



The role of fish and fisheries in recovering from natural hazards: Lessons learned from Vanuatu



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ABSTRACT

Coastal fisheries provide staple food and sources of livelihood in Pacific Island countries, and securing a sustainable supply is recognised as a critical priority for nutrition security. This study sought to better understand the role of fish for Pacific Island communities during disasters and in disaster recovery. To evaluate community impacts and responses after natural disasters, focus group discussions were held with men and women groups at ten sites across Shefa, Tafea, Malampa and Sanma provinces in Vanuatu. The combined impacts of category 5 Tropical Cyclone Pam (TC-Pam) in March 2015 and prolonged El-Niño induced drought have had a profound impact across much of Vanuatu. Terrestrial systems had been disproportionately impacted with substantial shortages in drinking water, garden crops, cash crops and damage to infrastructure. Localized impacts were noted on marine environments from TC-Pam and the drought, along with an earthquake that uplifted reef and destroyed fishing grounds in Malampa province. Communities in Malampa and Shefa provinces also noted a crown-of-thorns outbreak that caused coral mortality. The significant reduction in terrestrial-based food and income generation capacity generally led to increased reliance on marine resources to cope and a shift in diets from local garden food to rice. However, limited market access, lack of fishing skills and technology in many sectors of the community reduced the capacity for marine resources to support recovery. A flexible management approach allowed protected areas and species to be utilized as reservoirs of food and income when temporarily opened to assist recovery. These findings illustrate that fish and fisheries management is at the center of disaster preparedness and relief strategies in remote Pacific Island communities. High physical capital (e.g. infrastructure, water tanks and strong dwellings) is key for disaster preparedness, but supporting community social capital for the purpose of natural resource management and human capital for diverse adaptation skills can also improve community resilience. Recognizing the humanitarian value that well managed fisheries resources and skilled fishers can play to disaster relief adds another dimension to the imperative of improving management of coastal fisheries and aligning policies across sectors.

1. Introduction

The effect of natural disasters on rural and coastal communities in low-income and developing countries in the Indo-Pacific is an evolving arena for research and policy (e.g. Pomeroy et al., 2006; Da Silva and Yamao, 2007; Tewfik et al., 2007; Mills et al., 2011; Abdullah et al., 2016). The catastrophic 2004 tsunami that impacted across parts of Southeast Asia, and the typhoons that regularly devastate Philippines or cyclones that make annual landfall at the highly populated Bay of Bengal have naturally attracted the most attention due to their massive scales of impact. In comparison, there have been far fewer evaluations

of how Pacific Island communities cope and recover from natural disasters, despite high frequency of disasters and vulnerability. Notably, when evaluating exposure to natural hazards and societal vulnerability, four out of the ten countries at greatest risk in the world are located in the Pacific, and the population in Vanuatu is at highest risk in the world to suffer from natural hazards (UNU-EHS, 2015). Year 2015 saw Vanuatu hit by the worst cyclone in its history (category 5 Tropical Cyclone Pam), and in February 2016 Fiji was impacted by the most powerful cyclone ever recorded in the South Pacific Basin (category 5 Tropical Cyclone Winston). Both weather events left a swathe of lost lives, destroyed infrastructure and ruined livelihoods.

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Pacific Island populations are concentrated along the coasts where they rely heavily on fisheries resources for their livelihoods and food security (Govan, 2009; Foale et al., 2013; Sulu et al., 2015). But here, they are also exposed to rapid environmental change and natural hazards (Bell et al., 2011). For Pacific Island communities, the effects of climate change – including increase in temperature, increased frequency of extreme weather events, changing chemistry of oceans, sea level rise and increasing unpredictability of rainfall – pose serious threats to coastal ecosystem goods and services (Bell et al., 2016). There is a need for evaluations of impacts and coping strategies that are attuned to the Pacific way of life, with its high reliance on natural resources, and its unique customary practices for governing resources. Prompted by TC-Pam, this study sought to understand the impacts of shocks in communities and the role of fish in Ni-Vanuatu lives as they persevere and recover.

Vanuatu has a long history of customary coastal management practices (Johannes, 1998, 2002; Foale et al., 2011). The customary tenure, traditional ecological knowledge, and existing leadership structures are the foundation of community-based fisheries management in Melanesia (Govan, 2013). While fish is an important resource for daily life in Vanuatu, Ni-Vanuatu communities build their livelihoods from a range of natural assets, and fish and fishing must therefore be considered within a broader livelihood framework. This reasoning aligns with the requirement for integrated understandings about livelihoods and disaster coping strategies (Pomeroy et al., 2006). Therefore, this study assesses impacts across the five key livelihood capitals that constitute the asset pentagon in the sustainable livelihoods framework (e.g. DFID, 1999; Allison and Ellis, 2001). In addition, while TC-Pam was a historical event in Vanuatu's history of natural disasters, the assessment in this study sought to evaluate shocks and their impacts beyond the singular event of TC-Pam. Our study analyzed three dimensions of disaster and coping processes in Vanuatu between March 2015 and August 2016:

1. Shocks and their impacts
2. Assessment of impacts on livelihood capital assets
3. Strategies to cope with impacts

The study analyzes these three dimensions to answer the key question on what roles fish and fishing play during and after periods of hardship. In answering this question, we identify new lessons to guide current fisheries policy and future disaster relief interventions.

