A fast, integrated model to explore multiple futures and pathways for the Bangladesh Delta

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A fast, integrated model to explore multiple futures and pathways for the Bangladesh Delta

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Abstract: Bangladesh is one of the largest active deltas in the world, heavily dependent on the rivers and water resources for agriculture and other economic activities. Currently, the country is under threat from growing numbers of natural hazards and uncertainties due to climate change, sea level rise, population growth and socio-economic development. Bangladesh has recently formulated the Bangladesh Delta Plan 2100 focusing on the long term adaptive planning. To ensure sustainable development under the deep uncertainties, long term adaptive planning is required. Adaptive planning requires that the strategies/ policies are robust and flexible with changing future conditions. To explore different future conditions that may arrive due to certain course of action, a fast, integrated model of the overall deltaic system is required. Fast integrated models can be applied for large number of scenarios and actions over time (pathways) to understand the implications of different policy and measures adopted for delta development under uncertain future conditions. In this paper, a theory motivated metamodel for Bangladesh is presented. It is a simplified and integrated physical process-based dynamic model that can be used to simulate multiple futures over long (100-yr) time periods. For implementation of the model, python and pcraster is being used. The model is expected to provide quick insights of different policy actions/ measures and their implications on the overall system and thus assist in adaptive delta management under deeply uncertain future. The model development is still on-going and it is expected to be available in the future.

Keywords: Deep uncertainty; metamodel; adaptive delta management; pathway exploration.