
Project Idea Note

**Reforestation with Teak and *Gmelina* at the
Ecuadorian Coast**

A. Basic Project description

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| Name of Project and date submitted | Reforestation with Teak and <i>Gmelina arborea</i> at the Ecuadorian Coast. |
| Project summary | |
| Project description and proposed activities | <p>The project's principal objective is to implement plantations of Teak and <i>Gmelina arborea</i> for commercial purposes. From 2006 to 2012 6716 ha are going to be reforested. The area where the activities will take place are situated along the upper basin of the Guayas river in the Ecuadorian coast. The main part of the plantations will be located in Los Ríos province close to Buena Fe county. The remaining plantations will be found in the adjacent regions of Guayas and Pichincha provinces.</p> <p>The areas for reforestation are part of farms owned and extensively used by Agrícola Ganadera Reysahiwal AGR S.A.. Current land use is pasture. Hence intensive cattle ranching has been the sole land use for a long period (implemented before 1989) a partial loss of productivity due to degradation processes is on the way. Reforestation can be a way to protect soils and to engage a new economic perspective.</p> <p>Species to be used are Teak (<i>Tectona grandis</i>) and fast growing <i>Gmelina arborea</i>. While the latter species will be planted on 5221 ha, the former will be planted on 1495 ha. Purpose of the plantation is the production of timber for foreign and local markets.</p> |
| Technology to be employed | <p>The project will include:</p> <p>(i) Production of plants in a company's own nursery. Certified seedlings will be acquired from proven providers.</p> <p>(ii) Planting schedule: According to the annexed planting schedule (Annex I), Teak will be planted from 2006 to 2010 and <i>Gmelina</i>, from 2006 till 2012. Initial density will be of 625 plants/ha.</p> <p>(iii) Management: Silvicultural forestry techniques such as pruning, thinning and selective cutting will be performed. Thinning of Teak will be performed every 5 years. Final harvest will be in the twentieth year after planting. Thinning of <i>Gmelina</i> will be performed every 3 years. Harvest will be in the ninth year after planting.</p> <p>(iv) Technology will be used in accordance with FSC SmartWood certification.</p> |

| Owner and/or project developer | |
|--|---|
| Name | Agrícola Ganadera Reysahiwal AGR S.A. |
| Organizational category | Private company |
| Other function(s) of the project developer in the project | The company is owner of the project and develops it. |
| Summary of the relevant experience of the project developer | The company began forestry activities in 1988. The aim was to promote sustainable forestry. This included reforestation with several different species (native and exotics, including Teak and <i>Gmelina</i>) on lands in degradation process in the ecuadorian coastal region. Thus, two objectives were targeted: (i) a more sustainable development of the areas of influence of the activities and (ii) a sustainable source of income. Until 2006, 4066 ha have been reforested in 55 farms owned by the company and its associates. Since 2001 plantations of AGR SA were certified under the SmartWood Certification of the Rainforest Alliance. The Rainforest Alliance is accredited by the FSC. |
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| E-mail /webpage | jescobar@grupowong.com |
| Other Project Sponsors / financiers | |
| To be determined. Currently the project is looking for financing. | |
| Type of project | |
| Green House Gas (GHG) targeted | CO ₂ |
| Type of activities | Sequestration |
| Field of activities | Plantations for wood products at a commercial scale |
| Project location | |
| Region | South America |
| Country | Ecuador |
| Region / Province | Los Ríos, Pichincha y Guayas Provinces |
| Nearest town | Patricia Pilar (Buena Fé County, Los Ríos). |
| Brief description of the location | The project area is located in the upper basin of the Guayas river. The main part of the plantations will be located in Los Ríos province close to Buena Fe county. The remaining plantations will be found in the |

