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The impacts of sea level rise to the planning and development of coastal zones at Manjung, Perak, Malaysia

Nor Aslinda Awang, Wan Ahmad Hafiz Wan Mohamed Azhary and Mohd Radzi Abd Hamid
National Hydraulic Research Institute of Malaysia, Malaysia

Climate change and global warming are global issues and inevitable. It is predicted to cause global sea level rise (SLR), which may impacting the development of coastal zones, especially in the low lying areas such as river estuary. Continuous intense pressure for development in Manjung coastal zones may lead to disruption to natural processes, thus greatly impacting the shape of the coastline, ultimately resulting in loss of land due to erosion, degradation of coastal resources, loss of development opportunities, decrease in land values as well as increased exposure of human life and property to coastal hazards. Therefore, clear planning decisions with strong understanding and input on coastal processes are vital. The projected SLR along the coast of Manjung for the year 2020 and 2100 are 0.06 m and 0.56 m, respectively. A study was embarked to assess the extent of SLR impacts to the existing and future land use and identify the type of land uses that will be impacted, including the area coverage. With the projected SLR of 0.56 m in 2100, a total of 7,606 ha of land will be inundated. Assessment of the impacted area indicates that lands zoned for residential uses are most affected, accounts to a total of 3,530.53 ha (46.42%). The other major types of land use zone that will be impacted by the SLR are forest reserve (mangrove) and agriculture (including aquaculture) which account to 2,394.65 ha (31.48%) and 644.49 ha (9%), respectively. The study findings show that many critical urban areas are located within the high risk and future coastal hazards zone of coastal flooding. Therefore, the future local planner needs to decide either to protect the coast and estuary line, accommodate the hazards or taking retreat options in planning. Recommendations of future land use, urban infrastructure and settlement shall be guided away from areas with high coastal hazards to reduce the impacts of sea level rise.

aslinda@nahrim.gov.my