POTENTIAL IMPACTS OF SEA LEVEL RISE ON MANGROVES IN CA MAU CAPE, SOUTH VIETNAM: AN APPLICATION OF REMOTE SENSING TECHNIQUES FOR ASSESSMENT

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In Vietnam, the Ministry of Natural Resources and Environment reported that projected sea level is expected to rise about 30cm and 75cm respectively in 2050 and 2100 (MONRE, 2009). In a comparative analysis, the World Bank concluded that Vietnam ranks among the top 5 countries that will experience the adverse impacts of sea level rise (Susmita *et al.*, 2007). Being aware of climate change impacts, especially sea level rise, the Government of Vietnam approved a 'National target program to respond to climate change' (NTP) (NTP, 2008). One of the strategic objectives of the NTP is to assess climate change impacts on sectors and regions in specific periods and to develop feasible action plans to efficiently respond to climate change in the short-term and long-term to ensure sustainable development of Vietnam. Within the context of sea level rise due to climate change, Ca Mau cape is considered as the most vulnerable place in Vietnam. In order to assist the province in the development of their action plan to respond to climate change, this study will play an important role in attempts to provide scientific implications and appropriate solutions for integrating climate change issues into the action plan toward sustainable development.

Based on aerial and satellite images this study tried to estimate the changes in the sea level and the impacts on mangrove biodiversity and local communities in the mangrove area located in the Ca Mau cape, a natural mangrove ecosystem with high value of biodiversity, socio-economic importance and scenic beauty. Geographic Information Systems were used to make forecasts about the proposed scenarios on sea level rise and to identify critically endangered areas. Major technical constraints had however been foreseen: quality of images, spatial and temporal coverage of images, insufficient topographical data and basic projection opportunities of sea level data in combination with climate models.

The sea level of Ca Mau Cape has already risen with more than one meter during the last 60 years. Since the area is under the influence of both the East Sea and the Gulf of Thailand, a combined influence of erosion and accretion events causes a strong dynamic evolution in the mangrove forest. The erosion rate is about 22.2m per year while the accretion occurs with a rate of 47.1m per year. Projections of the difference in sea level between the past and the present, towards the future indicated that sea level in 2090 will increase 57cm, 64cm and 86cm respectively in the low emission scenario B1, medium emission scenario B2 and high scenario A1FI (relative to the period of 1980-1999). The results of the projections for the migration trends of the mangrove area in the future show that Ca Mau Cape will gain 14.2km², 16km² or 21.5km² mangrove forest depending on the emission scenario (B1, B2 or A1FI respectively). The interpretation of this result must however be combined with the further research on the amounts of mangrove area that will inundate when sea level will rise.

References

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