| Name of the project | Panama Canal Authority (ACP) Sustainable Forest Convert Establishment project |
|---|---|

| 1. A description of the project's general forest management objectives must be given. | |
|---|---|
| **a. Tree nursery** | One of the main objectives of the projects is to provide all the participants with the necessary outsourcing to complete the activities in the most efficient way as expressed in the management plan. There was one nursery established at the beginning of the project with the investment and technical advice of ACP. Nowadays the nursery is working independently and managed by a group of entrepreneur women. The nursery is not only for the project, providing the plants for the plantations from ACP, but is also providing plants to other local projects that follow the initiative of ACP.<br><br>ACP objective: Incorporate a nursery system to the project for future activities. For instance, the skill of raising seedlings may generate additional income by selling planting materials to other reforestation operations. Other trainings like about agroforestry systems, give to farmers the tools to implement these types of systems in order to have alimentary security and not only depend of the sales of wood. When farmers want to implement some Agroforestry or Silvopasture system, ACP will cover all the costs required by the system, like seedlings, fertilizers and training programs. ( Ref. 01-04-page79)<br><br>It is elemental to use high quality seeds for a successful project. Therefore ACP will control and provide the seeds to the different stakeholders. This will be elemental to achieve an homogeneous comparison growth due to the use of the same type of seed.<br>Sowing of the seeds into germination beds or directly into black polythene bags - depending on the requirements of each tree species.<br><br>• Sorting and transplanting of the seedlings into black polythene bags.<br>• a mix soil is used between sieved topsoil, rice husks and organic fertilizer<br>• Greenhouse protects the seedlings from direct sunlight and control the temperature<br>• Manual Weeding and watering is applied when necessary.<br>• Phytosanitary controls to prevent pests and disease<br><br>One of the main objectives is to standardize the process; therefore the mentioned points are applied for the 4 activities of the project. |
| **b. Land preparation** | The main objective is to control the impact in the soil due to the project implementation. To achieve this objective, mainly manual preparation was done and only small machinery was used some cases to diminish soil impact soil.<br><br>Other important objective is to obtain information from the existing type of soil in the plantation. Through a soil sampling and laboratory analysis the project Manager will be able to determinate the adequate use of fertilizers. Ref 3-11, pag 11, point c |

| 1. A description of the project's general forest management objectives must be given. | |
|---|---|
| | For all the 4 activities of the project land preparation will be a mix: Manually or mechanically, depending on the topography of the place. To prevent soil erosion. The land used to implement the reforestation project was before covered with Saccharum spontaneum or degraded soil that was used for catting. In both cases it is necessary ploughing to give the soil the right texture before planting. In the case of catting areas the soil is compacted and there is a higher impermeability. Ploughing is employed in flat areas and avoided in areas with slopes. This is a security principle to avoid post erosion from ploughing. No slash and burn technics are used for land preparation.<br>( Ref.03-02, page 1, points a,b,)(Ref.03-04, page 1, point a,b,c) |
| **c. Planting** | The main objective ist o obtain a mix plantation with.The ROC will follow a planting map and locate the sepcies based in the future positive interaction that will occurred between them. In this aspect for agroforestry and silvospastoral activities ; the taller tress that will be used for timber will be planted in different spacing ( 20x20) than the frutal trees (10x10). This will generate and equilibrium in the plantation. In the case of commercial and conservation plantations spacing is based in the tree species ( 3x3) b<br><br>Further the project area is planted in the traditional manner, using manual tools such as machetes, shovels, bars, hoes and brush-cutters. Planting is carried out before the rainy season to guaranty enough water for the trees during the first months of life. Planting is done manually. Planting holes are drilled with an auger before the trees are transported from the nursery. Seedlings are watered and then moved to the field where they will be planted. Seedlings are put into the pit and covered with the extracted soil using light pressure. A mix of organic fertilizer is used in the planting zone to provide enough nutrients to the tree. After planting the tree is codified and part of a monitoring period for 1 year, After one year is possible to obtain a mortality rate and begin selective replanting. (Ref. 01-04, page 79)Ref. 03-02, page 1, points a,b,)(Ref. 03-04, page) |
| **d. Beating up** | One of the main objectives of the project is quality control of the plantations. Therefore a technical group from ANAM and MIDA together with the Oficial representative institution from ACP " ROC" will also verified the planting activity ( Ref 03-03-,pag 2, point i)<br><br>In case of seedling-failure, replanting is carried out as soon as possible, especially in the tress which is younger than 2 months.<br>After elimination of the cause of planting failure and taking the necessary correction a restocking will be carried out. Weeds surrounding the seedlings will be slashed manually three times a year as necessary to ensure high survival rates and good growth in the first 4 years after. For ecological and social reasons manual weeding will be always a priority, rather than the use of chemicals. After 1 year it is planned a replanting activity (beating up only when mortality rate is superior to 10%) (Ref. 03-04, page )(Ref. 03-01, page 1, point 21) |
| **e. Maintenance** | The objective of ACP is to guaranty the survival rate of the tress. An average maintenance of the plantation of 4 times a year was established. There are several activities that are part of this maintenance. For agroforestry, silvopasture and commercial forestry activities: Cleaning the area around the tress with a radius of 50 centimeters and applying selective organic fertilization known as bocashi are important activities to consider.<br><br>For all activities: Protecting the reforestation area from grazing animals is achieved by surrounding the area with a living fence, using barbwire and special tree species as fence posts such as Poro (*Erythrina poeppigiana*). The continuity and proper quality of the fence is guaranteed through |

