

Navigating the Livelihood Landscape in Tonga

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Abstract

Many people in Tonga rely on services from the landscape to support their livelihoods, yet inhabitants remain acutely vulnerable to the impacts of a changing climate. This article presents examples of policy and project interventions which are impacting landscape users through trade-offs in managing natural resources, particularly around water and food security. Our reflections advocate the importance for holistic intervention approaches, designed and implemented to support rural livelihoods, promote landscape sustainability, and build climate resilience.

1. Introduction

The Kingdom of Tonga, a Polynesian archipelago nation of 170 islands spanning 700 km² across the South Pacific, has a relatively small population of approximately 100,000 people (1, 2). Whilst 70% of the population inhabits the island of Tongatapu, the level of urbanisation remains quite low, with estimates suggesting that 88% of the population still reside in rural areas (3). The majority of these rural communities are dependent upon the agriculture and fisheries sectors for their livelihoods (4), and careful management of the natural environment for future generations is therefore vital for ensuring sustainability of local livelihoods, particularly to safeguard water, food and energy security. Current policy and project interventions, such as special management areas (SMAs), are being executed to improve the health of marine and terrestrial environments. Future initiatives are also being considered, such as the government's proposed water bill to improve active management of groundwater resources. These interventions are important to build landscape resilience, particularly in the wake of recent climate events whereby decimating environmental impacts have ensued. For example, Cyclone Ian swept through the northern islands of Vava'u and Ha'apai in 2014, and Cyclone Gita the southern islands of Tongatapu and E'ua in 2018, leaving a large proportion of the population without shelter, power and water, as well as inadequate local food supplies. Here, based on our field observations, we reflect upon why despite the best intentions of management approaches, sometimes project and policy interventions are limited in effective development and implementation at the landscape scale.

2. Managing natural resources

Acknowledging the conflicts that can arise around natural resource management is imperative. In Tonga, landscape users are embedded in a traditional knowledge system that generally promotes the natural environment as an unrestricted resource. Simultaneously, government-imposed approaches are administering interventions that control access to natural supply. In the case of water accessibility, rural communities depend upon rainwater reserves as a supplement to groundwater wells, which are often poorly managed by village water committees due to the on-going costs and required expertise for maintaining infrastructure (5). Under current conditions, communities lack 24-hour water supplies, and groundwater is at increasing risk of saltwater intrusion, chemical

contamination, and leakage (6). The government has recently proposed legislation changes to water policies that aim to permanently take control of managing and maintaining groundwater wells for a fee; this has generally not been well-received by rural communities.

Within the marine environment spatial restrictions have been placed on marine resources by the government to try to restore degraded ecosystems through implementing SMAs. Whilst this designation status seeks to empower local communities to act as guardians for enforcing environmental protection, it also restricts fishing, and fishers have reported counter-activities, such as the use of products like dynamite, to enhance catch potential. Unsurprisingly, such practices can have devastating long-term environmental impacts. Overall reductions in marine resource accessibility have lowered the amount of fish in the local diet, and consequently the intake of processed foods and imported meat has increased. It seems that SMAs are protecting local nutritious food supply for the future without accompanying strategies to alleviate short-term impacts and stress on local livelihoods. One potential option being voiced is to investigate diversifying the aquaculture industry from purely commercial activities to supplying local nutritious food, and thereby increasing human capital.



Photographed by: Helena Shojaei

Fig 1 A trial plot of irrigated taro being cultivated by a commercial copra farmer; irrigation infrastructure is unaffordable for the majority of farmers in Tonga (left). Yams are an important staple crop in Tongan diet and a local cash crop (top right). Widespread kava dieback disease affecting crops in the islands of Vava’u (bottom right).

On the land further issues of natural resource management can be exemplified. In the early 1990s reports suggested that many squash farmers did not adhere to government advice regarding planting during the drought years, and as a result were affected by considerable profit losses and food scarcity

(6). More recently, further reports suggest inexperienced and small-scale farmers have planted other water-intensive crops, such as watermelon, during predicted drought periods in an attempt to maximise income. Such decision-making produces significant challenges for a country not equipped with adequate irrigation infrastructure, whereby farmers are forced to hand-water their crops from groundwater supplies; a water trade-off which compromises freshwater reserves used for all household needs. Other higher revenue crops have instigated similar resourcing issues. Rising market prices for kava have attracted an increasing number of farmers to cultivate the export crop, resulting in reduced fallow years, increased deforestation, land-clearing and mono-cropping. Additionally, the proliferation of kava planting has contributed to the rapid spread of kava dieback disease which is currently affecting 50% of the plantations in Vava'u (Fig 1). This poses a significant threat to people's incomes and the possible initiation of a local food security crisis.

