

Vulnerability to cyclone hazards of coastal livelihood in Bangladesh

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The occurrence of the storm surge during the cyclone in Bangladesh is very much common. Furthermore, the mean global temperature is predicted to increase by 1.4-5.8°C over the coming century which will cause changes in temperature, distribution of rainfall, the frequency and intensity of extreme weather events, and sea-level rise. Thus, it is imperative to establish a logical ground where the extent of the impact of cyclone disaster is correctly predicted. This research focuses on this particular aspect of future disaster mitigation planning in Bangladesh under the consideration of an empirical evidence of cyclone Aila of 2009 along with available climate data from secondary sources. Climate data includes wind speed, storm surge height, and temperature. The empirical data was collected through key informant interviews, focus group discussions and a household questionnaire survey in cyclone Aila affected southwest coastal villages of the country. By assuming a 95% confidence interval, the total sample size for household questionnaire survey was 1678 out of 25782 households. Samples were drawn proportionately from 44 villages. Geographic Information System (GIS) software (ArcGIS 9.3) was used to overlay the critical impact elements within the catchments zone of cyclone shelters. Adoption of a particular set of coping strategies depends not only the magnitude, intensity and possible impacts of cyclone hazards, but also on the socio-demographic characteristics. Results show a strong correlation between the wind speed during the cyclones and the tidal surge height. The historical data shows that the value of correlation between these two variables is 0.74. The value of correlation between storm surge and casualties is found to be 0.46. There also remains a strong positive correlation (value 0.71) between the wind speed during the cyclones and human casualties. Average wind speed during the cyclone period of last 50 years (1960-2009) was 166.368 km/h and the average storm surge height is 4.80 meter. The number of affected people due to the storm surge is also related with the extent of the affected area and population density. Accordingly, it was observed that more than two-third respondent could not reach in a safer place due to rush of water-intrusion and also because of inundation of road-network. The nearness to the available cyclone shelter, and place of taking shelter during cyclone is positively correlated ($r=0.38$; $p<0.001$). However, the poor people had less opportunity to take shelter in cyclone shelters, although none of the respondent groups whose monthly income is above 75USD stands without any infrastructural supports. Such important observation may hint the influence of local elites on the local disaster mitigation planning practice in Bangladesh. Finally, we also discuss existing coping strategies in the study area and recommended ways in which may be mainstreamed into the local level development planning agenda.