.5	<ul style="list-style-type: none"> Written guidelines shall be prepared and implemented to: control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.
Roads & Canals Construction and Maintenance	1.5	<ul style="list-style-type: none"> Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities by controlling access.
Pesticides	6.6	<ul style="list-style-type: none"> Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides.

Colombian Forestry Regulations

Colombian Decree 1180 specifies the activities that require an Environmental License. This Decree does not require an Environmental License for forest management, industrial tree plantations, agroforestry or wood processing plants. Nor does Decree 1180 require an Environmental License for the construction of roads, such as forest roads, that do not form part of the national road network.

Decree 1791 of 1996, however, regulates logging operations in natural forests. These regulations require a “Permiso” for logging on State lands and an “Autorización” for logging on private lands. Law 99 of 1993 gave the Regional Autonomous Corporations (CARs) the responsibility for emitting these documents. Each of the CARs in the regions where CFDP will finance or promote activities has emitted its own “Acuerdo” based on these regulations. All of these “Acuerdos” require the party interested in carrying out a logging operation to prepare a forest management plan based on Terms of Reference prepared by the CAR. The CAR reviews and approves (or disapproves) the management plan. Once the management plan is approved and logging operations are underway, the logger is then required to prepare reports at six-month intervals on its compliance with the forest management plan. The CARs review these reports and, based on field inspections, approve or disapprove them. If they are disapproved, then the CAR may fine the logging operation or establish measures with which it must comply. Figure VI.1 indicates the general process that the CARs follow in emitting and monitoring compliance with Decree 1791.

Industrial Tree Plantations and Agroforestry Plantings

Article 70 of Decree 1791 of 1996 requires that all tree plantations and trees planted within agroforestry systems be registered with the appropriate CAR. This registration requires that CAR personnel visit the planning site and the preparation of a “Concepto Técnico.” If the person or company that plans to plant the trees wishes to receive the CIF (*Certificado de Incentivo Forestal*) then a Plan of Establishment and Management must be prepared and approved by the CAR. This Plan defines the species of tree to be planted, the location of the plantation and other such information.

ANNEX F

Possible Third Party Reviewers

As part of the EP, Chemonics will contract third parties to review forest management and annual operational plans, to conduct post-logging assessment of environmental impacts and to design a monitoring system. The contraction will take place in a competitive fashion in compliance with their contractual terms. In order to insure however that local capacity exists to carry out these functions a preliminary search for possible institutions or consultants was conducted. The conclusion is that there is obviously the capacity in Colombia to carry out these roles. The following is a brief and non-inclusive summary of possible institutions that could be interested in conducting this work.

- 1) National University of Medellín: The NUM has a strong forestry department with multiple disciplines. Of special interest is Dr. Ignacio De Valle who is a renowned specialist in forest management and biometrics. He has worked with the creation of Colombia's standards for FSC certification and has been involved in the international debate on certification.
- 2) Tres Elementos: Tres Elementos is a consulting firm that specializes in environmental impact assessments. It has strong experience in the Amazonian forest and could form the right team of consultants to conduct the TPRs.
- 3) CAEMA: CAEMA is another local consulting firm, formed by national and international experts, that has worked with USAID in environmental assessments on a number of projects. It has worked in forestry and has extensive experience in the development of projects for CO2 sequestration including the establishment of baselines required to monitor and certify carbon accumulation.
- 4) University of Antioquia: The UA has a graduate program in environmental engineering that addresses environmental impact assessment processes. While the program is not specific to forestry, it interfaces with many of the issues facing the monitoring and evaluation of environmental impacts. It has staff and students that are interested in forest management related issues.
- 5) Instituto Van Humboldt: IVH is a local foundation (NGO) that specializes in biodiversity monitoring and evaluation. It is formed by a group of strong biologist, GIS specialists, and environmentalists from diverse backgrounds. It has conducted numerous projects that include biodiversity inventories and mapping, development and promotion of non-timber forest products, community forestry conservation activities, and protected areas management. It may be the ideal institution to conduct the post-harvesting monitoring.
- 6) Technical Group for Voluntary Forest Certification: The GTCFV is a foundation that has implemented several contracts related to promoting, monitoring and evaluating forest management operations. It has the internal capacity to conduct the TPRs.
- 7) Private consultants: There are numerous private consultants that could conduct the TPRs. Many of these operate under corporate umbrellas and can form teams of consultants to conduct a wide range of activities.