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| | <p>adjacent regions of Guayas and Pichincha provinces.</p> <p>The areas to be reforested are located inside farms owned by AGR S.A. and its associates. The farms and the specific areas which are going to be part of this Project will be selected during the ongoing planning process.</p> |
| Schedule | |
| Earliest project start date | 01/07 |
| Estimate of time required before becoming operational after approval of the PIN | <p>Time needed for financial commitments: 3 months</p> <p>Legal matters: 2 months</p> <p>Implementation: 6 years</p> |
| Project life span | 30 Years |
| Expected first year of Certified Emission Reduction (CER) | 2012 |
| Current status or phase of the project | The project is in the phase of planning and pre feasibility studies. Nonetheless, activities for planting Teak and Gmelina in the first year are on the way (see planting schedule). The project is seeking for finance in order to guarantee activities from 2007 onwards. |
| Ecuador position on the Kyoto Protocol | <p>Ecuador ratified the UNFCCC the 7th of November 1994 (R.O.#562).</p> <p>Ecuador ratified the Kyoto protocol the 20th of December 1999 (R.O.#1588).</p> |

B. Expected environmental and social benefits

| Environmental benefits | | | | | | | | | | | | | |
|---|---|------|------------------------|------|---------|------|---------|------|---------|------|---------|------|---------|
| Estimation of sequestered carbon | <p>Estimated tons of CO₂ – equivalent sequestered during the project's crediting period.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Tons CO₂e</th> </tr> </thead> <tbody> <tr> <td>2012</td> <td>116.832</td> </tr> <tr> <td>2017</td> <td>486.406</td> </tr> <tr> <td>2022</td> <td>442.073</td> </tr> <tr> <td>2027</td> <td>610.224</td> </tr> <tr> <td>2032</td> <td>213.571</td> </tr> </tbody> </table> <p>For further details please see Annex II.</p> | Year | Tons CO ₂ e | 2012 | 116.832 | 2017 | 486.406 | 2022 | 442.073 | 2027 | 610.224 | 2032 | 213.571 |
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| Baseline scenario | <p>Without project the baseline scenario would be pasture with ongoing degradation processes. Pasture is currently used for livestock breeding and for final production of beef for local markets.</p> <p>The plain areas in the zone where activities will take place is characterized by banana and oil palm plantations. The evenness of the terrain and a good transportation infrastructure guarantees this kind of land use.</p> <p>Land use in the areas characterized by slopes is pasture and growing of tropical crops. Typically these areas are poorly connected to transport infrastructure. This fact, combined with the fact that degradation processes are going on results in a less attractiveness of sloped areas for many alternative land uses.</p> <p>Hence there are few economic alternatives to cattle breeding, the situation of existing in the past and in the present would continue and could worsen the consequences of overgrazing. A lower productivity and an increased degradation process (thus, decreasing carbon stocks in the soils) would be the corollary.</p> | | | | | | | | | | | | |
| Existing vegetation and land use | <p>The areas that are going to be reforested are covered by grasses. Tree cover is less than 30%. Cattle breeding was the sole land use since before 1989.</p> | | | | | | | | | | | | |
| Local benefits | <ul style="list-style-type: none"> • Protection and regeneration of soils affected by degradation processes. Soils located on slopes will be protected from erosion processes. • Creation of buffer zones that support the conservation of native forest relicts. Thus, benefits for conservation of local biodiversity can be expected. | | | | | | | | | | | | |
| Global benefits | <p>Mitigation of Climate Change via Carbon sequestration.</p> | | | | | | | | | | | | |

| Socioeconomic benefits from the project | |
|---|---|
| Benefits on the national / sub regional level | <ul style="list-style-type: none">• The fraction of timber from renewable source in local markets will increase.• Good practice induced by SmartWood certification may generate a multiplying effect. |
| Benefits in local level | <ul style="list-style-type: none">• Local employment will be created. |
| Social impact studies | |
| Consistency between the project and the environmental priorities of the Host Country | The project will be consistent with national laws and regulations, in order to accede to National CDM Approval and to guarantee SmartWood Certification. Part of the planning phase refers to issues related compliance with legal matters. |

