

## 8 Environmental Management and Monitoring Plan

### 8.1 Environmental Management Measures

Environmental Management programs were drawn up on the basis of the results established in the Environmental Evaluation chapter, using the environmental impact matrix. The aim was for the project and all personnel involved in it to have a suitable guide that would enable them, as the case might be, to prevent, correct, mitigate or offset potential impacts and hence ensure that the project was carried out in a sustainable manner.

Listed below are the environmental management specifications for each component and element affected. In accordance with the provisions stipulated in Resolution 500.41-15-1753 of December 3, 2015, the environmental management specifications should include the following.

- **Object:** The purpose of carrying out each measure should be indicated, specifically and precisely.
- **Stage:** Reference should be made to one or more of the three phases of the project, namely installation, experimental and commercial, or production and post-operation, in the event of the activity being abandoned.
- **Environmental impact:** Specific impacts should be indicated, referring to type (direct, indirect, accumulative, residual) and area of influence, probability of occurrence, duration, tendency, magnitude, nature of effect, reversibility and mitigatability.
- **Cause of impact:** Factors, activities or risks that caused the environmental impact.
- **Environmental effect:** The extent to which ecosystems, resources or elements are affected, including human or cultural aspects.
- **Type of measure:** The prevention, protection, control, mitigation, restoration, recovery or offsetting actions it is intended to undertake in order to carry out the measure should be established.
- **Actions to be taken:** This relates to the specific measures that will be adopted in order to control or manage the environmental impact.
- **Technologies used:** This refers to the techniques, methods and systems that will be employed in carrying out each specific management measure.
- **Design:** Technical specifications, calculations, plans and other design items that will enable the management measure to be executed correctly.
- **Execution schedule:** The time to be taken to execute the measure should be indicated, together with the point at which (stage of activity) this will be done.
- **Person(s) responsible for execution:** Identify the company, entities or organization that will be directly responsible for executing the measure.
- **Personnel required:** This refers to the professional training and required experience of the personnel who will direct, carry out and control execution of the measure. The number of persons required by specialization should be indicated, plus the length of time that they will be hired.
- **Follow-up and monitoring:** The follow-up and monitoring indicators that will be used should be stated, such as samplings, observations, technical and financial execution progress records, results or effectiveness of the measure, receptiveness in the physical-biotic or social environment, and the extent of community participation. In addition to establishing control and monitoring mechanisms, the frequency of these should be determined.
- **Quantification and costs:** The measurement unit and quantity, plus the unit cost and total cost, should be established for each measure.

Table 9.1: List of environmental management specifications by cost and resource.

PROGRAM	RESOURCE	SPECIFICATION NAME	
Abiotic Component Management – MCA	Water	Specification MCA-01: Efficient use of water.	
		Specification MCA-02: Waste water management.	
	Waste	Specification MCA-03: Management of non-dangerous solid waste.	
		Specification MCA-04: Management of dangerous waste.	
		Specification MCA-05: Preventing and controlling pollution by chemicals and fuels.	
	Air	Specification MCA-06: Management of atmospheric emissions and noise.	
	Soil	Specification MCA-07: Soil management.	
		Specification MCA-08: Management and transportation of materials and equipment.	
		Specification MCA-09: Dismantlement and abandonment program.	
Biotic Component Management – MCB	Ecosystems	Specification MCB-01: Fauna wildlife management.	
		Specification MCB-02: Flora wildlife management	
		Specification MCB-03: Integrated pest and disease management.	
		Specification MCB-04: Management of forest fires.	
		Specification MCB-05: Forestry exploitation management.	
Socioeconomic component management (MCSE)	Human	Specification MCSE- 01: Project personnel labor wellbeing specification.	
		Specification MCSE- 02: Specifications for managing socioeconomic and socio-environmental impacts caused by the project.	
		Specification MCSE- 03: Management specifications.	

SOURCE: Valoración Económica Ambiental, 2017

8.1.1 Abiotic Component Management Program (MCA)

8.1.1.1 Efficient use of water specification

<b>SPECIFICATION MCA-01: EFFICIENT USE OF WATER</b>			
<b>ABIOTIC COMPONENT MANAGEMENT PROGRAM</b>			<b>RESOURCE: Water</b>
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To establish the necessary measures for ensuring water is used efficiently and saved on the project.</li> <li>To implement a drinking water treatment system for water consumption.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>		<b>ENVIRONMENTAL IMPACT</b>
<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>San Cristóbal</li> <li>Base Mono</li> <li>Paraíso PC</li> <li>Malvinas</li> <li>Tierradentro</li> <li>Toro I</li> </ul>		<ul style="list-style-type: none"> <li>Changes in water quantity (availability of water resources).</li> <li>Changes in water quality.</li> </ul>
<b>CAUSE OF IMPACT</b>			<b>ENVIRONMENTAL EFFECT</b>
<ul style="list-style-type: none"> <li>Accommodating personnel in camps.</li> <li>Resource used in irrigation and fertigation activities at the nursery.</li> </ul>			<ul style="list-style-type: none"> <li>Water resource affected in terms of changes in the availability and quality thereof.</li> </ul>
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation		Correction
X	X		
<b>ACTIONS TO BE TAKEN</b>			
<ol style="list-style-type: none"> <li>Install water flow meters to measure water consumption in each camp and in irrigation and fertigation activities in the nursery.</li> <li>Carry out annual analyses of the physical-chemical and microbiological parameters of water for human consumption.</li> <li>Hold a six-monthly training workshop for project personnel on the conservation, efficient use and saving of water.</li> <li>Install sanitary equipment and other accessories that have systems which guarantee the efficient use and saving of water.</li> <li>Carry out preventive maintenance on an annual basis on all pumping, storage and distribution structures, equipment and accessories relating to water for human consumption.</li> <li>Keep a monthly flow record of water from all catchment sources for human consumption and for use in the nursery (irrigation).</li> <li>Implement a drinking water treatment system for water consumption.</li> <li>During the dry and rainy seasons, conduct appraisals of surface sources that are used for catchment and determine the ecological flow thereof.</li> <li>Carry out an annual pumping test on underground wells that are used for catchment, to analyze conditions in the underground aquifer.</li> </ol>			
<b>TECHNOLOGIES USED</b>			
See Attachment 10.			

**SPECIFICATION MCA-01: EFFICIENT USE OF WATER**

- Methodology for appraising the flow of surface sources.
- Subjects to be discussed at half-yearly training sessions.
- Guide for the physical-chemical analysis.

**DESIGN**

See Attachment 10

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.

**PERSONNEL REQUIRED**

- Water technologist
- Non-qualified manpower
- Pumping test study, geological services company.
- FFC personnel responsible for environmental management.

**FOLLOW-UP AND MONITORING**

INDICATOR	ACTIONS	RECORD
Meters installed / Number of meters proposed	Install flow meters for water that is for human consumption	Monthly flow record of water for human consumption and irrigation in the nursery.
Water quality parameters within permitted limits established in Resolution 2115 of 2007	Take annual measurements of the physical-chemical and microbiological parameters of water for human consumption.	Analysis reports of water for human consumption.
Number of people trained in conserving water resources and the efficient use of water / Total project personnel.	Hold an annual training workshop for project personnel on conserving, saving, and the efficient use of water.	List of persons attending training sessions in the conserving, saving, and efficient use of water.
Efficient water use and saving accessories installed / Efficient water use and saving accessories proposed.	Install sanitary equipment and other accessories that have systems for saving water and ensuring it is used efficiently.	Monthly flow record of water for human consumption and for irrigation in the nursery.
Annual maintenance carried out / Annual maintenance proposed	Carry out preventive maintenance on an annual basis on all pumping, storage and distribution structures, equipment and accessories relating to water for human consumption.	Equipment and space maintenance chart.

<b>SPECIFICATION MCA-01: EFFICIENT USE OF WATER</b>		
Number of records kept / Number of records proposed	Monthly flow record of water for human consumption and for use in the nursery.	Flow record chart.
Number of appraisals conducted / Number of appraisals proposed	Carry out an annual pumping test on underground wells that are used for catchment, to analyze conditions in the underground aquifer.	Appraisal record chart
Number of pumping tests performed / Number of pumping tests proposed.	Carry out an annual pumping test on underground wells that are used for catchment, to analyze conditions in the underground aquifer.	Pumping test reports
<b>QUANTIFICATION AND COSTS</b>		
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.		

#### 8.1.1.2 Waste water management specifications

<b>SPECIFICATION MCA-02: WASTE WATER MANAGEMENT</b>			
<b>ABIOTIC COMPONENT MANAGEMENT PROGRAM</b>			<b>RESOURCE: Water</b>
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To establish the necessary measures for ensuring that waste water generated by the project is managed correctly.</li> <li>To implement a waste water treatment system for each camp that forms part of the project.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>		<b>ENVIRONMENTAL IMPACT</b>
<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>San Cristóbal</li> <li>Base Mono</li> <li>Paraíso PC</li> <li>Malvinas</li> <li>Tierradentro</li> <li>Toro I</li> </ul>		<ul style="list-style-type: none"> <li>Change in water quality.</li> <li>Change in soil quality.</li> </ul>
<b>CAUSE OF IMPACT</b>			<b>ENVIRONMENTAL EFFECT</b>
<ul style="list-style-type: none"> <li>Accommodating personnel in camps.</li> <li>Washing machinery and vehicles.</li> </ul>			<ul style="list-style-type: none"> <li>Water and soil resources affected in terms of changes in the quality thereof.</li> </ul>
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X	X		

**SPECIFICATION MCA-02: WASTE WATER MANAGEMENT**

**ACTIONS TO BE TAKEN**

1. Install waste water flow meters in every camp.
2. Conduct annual analyses of the physical-chemical and microbiological parameters of waste water.
3. Implement a waste water treatment system at every project camp.
4. Carry out preventive maintenance on the waste water treatment system.
5. Keep a monthly record of waste water flows at each camp, and try to record waste water produced and waste water treated.

**TECHNOLOGIES USED**

See Attachment 11

- Physical-chemical analysis guide

**DESIGN**

See Attachment 11

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.

**PERSONNEL REQUIRED**

- Water technologist
- Non-qualified manpower
- FFC personnel responsible for environmental management.

