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## **USING COMPLEX ADAPTIVE SYSTEMS TO INVESTIGATE ABORIGINAL-TOURISM RELATIONSHIPS IN PURN ULULU NATIONAL PARK: EXPLORING THE ROLE OF CAPITAL**

Resource management systems such as national parks are complex and dynamic with strong interdependencies between their human and ecological components. Their management has become more difficult as scale, impacts and consequences have increased and local communities have become increasingly involved. Increasing pressures from tourism have added to this management complexity. Complex adaptive systems thinking, and especially the metaphor of the adaptive cycle (Holling 2001), can potentially enhance our understanding of these resource systems, including national parks. The concept of the adaptive cycle can help understand changes over time in a system such as a national park.

Adaptive cycles are patterns of system development involving variations in capital, where capital is 'a stock with the potential to yield a flow of benefits' (Abel *et al.* 2006 p. 3). Variations in capital in turn affect a system's capacity to adapt to change. Systems with reduced capacity to adapt and respond to change in a positive way– for example, those with limited capital –lack alternative options to pursue in the face of change (Lacitignola *et al.* 2007). Exceptions to the adaptive cycle exist and systems will not always follow an adaptive path (Walker *et al.* 2006). Rather, systems may move into maladaptive cycles characterised by rigidity, poverty or 'lock in' traps (Allison and Hobbs 2006). In such systems, the capacity to adapt is either constrained or missing (Carpenter and Brock 2008). In social systems, the capacity to adapt has been linked to social capital.

The concept of capital provides a novel, innovative way of describing the relationship between national parks, tourism and Aboriginal people. It is considered within the context of complex adaptive systems, to allow for change and complexity, both hallmarks of this tourism interface. Purnululu National Park in the Kimberley region of Western Australia, and the associated Aboriginal community of Warmun, is the focus of this paper. Although Purnululu is an iconic World Heritage destination, the benefits from tourism are not necessarily being realised by the local Aboriginal people. In this study, the concept of capital helped to understand the relationships, changes and interactions (Walker and Salt 2006)

between tourism associated with Purnululu National Park and the Warmun community. Specific objectives of the study were to describe the opportunities and barriers to local involvement in protected area tourism, and analyse these using the concept of 'capital'.

An ethnographic approach emphasising 'lived-in' experience and the explicit consideration of context guided the inquiry (Tedlock 2000). Repeat semi-structured interviews were used to investigate local community perceptions of tourism in Purnululu and their place in it. Geographical ideas of community – occupying a discrete spatial location and centred on the Park – were adopted as the most appropriate unit of analysis for this research. The rationale behind this choice was the localised nature of Park tourism and the assumption that communities adjacent to Purnululu would be well placed to engage with Park tourism. For cultural reasons the sample consisted of sixteen elders and their immediate family members with authority to discuss the Purnululu area. Questions sought local Aboriginal perceptions of the importance of and ways in which the Park and tourism were beneficial or had a negative impact on the community.

This ethnographic approach revealed that tourism created opportunities for local people through patronage of local businesses, including a community-owned roadhouse and art gallery. These two venues hosted most of the interactions between locals and tourists. Passing tourist trade was a crucial source of income for many community members, representing a key benefit afforded by Park tourism. Direct employment within the Park was a further benefit. Tourist patronage and direct employment represent an opportunity for enhancing the financial, social and human capital of local people. However, both of these were limited in extent. Respondents recognised the potential but unrealised opportunities available to them through cultural tourism, such as guided Park tours or welcome to country ceremonies.

Barriers to local involvement in Park tourism included the lack of money for the Park managers to employ local people (i.e. inadequate financial capital) as well as limited skills (i.e. inadequate human and social capital). Many respondents, however, appeared content to remain separate from Park tourism. This was often linked to a 'lack of motivation'. Lack of motivation may be viewed in two ways. Firstly, in terms of limited human and social capital, which includes the skills, knowledge and networks needed to successfully engage in Park

tourism. Secondly, lack of engagement is a cultural choice and should not be interpreted as a lack of motivation or a concern related to social capital.

Results indicated that several avenues existed through which locals engaged with Park tourism, leading to increased income. Social and human capital was also built to some degree. However, the ability to develop relations further was constrained by limits in local human, social and financial capital. These limited stores of capital potentially translate into a reduced capacity to adapt. Overall, findings suggest that the local Aboriginal community lacks adaptive capacity and is stuck in a 'poverty trap' (Carpenter and Brock 2008). External inputs, such as investments in skills development and education, are potentially important means for building local human and financial capital. Such investments could increase the capacity of local Aboriginal people to adapt to change, thereby breaking the poverty trap.

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