3. The climate change challenge

Such issues related to water and food security demonstrate apparent trade-offs between direct economic returns, environmental preservation and sustaining livelihoods. External pressures are also compounding these challenges, particularly those related to climatic conditions. In Tonga, rising temperatures during the wet season are increasing biosecurity risks for the export of commodity crops. Sea level rises of 6mm have already resulted in coastal land erosion which, when coupled with ocean acidification, poses serious threats to fish habitats (7). Furthermore, estimated increases in the intensity of cyclones presents significant risk to both local infrastructure and food supplies (7). Building climate resilience within farming communities is critical, yet some weather predictions and forecasts have been deemed unreliable which has resulted in select farmers choosing to ignore official weather updates and advice, instead relying on more traditional methods of gauging the weather patterns and 'hoping for the best' by focusing on the lunar calendar. Through observations, it seems that weather advice is often only adopted where strong social relationships exist between the farmer and the agency providing the advice, rather than out of respect for authority, unless regulations are being lawfully enforced. We advocate that trust and communication are essential for supporting the sustainability of community livelihoods across Tonga.

4. Communication and collaboration

There is no quick or easy solution to addressing these natural resource challenges for supporting livelihoods and ensuring sustainable multi-functional use of landscapes. However, there are mechanisms which could help build climate resilience for environmental livelihood security more effectively. Improved communication between various stakeholders, such as between government ministries and with community participation, could be realised to co-develop complementary interventions. Several interdisciplinary boards have been initiated and subsequently folded over recent years, largely due to unreliable funding resources. Reliance on short-term one-off grants (often financed from foreign aid) presents continuing obstacles for ongoing collaboration. Yet, if

relationships between stakeholders can be strengthened and sustained, perhaps this would present improved focus for investing and targeting interventions to benefit multiple landscape users. Effective collaboration could enhance the productivity of information flows to reinforce the value of climate resilient-building projects and policies across the landscape.

5. Sustainable climate-smart landscapes

Across Tonga there are a variety of stakeholder groups, at various levels, involved in activities that shape how landscapes function and are used. As expected, the primary interests of these stakeholders vary, such as increasing economic returns from agriculture versus ensuring ecosystem sustainability. This is fuelling growing competition for limited natural resources (8) which presents various socio-cultural conflicts and difficulties. Research suggests that adopting a “landscape approach”, which provides a set of guiding governance principles and explicitly acknowledges the diversity of stakeholders (9), can provide the basis from which all interest groups can negotiate climate-sensitive landscape management strategies. A research project currently underway is seeking to use geovisualisation techniques and tools to support interdisciplinary stakeholder interaction, through communicating governance structures, examining trade-offs, negotiating strategies and enhancing understanding of collective problems (Fig 2). This project is aiming to navigate the complexities and challenges of Tongan landscapes to help enhance the capacity of landscape users to mitigate and adapt to present and impending climate threats which are, and will continue to affect water, energy and food security for supporting sustainable livelihoods. Find out more at www.livelihoodsandlandscapes.com.

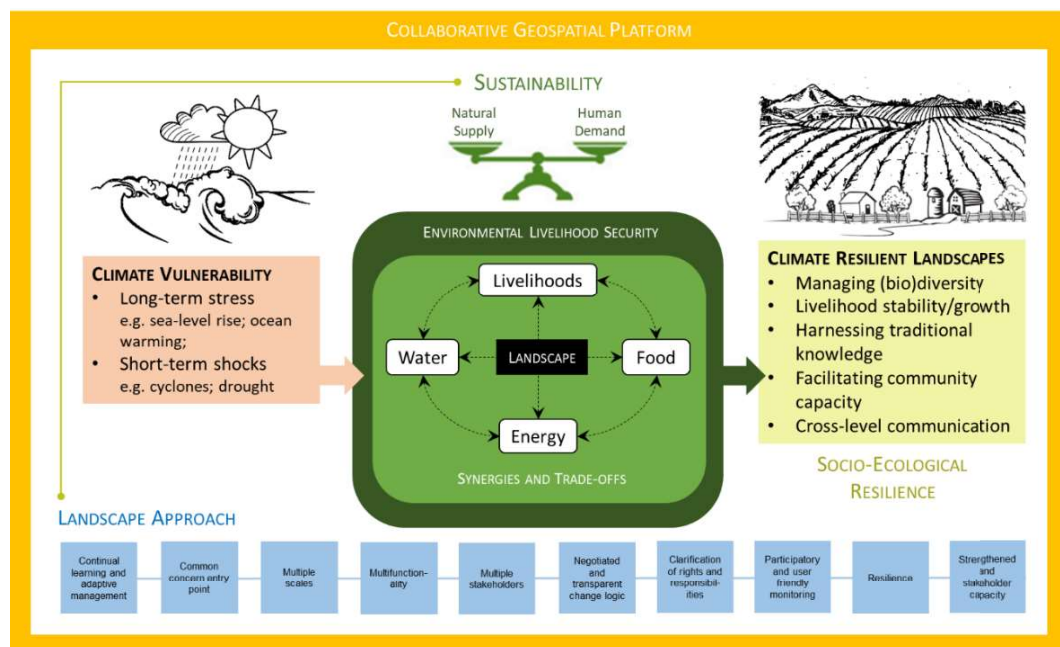


Fig 2 The process being followed to co-develop a collaborative geospatial platform. This tool development is following a landscape approach aiming to enhance environmental livelihood security and help build climate resilience in the South Pacific.

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