

Chapter 40

Farming Adaptations to the Impacts of Climate Change and Extreme Events in Pacific Island Countries: Case Study of Bellona Atoll, Solomon Islands

Viliamu Iese

The University of the South Pacific, Fiji

Elisabeth Holland

The University of the South Pacific, Fiji

Joseph Maeke

The University of the South Pacific, Fiji

Morgan Wairiu

The University of the South Pacific, Fiji

Sumeet Naidu

The University of the South Pacific, Fiji

ABSTRACT

Farmers in Pacific Islands' communities are considered to be most vulnerable to the impacts of increased temperature, sea-level rise, droughts, cyclones, and heavy rainfall. Farmers living on a raised atoll in the Solomon Islands (Bellona) were interviewed to understand their perceptions and experiences on the impacts of climate change and extreme events on their crops. Some examples of damage and impacts according to the farmers included rotting of roots, damage to leaves and branches, and destruction of fruits and valuable yields. Interviews also revealed that the ability of farmers to recover after disasters was dependent on their pre-disaster conditions, number and varieties of crops they had planted, type of cropping system in use, and consistent use of simple, traditional, and innovative adaptive techniques. Such techniques included crop rotation, change of planting and harvesting dates, and the planting of new resilient varieties.

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INTRODUCTION

The growth, development and production of food crops depend on both climatic (e.g. rainfall, temperature, humidity) and environmental (e.g. soil, water availability and topography) variables being sufficiently available and there is adequate protection from external factors (invasive species, pest and disease) (Wairiu et al. 2012). Any changes or shifts in the climate will therefore affect the physiology and output of food crops. While climate change will have global impacts, impacts on small islands are likely to be particularly significant. Mimura et al. 2007 asserted “*Small islands, whether located in the tropics or higher latitudes, have characteristics which make them especially vulnerable to the effects of climate change, sea-level rise and extreme events*”. These small island characteristics include their small area size, remoteness, isolation, exposure to extreme events or natural hazards, high or increasing population, low adaptive capacity and poor infrastructure and governance (Barnett and Adger, 2003). Both subsistence and commercial agriculture will be affected on small islands (Mimura et al. 2007). However, while coastal agriculture is likely to be most impacted by sea level rise causing inundation, intrusion and soil salinization, inland agriculture will be most vulnerable to extreme events such as flooding and drought (Mimura et al. 2007). As a consequence of climate change, the highest reductions in agriculture potential will be felt by the small Pacific Island countries (PICs) amongst other developing countries (ADB, 2009). Within PICs, it is the atoll islands and their inhabitants that are at greatest risk of climate change and extreme events (Barnett and Adger, 2003). Exacerbating this situation is the large dependence of PICs on their natural resources. Low-lying atoll countries such as Tuvalu, Kiribati and the Marshall islands are already experiencing the impacts of climate change and extreme events on their food crops, coastal fisheries and water (FAO, 2008). The Solomon Islands contains both atoll and low lying islands and also has problems in common with other atoll countries. Many Solomon Island communities on low-lying atolls are experiencing climate change impacts through sea level rise, salt water intrusion and extreme events (cyclones, droughts etc.) and have witnessed changes in the main staple food crops (Wairiu et al. 2012). One such atoll community is Bellona, located in southern Solomon Islands. The Bellona community has already experienced climate variations such as low rainfall and frequent cyclones which affected their food security and livelihoods (PACC, 2006; Rasmussen et al. 2009). In turn these impacts have been correlated with reduction of food production and food security. The Bellona community lacks adequate infrastructure. Difficulties in receiving service delivery from both the national and provincial governments are further highlighted by widespread tropical cyclone damage. For example, in the past five decades, four major cyclones have directly impacted the atoll, causing severe and extensive damage to crops, infrastructure (water tanks) and rural livelihoods (Reenberg et al. 2008). In many cases, periods of drought have followed cyclone events (Reenberg et al. 2008).

This chapter uses survey data from households and focus group discussions with farmers and elders to provide valuable insight into the impacts of climate change related extreme events on food crops in Bellona raised atoll in the Solomon Islands. Adaptation strategies that farmers have implemented to reduce crop yield loss and build their resilience against climate change uncertainties are also presented. Finally, conclusions and future research opportunities are considered.

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