| 1. A description of the project's general forest management objectives must be given. | |
|---|---|
| | regular maintenance. An adequate road network including bridges, culverts or other necessary constructions to cross water streams, will be installed to facilitate the planting operations, monitoring, pest control and for the case of fire outbreaks, immediate access for the firefighting crew. The road and path network will be planned, designed and build in a suitable way, taking the inclination of the terrain and water runoff into account.<br>Firebreaks will be prepared in advance of the fire season. This means planning carefully according to the climate in the location and manually clearing the firebreaks. Road are hugely important to gain quick access to one's plantation - not just in times of emergency (e.g. fires or if a worker is seriously injured) but also for general supervision of all silvicultural operations.<br>( Ref.01-04,page 222,Annex 11 ) ( Ref. 03-02,page 3,point 18)(Ref. 03-04, page). |
| **f. Pruning** | Pruning is important objective for all timber tress and especially applied in the commercial and agroforestry activity. The main aim is to improve the yield after the end of the period.<br><br>The aim of **pruning** is the removal of lower-branches to produce knot free timber in order to obtain higher prices on international timber markets due to increased wood properties. Pruning will be done during the dry season to improve the resilience of the tree and two prevent possible diseases coming from the activity. It will be done manually to avoid damages in tree crust (Ref.01-04, page 130, table 26).<br><br>It is recommended that at least 35-40% of the total height of the living crown should remain, in order to prevent a slowdown in growth. If too much of the crown (the photosynthetic area) is removed the tree will react through a slowed down development or even dieback. |
| **g. Thinning** | Thinning is an important objective for all timber tress and especially applied in the commercial and agroforestry activity. The main aim is to improve the yield after the end of the period.<br><br>Within of the planned management schemes to manage the different forestry schemes are established the thinning activity, in order to:<br>(i)increased light penetration to develop bigger crowns to accelerate diameter growth, (ii)increased percentage of trees reaching maturity improved wood quality, (iii)encouraged root development control of ground cover vegetation for erosion control, (iv)improve the tree distance and to maximize the growth.<br>The trees selected for thinning shall be selected to maximize the volume and value of the trees left for later thinning or felling, when larger piece size prices will be higher. A sanitary thinning will be executed followed by a selective thinning and roughly 50% of the original trees removed in these thinning by year five. Non-commercial trees will be left on the ground for nutrient release to the soil, support fauna and flora, thus increasing total biodiversity. (Ref. 01-04, page 130, paragraph 1) |
| **h. Harvesting** | The main objective of ACP is to contribute with forest connectivity. The Conservation management units will increase the connectivity of Soberania and Chagres National Parks. These management units will not be harvest.<br>The commercial plantations will follow a rotation period of 25 years and for the agroforestry and silvopature activity a selective logging of the timber tress ( 20% of the species) . |

| 1. A description of the project's general forest management objectives must be given. | |
|---|---|
| | For all the activities the following procedure will be follow:<br>The trees are marked with paint or flagging tapes to mark trees along the proposed skid trail route. Afterwards, the chainsaw operator cuts all trees with a diameter of 15 cm, or more, which are located at the prospective skid trail that has been planned and marked before. While opening the skid trail, felled trees should not damage nucleus trees, protected trees, or adjacent tree regenerations as well as disturb the skid trail construction by the tractor operator. The felling starts from the end of the prospective skid trail, with the felling direction away from the landing. After the skid trail route is cleared from undergrowth and trees, the chainsaw operator can work with the harvestable trees.<br><br>***Areas to be excluded from timber harvesting:***<br>Some restricted locations within the working areas will be excluded from the timber harvesting, such as in the following areas: (i)radius of 50 m from the edge of a water springs;(ii) at minimum, 25 m from the edge of a lake or coast measure from the highest tide toward the coast; (iii)at minimum, 15 m from the sides of a river, (iv)near the edges of steep lands (> 40%) to at least twice of those lands; and (v)Conservation and research areas. (Ref. 03-05, page 1-2, graph 1, 2) |

| 2. Evidence must be given that the boundaries of the project area, planting area (eligible and non-eligible), management units and nature conservation area are clearly defined and visible in the field. |
|---|
| The different activities will be marked and separated with different fences. This will allow the project to control and monitor the area. Project activities stratification and fence separation will play a key role in management.<br>**a) Demarcation of the sleeves:** subdivision of the paddocks considering the sources of water for each division. There will be pasture divisions up to two hectares per sleeve (Example, if there is a paddock of 10 hectares, there will be 4 divisions with live fences to get 5 sleeves of two hectares each).<br>**b) Live fences multi-strata:** Both in the perimeter fence as internal divisions, hedges should be made multi-strata, which are those with more than two species of trees of different heights and provide various uses (timber commercialization, conservation forestry, shadow trees, ornamental, etc..)<br>The fences will use stakes with height between 2 to 2.5 meters, with 4 to 8 inches thick and seeded at a depth of 30 to 40 centimeters to stop animals will be Planted every 10 meters of each other, for camp, and protected with personal protective wire in a triangle, so that the cattle will not harm them.<br>**c) Close Edge:** strengthen the close of each beneficiary pastures with barbed wire or live stakes in those places where the fence has symptoms of deterioration (rotting barbed wire, stakes and poles damaged or weak), so they represent a place where animals could get away. The perimeter fence of the property must be set and / or reinforced with barbed wire to four strings. The barbed wire must have the following specifications:<br>• Two wire size 15.5 or higher<br>• Barbed every 3.5 to 5 inches, size 15.5 or higher<br>• High-strength steel, galvanized<br>Detailed information (Ref. 03-04, page 2, point 31:a,b,c) (Ref. 03-02, page 3 point 18.e) |

3. A description of the following tree species characteristics must be given:
   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / Use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

| | Name (English, Latin and if possible local language) | Origin and distribution | Native? | Provenance | Main purpose / Use of trees | Possible pests and diseases | Time of use |
|---|---|---|---|---|---|---|---|
| 1 | Teca (tectona grandis) | Central and South America | no | India, Laos | commercial | Corticium salmonicolor Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 2 | Amarillo (Terminalia Amazonia) | Central and South America | Yes | Central and South America | commercial | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 3 | Zapatero (Hyeronima alchorneoides) | Central and South America | Yes | Central and South America | commercial | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 4 | Almendro de montaña (Dipteryx panamensis) | Central and South America | Yes | Central and South America | commercial | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 5. | María (Calophyllum brasiliense) | Central and South America | Yes | Central and South America | commercial and conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 6 | Roble (Tabebuia rosea) | Central and South America | Yes | India, Laos | conservation | Hypsipyla grandela Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |

