Assessing the regeneration status of the ankobra mangrove system, Ghana

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Globally, mangrove ecosystems are vanishing at fast rate with annual loss of 1–2% per year. It is estimated that this loss is five times greater than the forest loss worldwide. On the local front in Ghana, the Ankobra in the Ellembelle District has not escaped this loss. It remains one of the most threatened ecosystems in Ghana, mainly due to uncontrolled harvesting of mangroves and the use of the mangrove system in general. Impacts of these activities in mangrove forest ecosystems are the changes in mangrove vegetation structure, which increases the vulnerability of surrounding communities. Again, uncontrolled harvesting is a potential loss of above ground biomass of the forest. Therefore, an assessment of the trends in the conditions of the forest over time through characterizing the structural complexity is important for long-term sustainable management of the mangrove ecosystem. Therefore, this study is to assess and give a detailed structure of the Ankobra mangrove system. This is to identify whether the forest has the potential to regenerate based on its tree, juvenile densities, and the maturity index. Along transects which will be laid perpendicular to the estuary, 10 m × 10 m and 5 m × 5m belt transects will be used to sample adult and juvenile mangrove vegetations, respectively, in the adjacent sites of the estuary. Height and stem diameter (trees with stem diameter above 2.5 cm) of plants in each plot will be measured and grouped into maturity classes. All trees and juveniles in each plot will be identified to their taxonomic level and counted. Important Value (IV) of each species of mangroves will be determined from the relative frequency, relative density and relative dominance will be calculated for all tree species. Complexity indices for each site will be calculated. Spatial differences in tree, sapling and seedling densities will be tested. Morisita's index will be used to find dispersion among plots. Maturity index of the forest will be estimated, which is the ratio of sum of frequencies of individual species in the habitat and total number of species in the habitat. It is expected that there will be significant spatial variation in density, height, and diameter of adult vegetation and in densities among different regeneration classes. We expect the juvenile densities at the different sites to be significantly higher than the adult densities, the result of which will trigger the needed recommendation for management.

Keywords: Mangrove; Regeration potential; Density; Maturity index; Ankobra