Prediction of land loss from sea level rise due to global warming: the case study of Zanzibar Urban/West region, Tanzania

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The objective of the study was to predict land loss from sea level rise due to global warming in Zanzibar Urban/West region. The study based on water expansion which is caused by Sea Surface Temperature (SST). Data for 15 years (2001 to 2015) was used for prediction of SST for 50 years (2016-2065) by extrapolating the given data using matlab. Predicted SST was used to predict expected rise in sea level in 2065. Land loss that is likely to occur in 2065 was predicted using beach angle and forecasted sea level rise. Results from this study show that, there was an increase of sea level from 2000 to 2015. If the SST will continue to rise with the current rate of about 0.025 ºC/ year which makes 1.25 ºC for 50 years, we expect after 50 years (2016-2065) sea level will rise to about 0.013 m. This study has found that if everything will be as usual, the rise of 0.013 m of sea level will cause land loss of about 6705 m² to the coastline of Zanzibar urban/west region. This is about 0.003 % of Zanzibar urban/west region. The areas of Zanzibar urban/west region which will be most affected are Bububu, Maruhubi and Forodhani. Most of these areas are characterized by deep sand soil and having beach angle of 0º.