

## **ABSTRACT**

This Ph.D. Thesis entitled "Sea Level Rise due to Climate Change and its Impact along the Coast of Mumbai" contains the report of research conducted by Shri Sudipta Chakraborty, in the Department of Civil and Environmental Engineering under The Assam Royal Global University, Guwahati. The importance of the research is presented in Chapter-I. The primary objective of the research work is to predict climate change induced sea level rise along the coast of Mumbai city till 2050. An exhaustive review of literature on the concerned subject covering the history and contemporary research reports with references are summarized in Chapter-II. Review includes references from IPCC (from AR2 to AR5); UN, NASA; MOES (GOI), IITM Pune and various Civic Bodies of Mumbai like MCGM, MMRDA, MbPT etc. along with a plethora of scientific research papers mainly for past 10 years (2010 to date). Chapter-III captioned 'Materials and Methods' explain about the study area and the efficacy and process involved in The Climate Model of MIKE 21, one of the trustworthy software in the latest state-of-the-art third generation model in the related field, capable of producing multiple climate change scenarios in accordance with the most common scenarios depicted by IPCC's reports AR4 and AR5. The MIKE 21 HD FM numerical model software developed by Danish Hydraulic Institute has been used to accomplish the mission of the current research. The FM (Flexible Mesh) HD (Hydrodynamic) Model accommodates three most common scenarios (SRA1B, SRA2 & SRB1) from IPCC and is utilized to find the Sea Level Change at Mumbai up to 2050 for an optimum temperature rise of 1.65 °C. The results from the run of MIKE 21 have been presented in Chapter IV named 'Results and Discussions'. Sea Level Rise has been obtained as 0.395 m solely for temperature rise. Adding vertical movement of land, the effective Sea Level Rise of 600 mm is taken for mapping the inundation at Mumbai (2050). Validating the result Conclusion have been narrated in Chapter V and Recommendations including the directions for future researches in this topic are given in Chapter VI. At the end a Bibliography and Author's Bio is annexed for reference. List of papers published by the researcher (both International and National) during the period of study along with some technical parameters and the list of Tables and Figures have been appended.