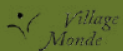




# Mangrove Economy: Calculations and Monitoring Process



# The Mangrove



The mangrove is a **marine ecosystem found in tropical zones** that includes all mangrove species. Mangroves are home to a wide range of animals including crustaceans, fish and molluscs, as well as migratory birds, reptiles, insects and mammals such as monkeys. It slows land erosion, solidifies soil and protects coastlines from wind, waves and storms. It is a source of wood, diversified food and medicinal plants for nearby populations.

**MANGROVES HAVE A CATCHMENT POTENTIAL 3 TO 5 TIMES GREATER THAN FORESTS.**

Source: UNESCO



The lifespan of a mangrove plant depends on several parameters. As long as there are no major disturbances, such as human activity or natural disasters, mangroves do not die. Studies and data suggest a conservative value of **60 years**.

## CO<sub>2</sub>e Capture Capacity of One Hectare of Mangrove

Quantification of the actual carbon stock in non-degraded mangrove areas is **219 tonnes of carbon (C) per hectare**. To support investment and sustainability of actions in the wetlands of southern Benin, a second feasibility study for a carbon finance project was carried out by CO<sub>2</sub>logic in 2019. This study resulted in an ex-ante sequestration rate estimate of **7.85 tCO<sub>2</sub>e/ha/year**.

[To see the full study.](#)

## What About Mangroves in Benin ?

In 2012, a study was carried out and the value of **11t CO<sub>2</sub>e/ha/year** was retained.

Each year, a hectare of mangrove accumulates tonnes of CO<sub>2</sub>e, and the average total stock can be as much as 1,000 t of CO<sub>2</sub>e, depending on the state of the ecosystem. It is estimated that **a mangrove ecosystem can capture between 11 and 15 years' worth of carbon dioxide.**

# CO<sub>2</sub>e Capture Capacity of a Mangrove Plant



Given the complexity of mangrove ecosystems, it's not easy to estimate sequestration per plant. Instead, we consider sequestration per hectare. In other words, carbon sequestration is counted from 5 years of age.

Source: Eco-Bénin

On average, there are 2,500 plants per hectare planted.

The cost of planting and monitoring a mangrove seedling over 5 years is 3 euros.

The actions that are taken into account in calculating this cost are :

- 1 **Nursery phase**
- 2 **Planting phase**
- 3 **Monitoring and maintenance of restored areas**
- 4 **Support for IGAs by community stakeholders**
- 5 **Supervision and monitoring of planting and restored areas**



## Thus:

(11 TCO<sub>2</sub> per hectare per year) divided by (2,500 trees per hectare) X 60 years life span  
**= 0.264 TCO<sub>2</sub>/tree, i.e. 4 plants per ton (1 T/0.264=3.8 trees)**

## Then:

The fee is 3 euros per plant + 3 euros for administration costs.

→ 3 euros X 4 plants + 3 euros  
**= 15 euros per tonne**



## Monitoring:

For each contribution made, contributors receive an e-card confirming the number of plants that will be restored.

Eco-Bénin has set up a monitoring protocol, available on request.



## Ecological Restoration of Mangroves

There are several approaches to restoring mangrove ecosystems. The most common is **direct replanting**. This involves planting either propagules or seedlings harvested from seed trees (wildings) or produced in nurseries. However, given the poor results achieved by most mangrove restoration projects using this classic approach, Ecological Mangrove Restoration (EMR) has been developed and has gained in interest over the last few decades.





The main aim of this approach is to **restore the biophysical conditions that influence the development of mangrove ecosystems**. In other words, it consists in restoring the hydro-sedimentary dynamics conducive to mangrove development, through the creation of channels that facilitate water supply to the site. Thus, under the effect of the tide, propagules are dispersed along the canals and on the restoration plots by means of water (hydrochory), guaranteeing **natural mangrove restoration**. The emergence of propagules that manage to attach themselves to the soil produces a large number of young plants.

In implementing this approach, it is also possible to help nature by planting mangrove seedlings on the plots and inside the canals. This **speeds up the ecosystem restoration process**, should the natural process fail to produce satisfactory results or take longer. It should also be noted that the ecological restoration of mangroves calls for several studies combining the assessment of local ecological knowledge, the choice of reference sites, the quantitative assessment of reference levels of environmental factors influencing the mangrove, the analysis of hydrological functioning, the presence of mangrove stands surrounding the site and capable of producing propagules and other factors.

**For further information, please contact us!**

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