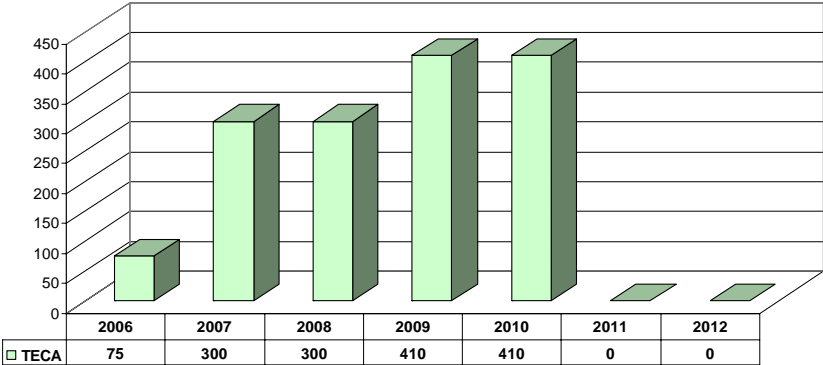
C. Finance

| Total project cost estimate | |
|--|---|
| Preparation costs | Land preparation costs US\$ 5,276,909 |
| Establishment costs | Planting US\$ 1,616,394 Maintenance US\$ 3,424,086 |
| Other costs (explain) | Administration US\$ 11,183,296 |
| Total project costs | US\$ 21,500,684 |
| Sources of finance to be sought or already identified | |
| Equity | To be defined, depending on planning |
| Debt – Long term | To be defined, depending on planning |
| Debt – Short term | To be defined, depending on planning |
| Non identified | |
| CDM contribution (complimentary earnings on the sale of CERs) | |
| Approach on permanence | tCERs |
| Indicative price on | 3 US\$/ton CO ₂ e |
| Sale of CERs until 2012 | US\$ 359.496 |
| Sale of CERs until 2017 | US\$ 1'459.218 |
| CERs sold in advance | To be determined |
| Basic estimation on profitability | |
| Financial return rate (FRR) | |
| FRR without CERs | [xxx] % |
| FRR with CERs, until 2012 | [xxx] % |
| FRR with CERs, 7 years period | [xxx] % |
| FRR with CERs, 10 years period | [xxx] % |

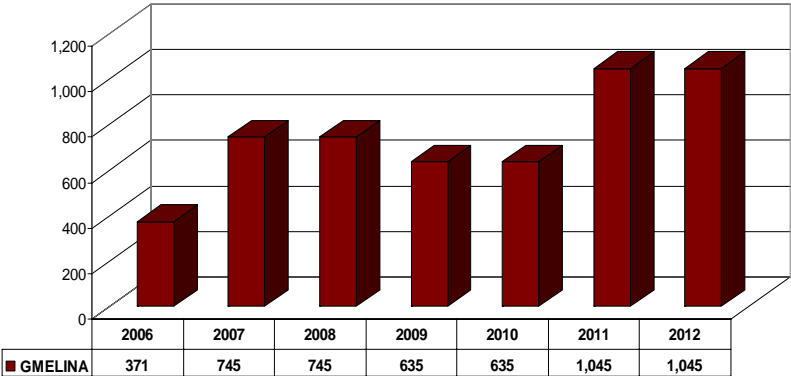
Annex I: Planting schedule:

Implementation of the activities will begin in 2006 at a small scale. From 2007 onwards activities are expected to increase significantly.

Teak will be planted from 2006 to 2010 as following:



Gmelina arborea will be planted from 2006 to 2012 as following:



Annex II: Estimation of sequestered carbon

Estimations of CO₂ removal of the "Teak" part of the project were based on the following allometric formula:

$$Y = 0.153 \times \text{DBH}^{2.382^1 \ 2}$$

Carbon in the dry matter was calculated according to the following formula:

$$C = Y \times C_f$$

Whereas:

Y : Aboveground dry matter, kg/tree
DBH : Diameter, cm
C_f : Carbon fraction, default value: 0.5