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   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / Use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

| | Name (English, Latin and if possible local language) | Origin and distribution | Native? | Provenance | Main purpose / Use of trees | Possible pests and diseases | Time of use |
|---|---|---|---|---|---|---|---|
| 7 | Chrysophyllum cainito | Central and South America | Yes | Central and South America | conservation | Hypsipyla grandela Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 8 | Cedro Amargo (Cedrela odorata) | Central and South America | Yes | Central and South America | agroforestry | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 9 | Eucalipto (Eucalipto Camaldulensis) | Central and South America | no | Australia | commercial | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 10 | **Espave (Anacardium excelsium)** | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 11 | Ceiba pentandra | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 12 | Guayacan (Tabebuia guayacan) | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 13 | Gliricida Sepium | Central and South America | Yes | Central and South America | agroforestry and silvopasture | Defoliation by leafcutter ants, wood infection by termites | 25 years |

3. A description of the following tree species characteristics must be given:
   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / Use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

| | Name (English, Latin and if possible local language) | Origin and distribution | Native? | Provenance | Main purpose / Use of trees | Possible pests and diseases | Time of use |
|---|---|---|---|---|---|---|---|
| | | | | | | and followed by fungi | |
| 14 | Algarrobo (*Hymenaea courbaril*) | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 15 | Erythrina poeppigiana | Central and South America | Yes | Central and South America | agroforestry and silvopasture | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 16 | Enterolobium cycloparpum | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 17 | Balsa (*Ochroma pyramidale* | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 18 | Bursera simaruba | Central and South America | Yes | Central and South America | silvopasture | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 25 years |
| 19 | Diphysa robinioides | Central and South America | Yes | Central and South America | silvopasture | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |

3. A description of the following tree species characteristics must be given:
   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / Use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

| | Name (English, Latin and if possible local language) | Origin and distribution | Native? | Provenance | Main purpose / Use of trees | Possible pests and diseases | Time of use |
|---|---|---|---|---|---|---|---|
| 20 | Apeiba tibourbou | Central and South America | Yes | Central and South America | agroforestry and silvopasture | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 21 | Guazuma ulmifolia | Central and South America | Yes | Central and South America | silvopasture | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 22 | Persea americana | Central and South America | Yes | Central and South America | agroforestry | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 23 | Inga sp. | Central and South America | Yes | Central and South America | agroforestry | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 24 | **Guazuma ulmifolia** | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 25 | Spondia mombin | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 26 | Cordia alliodora | Central and South America | Yes | Central and South America | agroforestry | Defoliation by leafcutter ants, wood infection by termites | 50 years |

3. A description of the following tree species characteristics must be given:
   a. Origin and distribution of the tree species (indicate if the species are native or not)
   b. Provenance of the seeds
   c. Main purpose / Use of trees
   d. Possible pests and diseases
   e. Time when forest products are foreseen to be used

| | **Name** (English, Latin and if possible local language) | **Origin and distribution** | **Native?** | **Provenance** | **Main purpose / Use of trees** | **Possible pests and diseases** | **Time of use** |
|---|---|---|---|---|---|---|---|
| | | | | | | and followed by fungi | |
| 27 | Erythrina sp | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 28 | Albizia adinocephala | Central and South America | Yes | Central and South America | agroforestry | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 29 | Jacardanda acutifolia | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |
| 30 | Annona muricata | Central and South America | Yes | Central and South America | conservation | Defoliation by leafcutter ants, wood infection by termites and followed by fungi | 50 years |

4. Evidence must be given that at least 10% of the project area is managed
   a. as a nature conservation area OR
   b. to meet a national or sub-national HCV area definition.

   Criterion 4. does not have to be fulfilled in case more than 30% of the project area is managed according to chapter '06 $CO_2$-fixation - Option 1b) Conservation forest'.

4. Evidence must be given that at least 10% of the project area is managed
   a. as a nature conservation area OR
   b. to meet a national or sub-national HCV area definition.

   Criterion 4. does not have to be fulfilled in case more than 30% of the project area is managed according to chapter '06 $CO_2$-fixation - Option 1b) Conservation forest'.

a. At least 10% of the total project area will be managed as conservation area. From the project are equivalent to 10 000 hectares, 1770 (ha) were designated for Conservation purposes. From the 2985 hectares selected as eligible planting area, 910 hectares were selected for conservation purposes (MU 06-14).
The ACP reforestation project intention considers the importance of forest close to the watersheds. Forests can easily absorbed water acting like sponges and preventing from possible flooding. In dry seasons through percolation water can be drained back to the river if more water is necessary. These areas are also of great importance for preventing soil erosion and possible landslides.

5. Evidence must be given that the nature conservation area is managed in order to establish, maintain or restore the natural ecosystem of the landscape the project is integrated in.

ACP as an entity of the Government of Panama has to comply and know every law and regulation concerning project development. Additionally, the project is implemented in close coordination and communication with the institutions which have jurisdiction over the project site (ANAM, MIDA and BDA). Nevertheless, there exist laws and regulations that could likely affect land use:

**Law Nº 41** (July 1st, 1998), also called the general environmental law, in its chapter IV establishes as follows with regards to land uses:
**Article 75**. Land use must be compatible with the nature and ecological aptitude of the land, in accordance with national environmental management programs. Productive uses of land shall avoid practices that favor the erosion, degradation or modification of the topographical features, with adverse environmental effects
The project activities aim to improve ecosystem services and provide an income source alternative to that derived from unsustainable use of forest patches. The project therefore does not induce soil degradation and is therefore in full compliance with Article 76.
The project is also in full compliance with Law 21 (1997), which establishes the regional development plan for the inter-oceanic region as well as the general plan concerning the use, conservation and development of the Canal area, with the aim of creating a zoning of land uses that would allow for an orderly development while at the same time protecting natural resources and ensuring the availability of resources for sustainable development in the Inter- Oceanic Region (Canal Watershed and Former Canal Zone). Detailed information (Ref. 01-04, page 63-64)

6. Evidence must be provided that the protection or management of the nature conservation area enhances habitat connectivity.

6. Evidence must be provided that the protection or management of the nature conservation area enhances habitat connectivity.

