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A Preliminary Assessment of Social Vulnerability in Ganga-Brahmaputra-Meghna Delta

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The Ganga-Brahmaputra-Meghna (GBM) Delta has a high population density and is exposed to rapid environmental changes making it one of the most stressed deltas in the world. The low-lying coastal areas of the Ganga-Brahmaputra-Meghna (GBM) Delta comprise 19 coastal districts of Bangladesh and two districts in India with significant land areas within 5 meters of sea level has a population of more than 50 million people at an average population density of 1100 people/km2. This population is exposed to a range of hazards such as severe cyclones, coastal erosion, and salinization, exacerbated by climate change and subsidence which imply severe stress on the resource dependent community of this region. This situation is further complicated by poverty and limited social well-being such as poor access to education/ health/ drinking water/ sanitation facilities, and lack of food and energy security. Thus assessing social vulnerability can help to understand which communities are susceptible to environmental change and guide adaptation actions to address these threats. This preliminary study aims to construct a socio-economic index by assessing the social vulnerability of coastal communities of GBM Delta taking consistent and common secondary data from the Census of India and the Bangladesh Bureau of Statisticsand applyinga Principle Component Analysis(PCA) methodology. Several statistical tests like Kaiser-Meyer-Olkin (KMO) have also been used to assess the appropriateness of using PCA. Among the selected common indicators, five major components are found to explain majority of the total variation of social vulnerability across the delta: (1) poverty, (2) dependency ratio, (3) agriculture dependency, (4) lack of sanitation and (5) existence of mud houses. The most important observation is the existence of a social vulnerability gradient across the coast. In other words, socially marginalised and vulnerable communities are found on the Delta margin in both India and Bangladesh. Several coastal sub-districts(Blocks in India, Upazila in Bangladesh) like Manpura, Basanti, Koyra, Teknaf, Sandeshkhali-II have maximum social vulnerability and have the potential to be adversely affected by environmental change, whereas several more inland sub-districts like Barrackpur-I, II, Panchlaish, Kotwali, Double Mooring have a comparatively low social vulnerability.This preliminary analysis of spatial variation of social vulnerability in the GBM delta suggests that a more intensive study of vulnerability and risk is required under a range of scenarios of climatic and socio-economic changes.
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