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Integrating social–ecological vulnerability assessments with climate forecasts to improve local climate adaptation planning for coral reef fisheries in Papua New Guinea

Justus Kithiia

School for Field Studies, Australia

A major gap exists in integrating climate projections and social–ecological vulnerability analyses at scales that matter, which has affected local-scale adaptation planning and actions to date. We address this gap by providing a novel methodology that integrates information on: (i) the expected future climate, including climate-related extreme events, at the village level; (ii) an ecological assessment of the impacts of these climate forecasts on coral reefs; and (iii) the social adaptive capacity of the artisanal fishers, to create an integrated vulnerability assessment on coastal communities in five villages in Papua New Guinea. We show that, despite relatively proximate geographies, there are substantial differences in both the predicted extreme rainfall and temperature events and the social adaptive capacity among the five fishing dependent communities, meaning that they have likely different vulnerabilities to future climate change. Our methodology shows that it is possible to capture social information and integrate this with climate and ecological modelling in ways that are best suited to address the impacts of climate-mediated environmental changes currently underway across different scales.

Biography

Justus is an alumnus of Macquarie University where he obtained his PhD in Environment and Geography. Since 2011 Justus has been a lecturer at the School for Field Studies (Australia), and an affiliated academic with the University of Minnesota. The School for Field Studies is an environmental study abroad programme with 8 campuses located in different parts of the world. Previously, Justus has worked as a lecturer at the University of Sydney and a tutor and research Assistant at Macquarie University. Justus is interested in interdisciplinary research where he applies theories and applications from both natural and social sciences to understand environmental management and change. In particular, he uses novel decision frameworks that support the sustainable use of natural assets in the face of global environmental change. Much of his research has concentrated on exploring the processes through which communities self-organize, and how their knowledge can be leveraged to respond to changes in local conditions. He has undertaken research activities in East Africa, Sydney, Far North Queensland, and most recently, Papua New Guinea.

jkithiia@fieldstudies.org

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