The National Park Soberania is part of a biological corridor; one of the most important areas along the Channel of Panama. Along this corridor it is possible to identify other areas such as the Camino de Cruces National Park, the Gatun Lake and the Natural Metropolitan Park close to the Panama City. Since 1980 under the executive decree N°13 of May 27 the area is protected and currently occupies and area equivalent to 19,525 hectares.
Really close to this region it is also possible to find the Chagres National Park. The park contains tropical rain forests and a set of rivers which provide sufficient water to guarantee the operation of the Gatun Lake, main lake of the Panama Canal: The Chagres River and the Gatun River are of great importance.
Even though the mentioned areas are protected along the region it is still of great importance to protect the buffer zone from all the mentioned areas. The ACP reforestation project concentrates in these areas with the main intension of creating connectivity between the reforestation projects and the protected areas. One important example is Ciudad del arbol which is located in the boarder of Chagres National Park and is being reforested with different native species. Since the reforestation area is directly linked to the national park; It is possible to evidence natural regeneration in the project due to birds and animals that transport different seeds to the planted area. The same situation is predicted in the reforestation project located in the boarder of Soberania National Park.

7. Key figures on the following areas must be provided:
   a. Project area
   b. Planting area(s)
   c. Eligible planting area(s)
   d. Nature conservation area(s)

| | Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| a. | Project area | 50ha | 70ha | 106ha | 424 ha | 1364ha | 743ha | **2807 ha** |
| b. | Planting area | 48ha | 44ha | 35ha | 328ha | 1184 ha | 702 ha | **2341 ha** |
| c. | Eligible planting area | 100 % | 100 % | 100% | 100% | 100 % | 100% | **100 %** |
| d. | Nature conservation area | 48ha | 44ha | 35ha | 5ha | 180ha | 33ha | **345 ha** |

| | |
|---|---|
| 8. Shapefiles with the following information must be submitted through ClimateProjects:<br>a. Project area(s)<br>b. Management Units | |
| **a.** | See zip folder :(Ref. 06-15-ACP-MU CFS SHP FILES) |
| **b.** | See zip folder :(Ref. 06-15-ACP-MU CFS SHP FILES) |

| | |
|---|---|
| 9. The certification body may require the submission of shapefiles with the following information:<br>a. Land-use classes of the project area 10 years prior to planting start — for '01 Eligibility'<br>b. Wetland areas within the project area — for '01 Eligibility'<br>c. Nature conservation area(s) — for '04 Environmental Aspects'<br>d. Neighbours of the project (individuals, villages, towns, etc.) — for '05 Socio-economic Aspects'<br>e. Eligible planting area and non-eligible planting area — for '06 $CO_2$-fixation'<br>f. Land-use classes of the project area just before the planting start — for '08 Baseline'<br>g. Infrastructure of the project (roads, rivers, houses, etc.) — for '11 Capacities' | |
| **a.** | See document (01-01- ACP-Eligible area map-Jan 2011.tif) |
| **b.** | No wetlands in the project area. (See document 03-06-ACP- Ramsar wetlands, Aug. 2012.jpf) Further info under: http://stri.si.edu/sites/soil/wetland_group/wetlands_panama.html |
| **c.** | See zip folder (Ref. 03-07-ACP-Certification body SHP files) |
| **d.** | See zip folder (Ref. 03-07-ACP GIS ZIP documentation) |
| **e.** | See document (Ref. 01-01- ACP-Eligible area map-Jan 2011.tif) |
| **f.** | See document (Ref. 01-02- ACP-Land cover map 2008-Jan 2011.tif) |
| **g.** | See zip folder (Ref. 03-07-ACP GIS ZIP documentation) |

# FSC and CCBS
# Combined Certification

For the evaluation of acceptance, version 4.0 of the FSC Principles & Criteria[1] and version 2.0 of the CCB Standard[2] were used. As the certification schemes are revised periodically, the acceptance of criteria is fixed to these versions.

Essential for the decision to include criteria from other standards is that their certification process is executed by an independent third party and that their criteria are developed in a transparent way, including stakeholder consultation.

The criteria of the FSC and CCBS standards were analyzed by the technical board of CarbonFix to assess whether elements of the certification schemes can partly or fully replace criteria of the CarbonFix Standard. Hereby not only the exact working of the criteria is considered, but also the context in which they are stated.

The following table gives a detailed overview on the results of evaluation from the different criteria of the standards. ✓ means that the respective CFS chapter is covered by the stated criteria of the other standard.

| Chapter | | FSC<br>Version 4.0 | CCBA<br>Version 2 |
|---|---|---|---|
| 01 | Eligibility | | |
| 02 | Additionality | | |
| 03 | Forest Management | | |
| 04 | Environmental Aspects | ✓<br>5.5, 6.1, 6.2, 6.3, 6.6, 6.7, 6.8, 6.9, 9.1 | ✓<br>G1-7, G1-8, G3-6, G3-7, B1, B2, B3 |
| 05 | Socio-Economic Aspects | ✓<br>2.3, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3 | ✓<br>G1-5, G3-7, G3-8, G3-9, G3-10, G4-4, G4-5, G4-6, CM1, CM2, CM3 |
| 06 | $CO_2$-Fixation | | |
| 07 | Project Emissions | | |
| 08 | Baseline | | |
| 09 | Leakage | | |
| 10 | Capacities | ✓<br>4.1, 6.6, 7.3 | ✓<br>G3-5, G3-11, G4-2, G4-3, G4-11 |
| 11 | Land & $CO_2$ Tenure | | ✓<br>G1-6, G5-2, G5-3, G5-4, G5-5, G5-6 |

[1] FSC-STD-01-001 (Version 4-0) EN
[2] www.climate-standards.org/standards/pdf/ccb_standards_second_edition_december_2008.pdf

# FSC and CCBS
# Combined Certification

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| Chapter | | FSC<br>Version 4.0 | CCBA<br>Version 2 |
|---|---|---|---|
| 01 | Eligibility | | |
| 02 | Additionality | | |
| 03 | Forest Management | | |
| 04 | Environmental Aspects | ✓<br>5.5, 6.1, 6.2, 6.3, 6.6, 6.7, 6.8, 6.9, 9.1 | ✓<br>G1-7, G1-8, G3-6, G3-7, B1, B2, B3 |
| 05 | Socio-Economic Aspects | ✓<br>2.3, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3 | ✓<br>G1-5, G3-7, G3-8, G3-9, G3-10, G4-4, G4-5, G4-6, CM1, CM2, CM3 |
| 06 | $CO_2$-Fixation | | |
| 07 | Project Emissions | | |
| 08 | Baseline | | |
| 09 | Leakage | | |
| 10 | Capacities | ✓<br>4.1, 6.6, 7.3 | ✓<br>G3-5, G3-11, G4-2, G4-3, G4-11 |
| 11 | Land & $CO_2$ Tenure | | ✓<br>G1-6, G5-2, G5-3, G5-4, G5-5, G5-6 |

[1] FSC-STD-01-001 (Version 4-0) EN
[2] www.climate-standards.org/standards/pdf/ccb_standards_second_edition_december_2008.pdf

| Name of the project | Panama Canal Authority (ACP) Sustainable Forest Convert Establishment project |
|---|---|

1. In order to account for project emissions due to the use of fossil fuels within the project (e.g. through machines, flights, etc.), 0.5% of the future $CO_2$-fixation must be deducted.