**FOLLOW-UP AND MONITORING**

INDICATOR	ACTIONS	RECORD
Parameters that adhere to reference values / parameters evaluated against reference values	Carry out corrective maintenance on the waste water treatment system.	Physical-chemical analysis report and maintenance chart.
Parameters that adhere to reference values / parameters evaluated against reference values	Measure the physical-chemical and microbiological parameters of waste water produced.	Waste water analysis reports
Waste water treated / waste water generated	Install a waste water treatment system.	Photographic record
Waste water treated / waste water generated	Measure the monthly flow of waste water produced in the inhabited core and the flow treated.	Flow record chart.

**QUANTIFICATION AND COSTS**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

8.1.1.3 Specifications for the management of non-dangerous solid waste

SPECIFICATION MCA-03: MANAGEMENT OF NON-DANGEROUS SOLID WASTE			
ABIOTIC COMPONENT MANAGEMENT PROGRAM			RESOURCE: Water, soils
OBJECTIVE			
<ul style="list-style-type: none"> <li>To establish environmental management measures that will enable the impacts generated when non-dangerous solid waste produced by the project is handled, stored and transported to be prevented and mitigated.</li> </ul>			
STAGE	PLACE TO BE APPLIED	ENVIRONMENTAL IMPACT	
<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>San Cristóbal</li> <li>Base Mono</li> <li>Paraíso PC</li> <li>Malvinas</li> <li>Tierradentro</li> <li>Toro I</li> </ul>	<ul style="list-style-type: none"> <li>Change in soil quality.</li> <li>Alterations in the physical-chemical properties of the soil.</li> <li>Change in ecosystem quality. (Fauna and flora affected).</li> <li>Change in landscape quality (Landscape modified)</li> </ul>	
CAUSE OF IMPACT		ENVIRONMENTAL EFFECT	
<ul style="list-style-type: none"> <li>Accommodating personnel in camps.</li> <li>Activities carried out by personnel throughout the project zone.</li> <li>Operation and maintenance of the nursery and plantations.</li> </ul>		Soil resource affected in terms of changes and alterations thereto.	
TYPE OF MEASURE			
Prevention		Mitigation	
X		X	
Correction		Offsetting	
ACTIONS TO BE TAKEN			
<p>Sell recyclable inorganic waste to companies in the area.</p> <p>Carry out annual physical-chemical analyses of the compost produced.</p> <p>Hold a training workshop for various levels of project personnel on the integrated management of solid waste.</p> <p>Construct a suitable site for the temporary storage of non-dangerous waste.</p> <p>Establish a site for treating non-dangerous waste.</p> <p>Provide the various facilities with containers (ecological points) where solid waste can be deposited.</p> <p>Measure the amount of solid waste collected by type.</p>			
TECHNOLOGIES USED			
See Attachment 12			
<ul style="list-style-type: none"> <li>Guide for the physical-chemical analysis of compost produced.</li> </ul>			
DESIGN			
See Attachment 12			

**SPECIFICATION MCA-03: MANAGEMENT OF NON-DANGEROUS SOLID WASTE**

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

**PERSONNEL REQUIRED**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.	<ul style="list-style-type: none"> <li>• Non-qualified manpower</li> <li>• FFC personnel responsible for environmental management.</li> </ul>
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**FOLLOW-UP AND MONITORING**

INDICATOR	ACTIONS	RECORD
Inorganic waste sold / Inorganic waste generated	Sell recyclable inorganic waste to companies in the area.	Solid Waste Record Chart
Numbers of analyses / Number of analyses proposed	Carry out annual physical-chemical analyses of compost produced each half-year.	Physical-chemical analyses of compost produced report
Number of persons trained in the integrated management of solid waste / Total project personnel	Hold a training workshop for various levels of project personnel on the integrated management of solid waste.	List of persons attending training workshops
The temporary storage site has the necessary characteristics for storing non-dangerous solid waste.	Construct a suitable site for the temporary storage of non-dangerous waste.	Photographic record
The temporary storage site has the necessary characteristics for storing non-dangerous solid waste.	Adapt a suitable site for the temporary storage of non-dangerous waste.	Photographic record
The temporary storage site has the necessary characteristics for storing non-dangerous solid waste.	Check storage conditions each month and, if necessary, carry out cleaning and disinfection of the temporary, solid waste storage site every six months.	Photographic record
Containers installed / Number of containers proposed	Provide the various facilities with containers (ecological points) where solid waste can be deposited.	Photographic record
Number of records made / Number of records proposed	Measure the amount of solid waste collected by type.	Solid Waste Record Chart

**QUANTIFICATION AND COSTS**



**SPECIFICATION MCA-03: MANAGEMENT OF NON-DANGEROUS SOLID WASTE**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

**8.1.1.4 Specifications for the management of dangerous waste**

**SPECIFICATION MCA-04: MANAGEMENT OF DANGEROUS WASTE**

<b>ABIOTIC COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE: Water, soil and ecosystems</b>	
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To establish environmental management measures that will enable the impacts generated when dangerous solid waste produced by the project is handled, stored and transported to be prevented and mitigated.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>	<b>ENVIRONMENTAL IMPACT</b>	
Operational Stage	<ul style="list-style-type: none"> <li>San Cristóbal</li> <li>Base Mono</li> <li>Paraíso PC</li> <li>Malvinas</li> <li>Tierradentro</li> <li>Toro I</li> </ul>	<ul style="list-style-type: none"> <li>Change in water quality</li> <li>Change in soil quality</li> <li>Change in air quality</li> <li>Change in landscape quality</li> </ul>	
<b>CAUSE OF IMPACT</b>		<b>ENVIRONMENTAL EFFECT</b>	
<ul style="list-style-type: none"> <li>Operation and maintenance of machinery and equipment.</li> <li>Accommodating personnel ins camps</li> <li>Operation and maintenance of the nursery and plantations.</li> </ul>		<ul style="list-style-type: none"> <li>Soil resource affected in terms of the quality thereof.</li> </ul>	
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation		Correction
X	X		
<b>ACTIONS TO BE TAKEN</b>			
<ol style="list-style-type: none"> <li>Deliver empty agrochemicals packaging to the supplier responsible therefor.</li> <li>Triple wash agrochemical packaging.</li> <li>Hold a training workshop for project personnel on the management of dangerous waste.</li> <li>Build a suitable site for the temporary storage of dangerous waste.</li> <li>Clean the site for the temporary storage of dangerous waste on a monthly basis.</li> </ol>			
<b>TECHNOLOGIES USED</b>			
See Attachment 13			
<b>DESIGN</b>			
See Attachment 13			

<b>SPECIFICATION MCA-04: MANAGEMENT OF DANGEROUS WASTE</b>			
<b>EXECUTION SCHEDULE</b>			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	
<b>PARTY RESPONSIBLE FOR EXECUTION</b>		<b>PERSONNEL REQUIRED</b>	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>• Non-qualified manpower</li> <li>• FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>			
Indicator	Activity	Record	
Temporary storage site with suitable conditions for storing dangerous waste	Build a suitable site for the temporary storage of dangerous waste.	Photographic record	
Number of cleaning sessions carried out / Number of cleaning sessions proposed	Check storage conditions each month and, if necessary, carry out cleaning and disinfection of the temporary, solid waste storage site every six months.	Record	
Quantity of dangerous waste delivered / Quantity of dangerous waste generated.	Keep a record of the quantity and type of dangerous waste generated in the project area.	Waste generation record chart	
Number of people trained in the integrated management of dangerous waste / Total project personnel.	Hold an annual training workshop for different levels of project personnel on the management of dangerous waste.	List of those attending training sessions.	
<b>QUANTIFICATION AND COSTS</b>			
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

#### 8.1.1.5 Specifications for preventing and controlling pollution by chemicals and fuels

<b>SPECIFICATION MCA-05: PREVENTING AND CONTROLLING POLLUTION BY CHEMICALS AND FUELS.</b>	
<b>ABIOTIC COMPONENT MANAGEMENT PROGRAM</b>	<b>RESOURCE: Water, soils and ecosystems</b>
<b>OBJECTIVE</b>	

**SPECIFICATION MCA-05: PREVENTING AND CONTROLLING POLLUTION BY CHEMICALS AND FUELS.**

- To minimize pollution risks resulting from the use of chemicals and fuels.

STAGE	PLACE TO BE APPLIED	ENVIRONMENTAL IMPACT
Operational Stage	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Changes in water quality.</li> <li>Changes in soil quality.</li> <li>Changes in ecosystem quality.</li> </ul>

CAUSE OF IMPACT	ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Soil preparation</li> <li>Fertilization, planting, harvesting, weed control, pest control, and diseases in plantations.</li> <li>Operation and maintenance of machinery.</li> </ul>	<ul style="list-style-type: none"> <li>Soil resource affected in terms of the quality thereof.</li> </ul>

TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	v.	vi.	vii.

ACTIONS TO BE TAKEN
<ol style="list-style-type: none"> <li>Hold an annual training workshop for project personnel on the management of agrochemicals and fuels.</li> <li>Avoid storing large quantities of fuel.</li> <li>Fill the tank and carry out maintenance work and the washing of machinery and equipment in the area specially set aside for these activities.</li> <li>Adhere to the protocol for handling agrochemicals and fuels.</li> <li>Carry out monthly maintenance on machinery, vehicles and equipment.</li> <li>Prepare the necessary amount to be used on plantations, to avoid some being left over.</li> <li>Keep an inventory of agrochemicals stored, and update this every month.</li> <li>Carry out monthly maintenance on machinery used for applying agrochemicals.</li> <li>Measure the quantity of fuels and oils used on the project.</li> </ol>

TECHNOLOGIES USED
See Attachment 14

DESIGN
See Attachment 14

EXECUTION SCHEDULE	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
Activities		X	
All activities to be carried out		X	
PARTY RESPONSIBLE FOR EXECUTION	PERSONNEL REQUIRED		

<b>SPECIFICATION MCA-05: PREVENTING AND CONTROLLING POLLUTION BY CHEMICALS AND FUELS.</b>		
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.	<ul style="list-style-type: none"> <li>• Vehicle maintenance personnel</li> <li>• FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>		
<b>Indicator</b>	<b>Activity</b>	<b>Record</b>
Number of inventories drawn up / Number of inventories proposed.	Keep a monthly inventory of agrochemicals stored at the project.	Agrochemicals inventory chart.
Number of maintenance activities carried out / Number of maintenance activities proposed	Carry out monthly maintenance on machinery used for applying agrochemicals.	Machinery, vehicles and equipment maintenance chart.
Number of inventories drawn up / Number of inventories proposed	Keep a monthly inventory of fuels and oils stored at the project.	Chart showing inventories drawn up
Number of inventories drawn up / Number of inventories proposed	Keep a monthly inventory of agrochemicals stored at the project.	Agrochemicals inventory chart
Quantity of agrochemicals used / Quantity of agrochemicals acquired	Monthly maintenance of machinery, vehicles and equipment.	Machinery, vehicles and equipment maintenance chart.
Number of accidents per month related to agrochemicals and fuels / Total number of accidents	Follow the guidelines established for handling / managing agrochemicals	Protocol for handling / managing agrochemicals
Number of persons trained in managing agrochemicals and fuels / Total project personnel.	Hold an annual training workshop on the handling / managing of agrochemicals and fuels.	List of persons attending training in the handling / management of agrochemicals and fuels.
<b>QUANTIFICATION AND COSTS</b>		
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.		

