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A critical examination of the flooding and its impact on the Munro Island in Southwest India

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Munro Thuruth (Island) is an island group comprising of 8 medium size and a few tiny islands located in the backwaters of the famous Ashtamudi lake in Kerala, South India. The Munro Island with an area of 13.4 sq.km is situated at the confluence of the Ashtamudi Lake and the Kallada river (9^{o}N Latitude and 76^{o} 37′ E Longitude). It is an artificial island built during the 18th Century by reclamation of the Kallada river delta on the downstream side, where it debouches into the Arabian Sea. The individual islands of the Munro group, with an elevation of 3.3m (approx.) above MSL, remained more or less stable till 1965. However, during the last two decades media reports on sinking/subsidence of the individual islands have drawn attention of scientists, politicians, administrators as well as the government. As per the reports, the subsidence or rise in surrounding water level has been rather alarming and this is quite evident from the perennial inundation observed at certain critical low-lying areas in the island. Speculations on the causative factors responsible for the permanent/alarming rates of inundation witnessed in the island are linked to both local and global changes in the environmental conditions. According to one school of thought it is land subsidence due to tectonic activity combined with sea level rise due to global warming that has contributed to the sinking of the Munroe Island. But there is another group that advocates that the flooding/inundation reached the critical level after the 26 December, 2004 Tsunami which struck the Kerala coast. In this study, the various causative factors and their respective roles in the rise in water level/ subsidence reported at various locations is being critically reviewed and the salient conclusions that emanated from the analysis are presented. The analysis reveals that the flooding in the Munro Island can be attributed to a multitude of factors like rise in sea level linked to climate change, wave setup and wind setup which act individually or in combination under favourable conditions; changes in morphology (post Tsunami) of the Ashtamudi estuary and changes in the inlet geometry over a period of time; land subsidence due to primary and secondary (creep) consolidation as well as the impact of ground vibration due to the movement of high speed trains ; groundwater drawdown due to excessive water extraction and reduction in fresh water flow from the Kallada river; sand mining from the river and reduced sediment inflow to the system because of the Kallada dam construction. The importance of carrying out numerical model studies to understand the tidal dynamics as well as the combined effect of tides, wind and waves on the water surrounding the islands which are located at varying distances of 8-10km from the Ashtamudi tidal inlet is also emphasized.

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