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Assessing retrospective and prospective landscape change through the development of social profiles of landholders: A tool for improving land use planning and policy formulation

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ABSTRACT

Land use planners, natural resource managers and policy-makers need to better anticipate and respond to the widespread changes and increasing pressures affecting land and seascapes. Social science and social–ecological research can play an important role in addressing these issues, as many – if not all – of the issues and solutions are human in nature. This paper explores the potential for utilising social profiles of a wide range of landholders in two rapidly changing agricultural landscapes in the Wet Tropics of Australia as a means to interpret historical land use change, and to assess the potential for future landscape change trajectories. The social profiles, developed from qualitative interview analysis, are based on key characteristics of different groups of landholders and include: (1) length of farm occupancy, (2) farm size, (3) farm 'survival' strategy, (4) commercial crops grown, and (5) landholder values attached to place. A set of social profiles emerged from the two locations that indicate an evolving agricultural and social landscape that is associated with changing perceptions and values—especially around the themes of rural space, land occupancy and use and management of that space. These profiles, in combination with an understanding of the changing economic and social context of the region, provide a means for improving land use planning, natural resource management and policy formulation, particularly in locations where a shift in the social profile may be occurring, creating opportunities for large-scale landscape change.

1. Introduction

Landscape planners have, for a long time, argued that the interests and needs of different landscape users and managers should be taken into account as professionally as the mapping of vegetation, soils, or land use in any planning process (e.g. Luz, 1993, 2000; Nohl, 1997; Bruns et al., 2000). To achieve this goal, Luz (2000) suggests the introduction of a 'social layer' in the superposition of thematic maps, which are generally used in planning processes, based on the collection of social and economic data from local stakeholders (e.g. Gravsholt Busck, 2002) and through local participation (Buchecker et al., 2003; Bohnet and Smith, 2007). As landholders are the key local stakeholders who actively use, manage and change landscapes, Primdahl (1999) argues that they should be included in landscape research, planning and management. He also argues that landholders should be considered as key stakeholders by planning and management authorities because it is they who are able to implement or oppose planning goals and measures derived from scientific data. However, planning and resource management remain the domain of the natural and applied sciences and, as a result, people are seldom perceived as an integral part of the cultivated landscape (e.g. Naveh, 2001; Tress and Tress, 2001). In the recent past, however, there has been recognition of the potential roles of local stakeholders as co-researchers, co-managers and policy advisors to achieve desired planning and management outcomes (e.g. Jessel and Jacobs, 2005; Plummer and FitzGibbon, 2006).

Social profiles or landholder classifications are typically being developed by rural sociologists and rural development personnel to better understand the variety of social (e.g. level of education, social networks) and economic (e.g. farm income, debt level) circumstances and value systems within a rural community, how this variation affects their land management attitudes and behaviour (e.g. uptake of a new technology), and how the differences subsequently lead to variation in the impacts of policies and programs across the community. Emtage et al. (2006) provide a review of landholder typologies developed in Australia in relation to natural resource management and suggest that landholder typologies provide a broad indication of the variations in the characteristics of landholders and are therefore important for targeted policy and program formation in natural resource management.

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To support an enhanced role for social data and stakeholder participation in land use planning and policy development, this research sought to understand the causes and consequences of landscape change occurring in two contrasting agricultural landscapes—one coastal and one upland landscape in the Wet Tropics region of Far North Queensland. In particular, the usefulness of developing social profiles for a wide range of landholders in these rural landscapes was explored by addressing the following questions:

(1) How does the current social profile of the rural farming community reflect the historical patterns of social and landscape change?
(2) How do different groups within the profile respond to, and therefore change, the biophysical landscape?
(3) How does the relative composition of the groups change over time, and how is this reflected in the landscape?

Further, the results of this research were explored in terms of the application of social profiling as a tool for improved management of change within existing planning processes.

2. Background and context

Intensive agriculture created considerable wealth over the last century in the small farming communities of the Wet Tropics region. However, while the sugar industry, the main agricultural industry along the Wet Tropics coast, faces potential long-term decline because of deteriorating terms of trade, the tourism industry has been growing rapidly (McDonald and Weston, 2004) and now has higher economic value and provides more employment in the region (Productivity Commission, 2003). Since the listing of the Wet Tropics World Heritage Area (WHA), conservation and primary production have usually been treated as mutually exclusive in the region. There is a perception that conservation takes place in the WHA, whereas primary production, urban expansion and economic development are happening elsewhere, to the exclusion of conservation.