The parameter has been considered and deducted from the total tCo2 from the project. The value was automatically quantified under the Climate Projects system.

2. In case fertilizer is used, 0.005 $tCO_2$ per kg of nitrogen (N) must be deducted. Hereby, no differentiation is made between synthetic and organic fertilizer.

The reforestation project uses organic fertilizer. It is expected a total of 2148 tCo2 coming from the use of organic fertilizers during the certification period. ( Ref 07-01, sheet 1)

| | |
|---|---|
| fertilizer mix | NPK 12-24-12 |
| Amount of N in 100 kg | 12g N |
| Total amount of N per hectare (kg) | 144 |
| Total amount of N in the planting area (kg) | 429552 |
| Total Planting eligible area (ha) | 2983 |
| Total tCo2 per hectare ( tCo2) | 0,72 |
| CFS N to Co2 conversion Factor | 0,005 |
| Total Emissions (tCo2) | 2148 |

Table 07-01: Amount of fertilizer use in the project

The project will use a "NPK 12-24-12" fertilizer mix. This means that in 100 kg of fertilizer 12% of the mix is nitrogen. According to the management plan a total amount of N in the planting area of 429,552 kg will be used during the certification period. The first five years are the most intensive years of fertilizer use. This is due to the need of improving soil conditions before the planting begins.Assuming the CFS tCo2 equivalence from kg N to tCo2, the project will generate 2148 tCo2 from emissions due to the use of nitrogen from fertilizers. (Ref. 03-02 Page 2, Point 16 D, Ref 03-04, Page 2, point 26.G). The value was introduced in the tCo2 climate projects calculation.

3. In case the biomass of the baseline is burned on the field for the purpose of land preparation, an additional 10% of the baseline emissions must be accounted for. This is due to other greenhouse gases ($N_2O$ and $CH_4$) that are released during the burning process.

**No slash and burn activities are considered for land preparation.**

3. In case the biomass of the baseline is burned on the field for the purpose of land preparation, an additional 10% of the baseline emissions must be accounted for. This is due to other greenhouse gases ($N_2O$ and $CH_4$) that are released during the burning process.

The planting of individuals is carried out manually or mechanically, depending on the topography of the place. Most of the total project area is planted in the traditional manner, using manual tools such as machetes, shovels, bars, hoes and brush-cutters. Planting in the remaining area is done mechanically, using agricultural tractors equipped with disks. The manual preparation of the land is preferred due to its low impact on soil. However, both activities achieve minimal impact by using adequate equipment and selecting the most convenient timing. The potential impact of the mechanical activities is estimated to have a short duration

Further detailed from land preparation under ( Ref. 03-10,page8)

Picture 07-01: Land preparation (Ref 01-04, page 80)

**Formula of calculation**
Baseline [$tCO_2/ha$] = (Baseline $_{woody\ biomass}$ [$tCO_2$] + Baseline $_{non\text{-}woody\ biomass}$ [$tCO_2$]) / Eligible planting area [ha]

| Name of the project | Panama Canal Authority (ACP) Sustainable Forest Convert Establishment project |
|---|---|

Describe the process, which was used to determine the parameter.

Two different baselines are used for all the management units: (i)Tropical grassland is applicable for the commercial and conservation MUs. This areas were covered with saccarum spontaneum, (ii) Tropical shrubland baseline is applicable for the agroforestry and silvopasture management units. This areas still have some remaining vegetation such as disperse tress wich are classified as rastrojo (shrubland)

For the eligible planting area of both activities a higher average baseline was considered. In some areas it was possible to find only grassland, but in some other areas it was possible to find a mix of Rastrojo and/or sparse trees. The complexity of the size of the polygons ( between 1 and 5 hectares) that comprehend the MUs is the reason to choose a higher baseline and avoid possible uncertainties of some smaller areas inside the MUs..

**Tropical grassland baseline:**
The following baseline is applicable for the commercial and conservation management units.
The above ground biomass equivalent to 8 tdm/ha was obtained from Orrego y del Valle ( 2001) obtained a value for grassland vegetation based in remote sensing technics ( See ref. 08-05, page 8)
The root to shoot radio equivalent to 1,58 was obtained from the IPCC study ( ref 08-06, page 8, table 6,1). This value belongs to subtropical and tropical grassland classification. The project is located in a tropical region.

**Based in CFS,** the calculation was done as following
Baseline = Aboveground Biomass (tdm/ha) * Belowground biomass (root to shoot ratio) * 0,5 (Carbon fraction)*3.66 (to convert C to CO2e) = tCO2/ha
Tropical grassland baseline= 8 tdm/ha * 1,6 tdm/ha * 0,5 * 3,66
Tropical grassland baseline= **23 t CO2**

**Tropical shrubland baseline:**
The following baseline is applicable for the agroforestry and silvopasture management units.
The above ground and belowground biomass value was directly obtained from the study Orrego and del Valle (2001) ( see ref. 08-04,).
The mentioned study calculates the biomass of the following components using destructive technics: (i) above biomass, (ii) necromass, ( iii) organic soil, (iv) roots.
**Based in CFS,** the calculation was done as following
Baseline = Aboveground Biomass (tdm/ha) * Belowground biomass * 0,5 (Carbon fraction)*3.66 (to convert C to CO2e) = tCO2/ha
According to the study: aboveground and belowground biomass= 17,2 tdm/ha ( see ref. 08-04, page2, paragraph2 and page 10). Tropical grassland
Tropical shrubland baseline= 17.2tdm* 0,5 * 3,66
Tropical grassland baseline= **31 t CO2**

