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Examining livelihoods shifts due to sea-level rise via the MIDAS (Migration, Intensification, and Diversification as Adaptive Strategies) model

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Abstract: Among the myriad impacts of sea-level rise, one set of impacts on livelihoods relates to the shift in freshwater, brackish water, and saltwater agriculture that will be possible in coastal areas. In South and Southeast Asia, Bangladesh and Vietnam are notable in particular for the growth of shrimp aquaculture as an adaptation to changes in salinity. However, while Vietnam has developed a clear and well-attended system of agro-ecological zoning, Bangladesh’s management of salinity is less developed. Conflicts arise among farmers sharing surface water systems over the use of sluice gates and the flow of fresh or salty water, with many farmers losing their capacity to produce as saline water for shrimp damages the rice potential of their fields. Using the MIDAS (Migration, Intensification and Diversification as Adaptive Strategies) agent-based modeling framework, I examine how differences in access to alternative income sources and differences in expectations for future water performance shape different paths of adaptation to sea-level rise in these contrasting agro-aquacultural environments.

Keywords: MIDAS, agent-based model, migration, Bangladesh, Vietnam, Sea Level Rise