ANNEX G

Environmental Assessment Team

The Environmental Assessment Team was comprised of the three following consultants:

Bruce Kernan/Team Leader: Mr. Kernan, a professional forester, is well known to USAID and intimately familiar with USAID environmental regulations as he served as USAID's Regional Environmental Officer in South America for several years in the 1990's. He currently is a consultant in forest management and environmental impact assessments throughout the region. He has worked with Chemonics International on numerous assignments related to environmental assessments addressing forest management and alternative development projects.

Jaime Ospina/Institutional Specialist: Dr. Ospina, a lawyer by profession, has been involved in the forestry sector most of his career. Most recently he served as vice-president for Pizano, SA, one of the leading wood product companies in the country. Currently he serves as a consultant for the private and public sectors, as well as for organizations such as USAID. He participated in the design of the CFDP under contract with USAID.

Jorge Arias/Forestry Sector: Mr. Arias is a professional forester. In his long standing career he has worked for many of the large forest products companies such as Carton de Colombia as well as within the Regional Corporations (CARs) in both the design and implementation of forest management activities, as well as in its monitoring and evaluation. He is thoroughly familiar with the FSC program and has participated with the GTCFV in Colombia. He therefore brings a diverse perspective on forest management to the assessment team.

John Nittler/Chemonics: The final document was edited and modified by John Nittler. Mr. Nittler, a forest economist, is Senior Manager for Natural Resources for Chemonics International and Project Supervisor for the CFDP. The modifications in some areas were substantial but largely built upon the findings of the EA Team.

BIBLIOGRAPHY

- AGUILAR Yellen, ALARCÓN Andrés y ARBOLEDA María Ofelia, (2003). Iniciativa Nacional en Certificación Forestal Voluntaria 1996 – 2002. GTCFV y WWF 2002.
- ARIAS Porras, Jorge Alejandro (1966). Estudio Preliminar de los Bosques Naturales de la Región de Pedeguita – Riosucio Chocó Colombia. Tesis de grado, Facultad de Ingeniería Forestal Universidad Distrital Francisco José Caldas Bogotá 1966.
- BANCO MUNDIAL (1991), Libro de Consulta para Evaluación Ambiental. Volumen II Lineamientos Sectoriales Departamento del Medio Ambiente. Trabajo Técnico No. 140, 1991.
- BANCO MUNDIAL (1992) “Libro de Consulta para Evaluación Ambiental” Washington, DC.
- CHEMONICS INTERNATIONAL, Plan de Trabajo de la Vida del Programa de Desarrollo Forestal para Colombia CFDP. USAID Nov. 2003.
- CONIF – CHEMONICS – USAID, Plan de Manejo Forestal Sostenible Predio La Esperanza Villagarzón Putumayo para Bosques y Maderas. Enero 2003.
- CONIF-CHEMONICS-USAID, No CAD 022-04, 2003 “Plan Piloto de Manejo Forestal Sostenible. Núcleo de Desarrollo Forestal Villagarzón, Unidad No 1 Alto Mecaya, Caso Predio la Esperanza.
- CONIF-CHEMONICS-USAID, Plan de Manejo Forestal Sostenible Unidad de Manejo No. 1 Alto Mecaya para Bosques y Maderas 2003.
- CONIF-CHEMONICS-USAID, Plan de Manejo de las Plantaciones Forestales Comerciales de los Resguardos de Silvia, Jalambo, y Caldos, Cauca. Unidad de Manejo Forestal Comunidades Indígenas Programa Bosques y Maderas. 2004.
- CONIF, (1998), Pautas para la Sostenibilidad de Plantaciones Forestales en Colombia. Serie No. 30 Conif. Bogotá, Octubre 1998.
- CONIF (1999) “Monitoreo Ecológico y Ambiental de los Bosques del Pacífico”.
- CONIF (1998) “Efectos de Plantaciones Forestales sobre Suelo y Agua”.
- CONIF (1998) “Efectos de Plantaciones Forestales sobre Fauna y Flora”.
- GUAUQUE José Omar (2004). Diagnóstico Regional del Núcleo Forestal Nariño. Programa Colombia Forestal CFDP, Bogotá enero 2004.
- CONPES, (1996) Política de Bosques. Documento Conpes No. 2834 Enero 31 de 1996.

