

# **Practical Application Of Western Indian Ocean (WIO) Region Mangrove Restoration Guide: Case Study Of Kunduchi Mangrove Forest, Tanzania**

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## **Submission:**

### **Background**

Mangroves are important ecosystems in Tanzania and the whole world providing breeding areas for fish, and climate regulation as they have more than five times carbon sequestration potential compared to the tropical rainforest. They protect the coast against erosion and support generally good ecosystem functioning. They were strongly degraded in the last three decades, and despite the strong regulations for preventing the degradation of mangrove forests in Tanzania and Kunduchi site, the coastal forests have not yet been able to regenerate naturally. Using remote sensing technology, reports show that within ten years before the mangrove protection law was enacted (between 1980 and 1990), the mangrove forest in Tanzania was lost from about 388.09 Km<sup>2</sup> to 6336.77 Km<sup>2</sup> in 1990 (FAO 2007). These coastal forests require an alternative artificial way through replantation. Aqua-Farms Organization has implemented a mangrove restoration since 2016. Over 10,000 mangrove seedlings were replanted between 2016 to 2021 on a 6 hectares area by the community at Mbweni and Kunduchi, The planting process was random and *Rhizophora* and *Cerriops* were the only genus replanted. The success rate after two years of monitoring in percentage ranged from 0 to 109% over 3 hectares area, also with some natural regeneration. It was not the distance from the sea that determined the success of the genus planted but rather the ecological conditions sites. Besides the genus planted other factors were the history of the site (whether mangrove were cut before), substrate/soil and hydrology

The drivers of deforestation and degradation at Kunduchi mangrove forest are Logging, climate change, encroachment, boat building, salt mining, Use of fish frying firewood and limited ocean literacy,

### **Method**

The project intends to implement the new guidelines for mangroves ecosystem restoration in the Western Indian Ocean (WIO) region. The reason for taking the guide as a curriculum is to provide the information that will help ensure successful mangrove restoration projects both in the area and elsewhere in Tanzania following a thorough research output by mangrove experts in the region the following are steps by steps procedure of mangrove reforestation according to WIO region restoration guideline, Problem Realization, Defining the Purpose of restoration, Understanding Governance, Stakeholder Analysis, Community Engagement, Site Assessment and Preparation, Establishment of nurseries, Out-Planting and management.

The drivers (challenges) will be addressed by enhancing training community (women

groups and fishers), children and stakeholders in mangrove rehabilitation activity, facilitating a good community-based (co-management) and participatory approach using the established Beach Management Units (BMUs). They will be empowered through problem-based training. The training will be to inform of the importance of conserving the mangroves and the benefits that this delivers. Likewise, the community will be informed of the long-term threats that result in mangrove destruction due to human induced activities.

Community joint forest agreement management the project will ask and enter the memorandum of understanding with Tanzania Forest Services on the right management of Kunduchi mangrove forest

Reforestation of the total 15000 of seedlings expected to be planted in the surveyed area of 5 hectares. The mangrove nursery of 15000 seedlings to be established

## **Results**

The area for mangrove reforestation assessed according WIO region restoration guide the result indicated that the sources of deforestation are anthropogenic activities. Nature of the area, topography and hydrology, bioturbation, soil type and species of mangrove available were recorded. Nursery setup based from degraded area assessed.

Selection of a site for establishing a mangrove nursery is the first important step in nursery construction, The location of the nursery influences the survival rate of reared seedlings, and consequently affects the success of The plantation project, the mangrove nursery established was permanent nurseries which can be flooded during the high tide and the 15000 of the seedlings were stocked by considering the WIO region of reforestation guide. The selection of mangrove species based from the report of degraded areas and the following species were selected for the nurseries *Avicenia marina* 7000 sp, *Ceriops tagal* 6000 sp, *Rhizophora mucronata* 1000 and *Bruguera gymnorrhiza* 1000. The success rate of species in nursery were > 90% this indicate the good success from the WIO guide

Training: 20 Women who are in an active environmental group and act also as fish processors were trained, 10 Beach Management Unit (BMU) members of the area were trained. This become a good achievement to incorporate the community in the all process of forest management

Training : 200 students from 4 schools (50 each) only 150 reached and trained on the importance of mangrove in the environment , 20 university students pursuing courses in Aquatic sciences, fisheries and natural resources assessment and management from the University of Dar es Salaam to be completed by July 2022. Reforestation (out planting) of 15000 seedlings from the nursery will start from May to July 2022 and all process will based according to the WIO region restoration guide

## **Conclusion**

This tailor-made training is aimed at reaching a win-win situation between man and nature. The content builds the skills of the trainees in the following ways; Knowledge of mangroves and how to manage them. This improves their management skills and helps in conservation efforts.