Sustainable development concerns, indicators, sustainable development of coastal and marine resources

Land Subsidence- A New Dimension In Coastal Hazard Of Bangladesh

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Abstract No : 110 Sustainable development concerns, indicators, sustainable development of coastal and marine resources Land Subsidence- A New Dimension In Coastal Hazard Of Bangladesh Md. Bazlar Rashid Rashid (1) and Mohammad Feruj Alam Alam(2) (1) Geological Survey of Bangladesh, 1000 Dhaka, Bangladesh Telephone: +880-01720614921 Email: bazlarrashid@ymail.com (2) GSB, 1000 Dhaka, Bangladesh Telephone: +88-01720614921 Email: bazlarrashid@ymail.com A number of fractures and depressions have been created in the south-western coastal part of Bangladesh, created panic among the local people. All the media reported this phenomenon with outmost important. Geoscientists discussed about the causes and ultimate results of these occurrences. In this connection, the area has been investigated from 26 to 31 July, 2011 to unveil the hidden facts of the occurrences. Topographically, the area is flat with low relief. Average elevation of the area is about 1 meter AMSL which slopes gently towards south. The area is blanketed with recent alluvial deposits. The deposits are consisted of about 6 meters thick clayey silt/silty clay layer which is underlain by a peat/peaty clay layer of about 4 meters thick. Peat is comprised with fully to partly decomposed and soft vegetal matters. Two types of depressions, Circular depressions and Elongated depressions- are found. The radius of the circular depressions is generally 1.5 meters and the depth is 2.5 meters. These depressions are commonly funnel-shaped and are found to occur in bamboo bushes. The elongated depressions are about 6 meters long and 1 meter wide with an average depth of about 1 meter. These depressions are occurred in big tree gardens. The possible factors responsible for land subsidence are : sub-surface geological conditions, long prevailing summer, excess withdrawal of ground water and heavy rainfall after long summer. There is no relation of the formation of these depressions to any neo-tectonic activity. Meteorological data confirm that, there is no considerable amount of rainfall in the dry season. As a result, ground water table dropped naturally well below the Peat/Peaty clay layers, might have caused lowering of water table for a long period. As a result, the Peat/Peaty clay layer became totally dry creating a gap between the peat layer and the overlying Clayey silt/Silty clay layer. Besides, numerous fractures in the Peat/Peaty clay layer as well as in the overlying Clayey silt/Silty clay layer might also have created. With the heavy rainfall, surface water was possibly intruded to the previously formed subsurface gap through the big tree roots, rat/fox holes and

surface fractures. The intruded water began to flow through the gaps and fractures. As a result, subsurface erosion of peat and sediments was taken place by the flowing water which drastically reduced the total sediment volume leading to the occurrences of these land subsidences. The shapes and sizes of the subsidence depend on the subsurface erosional pattern. It is noticed that these types of depressions are local phenomena. There is no possibility of large depression on regional scale. This is an ongoing process of the delta building activities.