#### 8.1.1.6 Specifications for the management of atmospheric emissions and noise.

<b>SPECIFICATION MCA-06: MANAGEMENT OF ATMOSPHERIC EMISSIONS AND NOISE</b>		
<b>ABIOTIC COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE: Air and noise</b>
<b>OBJECTIVE</b>		
<ul style="list-style-type: none"> <li>• To establish management measures for controlling sources of particle material emissions and gases related to project activities.</li> </ul>		
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>	<b>ENVIRONMENTAL IMPACT</b>

**SPECIFICATION MCA-06: MANAGEMENT OF ATMOSPHERIC EMISSIONS AND NOISE**

<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Alterations to noise levels. Changes in water quality.</li> <li>Air quality affected due to the emission of polluting gases and/or particle material.</li> </ul>
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CAUSE OF IMPACT	ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Operation of machinery and equipment.</li> <li>Movements of personnel in the project zone.</li> </ul>	<ul style="list-style-type: none"> <li>Air resource affected due to changes in the quality thereof.</li> </ul>

TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	X		

**ACTIONS TO BE TAKEN**

- The vehicles, machinery and equipment that are to be used will be required to have periodic maintenance and synchronization (machinery and equipment), in order to guarantee that they function properly.
- Only when a certain type of construction material needs to be transported will the following be required to be taken into account: that the vehicles used should be covered with a tarpaulin.

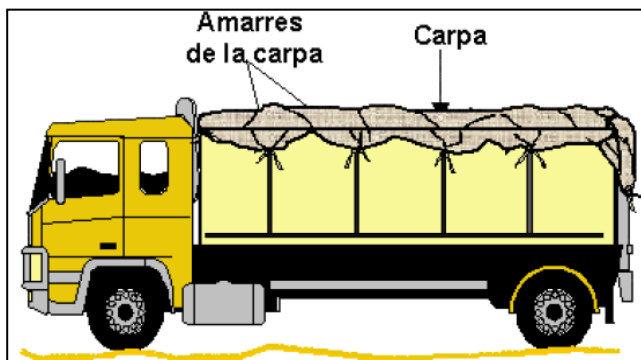


Illustration 1: Transporting material correctly

- Periodic inspections will be carried out of all equipment and machinery that makes any noise, in efforts to guarantee that it functions well, and any loose or worn parts should be replaced.

**TECHNOLOGIES USED**

- Periodic maintenance and synchronization record (machinery and equipment).

**DESIGN**

See Illustration 3  
See Attachment 15

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and

SPECIFICATION MCA-06: MANAGEMENT OF ATMOSPHERIC EMISSIONS AND NOISE			
			abandonment
All activities to be carried out		X	
PARTY RESPONSIBLE FOR EXECUTION		PERSONNEL REQUIRED	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>Personnel responsible for carrying out machinery, vehicle and equipment maintenance.</li> <li>FFC personnel responsible for environmental management.</li> </ul>	
FOLLOW-UP AND MONITORING			
Indicator	Actions	Record	
Quantity of machinery, vehicles and equipment that received maintenance / Total machinery, vehicles and equipment.	Carry out preventive maintenance on all equipment, machinery and vehicles.	Machinery, vehicle and equipment maintenance chart.	
viii. QUANTIFICATION AND COSTS			
ix. The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

#### 8.1.1.7 Soil management specification

SPECIFICATION MCA-07: SOIL MANAGEMENT		
ABIOTIC COMPONENT MANAGEMENT PROGRAM		RESOURCE: Soil
OBJECTIVE		
<ul style="list-style-type: none"> <li>To implement measures for protecting, conserving and recovering soil and the production capacity thereof.</li> </ul>		
STAGE	PLACE TO BE APPLIED	ENVIRONMENTAL IMPACT
Operational Stage	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Change in ecosystem quality.</li> </ul>
CAUSE OF IMPACT		ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Operation of machinery and equipment.</li> <li>Movements of personnel in the project zone.</li> <li>Preparation of ground.</li> <li>Establishment and development of plantations.</li> </ul>		<ul style="list-style-type: none"> <li>Soil resource affected in terms of the quality thereof.</li> </ul>
TYPE OF MEASURE		

SPECIFICATION MCA-07: SOIL MANAGEMENT			
Prevention	Mitigation	Correction	Offsetting
X	X		
<b>ACTIONS TO BE TAKEN</b>			
1. Carry out a soil quality analysis every seven years. 2. Take specific plantation requirements into account when carrying out fertilization.			
<b>TECHNOLOGIES USED</b>			
See Attachment 16			
<b>DESIGN</b>			
See Attachment 16			
<b>EXECUTION SCHEDULE</b>			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	
<b>PARTY RESPONSIBLE FOR EXECUTION</b>		<b>PERSONNEL REQUIRED</b>	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>Accredited laboratory</li> <li>FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>			
Indicator	Actions	Record	
Percentage of soil quality parameters within optimum ranges for crop development	Carry out soil quality analysis every three years.	Soil analysis reports	
Production per hectare	Carry out fertilization activities on the basis of soils analyses and in accordance with specific plantations requirements.	Chart recording preparation and application of agrochemicals.	
<b>QUANTIFICATION AND COSTS</b>			
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

#### 8.1.1.8 Specifications for the management and transportation of materials and equipment

SPECIFICATION MCA-08: MANAGEMENT AND TRANSPORTATION OF MATERIALS AND EQUIPMENT			
ABIOTIC COMPONENT MANAGEMENT PROGRAM		RESOURCE: Soil	
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To minimized the impact on the management and transportation of materials required during the project construction stage.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>	<b>ENVIRONMENTAL IMPACT</b>	
<ul style="list-style-type: none"> <li>Construction Stage</li> </ul>	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Generation of waste.</li> <li>Alteration to air quality due to particle material.</li> </ul>	
<b>CAUSE OF IMPACT</b>		<b>ENVIRONMENTAL EFFECT</b>	
<ul style="list-style-type: none"> <li>Construction - Forestry activity habitation plan.</li> <li>Adaptation of internal roads.</li> </ul>		<ul style="list-style-type: none"> <li>Air resource affected due to changes in the quality thereof.</li> <li>Soil resource affected due to changes in the quality thereof.</li> </ul>	
<b>TYPE OR MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X	X		
<b>ACTIONS TO BE TAKEN</b>			
<p>1. Acquisition of material from authorized sites.  Sites where construction materials will be acquired will be defined during the construction stage. Sites from which construction materials will be extracted should be purchased from third parties who hold permits valid at the time and a concession contract. Materials should be purchased from quarries and sources of materials that hold the respective permits, and such documents should be requested and verified.</p> <p>2. Transportation of materials  Covering cargo that is transported is obligatory, in order to avoid emissions and to prevent it from dispersing, in accordance with the provisions stipulated in Ministry of the Environment Resolution 541 of 1994, <i>"Whereby the loading, unloading, transportation, storage and final disposal of rubble, materials, elements, concretes and loose aggregates relating to construction and demolition, and organic matter, soil and subsoil from excavations, is regulated"</i>. The cover will be made of a strong material, in order to prevent it breaking or tearing, and it will be fixed firmly to the outside edges of the container or vehicle.</p> <p>When equipment is being transported, it should be remembered that the vehicle should carry a notice bearing the following text, as the case might be: "Danger, extra-long load", "Danger, extra-wide load", or "Danger, extra-long and extra-wide load".</p> <p>3. Storage of materials  When materials are being stored, it should be remembered that the area set aside for the storage of materials should be stripped and well away from nearby bodies of water.</p> <p>When construction materials are being stored temporarily, canvas and/or plastic sheets should be used for protection, in order to prevent materials being blown away by wind or rain.</p>			



**SPECIFICATION MCA-08: MANAGEMENT AND TRANSPORTATION OF MATERIALS AND EQUIPMENT**

**TECHNOLOGIES USED**

- Copies of environmental and mining permits and/or licenses.
- Record accrediting the fact that the vehicle meets the necessary conditions.
- Photographic record accrediting correct storage of the material.
- Record of linear meters of material stored. metros.

See Attachment 17

**DESIGN**

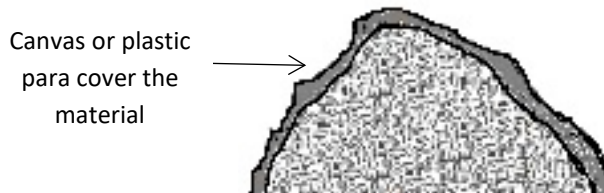


Illustration 2: Storage of material, showing canvas or plastic to cover the same

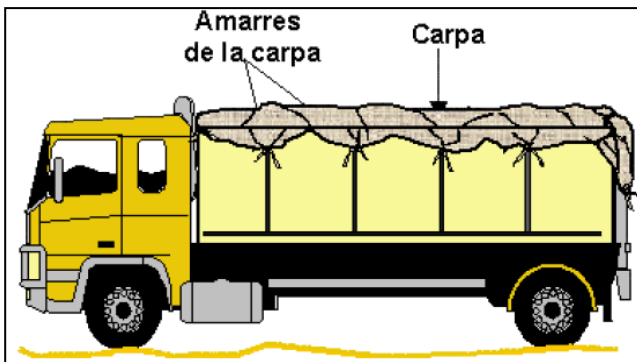


Illustration 3: Correct transportation of material

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	
<b>PARTY RESPONSIBLE FOR EXECUTION</b>	<b>PERSONNEL REQUIRED</b>		
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.	<ul style="list-style-type: none"> <li>• FFC personnel responsible for environmental management.</li> </ul>		

**FOLLOW-UP AND MONITORING**

Indicator	Actions	Record
Volume of duly licensed material acquired (m <sup>3</sup> ) / Total volume of material acquired (m <sup>3</sup> ) *100	Acquire construction materials from duly licensed sites.	Copies of environmental and mining permits and/or licenses.