2. Methods

2.1. Study sites and data collection

Focus group discussions were conducted 25 August to 29 September 2016 at ten sites across Shefa, Tafea, Malampa and Sanma provinces in Vanuatu (Fig. 1). The sites were selected to cover a range of circumstances and distances to the path of TC-Pam. Six sites were located within 60 km of the path of TC-Pam and were considered significantly impacted, while four sites were located 140 km or more from the central path of TC-Pam and were considered relatively un-impacted.

Two focus group discussions (FGD) were held at each site with groups of women and men separately. Each FGD was comprised of 4–8 individuals selected by community leaders to represent a cross section of the community. The field team consisted of three scientists experienced in FGD methodology, and at least one provincial fisheries officer. Focus group discussions were held in Bislama, the *lingua franca* of Vanuatu, with translation into local vernacular as required. Each FGD lasted for approximately 40–70 min and was audio recorded.

The FGDs aimed to understand the recent history of natural disturbances (shocks) at each site, how these had influenced livelihoods and natural resources and what role natural resources (specifically fisheries) played in recovery alongside other external support. To

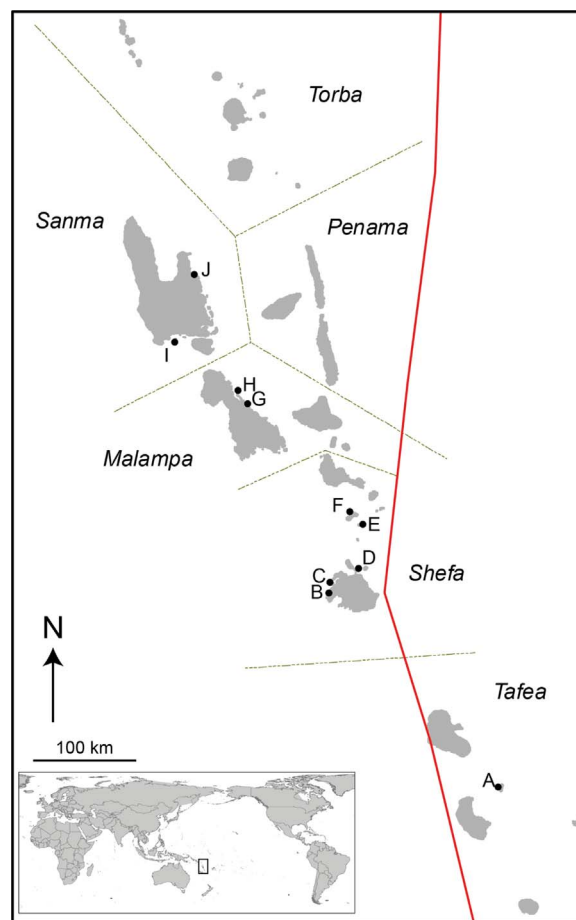


Fig. 1. Map of Vanuatu in the South Pacific. Sites are labeled A–J. The red line through the map represents the approximate path of TC-Pam in March 2015. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

complement the FGDs, informal discussions were held with community leaders to elicit general information on population, access to health, education, water and other key features of the village.

This study did not collect information at the household level: the findings in this study are indications of impacts and coping strategies built on the descriptions of community members in group conversation. As a result, we may not have captured the full picture of coping strategies that individuals or households may have taken.

2.2. Analytical framework

The assessment was structured using the livelihood assets component of the sustainable livelihoods framework. This component is considered a core element of the bigger framework (e.g. 1999), and comprises five key capital assets that construct livelihoods within an external context. This mix of capital assets is commonly illustrated as a pentagon where each tip of the pentagon represents each of the livelihood assets (Fig. 2):

The assets component is now an established framework that has been used to guide livelihood assessments in a myriad of contexts (e.g. Morse and McNamara, 2013). It was used in this study to organize the assessment of existing assets in study communities, and how these assets have been impacted by shocks at the time of the assessment.

The status of, and access to, assets prior to shocks and currently was qualitatively assessed and ranked upon completion of the FGD at a site. The audio recording of the FGD was used if required to confirm the thematic conversations and assist in the assessment. Informal conversations with community leaders were used to further clarify or confirm

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