Impacts of anthropisation phenomenon on mangrove landscape structure and change in the western coast of Madagascar

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Abstract

Mangrove landscape represents one of worldwide most valuable coastal landscape. According to landscape unit diversity that shaped these particular ecosystems, it offers a different range ecological, economic, cultural and social services. Nonetheless, an extensive literature review highlights different trend of dynamism over years including different range of dynamism: migration of mangroves, coastal change, deforestation, degradation and for the most case, with negative point of view. The importance of these change differs depending on localization area, types of mangrove ever it was estuarian or littoral mangrove, extent of mangrove and social context of each mangrove. In order to better understand underlined mechanism which drives mangrove landscape trend, landscape ecology approaches have been used. So, mangrove landscape in the western coast of Madagascar has been subdivided into “mangrove lots” where each lot are defined by sub-watershed supply delineated from streaming systems. Analysis was done separately for each mangrove lots. In the first hand, spatial and temporal analysis of the mangrove have carried out using remotely sensed data for each mangrove lots. Multi-temporal images were collected during the last three decades and processed using object-based classification. Correlation analysis have made between change parameters and structural characteristics of mangrove landscape. The derived analysis shows mangrove landscape structures and dynamism over years. In the other hand, anthropisation were assessed by villages inventory (number of rooftops) digitizing over very high-resolution images from Google Earth in the study area. This analysis was coupled to social survey conducted over a sample mangrove landscape area over three years and focusing on household activities and migration history for each landscape areas. The result show that
mangrove structures critically vary depending on mangrove lots. Mangrove deforestation and mangrove migration have a significant correlation with total extent area and the mean patch size of mangrove structures. Also, relative importance of inhabitants around mangrove lots depends on mangrove size and area itself, the reason why small patch of mangrove is more resistant from human-induced change compared to a large extent estuarian mangrove landscape. In addition, household migration strategies to mangrove landscape were more important over the large extent of mangrove due to the diverse economic opportunity for their livelihoods. So, mangrove landscape management should take into account the structure of mangrove itself to adjust preservation to coastal small household strategy.

**Keywords:** Anthropisation, mangrove landscape change, human-induced change, remote sensing, western coast of Madagascar