**SPECIFICATION MCA-08: MANAGEMENT AND TRANSPORTATION OF MATERIALS AND EQUIPMENT**

**QUANTIFICATION AND COSTS**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

**8.1.1.9 Dismantlement and abandonment program specification**

**SPECIFICATION MCA-09: DISMANTLEMENT AND ABANDONMENT PROGRAM**

**ABIOTIC COMPONENT MANAGEMENT PROGRAM**

**RESOURCE: Air, water, soil and landscape**

**OBJECTIVE**

- To establish the necessary measures for dismantlement and abandonment.

STAGE	PLLACE TO BE APPLIED	ENVIRONMENTAL IMPACT
<ul style="list-style-type: none"> <li>Dismantlement and abandonment stag</li> </ul>	<ul style="list-style-type: none"> <li>Project properties</li> </ul>	<ul style="list-style-type: none"> <li>Generation of rubble and organic and solid waste.</li> <li>Conflicts with the community.</li> </ul>

CAUSE OF THE IMPACT	ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Abandonment of the project.</li> </ul>	<ul style="list-style-type: none"> <li>Natural resources affected due to changes in the quality thereof.</li> </ul>

**TYPE OF MEASUREMENT**

Prevention	Mitigation	Correction	Offsetting
X	x. X	xi.	xii.

**ACTIONS TO BE TAKEN**

- Dismantlement and abandonment of facilities.

Abandonment of camps

- Dismantle and remove camps, houses, tents, equipment installed (solar panels, radios, etc.), fuel storage tanks, etc.; remove left-over materials from temporary storage sites and clean and correctly store solid waste.
- Remove rubble, waste, and any type of material left in project operation areas.
- Carry out the transportation and final disposal of waste, materials and other items with authorized entities that hold valid permits and/or environmental licenses, respectively.

- Restoration of areas worked on

- In the particular case of the project, since the vast majority of camps or bases are in private houses on the properties, the infrastructure should not be demolished; on the contrary, areas worked on in these areas will not be required to be restored.
- Meanwhile, in areas where trees are planted, they should be left standing and there is no need for them to be felled.

**SPECIFICATION MCA-09: DISMANTLEMENT AND ABANDONMENT PROGRAM**

- In cases where it might be necessary, affected areas should be levelled to a similar state to that which they were in originally and water control and management works should be carried out.
  - Restoration activities will be carried out in areas where temporary infrastructure has been built, and levelling, landscape shaping and revegetation work will be done, based on the original soil use.
3. Final cleaning of worksite
- When dismantlement has been completed, the site will be cleaned and all materials that can be recycled will be checked, such as containers, scrap, cables and other items, so that they can later be collected by a collection company or by internal personnel responsible for the process. Meanwhile, dangerous waste should also be delivered to certified entities for subsequent treatment and disposal. This will ensure that all ordinary waste that is produced and generated during the dismantlement and abandonment stages is correctly collected and disposed of, thereby avoiding any environmental liabilities.

**TECHNOLOGIES USED**

- Copies of environmental permits and/or licenses, and of permits and/or licenses relating to sites for the final disposal of waste.
- Photographic record of the dismantlement and abandonment activity.

See Attachment 18

**DESIGN**



Illustration 4: Storage of material, showing canvas or plastic to cover the same

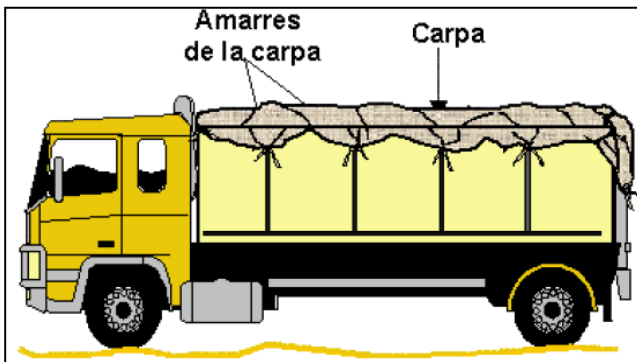


Illustration 5: Correct transportation of material

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment

SPECIFICATION MCA-09: DISMANTLEMENT AND ABANDONMENT PROGRAM			
All activities to be carried out			X
PARTY RESPONSIBLE FOR EXECUTION		PERSONNEL REQUIRED	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>FFC personnel responsible for environmental management.</li> </ul>	
FOLLOW-UP AND MONITORING			
Indicator	Actions	Record	
Volume of rubble, general waste and any other type of waste (m <sup>3</sup> ) / Total volume (m <sup>3</sup> ) *100	Keep a record of all dismantlement and abandonment activities.	Record of volumes of rubble, waste and any type of design.	
QUANTIFICATION AND COSTS			
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

### 8.1.2 Biotic Component Management Program (MCB)

#### 8.1.2.1 Fauna wildlife management specifications

SPECIFICATION MCB-01: FAUNA WILDLIFE MANAGEMENT			
BIOTIC COMPONENT MANAGEMENT PROGRAM			RESOURCE: Fauna
OBJECTIVE			
To implement measures aimed at protecting, conserving and restoring soil and its production capacity.			
STAGE	PLACE TO BE APPLIED	ENVIRONMENTAL IMPACT	
<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Change in ecosystem quality.</li> </ul>	
CAUSE OF IMPACT		ENVIRONMENTAL EFFECT	
<ul style="list-style-type: none"> <li>Preparation of land for planting plantations.</li> <li>Operation of equipment.</li> </ul>		<ul style="list-style-type: none"> <li>Fauna resource affected in terms of quality thereof.</li> </ul>	
TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	X		
ACTIONS TO BE TAKEN			

**SPECIFICATION MCB-01: FAUNA WILDLIFE MANAGEMENT**

1. Hold an annual training workshop for project personnel on fauna wildlife management.
2. Remove healthy, slow-moving animals (e.g. tortoises and armadillos) from any potentially harmful area and relocate them in an area that is safe for them and as near as possible to the place they are removed from.
3. Inspect the area before preparing the ground (harrowing and applying lime), in order to be sure that it is clear of animals.
4. Transport any animals that have been found injured to the Corporation’s fauna rehabilitation center.

**TECHNOLOGIES USED**

See Attachment 19

**DESIGN**

See Attachment 19

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.

**PERSONNEL REQUIRED**

- FFC personnel responsible for environmental management.

**FOLLOW-UP AND MONITORING**

Indicator	Actions	Record
Number of people trained in fauna wildlife management / Total project personnel	Hold an annual training workshop for project personnel on fauna wildlife management.	List of persons attending fauna wildlife management training.
Number of individuals relocated per month.	Remove healthy, slow-moving animals (e.g. tortoises and armadillos) from any potentially harmful area and relocate them in an area that is safe for them and as near as possible to the place they are removed from.	Fauna inspection chart.
Number of individuals relocated per month.	Inspect the area before preparing the ground (harrowing and applying lime), in order to be sure that it is clear of animals.	Fauna inspection chart.
Number of injured animals that are taken to the rehabilitation center each month.	Transport any animals that have been found injured to the Corporation’s fauna rehabilitation center.	Chart showing animals taken to the rehabilitation center.

**QUANTIFICATION COSTS**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.



8.1.2.2 Flora wildlife management specifications

SPECIFICATION MCB-02: FLORA WILDLIFE MANAGEMENT			
BIOTIC COMPONENT MANAGEMENT PROGRAM			RESOURCE: Flora
OBJECTIVE			
<ul style="list-style-type: none"> <li>To conserve the functional and structural attributes of ecosystems in the area of influence of the project.</li> </ul>			
STAGE	PLACE TO BE APPLIED		ENVIRONMENTAL IMPACT
Operational Stage	xiii. Project property		Change in ecosystem quality.
CAUSE OF IMPACT			ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Preparation of the ground.</li> <li>Establishment and development of the plantations.</li> <li>Construction of associated basic infrastructure.</li> </ul>			<ul style="list-style-type: none"> <li>Flora resource affected in terms of the quality thereof</li> </ul>
TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	xiv. X	xv	xvi
ACTIONS TO BE TAKEN			
<ol style="list-style-type: none"> <li>Protect forest, palm swamp and wetland ecosystems.</li> <li>Protect the ecotone between grassland, gallery forests and palm swamps.</li> <li>Provide grassland corridors associated with planted areas, so as to enable native fauna to migrate and access the necessary resources for maintaining their populations.</li> <li>Hold an annual training workshop for project personnel on environmental zoning and other ecosystem conservation strategies.</li> </ol>			
TECHNOLOGIES USED			
See Attachment 20			
DESIGN			
See Attachment 20			
EXECUTION SCHEDULE			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be performed		X	
PARTY RESPONSIBLE FOR EXECUTION			PERSONNEL REQUIRED

<b>SPECIFICATION MCB-02: FLORA WILDLIFE MANAGEMENT</b>		
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.	<ul style="list-style-type: none"> <li>• Non-qualified manpower.</li> <li>• FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>		
<b>Indicator</b>	<b>Actions</b>	<b>Record</b>
The average annual variation in species diversity in the canopy, in exclusion and intervention areas with restrictions, is less than 5 per cent.	Protect forest, palm swamp and wetland ecosystems.	Zoning map of project properties that identifies strategic ecosystems (inlets, palm swamps and gallery forests) and protection strips.
The average annual variation in species diversity in the canopy, in exclusion and intervention areas with restrictions, is less than 5 per cent.	Monitor the flora make-up of ecosystems in exclusion areas on an annual basis.	Biota monitoring chart.
The average annual variation in species diversity in the canopy, in exclusion and intervention areas with restrictions, is less than 5 per cent.	Protect ecotones between grassland, gallery forests and palm swamps.	Georeferenced photographic record of ecotones between grassland, gallery forests and palm swamps.
Number of persons trained in protecting areas classified as exclusion zones and intervention zones with restrictions / Total project personnel.	Hold an annual training workshop for project personnel on environmental zoning and other ecosystem conservation strategies.	List of persons attending training workshops on environmental zoning and other ecosystem conservation strategies.
Number of people with training, information, facilities, and the necessary logistics for promptly detecting and controlling fires that might break out.	Hold an annual training workshop for project personnel on preventing and fighting uncontrolled burning and fires.	List of persons attending training workshops on preventing and fighting uncontrolled burning and fires.

