Biodiversity, Ecosystem services, Social sustainability and Tipping points in East African drylands (BEST) NERC ref.: NE/1003673

Pre-project activities

Prior to start up, the PI presented project plans at the 2010 ESPA conference in Edinburgh. All BEST participants then collaborated to recruit for the pivotal PDRA role. Following ESPA policy the recruitment process was both international and electronically managed and Dr Aidan Keane was appointed as the unanimous choice from a strong field.

Activities undertaken

The project began on 1 April 2011, the latest start date allowed by NERC, with ILRI staff working to collate datasets of potential importance. Dr Keane took up post on 1 May 2011 as full time PDRA until anticipated project end date 30 March 2013.

The overarching goal of the project is to investigate how policy and economic incentives can improve the management of East African rangelands through their effects on pastoralists' livelihood choices. Through review of the literature, datasets and possible approaches our specific research questions have been refined and focused down to include:

- How are pastoralist households' decisions regarding the allocation of land, labour and capital to competing livelihood options affected by the establishment of conservancies?
- What are the economic and ecological consequences of these decisions, and do they exhibit trade-offs?
- How do the effects of conservancies differ between households which participate in the conservancy and those which are excluded?
- How can policy and economic incentives be designed to encourage more economically and ecologically sustainable livelihood options to be chosen?

The project was devised to follow a logical sequence from system description through the development of household decision models to predictions and scenario analysis, and to allow comparisons to be drawn between several case study sites offering contrasts in their social, policy and environmental conditions. Since the start of the project, substantial progress has been made towards the system description component, and we have also started work on model development.

An evaluation of various candidate sites for case studies led us to focus our efforts on the pastoral areas adjacent to the Maasai Mara in southern Kenya in the first instance. Detailed datasets on the livelihood activities pursued by households in this area were collected in the Reto-o-Reto project covering the period from 1998-2000 and 2004, during which time the system of land-tenure and land management underwent a series of rapid changes. This situation continues to evolve, creating an opportunity for our research to feed directly into the development of better management practices in the area in the near future.

The PDRA travelled to Kenya for three weeks at the end of July to work directly with the International Livestock Research Institute (ILRI), one of the project's principal collaborating research organisations. During this time he spent 7 days in the Maasai Mara familiarising himself with the current situation and beginning the process of engagement through a series of meetings with key stakeholders in the area's community-based conservancies. The trip was also used to liaise with the fourth partner research organisation ATPS, primarily responsible for engagement and dissemination, and to initiate planning for the first of two stakeholder-engagement workshops envisaged by the project. This workshop has been provisionally scheduled to take place on 14 February 2012 in Nairobi and will be hosted and co-ordinated by ILRI, with all partner co-investigators attending as well as policymaker, practitioner and community representatives.

At the time of writing, we have collated the existing household-level information and a variety of biophysical data for the wider region (Southern Kenya/ Northern Tanzania and Northern Kenya/ Southern Ethiopia) – including maps of land cover, settlement patterns, infrastructure and the boundaries of the newly formed conservancies and private land holdings. Through ILRI we have also obtained a complementary dataset collected by the Government of Kenya's Arid Lands Resource Management Project II which provides additional detailed information on the dynamics of households' livestock herds and the contributions of other activities to the households' economies for the focal Mara region.

These data and discussions with stakeholders have been used to identify the key processes at work in the system and to develop a conceptual framework for understanding how these processes interact with one another to influence household decisions. Guided by this framework we are in the process of developing and parameterising a model to investigate how the availability of payments for conservation should be expected

to affect households' livelihood decisions, a key question for the project. The model uses a technique known as stochastic dynamic programming (SDP) to derive the optimal sequence of choices that a household can make in order to maximise the probability that it will survive over a fixed time-horizon, based on its current state and the possibilities that are available to it. Similar approaches have previously been used to model the decision-making of pastoralist populations and can readily be used to predict how such decisions should be expected to vary according to characteristics such as households' wealth, the availability of labour and the productivity of land.

Plans and expected deliveries over coming months

Our first priority for the coming months is to continue to develop the SDP model for the Maasai Mara. We will use this model to predict the outcomes of two contrasting land-tenure scenarios: one in which land is owned and used collectively, as is the case under the group-ranch system which still pertains in much of Kenya, and a second in which land is privately owned and the rights to exclusive usage are well enforced, the situation fast emerging around Mara, particularly with the current proliferation of conservancies. In particular, we will ask whether conservation payments are expected to subsidise the purchase of larger herds, to drive changes in the species composition of herds, and/or to prompt a diversification out of livestock-based livelihoods. Having established the baseline behaviour of the model, we will also investigate how household decisions and viability would be affected by plausible climate-change scenarios (e.g., an increasing frequency of severe droughts). We hope to be in a position to present the initial findings from our analyses at the ESPA workshop at the end of October.

Alongside the continued development of our models for the Mara, we also intend to expand the process of system description to two new case-study areas: the Longido district in northern Tanzania, where data were also collected as part of the Reto-o-Reto project between 2002 and 2005, and a group of sites from northern Kenya and southern Ethiopia where household data were collected from 2000 to 2002 as part of the Pastoralist Risk Management (PARIMA) project. We have already obtained copies of existing data from both of these areas and have started to examine them in detail.

The initial process of system description has also uncovered some important gaps in the existing data. In particular, there is little detailed behavioural information available to formally discriminate between alternative models of decision-making (it is usually assumed that people act to maximise their utility over the short-term, but several plausible alternatives have been described). Our final priority for the coming months is to write applications for small research grants to support the collection of data to directly address this gap. We have well-established links with relevant Masters courses (ICL Conservation Science; UCL Anthropology Environment and Development) as well as with postgraduate research programmes in Kenya and, if funding can be obtained, we will recruit one or more suitable students to carry out this additional research.

Plans for delivering impact

Date	*Event*	*Location*	*Audience/Impact*
August 2011	Community/ stakeholder meetings	Mara, Kenya	Initial community engagement
October 2011	ESPA conference	London	ESPA community dissemination
February 2012	BEST workshop + ILRI/ ATPS press releases	ILRI, Nairobi, Kenya	Policymakers, practitioners and community representatives: stakeholder engagement and feedback on initial work
Feb-March 2013	Community meetings	S Kenya/N Tanzania + N Kenya/S Ethiopia	Pastoralist/ agro-pastoralist communities; local government and NGO workers
February 2013	BEST workshop + ILRI/ATPS press releases	ATPS, Nairobi, Kenya	Policymakers, practitioners and community representatives: engagement and feedback on near-completed work
March 2013 and thereafter	Local language summaries and media releases	ATPS	Kenya, Tanzania and Ethiopia; Pastoralist and agro-pastoralist communities and extension workers
March 2013 and thereafter	Media releases Policy briefings	ATPS	Kenya, Tanzania and Ethiopia policymakers and practitioners
March 2013 and thereafter	Academic papers		PNAS, J Appl Ecol; Cons Biol; Curr. Anthro; World Devt; Devt & Change etc