**Formula of calculation**
Baseline non-woody biomass [$tCO_2$] = (Baseline aboveground non-woody biomass [$tCO_2$] + Baseline belowground non-woody biomass [$tCO_2$]) * Eligible planting area [ha]

**Selected carbon pools**
Aboveground non-woody biomass = Fresh biomass * Dry-to-Wet ratio * Carbon fraction * C to $CO_2$ factor
Belowground non-woody biomass = Aboveground non-woody biomass * Root-to-Shoot ratio

## Baseline woody and non woody biomass

| Stratum | Tropical shrubland | | |
|---|---|---|---|
| **Baseline** non-woody biomass | Value:17,2 **tdm/ha**<br>International default value<br>Reference: 08-04 | | |
| Justification of the parameter | The same tropical vegetation form the study is applicable to the ACP region | | |
| | **Wet-to-Dry ratio** | **Root-to-Shoot ratio** | |
| Factors | Value: not applicable<br><br>Reference: not applicable | Value: not applicable<br><br>Reference: not applicable | |
| Justification of the factors | The study provides the value in tones of dry matter | Included in the calculation of the Scientific study | |
| **Baseline** non-woody biomass | **31 $tCO_2$/ha** | | |

| Stratum | Tropical grassland | | |
|---|---|---|---|
| **Baseline** non-woody biomass | Value:8 **tdm/ha**<br>International default value<br>Reference: 08-05, page 8, table 3 | | |
| Justification of the parameter | The same tropical vegetation form the study is applicable to the ACP region | | |
| | **Wet-to-Dry ratio** | **Root-to-Shoot ratio** | |

| Stratum | Tropical grassland | | |
|---|---|---|---|
| Factors | Value: not applicable<br><br>Reference: not applicable | Value: 1.6<br><br>Reference: 08-06, table 6,1 | |
| Justification of the factors | The study provides the value in tones of dry matter | IPCC study value | |
| **Baseline** non-woody biomass | **23 $tCO_2$/ha** | | |

**Formula of calculation**
Leakage [$tCO_2/ha$] = Leakage $_{aboveground\ woody\ biomass}$ [$tCO_2$] / Eligible planting area $_{project\ area}$ [ha]

| Name of the project | Panama Canal Authority (ACP) Sustainable Forest Convert Establishment project |
|---|---|

Describe the process, which was used to determine the parameter.

The possible sources of leakage from the project are deforestation due to displacement of agricultural and grazing activities, also wood collection that existed within the project area to outside of the project area. However, no leakage is anticipated for this project for the following reasons. The project does not expect to displace the grazing activities because it expects to improve the conditions of the grazing and agriculture areas through planting of high yielding grasses and crops, and reforest at least 10% of the area. Therefore, there shall be no leakage.

**Leakage in silvo-pasture systems and agro-forestry = $LKDisplacement,ttt=1$ = 0**

Displacement of activities in agro forestry and silvopastoral systems: 66% of the project areas will be designed to agro forestry and silvopastoral systems. In these systems the density of planting trees is low, thereby the integration with other land uses is possible, in fact some studies show that such arrangements can even be used to improve the productivity of pure systems ensuring acceptable long-term productivity and applying compatible management practices with the usual practices of the local population (Musalem, 2001 cited by Palomeque 2009). The aim of such systems is to diversify the production, increase organic matter in soil, fix atmospheric nitrogen, recycle nutrients, modify the microclimate and optimize the production system, respecting the principle of sustainability (SAGARPA, no year).
In this way the establishment of these kinds of systems does not require moving these activities outside the project area. The project idea is to maintain the activities and even to get improved yields and thus increased profits for the producers. For this reason there shall be no leakage.

Displacement of activities in forestry systems: tree forest plantations will be established in grassland which under use for livestock. Given the planting densities of these systems, it is not possible to develop a sideline. One of the objectives of the project A/R is to change the land use for smallholders, thus, with the implementation of the project, the most attractive option shall be to change from grasslands to forest use, so smallholders are more likely to quit farming and sell his livestock In some cases the land owner may want to continue with cattle grazing activity, despite the socioeconomic conditions of the region where there is not access to technological innovation and genetic improvement. In the project area there are about 780.44 km2 (22.59%) of pasture, agriculture, scrub, and grass lands where some grazing activities have the possibility to move, so it would not generate leakage by shifting activity caused by the establishment of forest systems.
According with Health, Education, Social and Economic Development (AED) and United States Agency for International Development (USAID) 2004, 65% of the PCW area is under livestock use, especially in areas with soils VI, VII y VIII17, as was reported in the Sustainable Management Program of Rural Areas in the Panama Canal Watershed (MASAR-CHCP by its acronym in Spanish) in its work document No 3, named Agro-economic Diagnosis and Recommendations. Also, AED argues that the production systems are extensive and with very basic technical controls where the carrying capacity is estimated in some cases below 0.5 animals / ha, although from the surveys carried out by this entity a simple average of the surveyed was 0.69 animals/ha. MANSAR also notes the existence in the PCW of 2,568 farms dedicated to the

Describe the process, which was used to determine the parameter.

livestock with a population of 73,927 bovines (0.9 animal/ ha) which is close to the National livestock data.

To be conservative we used the maximum carrying capacity data (0.9 animal/ha) to estimate the number of grazing animals that the reforestation for commercial purpose and reforestation with native species would displace to others areas (pastures) of the PCW. The grazing carrying capacity data in the 78,043.8118 ha of pastures in the PCW was estimated with the average from the three different data sources mentioned above (0.7 animal/ha). Therefore, the PCW's pastures have an average number of 54,370.52 grazing animals. The number of animals of the 1,675 hectares for commercial reforestation and the 1,770 hectares with native species was estimated as the product of the maximum load (0.9) and the area. Thus, the sum of 1,507.5 grazing animals in the reforestation for commercial purpose plus the 1,593 grazing animals present in the reforestation with native species would be 3,100.50 grazing animals present in the project area.