### 8.1.2.3 Specifications for comprehensive pest and disease management

<b>SPECIFICATION MCB-03: COMPREHENSIVE PEST AND DISEASE MANAGEMENT</b>		
<b>BIOTIC COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE: Fauna and flora</b>
<b>OBJECTIVE</b>		
<ul style="list-style-type: none"> <li>• To implement integrated management of pests and diseases as a strategy for minimizing impacts on fauna and flora in the region.</li> </ul>		
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>	<b>ENVIRONMENTAL</b>



SPECIFICATION MCB-03: COMPREHENSIVE PEST AND DISEASE MANAGEMENT			
Operational Stage	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Change in ecosystem quality.</li> <li>Changes in income and socioeconomic and cultural dynamics.</li> </ul>	
CAUSE OF IMPACT		ENVIRONMENTAL EFFECT	
<ul style="list-style-type: none"> <li>Pest and disease management for the plantations.</li> </ul>		<ul style="list-style-type: none"> <li>Fauna y flora resources affected in terms of the quality thereof.</li> </ul>	
TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	X		
ACTIONS TO BE TAKEN			
<ol style="list-style-type: none"> <li>Hold an annual training workshop for project personnel on the integrated management of pests and diseases.</li> <li>Monitor the state of beneficial microbiota in the soil on an annual basis.</li> <li>Back up chemical control technically with evaluations in the field.</li> <li>Rotate agrochemical products that are to be used for controlling pests and diseases, in order to prevent resistance to them developing in pests.</li> <li>Calibrate equipment, in order to prevent an overdose or underdose of agrochemicals being applied.</li> <li>Use low toxicity and high specificity insecticides as a last resort for controlling pests.</li> </ol>			
TECHNOLOGIES USED			
See Attachment 21			
DESIGN			
See Attachment 21			
EXECUTION SCHEDULE			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	
PARTY RESPONSIBLE FOR EXECUTION		PERSONNEL REQUIRED	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>Non-qualified manpower</li> <li>Accredited laboratory</li> <li>FFC personnel responsible for environmental management.</li> </ul>	
xvii. FOLLOW-UP AND MONITORING			
Indicator	Actions		Record

**SPECIFICATION MCB-03: COMPREHENSIVE PEST AND DISEASE MANAGEMENT**

Number of persons trained in the integrated management of pests and diseases / Total project personnel.	Hold an annual training workshop for project personnel on the integrated management of pests and diseases.	List of persons attending training workshops on the integrated management of pests and diseases.
Number of species associated with biological control present in the area of influence of the project.	Monitor the state of beneficial microbiota in the soil on an annual basis.	Biota monitoring chart
Quantity of agrochemicals used per month.	Back up chemical control technically with evaluations in the field.	Field evaluation reports
Quantity of agrochemicals used per month.	Rotate agrochemical products that are to be used for controlling pests and diseases, in order to prevent resistance to them developing in pests.	Chart showing agrochemicals applied
Annual number of pest outbreaks	Calibrate equipment, in order to prevent an overdose or underdose of agrochemicals being applied.	Equipment and spaces maintenance chart
Annual number of pest outbreaks	Use the releasing of biological controllers as a low-cost strategy for managing pests and diseases.	Biota monitoring chart
Annual number of pest outbreaks	Use low toxicity and high specificity insecticides and fungicides as a last resort for controlling pests.	Chart showing agrochemicals applied

**QUANTIFICATION AND COSTS**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

**8.1.2.4 Forest fire management specifications**

<b>SPECIFICATION MCB-04: FOREST FIRE MANAGEMENT</b>			
<b>BIOTIC COMPONENT MANAGEMENT PROGRAM</b>			<b>RESOURCE:</b> Landscape, ecosystems and air
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To conserve fauna and flora by preventing and dealing with fires</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>		<b>ENVIRONMENTAL IMPACT</b>
<ul style="list-style-type: none"> <li>Operational Stage</li> </ul>	<ul style="list-style-type: none"> <li>Project property</li> </ul>		<ul style="list-style-type: none"> <li>Destruction of ecosystems that are part of the natural areas protected by the project.</li> <li>Air pollution.</li> </ul>
<b>CAUSE OF IMPACT</b>			<b>ENVIRONMENTAL EFFECT</b>
<ul style="list-style-type: none"> <li>Burning of grassland on neighboring properties and with communities.</li> <li>Lack of care by project personnel, contractors, or people in the area of influence of the project.</li> </ul>			<ul style="list-style-type: none"> <li>Landscape, ecosystem and air resources affected in terms of the quality thereof.</li> </ul>
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X	X		
<b>ACTIONS TO BE TAKEN</b>			
<ol style="list-style-type: none"> <li>Hold an annual training workshop for project personnel on preventing and dealing with uncontrolled burning and fires.</li> <li>Equip project personnel with the necessary items for dealing with uncontrolled burning (backpacks, tankers, hoses, axes, mattocks, shovels, radio telephones, etc.).</li> <li>Carry out periodic maintenance of firewalls, as required.</li> <li>Carry out zoning of project properties, identifying areas where forest fires are most likely to occur.</li> <li>In dry seasons, carry out follow-up on areas where forest fires are most likely to occur.</li> </ol>			
<b>TECHNOLOGIES USED</b>			
See Attachment 22			
<b>DESIGN</b>			
See Attachment 22			
<b>EXECUTION SCHEDULE</b>			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment

<b>SPECIFICATION MCB-04: FOREST FIRE MANAGEMENT</b>			
Operational Stage		X	
<b>PARTY RESPONSIBLE FOR EXECUTION</b>		<b>PERSONNEL REQUIRED</b>	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>• Non-qualified manpower</li> <li>• FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>			
<b>Indicator</b>	<b>Actions</b>	<b>Record</b>	
Number of people with training, information, facilities, and the necessary logistics for promptly detecting and controlling fires that might break out.	Hold an annual training workshop for project personnel on preventing and dealing with uncontrolled burning and fires.	List of persons attending training workshops on preventing and dealing with uncontrolled burning and fires.	
Number of people with training, information, facilities, and the necessary logistics for promptly detecting and controlling fires that might break out.	Equip project personnel with the necessary items for dealing with uncontrolled burning (backpacks, tankers, hoses, axes, mattocks, shovels, radio telephones, etc.).	Inventory chart	
Area affected by forest fires / Forested area within the project	Carry out periodic maintenance of firewalls, as required.	Equipment and spaces maintenance chart	
Area affected by forest fires / Forested area within the project	Carry out zoning of project properties, identifying areas where fires are most likely to occur.	Zoning map, identifying areas where forest fires are most likely to occur.	
Area affected by forest fires / Forested area within the project	In dry seasons, carry out follow-up on areas where forest fires are most likely to occur.	Verification chart showing areas where forest fires are likely to occur.	
<b>QUANTIFICATION AND COSTS</b>			
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

#### 8.1.2.5 Forestry exploitation management specification

<b>SPECIFICATION MCB-05: FORESTRY EXPLOITATION MANAGEMENT</b>		
<b>BIOTIC COMPONENT MANAGEMENT PROGRAM</b>	<b>RESOURCE: Flora</b>	
<b>OBJECTIVE</b>		
<ul style="list-style-type: none"> <li>• To establish technical guidelines for the forestry exploitation activity, including the management of products and/or sub-products resulting from the same.</li> </ul>		
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>	<b>ENVIRONMENTAL IMPACT</b>

<b>SPECIFICATION MCB-05: FORESTRY EXPLOITATION MANAGEMENT</b>			
Operational Stage	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Land flora affected.</li> <li>Loss of vegetation cover.</li> <li>Landscape affected.</li> </ul>	
<b>CAUSE OF IMPACT</b>		<b>ENVIRONMENTAL EFFECT</b>	
<ul style="list-style-type: none"> <li>Adaptation and operation in plantation areas.</li> <li>Preparation and adaptation of land.</li> </ul>		<ul style="list-style-type: none"> <li>Landscape and ecosystem resources affected.</li> </ul>	
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X			
<b>ACTIONS TO BE TAKEN</b>			
<p>All actions described in the forestry exploitation plan will be carried out (see Attachment 23A), plus those described below.</p> <ol style="list-style-type: none"> <li> <b>Water resources</b>            Protection areas for bodies of water will extend for a distance of at least 200 meters from the limit of the protection area (maximum elevation of flooding in bodies of water).         </li> <li> <b>Soil resources</b>            Material resulting from exploitation activities will be disposed of in soils as a recycling method for organic waste on suitable sites (where it does not constitute any danger of forest fires occurring and, at the same time, does not inhibit natural succession processes at certain sites), with a view to it benefiting the physical properties of the soil.         </li> <li> <b>Waste resources</b>            Material resulting from exploitation activities will be stacked, in order to allow it to decompose naturally, thus benefiting the physical properties of the soil. It will be disposed of on suitable sites, where it does not constitute any danger of forest fires occurring and, at the same time, does not inhibit natural succession processes at certain sites.         </li> <li> <b>Fauna management</b>            The following procedure will be carried out with fauna prior to the commencement of activities: driving away, which will basically consist of using different methodologies and techniques as auditive stimuli, such as reproducing sounds that warn them of danger and mechanical stimuli like moving tree and bush vegetation.         </li> <li> <b>Dissemination among personnel</b>            The above will be duly disseminated among support personnel who will be involved in exploitation activities (machinery operators).         </li> </ol>			
<b>TECHNOLOGIES USED</b>			
See Attachment 23			
<b>DESIGN</b>			
See Attachment 23			
<b>EXECUTION SCHEDULE</b>			

<b>SPECIFICATION MCB-05: FORESTRY EXPLOITATION MANAGEMENT</b>			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
Operational Stage		X	
<b>PARTY RESPONSIBLE FOR EXECUTION</b>		<b>PERSONNEL REQUIRED</b>	
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.		<ul style="list-style-type: none"> <li>FFC personnel responsible for environmental management.</li> </ul>	
<b>FOLLOW-UP AND MONITORING</b>			
Indicator	Actions	Record	
Correct disposal of vegetable matter	Vegetable matter disposal report.	Photographic record	
Dissemination among personnel	(Number of persons trained / Total number of persons responsible for the activity) x 100	List of persons attending training sessions	
<b>QUANTIFICATION AND COSTS</b>			
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.			

