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Forest scholars empowering communities: A case study from the East Coast of New Zealand

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ABSTRACT

Forests and forestry in many forms are instrumental in contributing positively to environmental, social and economic outcomes in New Zealand. However, simply increasing production or efficiency has not always realised positive benefits for communities. In a current programme on the East Coast of New Zealand, we are undertaking action research to develop culturally appropriate adaptive governance capacity in forest-dependent and rural communities. These communities do not necessarily want more intense or increased forest or agricultural production. They must manage the tensions inherent in an increase in forest and agricultural production, while dealing with severe erosion and a range of social, environmental, economic and cultural aspirations. The processes we are experimenting with are designed to understand land-use actors, their interests, networks and perceived challenges. Using this information, we apply adaptive governance and Kaupapa Māori principles to encourage collaboration and innovative thinking and decision-making. This work is innovative in that it has not been done before in New Zealand, can be scaled up and across contexts, and shift thinking away from traditional forest approaches (i.e. exotic monocultures) that have not worked. This paper will present the conceptual framework for this study and some preliminary results around empirical tools.

1. Introduction

Forests provide society with significant benefits to the public and their private owners. Internationally, the formal forest sector contributes approximately 421 billion USD to national GDPs globally (Food and Agriculture Organization FAO, 2014), along with other public and private benefits. The FAO (2014) has also estimated that the value of the informal forest sector is approximately 124 billion USD, as at 2011. FAO (2014) data shows that the contribution of forestry to global GDP in 2011 was 1%; however, its relative contribution to the overall economy has declined due to faster growth in other sectors.

This background helps set the scene across New Zealand, where afforestation has predominantly been undertaken with the primary economic species, *Pinus radiata*. The current path is thus dominated by radiata pine log exports; the New Zealand Forest Owners Strategic Plan calls for increased export earnings of 8.7 billion USD by 2022 from the current level of 3.4 billion USD, through an alternative path. The strategic plan also calls for the "strong promotion of wood, diverse export markets, transformed construction industry, high-value wood-based manufacturing streams, and growing domestic processing capacity, supported by collaborative and aligned industry sectors" (Forest Owners Association FOA and Ministry for Primary Industries MPI, 2014: 41).

The current and future paths, however, both rely heavily on timber products from planted exotic forests. Native trees were considered, and at the time of the strategic plan in 2014, seen to have uneconomic growth rates. There was no consideration of alternative or non-timber products. Value can be extracted from these alternatives, as well as from the use of public benefits from forests. Public benefits or ecosystem services are often broken into four categories – provisioning services, regulating services, cultural services, and supporting services (Millennium Ecosystem Assessment MEA, 2003). New Zealand forests provide a number of specific ecosystem services including wood, fibre, ginseng, honey and oils (provisioning functions) (Dymond et al., 2012).

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Regulating functions include flood mitigation, avoided erosion and carbon sequestration (Bicknell et al., 2004; Jones et al., 2008; Yao et al., 2013). Cultural services include spirituality, aesthetic experiences, native species conservation (utility for Māori[1]), carbon sequestration and other non-tangible values (Harmsworth and Awatere, 2013; Yao et al., 2013; Yao et al., 2014).

In this paper, we present an integrated conceptual approach for implementing forestry futures in New Zealand which accounts for traditional timber values and alternative forest benefits and actors. We situate our approach in the context of New Zealand's Waiapu Catchment, where flood mitigation, avoided erosion, provisioning functions, and cultural services are of crucial importance to local communities. We describe the case study area and research background below before introducing and synthesising the three components of our conceptual approach. We follow with a discussion of potential and current methods and application of the approach, including preliminary insights and lessons learned from the Waiapu Catchment case study.

1.1. Case study area

The Waiapu Catchment on the East Coast of the North Island of New Zealand (Fig. 1) covers 173,400 ha and includes the Mata and Tapuaeroa Rivers, which join to form the Waiapu River. The catchment and its tributaries have some of the highest erosion and sedimentation rates in the world at approximately 35 Mt per year (Page et al., 2000; Miyamoto et al., 2003; Addington et al., 2007; Marden et al., 2012). This sedimentation has resulted in the aggradation of the river beds at a rate of around 0.2 m per year (Marden et al., 2012) resulting in the burial of alluvial land, roads, bridges and buildings, and an ongoing threat of flooding to homes, settlements and towns along the river (Bloomberg and Davies, 2012).

However, before the arrival of Europeans and even Māori (~ 600 years BP), the East Coast region was almost completely covered by native podocarp and hardwood forest (Marden et al., 2012). The erosion, therefore, can be attributed to the arrival of significant numbers of European settlers in the mid-19th century, who went about clearing native forests to create a landscape of short pasture for sheep and beef farming (Bloomberg and Davies, 2012), leading to today's severe erosion problems. Reforestation of the catchment is seen as essential (by all parties) to reverse the ongoing effects of erosion. There have been concerted efforts by the Ministry for Primary Industries (MPI) and the Gisborne District Council (GDC) to achieve this with the Erosion Control Funding Program (ECFP). However this is a classic case of a top down approach that has had to be updated and tweaked to achieve its primary goals.

