

Anthropogenic impacts causing forest fragmentation and affecting the navigability of bolongs in the mangrove forests of Sokone (Senegal). A geomatic study supporting the management of natural resources

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Sokone's mangrove lies in the natural region of Sine-Saloum in Senegal. It is a delta formed by two rivers branched into a multitude of creeks (bolongs) subject to the influence of the sea and tides (Lhomme, 1978). Economic activities of the region: artisanal fisheries, transport and trade of mangrove products (wood, oyster, shells,...) depend on mangrove and navigability of bolongs which is related to the state of the mangrove. Mangroves in this region are subject to both natural and anthropogenic pressures that cause degradation. Logging is the main anthropogenic cause of this degradation. Wood requirements are expected to increase due to population growth and deficit of means of control and management of natural resources (Géoris *et al.*, 2014, this issue).

This study is based on a combination of remote sensing and field work to identify and examine more or less disturbed areas caused by logging and sedimentation of bolongs responsible for the fragmentation, in order to conclude if this mangrove resists to natural and anthropogenic influences with respect to its structure and dynamics.

Mangrove areas as well as points of sedimented bolongs were identified on a visual basis of Google Earth images, field visits and a survey of the population. In total 36 quadrats of 100m² each along a land-water transect have been made. At each quadrat we recorded tree identity, stem diameter, distribution of adult, young and juvenile trees, tree height, salinity, number of cut stems, the X-Y coordinates of each adult tree and GPS coordinates.

A Detrended Correspondence Analysis (DCA) was applied to interpret the distribution of tree species in adult, young and juvenile in terms of present and future vegetation dynamics while the species-environment relationship was established through the canonical correspondence analysis (CCA). Past dynamics will be partly expressed through the frequency distribution of diameter classes at 2.5cm intervals (Dahdouh-Guebas *et al.*, 2002). The CCA results will be used to understand the impact of logging on the vegetation structure observed and hence the anthropogenic impact.

Land cover maps were drawn from Landsat TM 1988 and ETM+ 2007 images and a topographic map at a scale of 1:50,000 to view the recent occupation of mangrove and non mangrove. Sedimented bolongs sectors will be related to perimeters of disturbed vegetation through the map to determine if they match.

Results may highlight a relationship between forest fragmentation due to logging and sedimentation of bolongs. Wherever possible, we will identify areas of urgent conservation and provide guidelines for the restoration and/or exploitation of other areas.

References

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