### 8.1.3 Socio-Economic Component Management Program

#### 8.1.3.1 Project personnel labor wellbeing specification

<b>SPECIFICATION MCSE-01: PROJECT PERSONNEL WELLBEING</b>		
<b>COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE:</b> Human
<b>OBJECTIVE</b>		
<ul style="list-style-type: none"> <li>To promote labor wellbeing among personnel involved in the project.</li> </ul>		
STAGE	PLACE TO BE APPLIED	ENVIRONMENTAL IMPACT
Operational Stage	<ul style="list-style-type: none"> <li>Project property</li> </ul>	<ul style="list-style-type: none"> <li>Change in society's quality of life.</li> <li>Change in demand for manpower and services.</li> </ul>

SPECIFICATION MCSE-01: PROJECT PERSONNEL WELLBEING			
CAUSE OF IMPACT			ENVIRONMENTAL EFFECT
<ul style="list-style-type: none"> <li>Labor activities and interpersonal relations during installation and operation of the project.</li> </ul>			<ul style="list-style-type: none"> <li>Human resource affected in terms of the quality thereof.</li> </ul>
TYPE OF MEASURE			
Prevention	Mitigation	Correction	Offsetting
X	X		
ACTIONS TO BE TAKEN			
<ol style="list-style-type: none"> <li>Draw up a training program based on the different job profiles on the project.</li> <li>Implement the occupational health, hygiene and industrial safety program.</li> <li>Produce a job induction program.</li> </ol>			
TECHNOLOGIES USED			
See Attachment 24			
DESIGN			
See Attachment 24			
EXECUTION SCHEDULE			
Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	
PARTY RESPONSIBLE FOR EXECUTION			PERSONNEL REQUIRED
The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.			FFC personnel responsible for environmental management.
FOLLOW-UP AND MONITORING			
Indicator	Activity	Record	
Assimilation by personnel of the training received, by means of surveys.	Produce a job induction program.	List of persons attending induction	
Motivating aspects / demotivating aspects identified among personnel	Draw up a training program based on the different job profiles on the project	Training program for	

<b>SPECIFICATION MCSE-01: PROJECT PERSONNEL WELLBEING</b>		
		each job on the project
Motivating aspects / demotivating aspects identified among personnel	Implement the constant motivation program for project personnel.	Personnel motivation program
<b>QUANTIFICATION AND COSTS</b>		
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.		

### 8.1.3.2 Specifications for managing socioeconomic and socio-environmental impacts caused by the project.

<b>SPECIFICATION MCSE-02 MANAGEMENT OF SOCIOECONOMIC AND SOCIO-ENVIRONMENTAL IMPACTS CAUSED BY THE PROJECT</b>			
<b>COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE: Human</b>	
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To prevent, minimize and control the impacts that most frequently affect the quality of life of communities living near the project.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>		<b>ENVIRONMENTAL IMPACT</b>
Operational Stage	<ul style="list-style-type: none"> <li>La Venturosa inspection</li> <li>Puerto Murillo inspection</li> <li>Aceitico Inspection</li> <li>Project property</li> </ul>		<ul style="list-style-type: none"> <li>Change in society's quality of life.</li> </ul>
<b>CAUSE OF IMPACT</b>			<b>ENVIROMENTAL EFFECT</b>
<ul style="list-style-type: none"> <li>Project installation</li> <li>Project operation</li> </ul>			<ul style="list-style-type: none"> <li>Human resource affected in terms of the quality thereof.</li> </ul>
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X	X		
<b>ACTIONS TO BE TAKEN</b>			
<ol style="list-style-type: none"> <li>Provide interested populations, communities in the area of influence and social organizations with clear, prompt and reliable information about the project, and hold a project awareness workshop in the case of a community that does not know Forestal de la Orinoquia.</li> <li>Assign someone to be responsible for community relations and establish a permanent communication channel, thereby ensuring that possible impacts associated with project activities can be handled and resolved.</li> <li>Receive, deal with and resolve complaints made by the community resulting from project activities.</li> </ol>			
<b>TECHNOLOGIES USED</b>			
See Attachment 25			



**SPECIFICATION MCSE-02 MANAGEMENT OF SOCIOECONOMIC AND SOCIO-ENVIRONMENTAL IMPACTS CAUSED BY THE PROJECT**

**DESIGN**

See Attachment 25

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.

**PERSONNEL REQUIRED**

- FFC personnel responsible for environmental management.

**FOLLOW-UP AND MONITORING**

Indicator	Activity	Record
Number of communications from the community resolved / number of complaints, requests and other procedures received.	Based on the form relating to communications from the community dealt with, keep a record for internal company administration purposes.	File with record of communications from the community, and the respective procedure carried out for verification purposes.

**QUANTIFICATION AND COSTS**

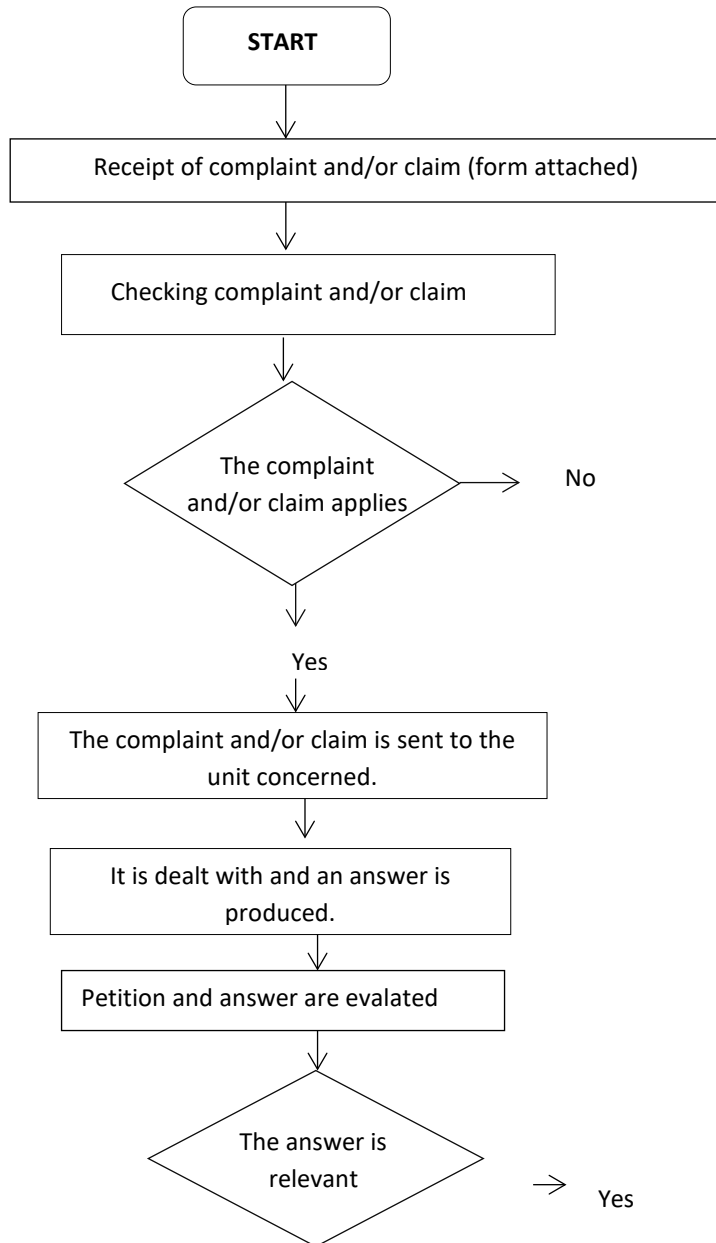
The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

**8.1.3.3 Specifications for handling, dealing with and resolving complaints.**

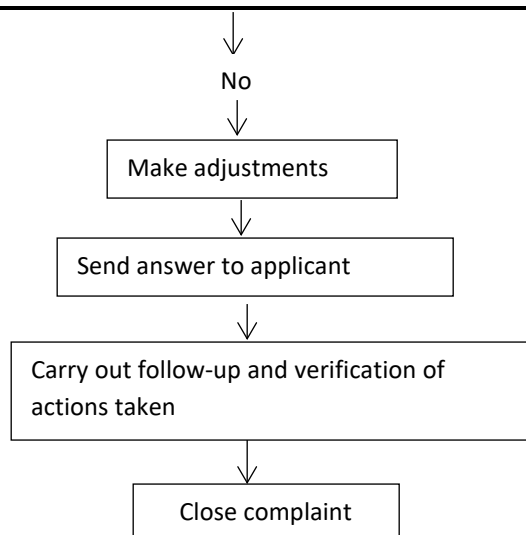
<b>SPECIFICATION MCSE-03: MEASURES FOR DEALING WITH AND RESOLVING COMPLAINTS</b>			
<b>COMPONENT MANAGEMENT PROGRAM</b>		<b>RESOURCE: Human</b>	
<b>OBJECTIVE</b>			
<ul style="list-style-type: none"> <li>To receive, process and administer complaints and claims in a prompt and objective manner, with a view to adopting measures for dealing with and improving activities carried out.</li> </ul>			
<b>STAGE</b>	<b>PLACE TO BE APPLIED</b>		<b>ENVIRONMENTAL IMPACT</b>
Operational Stage	<ul style="list-style-type: none"> <li>La Venturosa inspection</li> <li>Puerto Murillo inspection</li> <li>Aceitico inspection</li> <li>Project property</li> </ul>		<ul style="list-style-type: none"> <li>Change in society's quality of life</li> </ul>
<b>CAUSE OF IMPACT</b>			<b>ENVIRONMENTAL EFFECT</b>
<ul style="list-style-type: none"> <li>Installation of project</li> <li>Operation of project</li> </ul>			<ul style="list-style-type: none"> <li>Human resource affected in terms of the quality thereof</li> </ul>
<b>TYPE OF MEASURE</b>			
Prevention	Mitigation	Correction	Offsetting
X	X	xviii.	x
<b>ACTIONS TO BE TAKEN</b>			
<ol style="list-style-type: none"> <li>Establish a telephone line and a form for "petitions, complaints, claims and suggestions" and keep a record for internal and external company administration purposes.</li> <li>Make workers aware of the procedure to follow in the event of a complaint or claim being received, and also of making communities aware of the project.</li> </ol> <p>Community participation system and dealing with complaints and claims.</p> <p>Interested parties can join in project awareness workshops and thus participate in project administration.</p> <p>Requirements for receiving, processing and administering.</p> <p>If a complaint is to be processed in the corresponding manner, it should be justified, and also be respectful, serious, objective and warrant credibility.</p> <p>Means that can be used for receiving complaints.</p> <p>Telephone line, filling in the form for "petitions, complaints, claims and suggestions", and also physically using the respective form at project facilities.</p>			

**SPECIFICATION MCSE-03: MEASURES FOR DEALING WITH AND RESOLVING COMPLAINTS**

Path for dealing with and resolving complaints



**SPECIFICATION MCSE-03: MEASURES FOR DEALING WITH AND RESOLVING COMPLAINTS**



**TECHNOLOGIES USED**

See Attachment 26

**DESIGN**

See Attachment 26

**EXECUTION SCHEDULE**

Activities	Stage		
	Construction	Operation and maintenance	Dismantlement and abandonment
All activities to be carried out		X	

**PARTY RESPONSIBLE FOR EXECUTION**

The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist, and the HSEQ Leader.

