

# Study Of The Parameters Influencing The Success Rate Of Mangroves Reforestation In The Bay Of Assassins, South-west Of Madagascar

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## **Submission:**

### **Background**

As part of the implementation of a community mangrove carbon project called "Tahiry Honko" in the Bay of Assassins, the Association Velondriake with the support of the NGO Blue Ventures has initiated a community reforestation of mangroves in 10 villages surrounding the Bay, since 2015. The main objective of the project is to generate sustainable funding through the sales of mangrove carbon credits, and this will contribute to the sustainable management of mangroves and poverty reduction of local communities. Therefore, it's necessary to undertake a study of the factors contributing to the success or failure of mangroves reforestation such as types of substrate, physico-chemical factors (salinity and pH), depth of the water, and the frequency of sites inundation.

### **Method**

So, this study was conducted from January to April 2019 in the Bay of Assassins. The site study is located in the rural commune of Befandefa, south-west of Madagascar, at 22° 11' South and 43° 12' East. Four sites have selected for the realization of this study including Betsoriky, Bevoa, Beparasy and Andalanda. Those sites have distributed in two villages surrounding the Bay, including Befandefa and Ankindranoke. The choice of sites based on the availability of large areas to reforest and the problem of natural mortality of mangroves in the area. Four plots (400m<sup>2</sup> of surface) have installed in four sites and on three different types of substrates: sandy, sandy-muddy and muddy. Three species have planted there: *Rhizophora mucronata*, *Ceriops tagal* and *Bruguiera gymnorrhiza*, applying the mangrove reforestation protocol adopted by the Oceanium, Senegal. The monitoring have done 3 months after planting. This means counting all live and dead propagules in each plot. After planting, parameters, salinity and pH, frequency of inundation have taken.

### **Results**

All plots are only submerging during the high tide of spring tide with an average depth of 0.5 to 0.65 m. They have totally emerged during the neap tide and during the low tide of spring tide. The mean pH value for each site ranges from 7.71±0.08 to 8.28±0.07, and salinity from 23.70±2.68‰ to 29.00±1.41‰. The survival rate of species varies with substrate type. This is highest in the sandy substrate 93.94%; 64.65% in the sandy-muddy substrate and 46.47% in the muddy substrate. This also differs according to species of which 94.94±9.62% for *Rhizophora mucronata*; 65.65±28.80% for *Ceriops tagal* and 44.94±37.37% for *Bruguiera gymnorrhiza*. Then, *Rhizophora mucronata* represents the highest survival rate and *Bruguiera*

gymnorhiza the lowest. Furthermore, *Rhizophora mucronata* represents a high growth compared to other two species including *Ceriops tagal* and *Bruguiera gymnorhiza*. Positive correlation exists between water pH and survival rate of propagules. Salinity does not have an influence of propagules survival rate. Different biotic factors can also possess an influence on the success rate of mangrove reforestation because some dead propagules show mouthful marks. However, the responsible species have not identified yet. This case is only seen in the muddy and sandy-muddy substrate.

### **Conclusion**

So, this study allows to know some factors influencing the survival rate and the growth of these three species of mangrove and to bring recommendations and perspectives for the success of mangrove reforestation.