If these animals need to be re-arranged in other areas due to the forestry activities, it is clear that the grasslands areas of the PCW have the capacity to receive these animals. If this occurs it will be a total of 57,471.02 animals in 78,043 hectares available for this use. The load capacity in these areas would only increase to 0.736 animals / ha, which is below the maximum value that the land can withstand (0.9 animals / ha).

| | Area (ha) | Carrying Capacity (numbers of grazing animals per ha) | number of grazing animals |
|---|---|---|---|
| **Reforestation for commercial purpose** | 1,675 | 0.9 | 1,507.5 |
| **Reforestation with native species** | 1,770 | 0.9 | 1,593 |
| **Pastures Area in PCW** | 78,043.81 | 0.70 | 54,370.52 |
| **number of grazing animals in PCW with leakages** | | | 57,471.02 |
| **Carrying Capacity in PCW with leakages** | | | **0.736** |

Table 1: account of carrying capacity in PCW (See document 01-04, page 130. Table 26)

Thus we can conclude the PCW has grassland areas available to increase the cattle grazing activity, by this way, there is no leakage. On the other hand, respect to agricultural activity, as was mentioned before, although there are some areas destined to agricultural use, these areas will be changed to cattle raising use. This low productivity generates a low competitiveness level to sell the products, therefore the agricultural land use areas will be turned to cattle raising use. For that reason, it is unlikely that it generates a displacement to the activities by the agricultural activity, this assumption is supported by the authors Abardía & Morales (2008), who in the document "Desarrollo regional, reflexiones para la gestión de los territorios" indicate promoting the conversion of agricultural areas with low productivity to pastures for the cattle raising use as a strategy for the development in the country population.

| Describe the process, which was used to determine the parameter. |
|---|
| **Leakage in forestry systems = $LKDisplacement,ttt=1$ = 0**<br>It is hard to determine the firewood quantity demanded by the population of the Panama Canal Watershed. Several literature sources affirm that the firewood collection is the main cause of deforestation and forest degradation (Fundación Panama 2007). Nevertheless, there are few sources with the exactly value of the quantity of the collected firewood. The annual statistical summary (ANAM 2009) established that in 2009 29 m3 of firewood were used in the entire national territory.<br>The Panama Canal Authority sustainable forest cover establishment project aims to establish 10,000 hectares of forest plantation with native and introduced species as Teak. Within of the planned management schemes to manage the different forestry schemes are established the thinning activity, in order to improve the tree distance and to maximize the growth. The wood from the thinning activity is often left in the site in the first harvesting, since this is when defective trees are harvested. In the following thinning activities is possible to obtain wood of good quality. Generally, the wood from the tree trunk with minimal dimensions (commercial volume) is used to commercialize, the other wood is usually left in the site. A teak plantation study reports that among the commercial volume and the total volume approximately 18.36% could be lost (Carrillo 2009). Therefore, based on the planting schedule and the thinning regimes, we can establish that 539,253 m3 of wood from non-commercial use can be used as firewood. Additionally, in the harvesting activities the branches are left in the site, so that, those branches could become an additional source of firewood. The calculation of the total aerial biomass for the estimations of CO2 was made using values of biomass expansion factor from IPCC. The factor presents a relation between the biomass trunk and the aerial biomass (leaves and branches). Given that the leaves are not used as fuel, it must be discounted. Avendaño (2008) reports that from the total aerial biomass, the branches can represent up to 34%. Based on the projected wood to be harvested in the project, it is estimated that there will be 1,298,203 m3 from wood of branches, which can be used as fuel. Also, there is available material for fuel from the pruning activities, but this is not counted.<br><br>Fuel wood available in the project from non-commercial wood and branches from thinning activities. (See document 01-04, page 130. Table 26) |

Describe the process, which was used to determine the parameter.

| | Teak | Native | Agro forestry system | Silvopastoral |
|---|---|---|---|---|
| Harvesting volume according with the Schedule ($m^3$ $ha^{-1}$) | 575 | 301 | 271 | 131 |
| Total lost volume – Commercial Volume (%) | | 18.36% | | |
| **Non-harvesting volume from the trunk ($m^3$ $ha^{-1}$)** | **106** | **55** | **50** | **24** |
| Biomass expansion factor (dimensionless) | | 1.3 | | |
| Aerial Volume – Branches and leaves ($m^3$ $ha^{-1}$) | 747 | 392 | 353 | 171 |
| Branches percentage | | 34% | | |
| Branches volume ($m^3$ ha) | 254 | 133 | 120 | 58 |
| **Available volume for fuel wood ($m^3$ $ha^{-1}$)** | **360** | **189** | **170** | **82** |
| **Area (hectares)** | 1,675 | 1,770 | 4,147 | 2,408 |
| **Available volume for fuel wood ($m^3$)** | 602,217 | 333,744 | 703,851 | 197,646 |
| **Total Available volume for fuel wood ($m^3$)** | | **1,837,457** | | |

Table2: Fuel wood available in the project from non-commercial wood and branches from thinning activities. (See document 01-04, page 130. Table 26)

Based on the ANAM's data and the projection of the available volume for the firewood use, we can conclude that there shall be no leakages caused by firewood

| Describe the process, which was used to determine the parameter. |
|---|
| collection. In the event that the residents of the project area require wood for their necessities, they can remove the wood from pruning and thinning left on the field after the project operations in the area. There are available 1,837,457 m3of fuelwood that meets the requirements for renewable biomass. |

Overview of the results of the leakage analysis:

| | ID | Area | Leakage aboveground woody biomass |
|---|---|---|---|
| Stratum | 0 | 10000ha | 0 $tCO_2$ |
| **Sub-Total** | **0** | **10000 ha** | **0 $tCO_2$** |
| | | **Eligible area** | **10000 ha** |
| | | **Leakage** | **0$tCO_2$/ha** |

# General Terms & Conditions

Parties

- CarbonFix Standard UG, Germany (*CarbonFix*)
- Project participantss (*Project participants*)

Recitals

- These General Terms & Conditions (GTC) supplement the CarbonFix Standard (CFS) and set further criteria for its usage.
- The *Project participants* wish to use the CFS in accordance with the regulations of the CFS and these GTC.