**PERSONNEL REQUIRED**

- FFC personnel responsible for environmental management.

**FOLLOW-UP AND MONITORING**

Indicator	Activity	Record
Number of complaints, requests and procedures resolved / number of complaints, requests and other procedures received.	<ul style="list-style-type: none"> <li>• Based on the form relating to dealing with complaints and claims, keep a record for internal company administration purposes.</li> <li>• Make workers aware of the path to follow if a complaint or claim is made.</li> </ul>	File containing record of complaints and/or claims, with respective administration for verification purposes.

**QUANTIFICATION AND COSTS**

The costs involved in implementing the environmental management programs and measures established in this environmental management plan specification, with the information on the total implementation figure at the end of the chapter.

8.1.4 Specification for Environmental Management Plan with Information on Total Implementation Figure

<b>SPECIFICATION FOR ENVIRONMENTAL MANAGEMENT PLAN WITH INFORMATION ON TOTAL IMPLEMENTATION FIGURE</b>	
<b>TOTAL FIGURE FOR IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN</b>	<b>COMPONENT: Abiotic, Biotic, socioeconomic and operational</b>
<b>OBJECTIVE</b>	
<ul style="list-style-type: none"> <li>To provide information on the total figure for implementing the environmental management plan for the project.</li> </ul>	
<b>TARGET</b>	<b>COMPLIANCE INDICATORS</b>
To update the Environmental Management Measures technical study for the project, in accordance with the provisions stipulated in Resolution 500.41.15.1753.	Approval of the evaluation of the Environmental Management Measures (MMA) technical study and the granting of environmental permits.
<b>ACTIVITIES GENERATING THE SAME</b>	<b>IMPACTS TO BE MANAGED</b>
	<ul style="list-style-type: none"> <li>Change in water quality</li> <li>Change in soil quality</li> <li>Change in air quality</li> <li>Change in landscape quality</li> </ul>
<b>TYPES OF MEASURE TO BE EXECUTED</b>	
<ul style="list-style-type: none"> <li>Control</li> <li>Prevention</li> <li>Mitigation</li> </ul>	
<b>ACTIONS TO BE EXECUTED</b>	
<ol style="list-style-type: none"> <li>Complete soil analysis</li> <li>Physical-chemical analysis of compost</li> <li>Physical-chemical and microbiological analysis of drinking water.</li> <li>Analysis of beneficial microbiota in soil</li> <li>Construction of San Cristobal agrochemicals warehouse</li> <li>Construction of San Cristobal fertilizers warehouse</li> <li>Construction of filtering fields</li> <li>Construction of composting plant</li> <li>Construction of fuel filling platform</li> <li>Construction of temporary storage site for solid waste (measurements 10 meters * 5 meters)</li> <li>Construction of machinery workshop</li> <li>Construction of washing zones</li> <li>Implement a drinking water treatment system for water consumption</li> <li>Installation of water flow meters for consumption and irrigation in nursery</li> <li>Installation of waste water flow meters</li> <li>Installation of containers for waste</li> <li>Installation of sanitary appliances and other accessories with efficient water use and saving systems</li> <li>Preventive maintenance on all pumping structures, equipment and accessories</li> <li>Pumping test</li> </ol>	

<b>SPECIFICATION FOR ENVIRONMENTAL MANAGEMENT PLAN WITH INFORMATION ON TOTAL IMPLEMENTATION FIGURE</b>
20. Implement a waste water treatment system 21. Physical-chemical and microbiological analysis of waste water 22. Transportation and final disposal of ordinary waste 23. Collection and final disposal of industrial waste 24. Collection and final disposal of contaminated waste 25. Collection and final disposal of used oil waste 26. Transportation of dangerous waste 27. Compensation measure for protection area
<b>COMPLIANCE RECORD</b>
1. Results of physical-chemical and microbiological analyses for drinking water and waste water, and physical-chemical analyses of compost produced 2. Results of air quality samplings 3. Results of soil microbiological analyses 4. Photographic record of alterations to temporary storage areas for solid waste and agrochemicals 5. Record of flows, showing water savings after implementation of accessories.
<b>PARTY RESPONSIBLE FOR EXECUTION AND PROFILE OF PARTY RESPONSIBLE</b>
<ul style="list-style-type: none"> <li>The party responsible for execution and control of, and follow-up on, the programs will be a FFC Environmental Engineer or environmental sciences specialist.</li> </ul>
<ul style="list-style-type: none"> <li>TOTAL COST OF IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN</li> </ul>
\$ 1,088,613,148

## 8.2 Monitoring and reporting procedures

Monitoring will be conducted in accordance with the Environmental Management Plan and Plantation Management Plan (PMP) which has been prepared for the project. The PMP comprises the following plans which are in the process of being developed in accordance with the requirements of the IFC PS:

- Social Plan
- Environmental Plan
  - Water Management Plan
  - Waste Management Plan
- Health, Safety and Security (HSS) Plan
- Planning and Technical Plan
- Silviculture Plan
- Contractor Management Plan
- Forest Engineering Plan
- Forest Protection Plan
  - Fire Management Plan

### 8.2.1 Follow-up and monitoring program

The follow-up and monitoring sheets record changes on the project's baseline in the abiotic, biotic and socioeconomic environments, as well as the environmental activities.

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 1 - WATER</b>	
<b>OBJECTIVE</b>	To verify the compliance with the actions proposed in the Management Sheets for the water component. To monitor the evolution of water efficient use and saving and the quality conservation of water resources.
<b>COMPONENT</b>	Water
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	<ul style="list-style-type: none"> <li>• Change in water quality</li> <li>• Change in water quantity</li> </ul>
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<ol style="list-style-type: none"> <li>1. To install water flow meters for water consumption in each camp and for consumption in irrigation and fertirrigation in nurseries</li> <li>2. Carry out an annual analysis of physicochemical and microbiological water parameters for human consumption</li> <li>3. To hold a biannual training session aimed at the project's members on water conservation, efficient use and saving</li> <li>4. To install faucets, toilets and other accessories with saving systems for efficient water use</li> <li>5. To carry out preventive maintenance of all structures, equipment and accessories for water pumping, pipelines, storage and distribution for human consumption, once a year</li> <li>6. To record monthly the water flow for human consumption and consumption in nurseries (irrigation), from all capturing sources</li> <li>7. To implement a drinking water treatment system for water consumption</li> <li>8. To gauge monthly surface sources which are for capturing and to determine its ecological flow</li> <li>9. To carry out an annual pumping test to groundwater wells, which are for capturing; the test must analyze the conditions of underground aquifers</li> <li>10. To install wastewater flow meters in each camp</li> <li>11. To carry out annual analysis of wastewater physicochemical and microbiological parameters</li> <li>12. To implement a wastewater treatment system for each project's camp</li> <li>13. To carry out preventive maintenance of the wastewater treatment system</li> <li>14. To record monthly the wastewater flow in each camp registering produced wastewater and treated wastewater</li> <li>15. To analyze biannually the wastewater physicochemical and microbiological parameters</li> </ol>
<b>PARAMETERS TO BE USED IN ORDER TO CHARACTERIZE THE</b>	<ol style="list-style-type: none"> <li>1. BOD: Biochemical oxygen demand for five (5) days</li> <li>2. COD: Chemical oxygen demand</li> <li>3. TSS: Total Suspended Solids</li> <li>4. pH: Hydrogen potential</li> </ol>

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 1 - WATER</b>	
<b>COMPONENT'S STATE OR EVOLUTION</b>	<ol style="list-style-type: none"> <li>5. T: Temperature</li> <li>6. F: Flow</li> <li>7. Total Coliforms and E. coli</li> <li>8. Chlorides, sulphates, nitrates, phosphates</li> <li>9. Calcium, magnesium, sodium</li> <li>10. Total hardness</li> </ol>
<b>LOCATION OF CONTROL POINTS</b>	The quality analysis of water sources and flow measurement will be carried out in all the points from which water is being taken for any type of project's activity.
<b>MEASUREMENT DURATION AND FREQUENCY</b>	Biannual sampling frequency during the project's lifespan.
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	The quantitative levels or permitted limits for dumping will be those established in the relevant national or local regulations, those indicated in the rulings which grant dumping permits. Regarding water uses, flows and their use, they will be those established by CORPORINOQUIA in the respective concession rulings.
<b>FREQUENCY FOR SUBMITTING REPORTS</b>	A report will be prepared annually.
<b>CONTROL ENTITY</b>	CORPORINOQUIA

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 3 - ECOSYSTEMS</b>	
<b>OBJECTIVE</b>	To verify the compliance with the actions proposed in the Management Plan for flora and ecosystem conservation
<b>COMPONENT</b>	Ecosystems
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	Change in ecosystem quality
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<ol style="list-style-type: none"> <li>1. To protect forest ecosystems, morichales and wetlands.</li> <li>2. To protect the ecotones between savannas, gallery forests and morichales</li> <li>3. To maintain savanna corridors associated with the cultivation areas that allow the native fauna to migrate and access the necessary resources for the maintenance of its populations</li> <li>4. To carry out an annual training session aimed at the project's members on preventing illegal wildlife trafficking</li> <li>5. To carry out an annual training session aimed at the project's members on the integrated plague and disease management</li> <li>6. To monitor the state of soil's beneficial microbiota</li> <li>7. To sustain technical chemical control with field assessments</li> <li>8. To rotate agrochemical products to be used in order to avoid plague resistance</li> <li>9. To carry out equipment calibration in order to avoid agrochemical overdoses or sub-doses</li> <li>10. To use low-toxicity and high-specificity insecticides as a last resort for plague control</li> </ol>