However, there is now increasing recognition that management across boundaries is needed to address the key development and management challenges faced by the Wet Tropics. For example, changes in agricultural land use and management practices are advocated under the 'Reef Water Quality Protection Plan' as a critical mechanism for reducing land based run-off entering the Great Barrier Reef lagoon (Australian Government & Queensland Government, 2003). Similarly, habitats within the agricultural landscape (outside the WHA) are in need of preservation or rehabilitation to ensure that ecosystem processes are sustained to support terrestrial and aquatic biodiversity. At the same time, agriculture, tourism, urbanisation and recreation need to be recognised as increasingly competitive land uses for both developed and natural areas, which raises the question of how to sustainably develop these rural landscapes and communities (Barr, 2003; Centre for Rural and Regional Innovation Queensland, 2005). The two contrasting rural landscapes studied in this research, the Mossman coastal and the Julatten upland landscapes are cases in point.

3. Methods

3.1. Case study locations

The Wet Tropics bioregion stretches over 500 km along the Queensland coast between Townsville and Cooktown and forms a strip approximately 50 km wide (Fig. 1). In 1988, the Wet Tropics bioregion was recognised for its exceptional environmental values and some 900,000 ha (48%) of the bioregion was given World Heritage status. The major vegetation type of the World Heritage Area (WHA) is rainforest. It contains the highest biological diversity in Australia and is recognised as one of the mega-diverse regions of the world (Williams et al., 2001). The bioregion occupies approximately 1% of Queensland, yet provides about 10% of the gross values of agricultural production in the state and about 22% of tourism activity (Natural Resource Management Board, 2002). The Great Barrier Reef, also inscribed on the World Heritage list, borders the Wet Tropics to form a unique setting where two WHAs meet (McDonald and Lane, 2000).

Both the Mossman coastal and the Julatten upland landscapes are located in the northern part of the bioregion (Fig. 1). The Mossman coastal landscape is fully surrounded by WHAs; the mountainous Wet Tropics rainforest to the west and the Great Barrier Reef to the east. Sugarcane is the dominant agricultural land use on the coast (Fig. 2). The second case study area – Julatten – is located southwest of Mossman, and is an upland landscape partly surrounded by World Heritage rainforest which opens up towards the west, where dry sclerophyll woodlands replace rainforest (Goosem et al., 1999). Improved pastures for cattle production are a common feature in the Julatten landscape (Fig. 3). The climate on the coast is characterised by very humid summers and mild, relatively dry winters (Murtha, 1989), whereas the climate in the Julatten area, at an altitude of 440 m, is more pleasant and less humid than the coast. Rainfall ranges from about 1100 to 1700 mm on the Julatten uplands and from about 1800 to >3000 mm on the coast with sharp rainfall gradients. Mean maximum summer temperature on the coast range from 30 °C during December and January to 25 °C during July. Mean monthly minimum temperatures range from 24 °C in January to 17 °C in July (Wilson, 1991). In the Julatten uplands occasional frosts may be experienced in the winter months of June to August.

3.2. Historical analysis and current landscape character

The historical analysis involved a review of local literature, a wide range of reports, and comparisons between historical and current cadastral maps, aerial as well as landscape photographs. Bioregional ecosystems descriptions (Goosem et al., 1999) and map overlays of different landscape factors (e.g. geology, landform, soils, climate, vegetation, land use) assisted in the identification of areas with common landscape characteristics, such as particular combinations of geology, landform, soils, vegetation, land use, and settlement pattern. In addition, data on aesthetic and perceptual characteristics and condition of the landscape were recorded in the field, all of which contribute to the current landscape character (Swanwick and Land Use Consultants, 2002). The historical analysis and current landscape character informed the development of the interview questions (see below).

3.3. Social profiles through qualitative interviews

Given that the primary objective of this research was to assess retrospective and prospective landscape change as determined by social profiles and historical analysis, it was important to include the widest possible range of landholders from different locations within the study areas. The aim was not to extrapolate from a representative sample, but to explore through a micro-sociological case study analysis the defining features, motivations, views, values and management approaches of the different landholders in order to separate them into distinctive groups (Yin, 2002).

In total, qualitative data were collected from 30 semi-structured interviews with 42 respondents (Table 1). The interviews were both