Estimations of CO₂ removal of the "Gmelina" part of the project were based on the following allometric formula³:

$$V = e(-11.642 + 2.244 \times \ln(\text{DBH}) + 1.122 \times \ln(h))$$

Carbon was estimated on bases of the volumen as following:

$$C = V \times D \times C_f$$

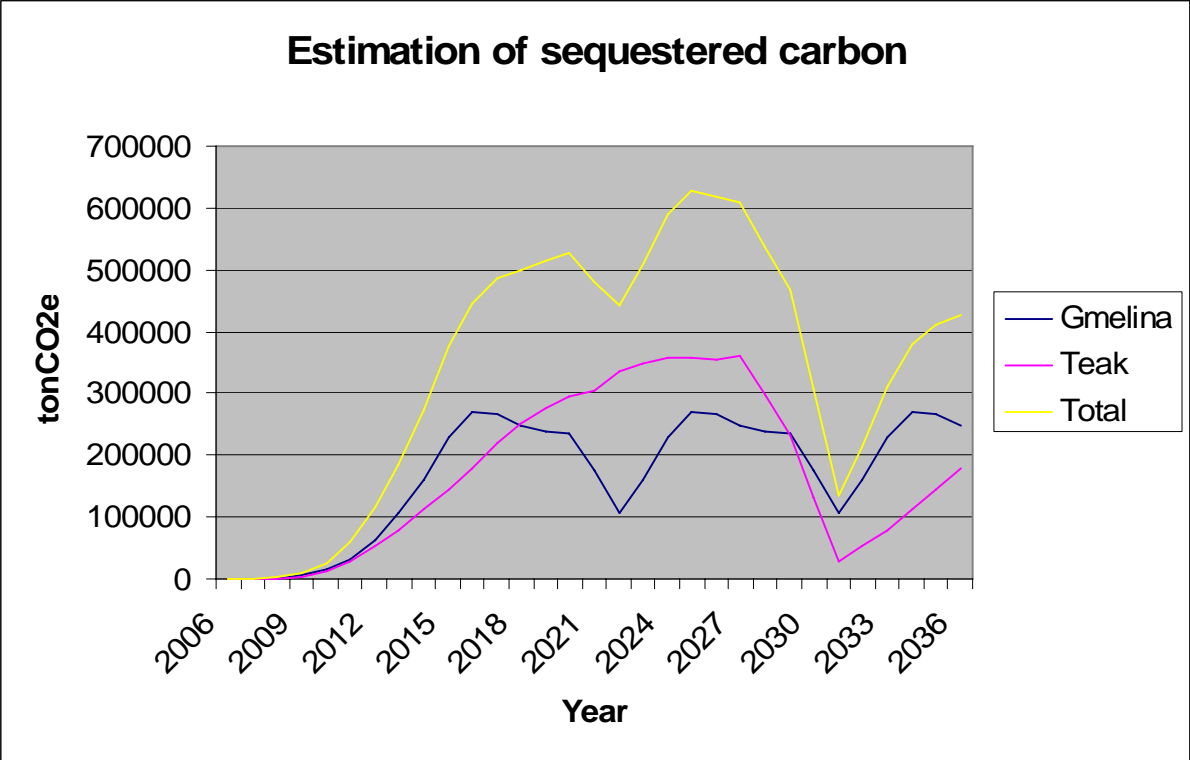
Whereas:

V : Above ground volumen
DBH : Diameter
D : Density, value: 0.41²
C_f : Carbon fraction: 0,36³

¹ Kraenzel et al, 2003.

² IPCC, GPG for LULUCF: Annex 4A.2 Examples of allometric equations for estimating aboveground biomass and belowground biomass of trees

³ Moya and Rojas, 1999



Annex IV: References

- IPCC, Good practice Guidance for Land Use, land Use Change and Forestry.
- Kraenzel M, Castillo A, Moore T and Potvin C (2003): Carbon storage of harvest age Teak (*Tectona grandis*) plantations, Panama, *Forest Ecology and Management* 173: pp. 213 – 225
- Moya and Rojas (1999): Fijación de carbono en planatciones de Melina (*Gmelina arborea* Roxb.), teca (*Tectona grandis* L.f.) y pochote (*Bombacopsis quinata* Jacq.) en los cantones de Hojancha y Nicoya, Guanacaste, Costa Rica. Tesis de la Univesidad Nacional de Costa Rica, Facultad de Ciencias de la Tierra y el Mar.