



Migration in Deltas: An Integrated Analysis

Robert J. Nicholls (1), Craig W. Hutton (2), Attila Lazar (1), W. Neil Adger (3), Andrew Allan (4), Inaki Arto (5), Katharine Vincent (6), Munsur Rahman (7), Mashfiqus Salehin (7), Hazra Sugata (8), Tuhin Ghosh (8), Sam Codjoe (9), and Kwasi Appeaning-Addo (10)

(1) University of Southampton, Engineering and the Environment, United Kingdom (r.j.nicholls@soton.ac.uk), (2) University of Southampton, Geography and the Environment, United Kingdom, (3) Geography, College of Life and Environmental Sciences, University of Exeter, Exeter, UK, (4) University of Dundee, Dundee, UK, (5) Basque Centre for Climate Change, Bilbao, Spain, (6) Kulima Integrated Development Solutions, Hilton, South Africa, (7) Institute of Flood and Water Management, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, (8) School of Oceanography, Jadavpur University, Kolkata, India, (9) Regional Institute of Population Studies, College of Humanities, University of Ghana, Accra, Ghana, (10) Department of Marine and Fisheries Science, College of Basic and Applied Sciences, University of Ghana, Accra, Ghana

Deltas and low-lying coastal regions have long been perceived as vulnerable to global sea-level rise, with the potential for mass displacement of exposed populations. The assumption of mass displacement of populations in deltas requires a comprehensive reassessment in the light of present and future migration in deltas, including the potential role of adaptation to influence these decisions. At present, deltas are subject to multiple drivers of environmental change and often have high population densities as they are accessible and productive ecosystems. Climate change, catchment management, subsidence and land cover change drive environmental change across all deltas. Populations in deltas are also highly mobile, with significant urbanization trends and the growth of large cities and mega-cities within or adjacent to deltas across Asia and Africa. Such migration is driven primarily by economic opportunity, yet environmental change in general, and climate change in particular, are likely to play an increasing direct and indirect role in future migration trends. The policy challenges centre on the role of migration within regional adaptation strategies to climate change; the protection of vulnerable populations; and the future of urban settlements within deltas. This paper reviews current knowledge on migration and adaptation to environmental change to discern specific issues pertinent to delta regions. It develops a new integrated methodology to assess present and future migration in deltas using the Volta delta in Ghana, Mahanadi delta in India and Ganges-Brahmaputra-Meghna delta across India and Bangladesh. The integrated method focuses on: biophysical changes and spatial distribution of vulnerability; demographic changes and migration decision-making using multiple methods and data; macro-economic trends and scenarios in the deltas; and the policies and governance structures that constrain and enable adaptation. The analysis is facilitated by a range of consistent scenarios from global to delta scales, developed in consultation with major stakeholders. Initial results suggest that migration decision-making strongly interacts with diverse measures for adaptation of land, water and agricultural management. A key normative challenge is to identify the parameters of successful migration and adaptation across delta regions, to inform policy analysis and formulation.

Key words: Deltas, sea-level rise, migration and adaptation

Acknowledgement: DECCMA (Deltas, Vulnerability & Climate Change: Migration & Adaptation) project is part of the Collaborative ADAPTATION Research Initiative in Africa and Asia (CARIAA), with financial support from the UK Government's Department for International Development (DFID) and the International Development Research Centre (IDRC), Canada.