The biogeophysical environment, along with the social and economic environments were devastated in 1988 when the area was hit by Cyclone Bola. The cyclone was the largest magnitude storm and rainfall event on record in New Zealand, leading to severe hillslope erosion and resulting in an estimated 7.3 million USD damage (Scion, 2012). The cyclone also caused extreme rates of erosion and river aggradation (Scion, 2012).

According to the 2013 Census, the Waiapu Catchment is home to 2091 inhabitants, with 750 (36%) in Ruatoria, the main township in the area (Stats, 2014). Compared to the population in 2006 (2304 [Scion, 2012]), the population has decreased by 9% over seven years. Scion (2012) noted that while the population was slowly increasing through the 1980s until 1986, it has been in decline since.

The ethnic makeup of the population in the catchment is self-reported as 29% European, 84% Māori and 6% other ethnicities (Stats, 2014).[2] These numbers show that the area is sparsely inhabited, with the population overwhelmingly Māori. The Waiapu Catchment suffers from the highest levels of socio-economic deprivation in New Zealand, according to the New Zealand Deprivation Index 2013 (Atkinson et al., 2014).

The Waiapu Catchment is of great spiritual, cultural and economic significance to Ngāti Porou (the local Māori tribe or iwi), and the health of the catchment extends well beyond the physical elements of the landscape. Across each of the social, economic and environmental challenges facing the Waiapu Catchment and the people that live there is the holistic worldview of Ngāti Porou. Renewed interest in the social, economic and environmental wellbeing of the Waiapu Catchment has emerged from the recent Treaty of Waitangi settlement between Ngāti Porou and the New Zealand Crown (c.f. Gibbs, 2006).

As part of the Treaty of Waitangi settlement between Ngāti Porou and the Crown, a 100 year Memorandum of Understanding (MoU) was signed between Ngāti Porou and the Crown (represented by MPI and GDC) in 2014, binding the three entities to the lofty goals of healthy land, healthy people, and healthy rivers (MPI, 2014). The first clause of the MoU states "… the Crown recognised the significance of the Waiapu River to Ngāti Porou and the impacts of erosion in the Waiapu Catchment … and acknowledged damage from deforestation [and] *the exclusion of Ngāti Porou from historical erosion control and catchment management decision making…*" [*emphasis added*] (MPI, 2014: 1).

1.2. Research and governance context

The current project was conceived and implemented with Ngāti Porou research partners as a continuation of previous research in the Waiapu Catchment. Past work mapped the vulnerabilities and capabilities landscape of the catchment and identified key gaps in existing governance structures and processes which hinder transformational change (Page et al., 2000; Scion, 2012; MPI, 2014; Warmenhoven et al., 2014). The conceptual approach we present here integrates adaptive governance, action research, and Kaupapa Māori frameworks to help address these gaps. Kaupapa Māori, a philosophy that centres Māori knowledge, attitudes, skills and values, is essential for research in our case study community and the New Zealand context more generally.

Many of the goals for the Waiapu Catchment (social, cultural, environmental and economic restoration) have already been attempted through traditional government policy actions. However, the community aspirations are often absent or overlooked in favour of mainstream economic goals. This oversight is reflective of the slow emergence in New Zealand of the globally ongoing turn towards governance, focusing on stakeholder and public participation in forest-related decision-making (Secco et al., 2014; Wallin et al., 2016). Despite its delayed emergence, the use of adaptive governance frameworks is critical to effectively engaging the complex, long-term social, ecological, economic, and cultural challenges facing the Waiapu Catchment (Adger et al., 2005). The research was further shaped following an action research approach, where the foundational philosophy was to engage local Ngāti Porou researchers and aspirations as central to the project (Warmenhoven et al., 2014). The research programme thus carries on a five-year 'tradition' where researchers are 'embedded' in local communities, where several of the researchers involved in this and previous projects are local community members. Given the case background and history, the project jointly incorporates a Kaupapa Māori framework.

The research is being undertaken with the tacit approval and encouragement of a wide variety of interested community and governmental parties – planners, soil experts, engineers, conservation officers, land managers and local Māori. The aim of the research is to test adaptive governance principles in an indigenous context in New Zealand in order to bring about new ways of thinking for decision-makers. The approach may be localised to the Waiapu Catchment; however, the principles involved may be scaled up and 'out' to other communities as well as at larger scales (i.e. regional or national scales).

We believe that an adaptive approach to governance is essential to

[1] Māori are New Zealand's indigenous people.

[2] Statistics New Zealand allows respondents to select up to three ethnic backgrounds, which accounts for the total being greater than 100%.