<b>FOLLOW-UP AND MONITORING SHEET NUMBER 3 - ECOSYSTEMS</b>	
	<ol style="list-style-type: none"> <li>11. To hold a biannual training session aimed at the project's members on preventing and taking care of fires and uncontrolled burning</li> <li>12. To provide the project's staff with the necessary elements to deal with uncontrolled burns (backpacks, tank trucks, hoses, axes, hoes, shovels, radio telephones, etc.)</li> <li>13. To carry out periodic maintenance of fire barriers</li> <li>14. To conduct the zoning of project's properties identifying the areas of greater susceptibility to fires</li> <li>15. To follow up areas of greater susceptibility to forest fires during dry periods</li> </ol>
<b>PARAMETERS TO BE USED TO CHARACTERIZE THE COMPONENT'S STATE OR EVOLUTION</b>	The natural ecosystems' baseline of distribution over the territory will be used as a comparative parameter, as well as the information on the ecosystems' floristic composition in the project's area of influence.
<b>LOCATION OF CONTROL POINTS</b>	Territory's global assessment of changes in the ecosystems' vegetal cover and biological composition, in addition to the selected points, which must be representative to establish plantations
<b>MEASUREMENT DURATION AND FREQUENCY</b>	During the project's lifespan every 5 years
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	The baseline information will be considered the lower critical limit.
<b>FREQUENCY FOR SUBMITTING REPORTS</b>	Annual reports on executed actions will be prepared regarding this component.
<b>CONTROL ENTITY</b>	CORPORINOQUIA

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 4 – WILD FAUNA</b>	
<b>OBJECTIVE</b>	To follow up the management measures proposed in the Management Plan for the conservation of the region's wild fauna. To monitor the project's impact on fauna.
<b>COMPONENT</b>	Fauna
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	<ol style="list-style-type: none"> <li>1. Change in ecosystems' quality</li> </ol>
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<ol style="list-style-type: none"> <li>1. To hold an annual training session aimed at the project's members on wildlife management</li> <li>2. To remove healthy slow-locomotion animals (for example, turtles and armadillos) from any potentially harmful area and relocate them in a safe area for them, as close as possible to the place where they were removed from</li> <li>3. To examine the area prior to the land preparation (rake and application of lime) in order to ensure that it is animal-free</li> <li>4. To transport injured animals to the Corporation's wildlife rehabilitation center</li> </ol>

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 4 – WILD FAUNA</b>	
<b>PARAMETERS TO BE USED TO CHARACTERIZE THE COMPONENT'S STATE OR EVOLUTION</b>	The natural ecosystems' baseline of distribution over the territory will be used as a comparative parameter, as well as the information on the ecosystems' floristic composition in the project's area of influence.
<b>LOCATION OF CONTROL POINTS</b>	In the project's areas where plantations are developed.
<b>MEASUREMENT DURATION AND FREQUENCY</b>	During the project's lifespan
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	The baseline information will be considered the lower critical limit.
<b>FREQUENCY FOR SUBMITTING REPORTS</b>	Annual reports will be prepared on the executed actions regarding this component.
<b>CONTROL ENTITY</b>	CORPORINOQUIA

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 5 - SOCIOECONOMIC</b>	
<b>OBJECTIVE</b>	<ul style="list-style-type: none"> <li>• Monitor the actions proposed in the Management Plan for the socioeconomic component</li> <li>• Follow up permanently the prevention and management of social conflicts that may arise during the project's development</li> </ul>
<b>COMPONENT</b>	Human
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	<ul style="list-style-type: none"> <li>• Change in society's quality of life</li> <li>• Change in Workforce and Services demand</li> <li>• Generation of social conflicts</li> </ul>
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<p>The execution of the following activities will be verified:</p> <p>Occupational well-being of the project's staff:</p> <ol style="list-style-type: none"> <li>1. To establish a work orientation program.</li> <li>2. To implement the occupational health, hygiene and industrial safety programs</li> <li>3. To establish a training program according to the profiles of the project's different positions</li> </ol> <p>Management of socio-economic and socio-environmental impacts generated by the project:</p> <p>Prevention of social conflicts</p> <ol style="list-style-type: none"> <li>1. To provide clear, timely and reliable information about the project to the interested population, to the communities living in the area of influence and to the social organizations and hold a project's socialization session, in the case of a community that does not know Forestal de la Orinoquia</li> <li>2. To identify early those issues that may generate social conflicts</li> </ol>

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 5 - SOCIOECONOMIC</b>	
	<p>Management of social conflicts</p> <ol style="list-style-type: none"> <li>1. Appoint a manager for community relations and to establish a permanent communication channel, in order to manage and solve the possible impacts associated with assigning a manager for community relations and establishing a permanent communication channel, and thus to manage and to solve the possible impacts associated with the project's development</li> <li>2. To receive, manage and solve the community's complaints generated by the project's development</li> <li>3. To create a scenario to negotiate with the community the solution to social conflicts</li> <li>4. If no solution is reached with the community, it will be escalated to the relevant authorities</li> </ol> <p>Management of customer service and resolution of complaints:</p> <ol style="list-style-type: none"> <li>1. To create a telephone line and a format for "petitions, complaints, claims and suggestions"</li> <li>2. To inform the workers about the management procedure in case of a complaint or claim, and also the socialization with the project's communities</li> </ol>
<b>PARAMETERS TO BE USED TO CHARACTERIZE THE COMPONENT'S STATE OR EVOLUTION</b>	The project will develop internal activities aimed at learning and assessing the organizational environment and interests, expectations, etc. for the different interest groups in the project's area of influence, so it is possible to monitor the evolution of the project's levels of acceptance by the community, its employees, contractors, etc., as objectively as possible.
<b>LOCATION OF CONTROL POINTS</b>	Occupational and organizational issues will be monitored in the areas sown and, in the project's administrative, operational premises, etc. The community issues will be monitored within the project's areas of influence, in municipal centers and in populated centers.
<b>MEASUREMENT DURATION AND FREQUENCY</b>	Permanently during the project's lifespan
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	Even though perception and opinion issues are not easily quantifiable and measurable, a procedure will be designed allowing periodic and objective assessment of changes in communities', workers', contractors' and another stakeholders' perception.

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 6 - SOIL</b>	
<b>OBJECTIVE</b>	To verify the compliance with the actions proposed in the Management Sheets for the soil component
<b>COMPONENT</b>	Soil
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	Change in soil quality

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 6 - SOIL</b>	
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<ol style="list-style-type: none"> <li>1. To analyze soil quality every 7 years.</li> <li>2. Fertilize in accordance with the plantations' specific requirements</li> </ol>
<b>PARAMETERS TO BE USED TO CHARACTERIZE THE COMPONENT'S STATE OR EVOLUTION</b>	<ol style="list-style-type: none"> <li>1. Texture</li> <li>2. NNO3</li> <li>3. NNH4</li> <li>4. P</li> <li>5. K</li> <li>6. Ca</li> <li>7. Mg</li> <li>8. S</li> <li>9. Na</li> <li>10. Fe</li> <li>11. Mn</li> <li>12. Cu</li> <li>13. Zn</li> <li>14. B</li> <li>15. Chlorides</li> <li>16. pH</li> <li>17. CIC</li> <li>18. Moisture saturation</li> <li>19. Bulk Density</li> <li>20. Organic Carbon</li> <li>21. % of base saturation</li> <li>22. Aluminum</li> </ol>
<b>LOCATION OF CONTROL POINTS</b>	Soil quality analysis will be carried out in all properties where plantations are established.
<b>MEASUREMENT DURATION AND FREQUENCY</b>	The frequency for soil quality analysis will be every 7 years during the project's lifespan.
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	The soil's quantitative levels or permitted limits will be those established in national or local relevant regulations.
<b>FREQUENCY FOR SUBMITTING REPORTS</b>	A report will be prepared once the samples for soil analysis have been taken (every 3 years).
<b>CONTROL ENTITY</b>	CORPORINOQUIA

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 7 WASTEWATER</b>	
<b>OBJECTIVE</b>	<ul style="list-style-type: none"> <li>• To follow up the compliance with the actions proposed in the Management Sheets for the wastewater component</li> <li>• Follow up the implementation of necessary measures to appropriately manage wastewater generated by the project</li> <li>• Follow up the implementation of wastewater treatment systems for each project's camp</li> </ul>
<b>COMPONENT</b>	Water
<b>ASSOCIATED ENVIRONMENTAL IMPACTS</b>	<ul style="list-style-type: none"> <li>• Change in water quality</li> <li>• Change in water quality</li> </ul>

<b>FOLLOW-UP AND MONITORING SHEET NUMBER 7 WASTEWATER</b>	
<b>METHODS TO BE USED OR FOLLOW-UP ACTIONS</b>	<ol style="list-style-type: none"> <li>1. To install wastewater flow meters in each camp</li> <li>2. To analyze annually the wastewater's physicochemical and microbiological parameters</li> <li>3. To implement a wastewater treatment system for each project's camp</li> <li>4. To carry out preventive maintenance of wastewater treatment system</li> <li>5. To record monthly wastewater flow in each camp, registering produced wastewater and treated wastewater</li> </ol>
<b>PARAMETERS TO BE USED TO CHARACTERIZE THE COMPONENT'S STATE OR EVOLUTION</b>	<ol style="list-style-type: none"> <li>1. Flow</li> <li>2. pH</li> <li>3. Dissolved Oxygen</li> <li>4. Temperature</li> <li>5. DBO5</li> <li>6. DQO</li> <li>7. Total Suspended Solids</li> <li>8. Fats and Oils</li> <li>9. Total and fecal coliforms</li> <li>10. Conductivity</li> <li>11. Chlorides</li> <li>12. Total hardness</li> <li>13. Phenols</li> </ol>
<b>LOCATION OF CONTROL POINTS</b>	Wastewater quality analysis will be carried out in all properties where plantations are located.
<b>MEASUREMENT DURATION AND FREQUENCY</b>	The frequency of analysis for dumping quality is annual during the project's lifespan.
<b>QUANTITATIVE LEVELS OR PERMITTED LIMITS</b>	The soil's quantitative levels or permitted limits will be those established in national or local relevant regulations
<b>FREQUENCY FOR SUBMITTING REPORTS</b>	A report will be prepared once physicochemical analysis has been taken.
<b>CONTROL ENTITY</b>	CORPORINOQUIA