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A social contract with the ancestors—Culture and ecosystem services in southern Madagascar

Jacob von Heland [a,*], Carl Folke [a,b]

[a] Stockholm Resilience Centre, Stockholm University, 106 91 Stockholm, Sweden
[b] Beijer Institute, Royal Swedish Academy of Sciences, PO Box 5005, 104 05 Stockholm, Sweden

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ABSTRACT

We investigate the role of culture in sustaining essential ecosystem services in the arid and erratic climate of an agropastoral landscape in southern Madagascar. Our fieldwork and interviews in Ambovombe subprefecture in Androy addressed land use, agropastoralism, livelihood, institutions and their moral basis. Our analysis points to the interdependence of cultural practices and ecosystem services: sacred forests, crop pollination, subsistence farming, cattle economy and societal transition and purification rituals. We posit a social-ancestral contract that works as a moral attractor structuring and sustaining the agropastoral ecosystem services system. The contract between living and nonliving clan members underpins the cultural practices and rituals that regulate the vulnerable agropastoral system. We conclude that the well-being values of the inhabitants of the south of Madagascar depend upon moralities that lend legitimacy and stability to the management of the social–ecological processes that precondition ecosystem services production. Neither ecosystem nor culture delivers ecosystem services to society. Ecosystem services are generated by an interdependent social–ecological system in which knowledge, practice, and beliefs coevolve: culture is a key factor in their generation and persistence. The study suggests these are significant interdependences to consider in dynamic analyses of ecosystem service production.

1. Introduction

The ecosystem services approach has become integral to how we think about the future of humanity, the management of ecosystems, and the course of biological evolution (Norgaard, 2010). A major challenge for this approach is to better understand the importance of human feedbacks in upholding ecosystem services by learning from place-based long-term social–ecological research (Carpenter et al., 2009; Daniel et al., 2012). Our response to that challenge took us to a dryland site for research on ecosystem services and social–ecological systems: Androy, in southern Madagascar (Tengö et al., 2007; Bodin et al., 2006; Elmqvist et al., 2007; Bodin and Tengö, 2012). Archaeological evidence suggests that there have been at least four dominant livelihood systems in Androy during the last thousand years: (i) hunting-gathering around the 10th century AD, (ii) fishing with nets, spears and dugout canoes by mobile communities from around the same time, (iii) coastal trade up to the 13th century, (iv) agropastoralism from the 15th century to the current era, including the cultivation of cacti after their introduction in the 18th century (Battistini, 1964; Vérin, 1986; Parker Pearson, 1997; Fee, 2003). Each system exploited particular biological entities and processes, producing specific social–ecological dynamics between humans, land- or seascapes. From the 16th century to present a particular low-intensive agropastoral system has dominated. At present, more than 80% of the residents in the region depend upon agropastoralism for their livelihood and subsistence (CGDIS, 2005; WFP, 2009). However the ecology, geology and climate of Madagascar's south coast has produced an extreme environment for agropastoralism (Frère, 1958). Most challenging to the agropastoral system is an arid climate, irregular rainfall and cyclical droughts (Guèrin, 1966, 1969). Yet, in the face of such harsh conditions, the agropastoralists recover and restore the social–ecological processes of agropastoralism that provide the ecosystem services critical for their being.

In this article we are interested to understand how culture influences the long-term persistence of the agropastoral system in Androy. Specifically how social practices produce relations and feedbacks between heterogenous social and ecological processes resulting in an emergent agropastoral system, and how these

* Corresponding author. Tel.: +46 707272487; fax: +46 8 15 24 64.
E-mail addresses: jacob.heland@stockholmresilience.su.se, jacobvonheland@gmail.com (J. von Heland).

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social practices are articulated with reference to cultural norms, beliefs and values. To that end we analyze the agropastoral system of clan-based communities of Ambonaivo municipality in southern Madagascar.

