

Translated from Arabic

Sea level rise is one of the main and undeniable effects of climate change. As in all small island developing States, sea level rise in Bahrain poses a threat to the coasts of the six main islands, and the majority of the Kingdom's population and infrastructure is located along those coasts. Population density is currently high in coastal areas that are 2 m or less above sea level.

The aim of the vulnerability assessment of coastal areas is to determine and measure the extent of sea level inundation, depending on land use and location, and address a range of sea level rise scenarios for 2050 and 2100. The study covers the entire land area, from the coast to interior areas the elevation of which is 2 m above sea level, and seven different regions, namely, northern and southern Bahrain, Muharraq, Sitrah, Umm al-Saiyan and the six islands. A three-part methodology, which included gathering and processing data and modelling sea level inundation, was used.

Figure 1 shows the extent of sensitive land area in Bahrain under various sea level rise scenarios. Figure 2 shows critical land area, by elevation and island, that is 2 m or less above mean sea level.

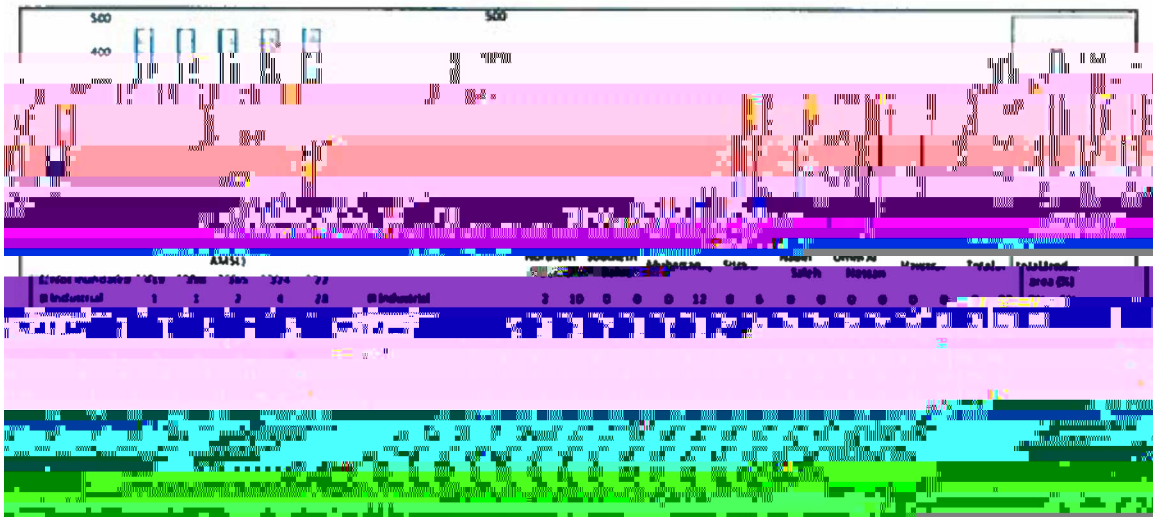


Figure 1 shows the extent of sensitive land area in Bahrain under various sea level rise scenarios. The results confirm that Bahrain is highly vulnerable to a rise in sea level, and that even a small rise in sea level could result in the inundation of certain types of land. Following are some of the main impacts: Wetlands could be subject to significant inundation; approximately 27.6 m<sup>2</sup>, or half of all wetlands, could be submerged if the sea level were to rise by 0.5 m, while three quarters of all wetlands could be submerged if the sea level were to rise by up to 1.5 m.

- 7 Some 80.6 m<sup>2</sup> of reclaimed land could be affected by a small rise in sea level; approximately 2 per cent (1.6 m<sup>2</sup>) could be submerged if the sea level were to rise 0.5 m, and approximately 10 per cent (14.6 m<sup>2</sup>) if the sea level were to rise 2 m.
- 7 Built-up areas are among the best suited to withstand sea level rise. Less than 2 per cent (2.6 m<sup>2</sup>) could be submerged if the level were to rise no more than 1 m, and only 10 per cent (11.6 m<sup>2</sup>) could be submerged if the level were to rise no more than 2 m.

- 7 Industrial zones are more vulnerable to sea level rise than built-up areas. Approximately 1% per cent 84 km<sup>2</sup> of such land could be submerged if the sea level were to rise 2 m, and less than 1% per cent 81 km<sup>2</sup> if it were to rise no more than 1 m.
- 7 All types of land could be severely affected if the sea level were to rise 8 m. The Airport of the Kingdom of Bahrain could be completely inundated, while wetlands, reclaimed areas and industrial areas could lose at least 4 per cent of their total area. Built-up areas could lose approximately 74 per cent of their total area. Of the total critical land area, which measures 470 km<sup>2</sup>, only 72 km<sup>2</sup> 81% per cent could be submerged, because its elevation is more than 8 m above sea level.

Climate change will exacerbate the current unsustainable supply of and demand for water. Sea level rise may cause seawater to intrude into aquifers and could affect the intake and discharge canals of water desalination plants.