CONPES (2001) “Estrategia para la Consolidación del PNDP” Documento Conpes 3125 Julio 2001.

CONPES (2003) “Política de Estímulo a la Reforestación en Colombia” Documento Conpes 3227, Octubre 2003.

CONSEJO COMUNITARIO BAJO MIRA Y FRONTERA, Plan de Manejo Integral Ambiental del Territorio Comunitario 2003 – 2013 Ecofondo – Coagropacífico. Tumaco 2003.

CORPOURABA-PROFOREST (2001) “Desarrollo Forestal de la Región de Urabá”.

CORPONARIÑO, (2001) “Plan de Gestión Ambiental Departamento de Nariño 2002 – 2006” Pasto 2001.

CRC, Plan de Gestión Ambiental Departamento del Cauca, Popayán 2001.

CORANTIQUIA, Plan de Gestión Ambiental Regional 1998 – 2006 Medellín 1998.

CVC - DNP – UNICEF, (1983) Plan de Desarrollo Integral para la Costa Pacífica de Colombia” Pladeicop CVC Cali Noviembre de 1983.

DANE (2004) “Censos Nacionales” Página Web dane.gov.co.

DEPARTAMENTO DE ANTIOQUIA, (1999). Plan Estratégico de Antioquia “Visión de Futuro hacia la Identificación de Líneas Estratégicas de la Sub-región Nordeste”. Medellín 1999.

ESTEROS, “Territorios de Comunidades Negras y Recursos del Bosques” Revista No. 6 julio de 1996.

GTCFV y WWF, (2003) Normas para Certificación Forestal Voluntaria de Plantaciones y Bosques Naturales en Colombia Bajo el Esquema del FSC. GTCFV Cali Nov. 2003.

GOMEZ (2002) “Legislación Indígena Colombiana”, Bogotá.

INSTITUTO DE INVESTIGACIONES DEL PACÍFICO, (2000) “Propuesta para la Acción Regional del Pacífico. Biodiverso en el Presente Milenio.” Agenda Pacífico XXI.

KERNAN BRUCE, (2003). Reducción Sostenida de Cosechas Ilícitas de Coca Mediante el Desarrollo Alternativo en Areas Objetivo de Perú. Chemonics. 2003

LEY 21 DE 1991, LEY 79 DE 1993, LEY 160 DE 1994. (2004) Página Web, Sección public-jurídicas, banrep.gov.co.

MARAG Y ROCHE, (1998). Reactivación del Sector Forestal Industrial de la Costa Pacifica del Departamento de Nariño. Corponariño Pasto, Septiembre 1987.

MERSCHROD Kris (2003) "Monitoring and Evaluation" CFDP, Medellín.

MINISTERIO DE AGRICULTURA. (2002). Características y Estructura del Sector Forestal, Maderas y Muebles. Observatorio Agrocadenas Bogota 2002.

MMA, MADR, MINCOMERCIO, MINDESAROLLO y DNP. (2000) Plan Nacional de Desarrollo Forestal Bogota 2000.

OIA (2002) "Informe Final Proyecto Forestal de los Territorios Indígenas de Antioquia".

OIMT (1998) "Criterios e Indicadores para Ordenación de los Bosques Tropicales Naturales".

PIÑEROS José Ignacio (2003) "Región Bajo Atrato-Urabá, Diseño de Diagnóstico Forestal".

RODRIGUEZ BECERRA Manuel, (1994) "Retos y Oportunidades". Ex - Ministro del Medio Ambiente. BOGOTÀ JULIO DE 1994.

PUBLICACIONES LEGIS (2004) "Régimen Legal del Medio Ambiente".

RODRIGUEZ Gloria Amparo (2000) "Breve Reseña sobre la Política y la Legislación Ambiental en Colombia". Abogada especializada en Derecho Ambiental del Universidad del Rosario.

SITEP (2004) "Boletín No 5".

TIERRA VERDE, (1994). Ahora o Nunca: Protección Forestal. Informe Especial, Octubre 1994.

USAID (2002) "Colombian Forestry Development Program USAID".