

CO₂ CARBON UPTAKE REPORT - COLOMBIA



GREENHOUSE MARKETEERS

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1 INTRODUCTION

A few steps need to be taken to calculate the total amount of CO₂ that is stored per hectare of bamboo grown on the plantations of Bamboo Import Europe (BIE from now on):

- Calculate the current amount of carbon stored in the land vegetation.
- Calculate the total amount of carbon stored in the future mature bamboo plantation.
- Calculating the amount of carbon stored in the durable products produced by the bamboo plantation.

2 COLOMBIA – TOTAL CARBON SEQUESTRATION

The difference between the future amount of carbon on the land and the current amount on the land is the total extra amount of stored carbon.

1.1 Current amount of carbon on the land

The current situation can be categorised as predominantly tropical grassland. This land has a total dry biomass content of 16.1 tonnes per ha (IPCC, 2004), leading to a current amount of stored carbon of 3.1 tonnes per ha. This value equates to **11.4 tonnes of CO₂ stored per hectare**.

1.2 Future amount of carbon on the land

Bamboo of the species *Guadua angustifolia* will be planted on the land in a 5m x 5m arrangement with 400 clumps per hectare. Using the numbers provided by BIE, considering the plantation will reach a mature state after seven years (i.e. matured culms), it would equate to **476 tonnes of stored CO₂ per hectare**.

1.3 Durable products pool

Durable products act as a carbon sink, as they still contain the amount of carbon stored by the bamboo. BIE produces four different products for the bamboo:

- Firewood/crafts and furniture
- Building material
- Crushed mats
- Sticks

Only the last three are considered durable products (firewood/craft bamboo has a shorter lifespan). It is then necessary to calculate yearly yield potential and the biomass content in the different products as the plantation matures.

Yearly yield potential

These are the assumptions made in this process:

- Only the culms mass is considered for the durable products.
- The 15% harvesting rate per year
- Plant carbon fraction of 0.49 C/biomass (IPCC, 2004)

The following table shows the yearly yield potential per durable product

Table 1 Yearly yield potential

Product name	Length from the culm*	Yearly yield potential
	(m)	(ton biomass / ha / yr)
Building material	6	10.46
Crushed mats	4	6.98
Sticks	7	12.21

*Source: BIE

Durable products

Table 2 shows the BIE product lifespan distribution and the carbon storage using the previously calculated yearly yield potential.

Table 2 Product's carbon storage

Product lifespan distribution (in %)*				Carbon storage	CO ₂ uptake
Product	3-5 years	10 years	50+ years	ton C/ha	ton CO ₂ /ha
Building material	30%	50%	20%	83.0	304.4
Crushed mats	40%	50%	10%	39.7	145.5
Sticks	60%	40%	0%	38.3	140.4
TOTAL				161.0	590.3

*Source: BIE

Thus, the total carbon storage in the product pool is 161 ton C/ha, which is **590.3 ton of CO₂ per hectare**.

3 CONCLUSION

The total amount of carbon uptake by one hectare of land can now be calculated by subtracting the current amount of carbon stored on the land (previous to the plantation) from the future amount of carbon on the plantation and adding the amount of carbon in the durable products pool. When the equilibrium is reached, the CO₂ uptake of the Colombian Guadua plantation will be: $-11.4 + 476.0 + 590.3 \approx$ **1055 tonnes CO₂ per ha**.

4 REFERENCES

IPCC (2006). 2006 IPCC guidelines for national greenhouse gas inventories. *Institute for Global Environmental Strategies, Hayama, Kanagawa, Japan.*