



Addressing the challenge of climate change mitigation via promotion of effective cooperation: a game theoretic approach applied to low and least developed nations.

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The challenge of global climate change can be understood as a collective action problem. If all nations cooperated to work towards the significant reduction of greenhouse gas emissions, then not only would substantial future costs be reduced, but potentially large economic and social benefits could be obtained in the near and long term [1]. However, in the absence of effective global action, nations that undertake significant mitigation may be penalised by way of reduced competitiveness. Our recent work [2] has shown how a game theoretic approach can be used to incentivise individuals, organisations, regions and nations to effectively cooperate to mitigate climate change. We are now developing this approach and applying it to regional case studies in coastal regions of developing nation states. Our approach is centered around the promotion of cooperation between individuals for the production of public goods that reduce vulnerabilities to climate change driven natural hazards. This work has the potential to cross scales of organisation, complexity and region.

[1] [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.) IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.

[2] Doncaster, C.P., Tavoni, A. and Dyke, J.G., 2017. Using adaptation insurance to incentivize climate-change mitigation. *Ecological Economics*, 135, pp.246-258.