In the article we link the discussion of ecosystem services in the Millennium Ecosystem Assessment (2005) to resilience thinking that deals with the interplay between abrupt change and persistence, adaptability, and the capacity of social–ecological systems to transform (Gunderson and Holling, 2002; Folke et al., 2010). This is combined with an analysis of cultural resilience (cf. Hastrup, 2009) based on our ethnographic fieldwork in southern Madagascar. Human culture contains and transmits morality, order and identity, shaping social and ecological relations over generations (Crumley, 1994; Lansing, 2006; Taylor, 2004; Barthel and Isendahl, 2012). Our approach derives from complex adaptive systems thinking (Levin, 1999) and a humans-in-the-environment perspective (Descola and Pálsson, 1996; Berkes and Folke, 1998).

The case study illustrates the tight interdependence of culture, resilience and ecosystem services. The findings show how people faced with uncertainty and change relate to, and interpret, a social contract with the ancestors to sustain their agropastoral system and its associated ecosystem services. We call this a *social-ancestral contract* (see section 2.3). We suggest that this ancestral contract has been an important inter-generational attractor that has guided the joined history of local groups and their highly fluctuating environment. Through an adaptive process of trial and error they have developed practices and rituals that maintain the agropastoral system and the ecosystem services they depend upon for subsistence. We propose that the social contract with the ancestors plays a significant role in understanding how the Tandroy-Androy social–ecological system in the south of Madagascar persists despite the vulnerability of the system to recurring climatic shocks.

The first part of the paper describes concepts, theory and methods and the agropastoral system itself. Our results are presented in three sections, beginning with the critical ecosystem services of the agropastoral system and unraveling the interrelationship between its main elements (humans, crops and cropland, cattle livestock, forests, bee pollinators and cacti) (the elements are presented in Photo-Table 1). Next, we describe the temporal interplay between the vulnerable social–ecological system and climate variability: how the system collapses during prolonged drought and then regenerates (Fig. 1). Finally, we present evidence that a moral attractor of the Tandroy culture, manifest in ritual practice, makes an essential contribution to the resilience of the agropastoral system and its ecosystem services (Photo-table 2). We discuss varieties of social-ancestral contracts and their broader relevance to research on ecosystem services and social–ecological systems. We conclude that shifting Androy's agropastoral system into less vulnerable pathways must take into account more than the ecosystem services of the agropastoral system; the moral order that contributes to its persistence must also be incorporated.

2. The theoretical foundation for analysis of the agropastoral system

We approach the analysis of key social and ecological components and feedbacks of the agropastoral system and its ecosystem services from a complex adaptive system perspective (2.1). We apply resilience thinking (2.2) to study the temporal dynamics and persistence of an agropastoralism exposed to climate shocks. Finally, we employ a theory of social imaginaries (2.3) to examine the cultural basis of the persistence of the Tandroy agropastoral system and the "social-ancestral contract" as a Tandroy social imaginary (2.4).

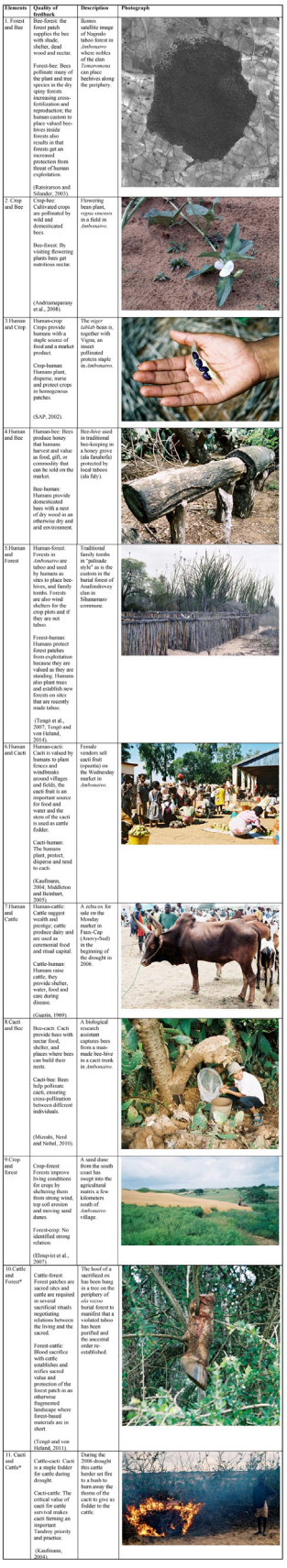

Photo 1. Critical feedbacks of the agropastoral system.