AGRICULTURAL BIODIVERSITY AND RESILIENCE TO CHANGE IN PAPUA NEW GUINEA

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Just as biodiversity is a crucial component in enhancing resilience of ecosystems, agricultural biodiversity is crucial for enhancing agricultural resilience to change. Agricultural biodiversity delivers household food security and buffers farm incomes against risk (e.g. Smale 2006; Di Falco et al. 2010) and offers the resource for crop switching, one of the most oft-cited adaptation strategies to climate change (e.g. Howden et al. 2007, Phiri and Saka 2008.) Given this crucial role, the dynamics of farmers' crop switching decisions are highly under-studied. This not only includes extant crop diversity, but also farmers' motivations for choosing crops and varieties, how they learn of different crops and varieties, and their access to planting materials (the literal seeds of diversity.) To the extent that such issues have been examined previously, few studies have an explicit 'resilience' focus and most have been focussed in Africa or Latin America, with no similar work coming out of Oceania. This is despite major attention placed on other facets of environmental change in Oceania (e.g. sea level rise, Barnett 2001), its extant diversity of plants and crops, and the fact that it has a uniquely strong foundation of historical research on which to examine, "the future of global climate and its effect on people in sensitive environments." (Brookfield 1991:209)

This paper fills this niche through an examination of the role agricultural biodiversity in adaptation to change in socio-ecological systems in Papua New Guinea (PNG). Both definitions of resilience (withstanding shocks and regeneration/reorganization in response to change) are considered, drawing on the framework developed by the Resilience Alliance (2010.) Quantitative and qualitative methods are applied to novel data from a 2010/2011 research initiative, including a survey of 350 farm households in four areas of PNG. While the focus is on climatic factors of change, other drivers are also examined. It is shown how interactions between natural and social structures ensure the overall social-ecological resilience of the systems amidst multiple drivers of change: environmental, social, and economic. However, it is also found that resilience may itself be influenced (and potentially degraded) by these change-drivers. This research offers interesting and novel insights important for considering the future of agricultural adaptation and conservation of agricultural biodiversity (currently under threat worldwide, FAO 2009) in the face of growing environmental, social, and economic challenges.

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