Fish assemblages in Tanzanian mangrove creek systems influenced by solar salt farm constructions.

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Abstract

Deforestation of mangrove forests is common occurrence worldwide. We examined fish assemblage composition in three mangrove creek systems in Tanzania (East Africa), including two creeks where the upper parts were partly clear-cut of mangrove forest due to the construction of solar salt farms, and one creek with undisturbed mangrove forest. Fish were caught monthly for one year using a seine net (each haul covering 170 m2) within three locations in each creek, i.e. at the upper, intermediate and lower reaches. Density, biomass and species number of fish were lower in the upper deforested sites compared to the mangrove-fringed sites at the intermediate and lower parts in the two creeks affected by deforestation, whereas there were no differences among the three sites in the undisturbed mangrove creek system. In addition, multivariate analyses showed that the structure of fish assemblages varied between forested and clear-cut sites within the two disturbed creeks, but not within the undisturbed creek. Across the season, we found no significant differences except for a tendency of a minor increase in fish densities during the rainy season. At least 75% of the fishes were juveniles and of commercial interest for coastal fisheries and/or aquaculture. Mugil cephalus, Gerres oyena and Chanos chanos were the most abundant species in the forested sites. The dominant species in the clear-cut areas were M. cephalus and Elops machnata, which were both found in relatively low abundances compared to the undisturbed areas. The conversion of mangrove forests into solar salt farms not only altered fish assemblage composition, but also water and sediment conditions. In comparison with undisturbed areas, the clear-cut sites showed higher salinity, water temperature as well as organic matter and chlorophyll a in the sediments. Our results suggest that mangrove habitat loss and changes in environmental conditions caused by salt farm developments will decrease fish densities, biomass and species numbers as well as alter the overall fish assemblage composition in the salt farm area but not downstream in the creek.

Key word Fish**,** salt, constructions