## Content

**1. Definitions**

1.1. Every word underlined with dashes is defined in the part 'Terms' of the CFS.

1.2. *CarbonFix* stands for the organisation as well as for its representatives, employees or agents.

1.3. *Project participants* include all of the following parties:

a. Project developer
b. Owner of the $CO_2$-rights
c. Owner of the land
d. Owner of the timber
e. Owner of other resources
f. Project financier

**2. Commencement, amendment and termination of these GTC**

2.1. These GTC commence on the date on which the *Project participants* sign for acceptance.

2.2. *CarbonFix* may amend these GTC in accordance with the chapter 'Adaption of the CFS' of the CFS.

2.3. They shall continue to be valid until terminated by finishing the respective relationship between the *Project participants* and *CarbonFix*.

**3. General**

3.1. The *Project participants* declares/agrees to the following:

a. To comply with the regulations of the CarbonFix Standard for the crediting period of the project.
b. To submit accurate and true project information.
c. To comply, in respect to the CFS, with all national and international laws concerned.
d. To communicate in a fast and clear manner with *CarbonFix* in any matter concerning the project.
e. To allow people interested to visit the project. Costs are met by the visitor.
f. To permit $CO_2$-buyers of the project as well as *CarbonFix* the use of all project information that is publically available via the ClimateProjects website.
g. To allow *CarbonFix* to use the name (including logo) of the *Project participants* for all purposes concerning the CFS.
h. To accept the consequence in case of a project exclusion in accordance with the chapter 'Project exclusion' of the CFS, and not file suit against *CarbonFix*.

**4. Privacy and Project participants Information**

4.1. The *Project participants* allow *CarbonFix* to use its personal information for administrative use as well as for sending relevant information, including the newsletter.

4.2. CarbonFix stores all information of the *Project participants* that is necessary for running the CFS most efficiently.

4.3. *CarbonFix* will not allow third parties access to the *Project participants* information without its prior approval, unless *CarbonFix* is required to do so by law.

4.4. The *Project participants* may request *CarbonFix* to access and correct its personal information at any time.

**5. Intellectual Property / Copyright**

5.1. The CFS including its name, logo, texts and images are copyrighted property of *CarbonFix*. All rights reserved. The assisting document 'Communication package' applies.

5.2. Each party acknowledges and agrees that, except for the rights expressly provided for in the CFS, these GTC and any rights otherwise agreed upon between the parties, neither party shall acquire any rights, title or interest in or to any (pre-)existing Intellectual Property Rights, including but not limited to name and logo of the other party.

**6. Liability and Limitation**

6.1. *CarbonFix* does not give any representation, warranty or guarantee with the CFS documents. *CarbonFix* shall not be liable for any mistakes or damages resulting from the use of this information unless it is based on gross negligence or intention. This limitation does not apply to damages to life, body or health.

6.2. *CarbonFix* expressively disclaims any liability for losses due to the exclusion of a project or any other measures put into place on the base of the regulations of the CFS.

6.3. *CarbonFix* is not responsible for any actions or omissions of any of the *Project participants*.

**7. Indemnity**

7.1. To the extent permissible by law, the *Project participants* indemnifies *CarbonFix* from and against all proceedings, actions, claims, demands, losses, liabilities, damages, costs and expenses which may be made or brought against or suffered or incurred by using the CFS.

7.2. The indemnities in these GTC are continuing obligations of the *Project participants*, separate and independent from other obligations and survive the termination of these GTC. Furthermore they are absolute and unconditional and unaffected by anything that might have the effect of prejudicing, releasing, discharging or affecting in any other way the liability of the party giving the indemnity.

**8. Legal Disputes**

8.1. German Law is applicable for any legal disputes with *CarbonFix*. The place of jurisdiction is Germany.

**9. Procedural**

9.1. Any unclear or unsolved issue shall be dissolved by the technical board of *CarbonFix*.

9.2. These GTC shall not be overruled by opposing regulations of the addressed *Project participants*.

9.3. Regulations between an individual *Project participants* and *CarbonFix* that are different to the ones as set out in these GTC are only valid if they are in written form.

9.4. The rights and obligations herein are personal to both parties and may not be assigned or delegated to a third party without the express written consent of the other party.

9.5. If individual terms of these GTC are invalid or unenforceable the validity of other terms shall not be affected.

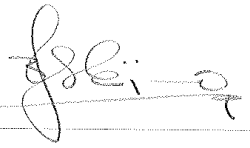
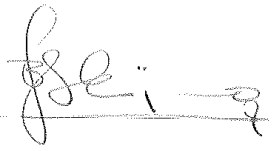
| Name of the project | **Panama Canal Authority Sustainable Forest Cover Establishment Project** |
|---|---|

**I have read, understood and agree to the GTC of *CarbonFix* and the requirements set by the CarbonFix Standard v3.2.**

| Project developer | Forest Finance Group<br>Eifelstr.20<br>53119 Bonn<br>Authorized person:<br>Andreas Schnall<br>Head of Forestry department<br>01711411238<br>andreas.schnall@forestfinnace.de |
|---|---|

# General Terms & Conditions

**I have read, understood and agree to the GTC of *CarbonFix* and the requirements set by the CarbonFix Standard v3.2.**

| | |
|---|---|
| | **Signature :** |
| **Owner of the $CO_2$-rights** | Panama Canal Authority<br>Edificio de la Administración, Balboa, Panamá<br><br>Authorized person:<br>Jorge L. Quijano<br>Administrator<br>+(507) 272-1400<br>pmorales@pancanal.com<br><br>**Signature :**  |
| **Owner of the land** | See attached letter |
| **Owner of the timber** | Panama Canal Authority<br>Edificio de la Administración, Balboa, Panamá<br><br>Authorized person:<br>Jorge L. Quijano<br>Administrator<br>+(507) 272-1400<br>pmorales@pancanal.com<br><br>**Signature :**  |
| **Owner of other resources** | N/A |
| **Project financier** | Panama Canal Authority<br>Edificio de la Administración, Balboa, Panamá<br><br>Authorized person:<br>Jorge L. Quijano<br>Administrator<br>+(507) 272-1400<br>pmorales@pancanal.com<br><br>**Signature :**  |