ABSTRACT

Mumbai's vulnerability to several climate disasters, such as river floods, landslides, droughts, tropical cyclones, and wildfires, poses significant challenges to the preservation of assets and the development of urban resilience. Several data sources and modelling techniques are used in this work to assess the potential risks and impacts of these hazards in Mumbai under different Representative Concentration Pathway (RCP) scenarios.

Tropical cyclone historical trends and future projections are obtained from the IBTrACS dataset, which is analyzed using the CLIMADA software. Similarly, river flooding risks are evaluated using climate and hydrological models from the Inter-Sectoral Impact Model Intercomparison Project phase 2b, which provides data on flood vulnerability and potential socioeconomic consequences.
Using the IPCC standardized precipitation index raster, drought hazard data are downscaled and incorporated into the CLIMADA model to assess the severity and potential impact on landslides. A complete evaluation of landslide risks and the ensuing financial ramifications is made possible by the utilization of data from the NASA Landslide Catalog to analyze landslide hazards. Wildfire hazard is also evaluated and analyzed using data from the Fire Information for Resource Management System (FIRMS) and the CLIMADA model.

According to the findings, in higher emission scenarios, such as RCP 8.5, the intensity and impact of climate hazards on Mumbai's assets are predicted to increase significantly.
But by implementing a wide range of mitigation strategies, such as infrastructure improvements, early warning systems, community involvement, and ecosystem restoration, Mumbai can fortify its resilience to these dangers and safeguard its assets moving ahead. This integrated approach to risk assessment and mitigation gives rich insights that can be very helpful for making informed decisions and planning for disasters in Mumbai and other sensitive metropolitan areas facing similar climatic concerns.

Keywords: Climada, Physical Value at Risk, Assests, RCP Scenarios